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Electronic Musician

December 1993

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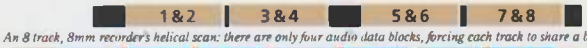
Its revolutionary impact on the recording industry has made ADAT the de facto standard in digital multitrack. The enormous number of ADAT users worldwide, the fact that Fostex has licensed the ADAT format for their own digital recorder, and the growing list of leading companies focusing on industry compatibility by becoming members of The ADAT Group™, all mean that when you choose ADAT, you're compatible with a vast array of music and audio equipment, now and in the future. And, you're supported by a network of professionally trained Authorized ADAT Service Centers worldwide.

The adat Group™

The ADAT Format – made for multitrack

ADAT records eight tracks of 16-bit linear, 48 kHz sample rate audio, with no data compression "tricks" or channel sharing. We chose Super VHS® (S-VHS®) tape as a foundation, then designed ADAT's data structure and heads specifically for the rough-and-tumble, back-and-forth, punch-in-and-out environment of multitrack recording. To make sure that recording one track wouldn't disturb any other track, we divided each helical scan into eight separate data blocks. Some digital recorders combine data from two different channels into the same data block on tape, which means that each time you record a track, another track must be read into a buffer and actually re-recorded even though it is in "safe" mode.



An 8 track, 8mm recorder's helical scan: there are only four audio data blocks, forcing each track to share a block with another.

An ADAT's helical scan: ADAT tracks are safely separated into 8 discrete data blocks. (Both vertical dimensions enlarged for clarity)

The 8 track, 8mm helical scan format risks introducing errors into "safe" tracks each and every time you press record.

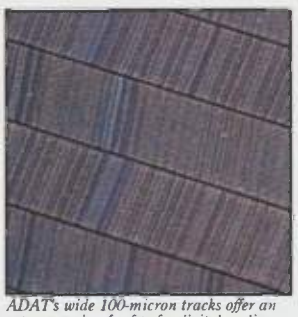
The ADAT format records each track discretely, as all professional multitrack recorders should.

Bigger is Safer

Microscopic contaminants in the studio aren't just probable, they're statistically inevitable. If the format can't overcome them, they'll cause mistracking, noise, distortion, even total muting of the audio. Formats smaller than S-VHS are more vulnerable to contaminants, dropout, and misalignment, especially when exchanging tapes between machines. One 8mm digital format attempts to squeeze the same amount of sound into one-tenth the tape area that ADAT does. ADAT's S-VHS tape offers more total surface area to meet the demands of digital recording, and its wider 100 micron tracks are five times less vulnerable to being derailed by dust. Because even though technology makes it possible to make formats smaller and smaller, dust stays the same size.

Comparison of tape areas for 1 second of audio: ADAT (1,211 mm²) and the 8 track, 8mm helical scan format (133 mm²).

Actual microscopic comparison of the ADAT tape format and the 8 track, 8mm helical scan format (enlarged approximately 100 times).



ADAT's wide 100-micron tracks offer an extra margin of safety for digital audio.

The 8mm's 20-micron tracks squeeze more data into the same area, with little room for error.

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than any other company. More than Sony. More than Mitsubishi. More than Yamaha, Akai, and Tascam combined.

More than just a tape recorder– The ADAT System

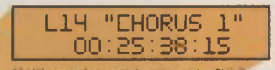
ADAT, when combined with the BRC™ Master Remote Control, is a complete digital recording and digital editing system with features that no other recorder, analog or digital, can match. The BRC is a full-function autolocator and MIDI/SMPTE time code chase-lock synchronizer. Plus, it controls digital copying between ADATs, like a disk-based recorder, but much simpler to use.

A fiber optic cable for digital connection is included with every ADAT.

The ADAT MultiChannel Optical Digital Interface digitally transmits up to eight ADAT channels at once over a single fiber optic cable to any track on any ADAT in the system without repatching, all in the digital domain. Now you can "fly in" that perfect vocal part to multiple locations in seconds, with absolutely no generation loss. And our new QuadraSynth™ keyboard has an ADAT digital interface so you can record it without ever leaving the digital domain.

The BRC Master Remote Control, shown with optional RMB™ Remote Meter Bridge, supercharges your ADAT System by adding SMPTE and MIDI synchronization, storable autolocation points, copy and paste digital editing and more.

ADAT/BRC digitally stores important session notes



Unlike analog autolocators, the BRC can recall 460 points, storable on each ADAT tape for later recall, so you can keep your mind on the project instead of having to remember minutes, seconds and frames.

Instead of scribbling notes on cumbersome studio track sheets, the BRC lets you store 400 autolocation points, 20 Song start points, punch in and out points, MIDI tempo maps, SMPTE offsets, and more in the two-minute data header of the ADAT tape. The BRC's alphanumeric display lets you name each cue point and song. It even has a handy built-in list of 16 standard cue point names you can edit.

The ADAT Worldwide Network

Thousands of ADAT Worldwide Network™ multitrack recording group members are reaping the benefits of choosing The ADAT System. As WWN members, they are able to collaborate and exchange ADAT tapes with other talented musicians, producers, composers and engineers throughout the world. Alesis is proud that so many creative people worldwide are using this American-made product, making ADAT the most popular digital multitrack tape recorder in history. The recording professionals below don't endorse ADAT, they *use* it every day. Their credentials speak for themselves. Visit your Authorized ADAT dealer and see what the new standard in digital multitrack recording can do for you.

Dave Rouze
Technical engineer for Larry Carlton, currently using ADAT to record all Larry's live concerts. 2 ADATs and a BRC

Jay Graydon
Two time Grammy® Award winning (twelve nominations) producer, engineer, writer, and guitarist. 4 ADATs and a BRC

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Country Music Hall of Famer. Producer of many legendary country music artists. 9 ADATs and a BRC

Francis Buckley
One of the top dance and pop engineers in Hollywood. 4 ADATs and a BRC

Web Staunton
Grammy-nominated chief engineer and studio owner. 3 ADATs and a BRC

Mick Guzauski
L.A.'s leading platinum mixdown engineer. 4 ADATs and a BRC

Andy Hilton
Owner and Chairman of the largest pro-audio equipment for hire company in the U.K. and Europe. Plenty of ADATs.

Ray Benson
One of country music's hottest producer/arranger/writers. 3 ADATs and a BRC

Tom Size
Has engineered and mixed a wide range of music from rock to legendary jazz. 3 ADATs and a BRC

Russell Brower
Two Emmys (eight nominations). Sound designer and producer for film, television and major theme parks. 2 ADATs and a BRC

Tim Wilson
Consultant and system designer for leading recording artists and songwriters. Has installed more ADATs than he remembers.

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Cover: Photo by Robert Perry.
Special thanks to Microsoft, MIDIMan, Roland, Shure, and Tascam.

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Whither MIDI?

After years of active development, the MIDI spec is starting to stagnate.

ANNE HAMERSKY

Few things have been more sure in the brief history of the electronic-music industry than constant, dramatic change. From new developments in synthesis technology to the looming presence of the all-digital studio, we've always counted on the fact that something better, faster, and cheaper is just around the corner.

This even applies to the core technical standards, such as MIDI, on which most of the industry's products are based. During its formative years, MIDI's caretakers (the MIDI Manufacturers Association [MMA] and the Japanese MIDI Standards Committee [JMSC]) generated many additions to the spec, including new Continuous Controller messages, Standard MIDI Files (SMFs) MIDI Time Code (MTC), and the Sample Dump Standard (SDS).

Recently, MIDI's development has slowed to a crawl. Since the introduction of General MIDI (GM) in 1991, Show Control in 1993, and MIDI Machine Control (MMC) in early 1992, little has been done to extend the spec beyond its current scope. In part, this could reflect how well some of these changes have been accepted. For example, GM's rapid adoption by synth makers and the computer industry brought renewed vigor and interest to MIDI.

However, MMC is off to a surprisingly slow start. Nearly two years after its formal introduction, few products support MMC, even though several manufacturers were involved in its creation and many more pledged support. Of course, MMC is an enormous, far-reaching extension to MIDI and implementing it takes time. On the other hand, GM is merely a formalization of certain parts of the standard that many manufacturers had already started to accept.

Some manufacturers claim that part of the reason for the delay is the low demand for MMC (and other additions to MIDI) from the buying public. In fact, you can probably correlate the slowdown in MIDI's development to the general plateau in the electronic-music market after years of explosive growth. Others argue that most of the existing spec's development was driven by technical necessity rather than consumer demand.

Regardless of what caused the slowdown in MIDI's development, a more important question should be asked: Does it matter?

Apparently, some members of the MMA aren't concerned because they believe MIDI is basically finished. They think people should concentrate on developing applications for what currently exists. Others are frustrated by the lack of movement and believe important extensions can and should be made.

Although I understand and appreciate the concerns of the first group, I don't believe MIDI is finished. Several important extensions would greatly ease the day-to-day use of MIDI hardware and software. For example, I would like to see an extensive polling protocol that software manufacturers could use to automatically determine what is connected to the computer. If an instrument doesn't respond, the software could simply request the user to fill in a few basic specs about that gear. In addition, the SMF spec would be more useful with extensions for digital-audio pointers and notation.

MIDI has made tremendous strides in its 10-plus years of existence. From yesterday's simple keyboard layering to today's complex, computer-centric sequencing environments, the music-making chain of composition, recording, and performance has been transformed by the capabilities of MIDI-equipped gear. Here's hoping the future will bring us many new MIDI-based opportunities.

Bob O'Donnell

Electronic Musician

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BPA INTERNATIONAL

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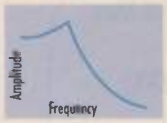
The Future. Plane and Simple.

Does the world of electronic musical instruments seem like it's stuck in an endless rut? New bells. New whistles. Same old sound...

Well, if so, take E-mu's new Morpheus™ Z-Plane™ Synthesizer for a test drive. Sure, it's got bells and whistles in abundance. But it's got something else that sets it apart from the digital crowd: new sounds and expressive control that you've never experienced in a MIDI instrument.

At the heart of Morpheus is E-mu's new Z-Plane Synthesis technology. Unlike the simple 2-or 4-pole filters of traditional synthesizers, Morpheus' 14-pole Z-Plane filters are capable of modeling virtually any resonant characteristics and then interpolating (or "morphing") between them in real time.

Imagine sending a saxophone through the body of a violin and then smoothly morphing it into a distortion guitar. Or send a piano through the resonances of the human vocal tract pronouncing a variety of vowels. Or sweep a synth pad with 32 polyphonic flangers. Or use a mod wheel to control the subtle timbral changes that result from picking an acoustic guitar at different distances from the bridge. These are just hints of what Morpheus is all about.



Traditional Synthesis

Single, 4-pole lowpass filter with resonance.

Z-Plane Synthesis

Allows you to "morph" sounds through multi-dimensional, 14-pole filters.

And remember those bells and whistles? Morpheus gives you everything you need to harness its Z-Plane filters. Like a seriously enhanced version of our powerful MIDIPatch™ Modulation System. Like multi-segment function generators for microscopic sound-sculpting. Like a new Hyper-Preset mode that lets you split, layer and cross-switch between 16 presets at once—for sounds so thick you can swim in them.

And since Morpheus is from E-mu, all this power comes wrapped in the industry's clearest, most straightforward user interface. Add 32-voice polyphony, 16 part multi-timbral operation and dual stereo effects processors, and you've got the synthesizer to move your music into the next century.

Best of all, you won't have to wait for the next century. Check Morpheus out today at your local E-mu dealer. Where the future is now.

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If I'd known about this, I would have cut off my nose instead.

Being the visual person he obviously was, Vincent Van Gogh would have instantly appreciated the new JV-1000. Because unlike so many instruments that look exactly like so many other instruments, this particular synthesizer workstation looks unlike anything you've ever seen before. And as you'll learn in a moment, it also performs unlike anything you've seen before. But, we're getting ahead of ourselves.

See the LCD display? The one on the left or the one on the right, you ask? And that's the point, because the new Roland JV-1000 actually has two of them—one for the synthesizer and one for the sequencer.

With the JV-1000 we've integrated our remarkable synthesis, waveform and sequencing technologies into a single unit that provides unrivalled music production and performance capabilities along with a 76-note keyboard.

The synthesizer section has 4Mbyte of ROM waveforms, which encompass everything from breathtaking acoustic instruments to dynamic synthesizer textures to an extraordinary array of drum and percussion sounds.

And if you'd like to expand the waveform memory

Roland Corporation US,

World Radio History

further, get your hands on any of our SR-JV80 series of 8Mbyte Expansion Boards or PCM waveform cards.

If you wish, you can also take advantage of a user-installable Roland VE-GS1-01 Expansion Board and in the process, add a complete GS synthesizer module. You'll be rewarded with 226 sampled sounds, drum kits and digital effects, as well as an additional 28 voices of polyphony and 16 part multi-timbral capability—giving you an extraordinary 56 voices of polyphony and 24 part multi-timbral performance literally at your fingertips.

The sequencer on the JV is our widely acclaimed Super MRC with eight tracks, each of which has 16 channels. A staggering array of editing capabilities gives you easy access to every event on every track.

The 3.5" floppy disk drive can save and load both your Super MRC sequencer files and SMF, or Standard MIDI Files, thereby giving you access to the extensive Standard MIDI/GS library that's now available. And your sequences can easily be loaded to and from any other sequencer using the SMF format.

The 76-note keyboard is both velocity-and after-touch-sensitive. It's capable of controlling up to eight external MIDI channels simultaneously, each with its own independent key zone and volume, panning, velocity curve and program change.

You'll find eight control sliders on the front panel which can be used either for editing sounds, for mixing volume and panning on sequenced tracks, or even for external MIDI control. Consequently, the JV-1000 works beautifully as a MIDI master keyboard.

By now you no doubt appreciate that the new Roland JV-1000 is a truly remarkable workstation. All that's left is to play one at your music store. You'll appreciate your ears as never before. Roland®

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It's got POWER

It's Simple to use

It feels good and affordable

POWER

Program versatility is what today's musician wants and it's built into the Studio 900. You are fully in command of program changes, bank select, Midi channel assignment and transpose modes providing control over an infinite array of sound sources. Pitch and a programmable wheel with 127 control functions makes volume, pan, after touch, pitch and modulation changes a breeze.

Simple

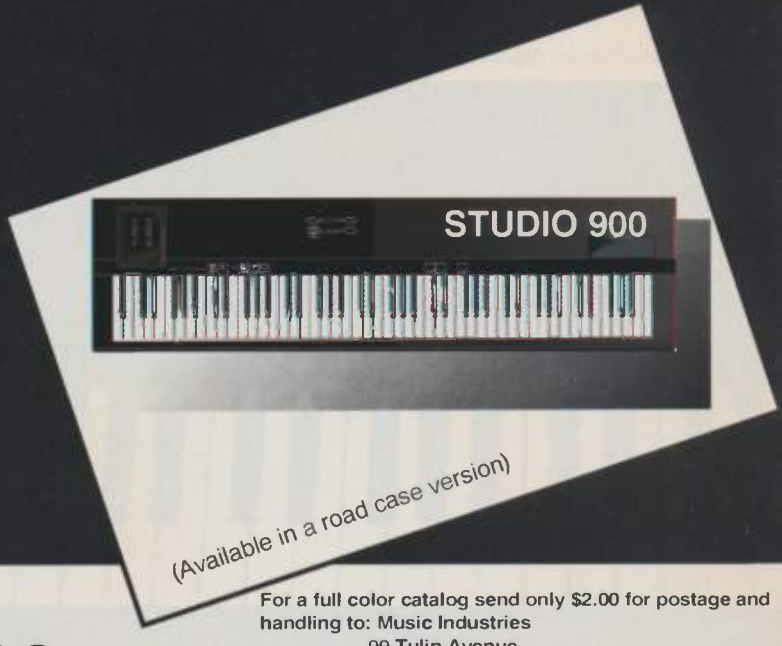
It's easy to play too! You will be having fun creating today's music right out of the box. The icons and symbols are an integral part of the keyboard design providing fast learning and quick response. We have made it simple so you don't have to be a rocket scientist.

feels good

The minute you strike a chord, you'll know this instrument will perform even for the most sensitive musicians. Full 88 weighted keys with hammer action that are velocity sensitive give crescendo a new meaning.

affordable

Fatar technology not only built great features and superb action into the "Studio 900" but affordability as well. You will be plesantly surprised at the modest price and how easy it is to own one.



(Available in a road case version)

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EQ TIP

I enjoyed the article "Recording Musician: EQ Workshop" (October 1993), but you failed to mention my favorite tip for getting the most out of a parametric equalizer.

The instinctive way to use a parametric equalizer is to set it for some amount of boost, then twiddle the frequency until the instrument or track sounds better. But what is often wrong with a track is an abundance of harmonics and other components that sound bad. A better way to improve many tracks is to set a moderate (6 to 8 dB) amount of boost and sweep the frequency control to find the range that sounds the worst. Once you determine this optimum setting, set the boost/cut back to zero, and wait a moment for your ears to get used to the track's original timbre. Finally, cut the gain in that frequency range by a varying amount until the sound is the way you like it.

Ethan Winer
West Redding, CT

ORCHESTRAL MANEUVERS

Paul D. Lehrman's contention that orchestral music mixed with modern synthesized sounds is "the stuff Stravinsky could only dream about" ("The Electronic Orchestra, Part 2," October 1993) is just plain silly. I think possibly the reverse is true: Many synthesists, including myself, dream of ways of getting their one-dimensional MIDI instruments to match the depth of expression and invention Stravinsky accomplished over 80 years ago.

The idea that we have certain "predictable emotional reactions" to orchestral sounds is unfortunately part of a pervasive ignorance of classical music. I would suggest that the challenge is to extract soul or musicality out of the relatively sterile "millions of unique and evocative sounds" created by modern MIDI gear.

I use synths and samplers every day, creating music for commercials and TV soundtracks. For reasons of economy, I'm often called upon to approximate the sound of a live orchestra. But the minute Mr. Lehrman starts implying we're better off musically because of MIDI, or comparing Stravinsky's complex orchestrational technique to patches dialed up on a rack module, he's skating on thin ice. Perhaps he will bring to this glorious new world of music the equivalent of film "colorization" and improve some of those dated classics for us. (The *Rite of Spring* could use a nice stereo pad here and there...)

Carl Wurtz
Burbank, CA

It was with great interest and delight I read Paul Lehrman's article on the electronic orchestra ("The Electronic Orchestra, Part 1" September 1993). I have used many of these same techniques and have obtained more than satisfactory results.

This is not to say I haven't had my share of problems when translating a score from the printed page to MIDI. Balancing the woodwinds is particularly difficult. I have found that even though prepatched woodwind sounds from the same synth sound good separately, they usually sound out of balance when combined. I got around this problem by using samples taken from the same studio, same location, same microphone, same mixing console, and same sampler. Certain string ensemble articulations, such as a long, bowed, chromatic 32nd-note run, have also been giving me headaches, but I just use legato fingering and overlay the part three to four times.

Peter Buchta
Staten Island, NY

ANALOG LIVES

After years of multitracking on 4-track cassette, I decided the time had come to move on. After extensively researching all the new, affordable, digital-multitrack recording media, I put together enough dough to purchase the unit I liked best. I ended up with a good ol' 8-track, ½-inch, 15 ips analog recorder. Although some of my musician friends think I'm a little loony, I know I made the right decision. In all of my research and listening tests, nothing digital sounded as warm and fat as an analog deck with dbx or Dolby S. Period.

Thanks for the article on analog recording ("Recording Musician: Putting a Sparkle on Analog," September 1993). I can completely relate to Mr. Brighton's remark, "There's something weird about [digital recording's] high-end resolution." It's refreshing to know that **EM** is not abandoning analog recording and jumping on the all-digital bandwagon.

Justin Billen
Greeley, CO

BACK TO SCHOOL

Thank you for the many informative articles regarding MIDI, and thanks also for "Cool Schools" (September 1993). I am a professional trombonist of 25 years who recently entered the MIDI world. I've learned a lot from reading **EM** and from local music store reps; however, my education has been slow and frustrating. (My teaching gig leaves me precious little time to devote to my MIDI setup, let alone my trombone chops.)

After reading the article, I contacted Bill Purse, chairman of the Music Synthesis and Guitar Departments at Duquesne University in Pittsburgh, Pennsylvania. Bill was very helpful in recommending several books and summer workshops geared to address my

DAVID SMITH

World Radio History

education needs: sequencing for live performance and pre-recording sessions.

Thanks for helping me get on the right track—digital, of course.

Thomas F. Jenkins
Wilmington, OH

BUYER'S GUIDE BLUES

I have just finished studying your "Notation Software Buyer's Guide" (August 1993). And, as always with your "Guidebook" articles, I am left with a combination of great quantities of information and a good bit of confusion.

I have used the same scoring program for nearly three years, producing absolutely gorgeous scores and hating every minute of it. Having just finished a large orchestral piece, the scoring of which I thought surely would be the end of my sanity, I decided it really was time for a change. So I looked toward your article as the sure arrival of the Electric Messiah.

Of course, it was not. My program was in there with the rest, but none of its painful weaknesses were highlighted, and its distinctive strengths were barely noted. It neatly slid in with the crowd: just another one of the gang. Horrors! Are they all this bad?

Of course they aren't. Friends who have other notation programs tell of widely varying strengths and weaknesses, none of which are brought forward in your article. The problem, I am sure, is your format and style: The tables give information that is good for flushing out the real duds. But the strong programs still stand shoulder-to-shoulder.

I'm sure every one of the top programs has its strong points. What I really need to know is which one is strongest where it counts? Which one casts off the best? Which one is easiest to set lyrics in? Which one preserves most formatting from score to parts? Which one crashes all the time? Which one forces you to learn impossible codes that inspire mistakes by their complexity? Which one has a useless manual? Specific answers to questions such as these would have been a big help.

I think it's time to swallow hard and give us some specific, subjective input in these guides. Then next month open up three more pages of your letters column for a real World War.

David Tcimpidas
Livingston Manor, NY

BINAURAL PLEASURE

In reference to Jeff Hadden's letter (August 1993), binaural recordings can be obtained through a company called The Binaural Source. They have a catalog of several dozen recordings produced in the binaural format. Their address is PO Box 1727, Ross, CA 94957; tel. (415) 457-9052.

Ron Grove
Toms River, NJ

TECHNO-PIONEERS

I've noticed one thing about your Pro/File section: It seems to ignore the musicians out there who are really expanding the sound of electronic music. Take for example the last couple issues: Faith No More? Skatenigs? Sure, it's great to have variety, and it's nice you credit bands who are unlikely to use MIDI. But what about the pioneers of the current sounds of electronic music? How about Erasure's *Abba-Esque* album, an excellent example of orchestration, different sounds and samples, and incredible vocals. Or Information Society's *Peace and Love, Inc.*, with brilliant harmonies and a cutting-edge sound. Don't forget to recognize those who put us "techno-pioneers" where we are now.

Benjamin Baker
Keene, NH

THE COST OF A STAMP

I am writing to put in my 29-cents worth regarding the large number of multimedia articles published in recent months. Although I have a marginal interest in video production, my main focus is music for live and studio gigs and occasionally for video or film.

Are subscribers asking for more multimedia articles, or have a few influential subscribers (or writers, or advertisers) led to this change? Perhaps there is another trade publication that deals with this more in-depth (the way **EM** does with music) that could better satisfy interested readers and cure your magazine of the split personality it seems to be developing.

John Carroll
Eugene, OR

John—The purpose of the "Multimedia Musician" column is to cover exactly the types of things you are interested in: doing the music and audio for non-music specific projects. We started the column and have included a few other articles covering multimedia because we've found many musicians are getting jobs doing this kind of work and are interested in more information.—BO'D.

THE FUTURE

Try to imagine, 50 years from now, a person sitting in front of a computer, scoring countless movies and hit soundtracks at the push of a button. Can you call what that person is doing writing music?

That mindset is already here. Take a look at the terms used by musicians today:

1. People don't write music, they sequence it.

2. Music is stored not on manuscript, but on hard drives.

3. Many articles have been written (some in **EM**) about how to imitate bands and how to have computers write the music people should be writing.

With all of the progress made on computer-generated music, can you truly be sure that twenty years from now people will be writing music, not writing the programs/algorithms to do it for them? [*No, we can't be sure.—BO'D*] Don't worry, even though I don't agree with many articles you write, I still enjoy reading them and will continue to subscribe.

Jeremy Selan
Skokie, IL

ERROR LOG

October 1993, "What's New," p. 18: The transmitter, not the receiver, for Aquila Systems' MR2 MIDI wireless system is powered by a 9V battery. Expected battery life is at least six hours with Ultralife lithium batteries and three hours with rechargeable NiCads. The receiver uses an external, 12V supply.

October 1993, "Build the EM Hiss Whacker," p. 81: The internal VCA has a nominal gain of 1, not zero.

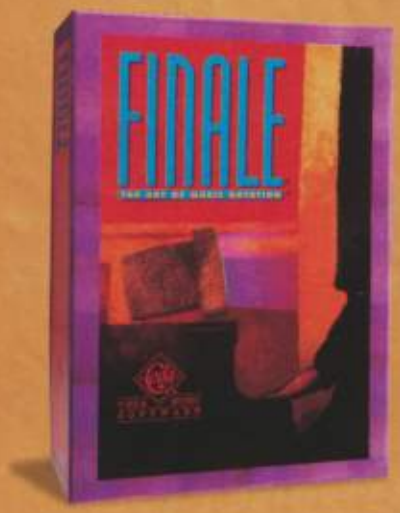
We welcome your feedback.
Address correspondence to "Letters," Electronic Musician, 6400 Hollis St. #12, Emeryville, CA 94608. Published letters may be edited for space and clarity.

World Radio History

WHAT DO

Jurassic Park, The Baptist Hymnal, Malcolm X, *The Chicago Symphony*, Frank Zappa, The Tonight Show, Sesame Street Songbook, Hal Leonard Publishing *and* A Few Good Men

HAVE IN COMMON?



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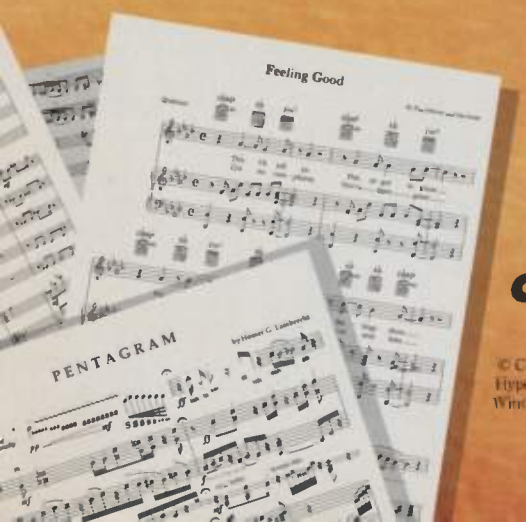

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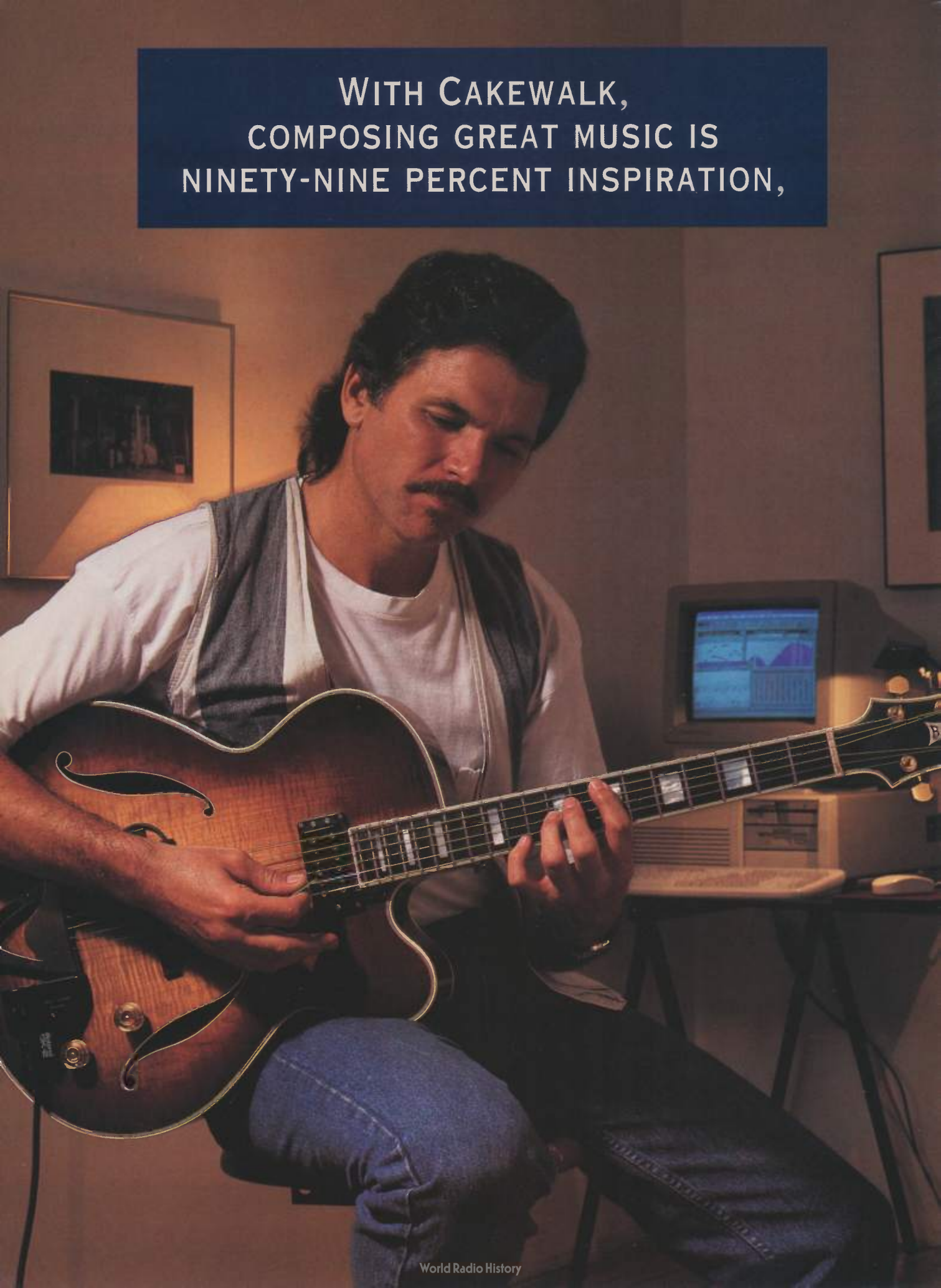


World Radio History

ONE PERCENT PERSPIRATION.

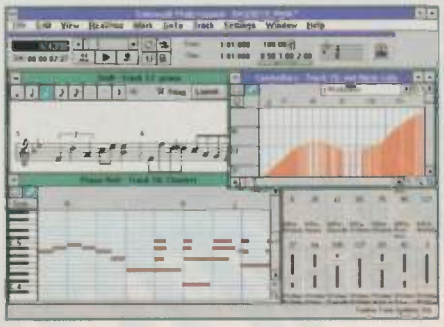
Cakewalk Professional for Windows™ 2.0 is the MIDI sequencer that's powerful enough to transform your inspirations into compositions. Yet it's no sweat to use.

MAKE A NOTATION OF THIS.

Cakewalk Professional works in concert with you every step of the way. In fact, new version 2.0 not only helps you create your compositions, it also prints them. The multi-track Staff view lets you edit and print up to 16 staves in multiple key signatures, as well as title, performance instructions, author and copyright information. It even displays and prints triplets. All in the font size you select.

YOU'LL LOVE THE VIEWS.

With Cakewalk Professional, composing music is an aural and visual experience. You can use the Piano



Roll view to insert, resize and move notes in a grid. The detailed Event List view lets you edit MIDI and multimedia events on multiple tracks at once. Use the Track/Measure view to assign track parameters like MIDI channels, instrument patches and key offsets, even in real-time.

Cakewalk
PROFESSIONAL
for Windows

Other extraordinary Cakewalk Professional features include a Controllers view, a variable timebase of up to 480 pulses per quarter note, a Markers view for creating text "hit points," an Event Filter and on-line help screens.

NEW WAYS TO COMPOSE YOURSELF.

Cakewalk Professional 2.0 offers other new features like:

- Play List view for live performance
- 48 assignable faders (16 sliders, 32 knobs)
- Real-time editing
- Remote control from MIDI keyboard
- "Hot Key" macros
- Loop record
- Punch record on the fly
- Big Time display

INSPIRED YET?

If you feel inspired to find out more about Cakewalk Professional for Windows 2.0, or to learn the name of the dealer nearest you, give us a call at **800-234-1171** or **617-926-2480.** Cakewalk Professional lists for just $349. If you'd like, we'll send you a demo disk for just $5 so you can see and hear Cakewalk Professional for yourself.

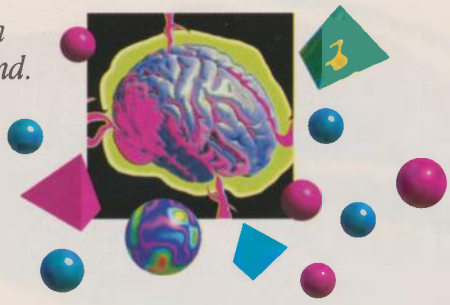
Twelve Tone
SYSTEMS
P.O. Box 760, Watertown, MA 02272

System Requirements: IBM PC with 10 MHz 80286 or higher, 2 MB of RAM, mouse; Microsoft Windows 3.1. Supports any combination of up to 16 MIDI ports on devices with Multimedia Extensions drivers (including Roland MPU-401 compatibles and Music Quest MQX interfaces). Cakewalk Professional for Windows is a trademark of Twelve Tone Systems. Other products mentioned are trademarks of their respective owners.

World Radio History

This is your brain.

This is your brain on Super 3D sound.



Bored with your boards? Try a swift kick in your musical inspiration with the Super 3D Sound of a Kawai X50-D. To be brief: you've never before heard sound this good coming from an all-in-one keyboard-controller-drumbox-recorder-player. Skeptical? Believe it. The secret is an all-new carefully crafted design with four multi-directional speakers plus additional sound processing. The name is Super 3D. The experience is incredibly big.

We add to that some of the best instrument samples you've heard—even at three times the price—all with General MIDI compatibility and Digital Reverb. Want to try something new? Hit any one of the hundred accompaniment styles available and you're expanding your range with exciting new music. Like what you just played? Dump it into the song Recorder, with 5 Track Overdubbing up to 3000 notes.

For the pro, the X50-D's a dream: set up, plug in, and turn on—there's never been a better shortcut to musical experimentation. For the rookie, it's a miracle: hit the One Finger Ad-lib button—you're playing better music faster than ever before. For the Multimedia artist, it's a lifesaver: connect via the convenient MIDI jacks—the best all-in-one music box you can buy.

But OK, we know this is only an ad—you actually have to go down to your dealer to find out if we're being honest (we are). Energize your imagination with a mega-dose of X50-D musical firepower. And have some fun while you're at it. For only $699.00 retail, you can reinspire your brain with very little pain.

WIN A KAWAI SPRINGTIME IN JAPAN...and Loads of Other Prizes! Try or buy any Kawai product and you're immediately eligible for our exciting new contest! See your dealer for details!

KAWAI

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WHAT'S NEW

▲ YORKVILLE YSM-3

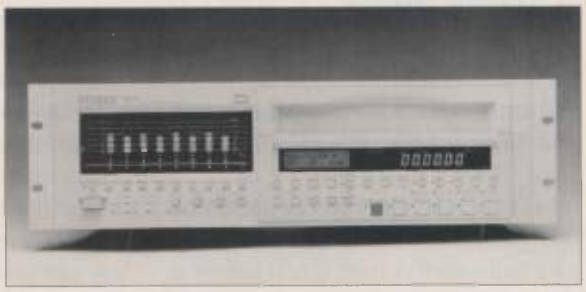
Yorkville's YSM-3 ($499 ea.) is a 3-way studio monitor that includes a 12-inch woofer; a 5.5-inch mid-range driver made of new polymers; and a 1-inch, hyperbolic, dome tweeter. The crossover points are 700 Hz and 3 kHz. The speaker handles up to 250W (program) into 4 ohms.

According to the manufacturer, the system uses optimized crossover routines and high-grade components to achieve a smooth frequency response and exceptional clarity for "fatigue-free" listening. Frequency response is rated at 35 Hz to 20 kHz (±3 dB). The YSM-3 measures 25.75 x 16.8 x 11.5 inches and weighs 45 pounds. Yorkville Sound; tel. (716) 297-2920; fax (716) 297-3689.

Circle #401 on Reader Service Card

▶ FOSTEX RD-8

Fostex is shipping the RD-8 8-track, digital tape recorder ($4,799). The machine is fully Alesis ADAT software- and hardware-compatible and records on S-VHS tape at 44.1 or 48 kHz, with 16-bit, 64x oversampling A/D converters. In addition to -10 dBV and +4 dBu analog I/O, the RD-8 offers the ADAT-format, 8-track, optical digital interface. Frequency response is rated at 20 Hz to 20 kHz (±0.5 dB) and crosstalk at better than -90 dB; there is no measurable wow or flutter.



The RD-8 supports up to 100 locate points, and its Auto Record function provides precise, microprocessor-controlled punches. Crossfade time is fully controllable for machine-to-machine assembly editing. More than 40 operating parameters can be stored on tape in a table of contents, so you can quickly restore a particular setup.

The machine contains an all-format, SMPTE/EBU time-code generator/reader (with MTC conversion) that does not use a tape track. The time code is recorded to a sub-code area of the tape. The onboard synchronizer provides full chase-lock, with offset, and the RD-8 can also sync to external clock. For video applications, the RD-8 can be controlled via RS-422 and offers time-code pull-up and pull-down functions for transfers between film and video. A Track Slip function (up to 170 ms delay) helps maintain sync to picture.

A backlit, variable-contrast LCD shows offsets, punch points, generator functions, etc., and most operations are no more than two levels deep in the user interface. Fostex's Model 8312 remote controller (included) provides tranport functions and lets you select two locator points. Fostex; tel. (310) 921-1112; fax (310) 802-1964.

Circle #402 on Reader Service Card

▶ S&S INDUSTRIES SQUADRON

S&S Industries announced the Squadron ($1,099), a 6-piece, electronic drum kit comprising a 10-inch, dual-trigger pad; three 8-inch, dual-trigger pads; a 6-inch, dual-trigger pad; and a bass-drum trigger pad. The kit includes an all-metal Gibraltar rack and eleven cables with cable straps.

The Stinger P1, P2, and P3 dual-trigger pads have real drum heads and rims, with triggers on pad and rim for triggering two sounds. Mono and stereo output jacks are provided. The ST7000 bass-drum trigger pad works with most standard kick-drum pedals and comes with a black maple, reverse-angle beater. Industrial velcro on the bottom prevents slippage, and a proprietary Resilient Compression Chamber design isolates the triggering device from vibration and impact. The Squadron kit is compatible with most trigger-to-MIDI modules. S&S Industries; tel. (408) 629-6434; fax (408) 629-7364.

Circle #403 on Reader Service Card

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▲ LEXICON JAMMAN

Lexicon's 1U rack-mount JamMan ($449) is a sampling delay with a user interface that describes tempo and delay-time in musical durations, rather than milliseconds.

In Echo mode, the Tap Tempo feature lets you set the delay time by tapping on a footswitch or front-panel button at the desired tempo. You can cut the delay time by half, a third, or three-quarters (e.g., changing a quarter-note echo to an eighth note, eighth-note triplet, or sixteenth note).

In Sampling mode, you can trigger sample-record or sample-playback via a footswitch, front-panel button, or audio trigger (input-level threshold). Samples can be played backward. In Loop mode, you can create a rhythmic, infinite loop, then overdub additional parts or play on top of the loop. JamMan can sync to external MIDI Clock, or can calculate the tempo and send MIDI Clock. Up to eight loops can be created, depending on the loop length and available memory.

The JamMan provides eight seconds of delay, which can be expanded to 32 seconds with PC-type ZIP RAM. All front-panel controls can be MIDI-controlled, and a dual footswitch for the Tap and Reset/Bypass functions is included. A dual footswitch for the remaining controls—Select and Function—is optional. Lexicon; tel. (617) 736-0300; fax (617) 891-0340.

Circle #404 on Reader Service Card

▶ EAW MS103 & MS63

Defying conventional wisdom, Eastern Acoustic Works designed its 3-way, Forsythe Series MS103 ($1,295) and MS63 ($1,095) speaker systems to serve as either studio monitors, or high-output sound-reinforcement speakers. The MS103 uses a 15-inch woofer and the MS63 a 12-inch woofer. Both systems couple the woofer with a 6-inch, carbon-fiber, midrange driver and a soft-dome tweeter. The stiff, carbon fiber is said to provide minimal distortion at high output levels, yet has low mass for accurate transient response. According to the manufacturer, the soft dome tweeter offers higher internal damping and lower inherent ringing than metal domes, producing good HF response with less ear fatigue. EAW's

proprietary WGP waveguide maintains dispersion at 100° above 500 Hz.

The speaker enclosures use minimum-diffraction baffles, midrange and high-frequency sub-enclosures, and woofer vents. The systems are designed with mirror-image, L/R cabinet pairs. Hanging hardware is integrated into the cabinet.

The MS103 can handle 700W (into 4Ω, AES standard) to produce 123 dB SPL at one meter, with a frequency response of 40 Hz to 19 kHz. The MS63 can handle 400W (into 4Ω) to produce 121 dB SPL, with a frequency response of 50 Hz to 19 kHz. Both systems have passive, fourth-order, 24 dB/octave crossovers. The MS103 is optimized for biamplification, using EAW's MX200i or MX300i signal-processing unit, which provides phase-compensation delay. Eastern Acoustic Works, Inc.; tel. (800) 992-5013 or (508) 234-6158; fax (508) 234-8251.

Circle #405 on Reader Service Card

▶ CB LABS PRX-902

CB Labs' PRX-902 ($259) is a footpedal that reproduces the sound of an overdriven tube amp. The tube-amplifier emulator does not use heavy compression and is designed to retain the unique tonal dynamics of the guitar, pickup, and performer. According to CB Labs, the product's MOSFET buffering provides a combination of low noise and high gain that is especially desirable for studio applications.

The PRX-902 includes an active, 3-band EQ that affects the distortion range. A Gain control affects distortion, sustain, and harmonics, and there is a separate Output level pot. The Contour settings let you select ten different sounds, including Miked Amp, Open Back, Closed Back, three kinds of tube sounds, two Presence EQ settings, and two preprogrammed notch filters. The Contours can be modified with the Lead switch, which provides mid and high boost for increased pick attack, and the Attack switch, which boosts lows and highs for a fatter sound at low volumes. In addition to its ¼-inch, instrument-level input, the unit has ¼-inch, line out; XLR out; and headphone out jacks. It operates on a 9V alkaline battery or AC adapter (included). CB Labs; tel. (203) 335-1093; fax (203) 331-9214.

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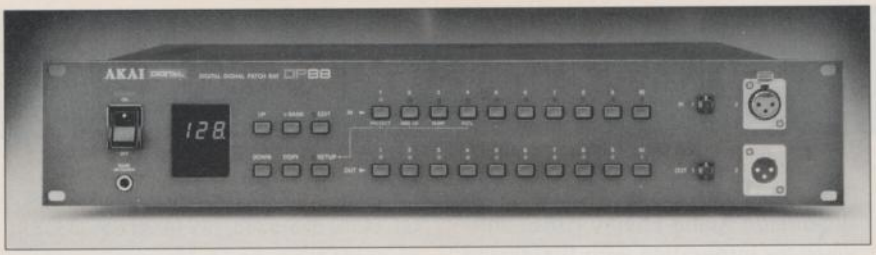


▲ AKAI DP88

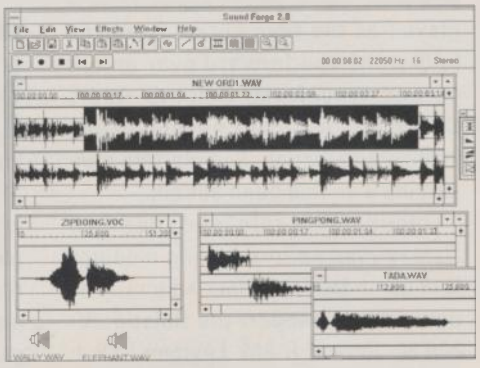
Akai introduced the DP88 Digital Signal Patch Bay ($1,095), a 2U rack-mount, programmable, 10 x 10 digital signal-router. The unit has eight XLR inputs and outputs and two optical I/O connectors, providing an electrical/optical interface. One XLR I/O pair and one optical pair are located on the front panel, and the others are on the rear panel.

Programmed setups can be stored in up to 128 memory locations and can be selected from the front panel, with a footswitch, or by MIDI Program Change commands. Akai/IMC; tel. (817) 336-5114; fax (817) 870-1271.

Circle #407 on Reader Service Card

▶ SONIC FOUNDRY SOUND FORGE

Sonic Foundry released *Sound Forge* 2.0 ($179), an audio waveform editor for the PC and *Windows* 3.1. Editing features include cut, copy, paste, mix, crop, crossfade, replicate, and replace. The program supports "drag-and-drop" editing between windows, and you can drag one channel of a stereo file into a mono file and vice-versa. Sound Forge provides sample-rate conversion (at rates from 2 kHz to 60 kHz) and lets you convert stereo files to mono and 16-bit files to 8-bit. Up to 40 soundfile windows can be open simultaneously for each 2 MB of system RAM.



Effects include delay, predelay, distortion, flip, fade, pan, resample, reverse, volume, normalize gain, and noise gate (with attack and release). Processing can be applied to one channel of a stereo file, and you can draw custom pans and fades.

Forge lets you edit not only standard WAV files, but Creative Labs VOC, Macintosh AIFF and SND, Amiga SVX, Covox VB, Dialogic VOX, Turtle Beach *SampleVision*, and NeXT/Sun audio files. It also supports Microsoft ADPCM and Dialogic VOX ADPCM 4:1 compression formats. Other features include zoom, on-line help, and the ability to enter text comments, a copyright notice, creation date, etc. Sonic Foundry; tel. (608) 256-3133; fax (608) 256-7300.

Circle #408 on Reader Service Card

▼ WAVES Q10

Israeli developer Waves, Ltd., announced *Q10* ($399), the first third-party, software plug-in for Digidesign Pro Tools, ProMaster 20, Sound Tools II, and Audiomedia II systems. A version for the original Sound Tools is expected soon.

The software provides ten stereo bands of fully parametric, IIR filtering, including high and low shelving and highpass and lowpass filtering. The left and right channels can be equalized separately, and multiple bands can be adjusted simultaneously. You can adjust any parameter by clicking and dragging the graph, or adjusting the displayed values. Gain is adjustable by ±18 dB, center frequency from 16 Hz to 21 kHz, and "Q" continuously from 0.5 to 100. The filters are noise-shaped to provide at least a 110 dB signal-to-noise ratio in the digital domain.

Q10 offers an A/B Compare function, parameter copy/paste, and global Undo. It has input and output gain trims, VU metering, overflow counters, and peak indicators that count each occurrence of digital 0 dB. Rockwell Digital (U.S. distributor); tel. (310) 315-3480; fax (310) 315-1913.

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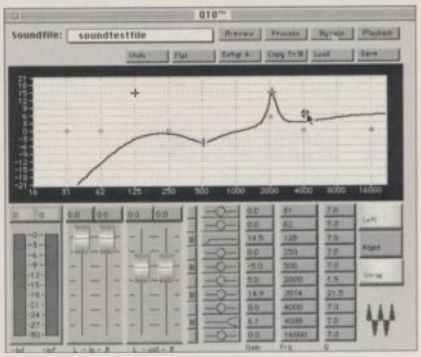

▶ KURZWEIL MICROPIANO

Kurzweil's half-rack, stereo, MicroPiano sound module ($499) offers five sampled instrument sounds, including grand piano, ensemble strings, Hammond organ, Rhodes piano, and FM-style electric piano.

The 32 factory presets comprise full-keyboard setups, splits, and layered sounds. The MicroPiano's global tuning and transposition parameters are user-programmable, and the instrument offers both stretched and non-stretched tuning options for its piano sound.

The MicroPiano's digital effects processor can produce sixteen different reverb and chorus effects. Kurzweil Music Systems; tel. (310) 926-3200; fax (310) 404-0748.

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REV UP ▲ ▲ ▲ ▲ ▲

▲ SOUND QUEST

Sound Quest released *MIDI Quest* 4.0 for *Windows* 3.1 ($319; upgrade from version 3.0 $75), DOS, Macintosh, Amiga, and Atari ST ($299; upgrade from version 3.0 $59). The universal editor/librarian now supports over 180 MIDI devices and adds window-icon bars. The graphic editors are improved, including automated MIDI-channel selection in the Multi/Combi editors. The *Windows* version has a native *Windows* implementation, including standard fonts, sliders, and icons. Sound Banks can be exported directly into Twelve Tone Systems' *Cakewalk*, so you can select patches by name when sequencing. Sound Quest; tel. (800) 667-3998 or (604) 874-9499; fax (604) 874-8971.

Circle #411 on Reader Service Card

▶ OPCODE SYSTEMS

Opcode Systems announced *Studio Vision* 1.5 ($995; upgrades from 1.4 $99). The new version of the integrated sequencing/hard-disk recording program supports 4-channel recording using Digidesign Audiomedia I/II, Sound Tools I/II, and Pro Tools. It offers simultaneous 4-channel I/O with Sound Tools II and Pro Tools hardware and 2-channel I/O with the other systems. The program also supports Digidesign Audio Engine (DAE) software for integration with Digidesign hardware, including the TDM bus, which routes audio data among compatible NuBus cards.

Version 1.5 also includes MIDI Machine Control support; a new *AV Controls* application allows tape-track enabling and full transport control. The program can now send MTC, and Click in Countoff is available while synched to SMPTE. Audio scrubbing has been added, where digital audio is played as the Mac cursor is moved backward and forward over an on-screen waveform. Smooth Audio Controllers improves audio pan and volume automation. Sample-rate conversion also has been added.

Opcode also released four new *Galaxy Plus Editors* editing modules ($49 each; $99 for all four editors). The new editors support the Roland JV-80/880, Roland R-8M, Lexicon LXP-1, and Korg O3R/W and O1/W family. Manuals are included with the upgrade. The editors also are now included as choices for Opcode's single-editor *Edit One*. Opcode Systems; tel. (415) 856-3333; fax (415) 856-3332.

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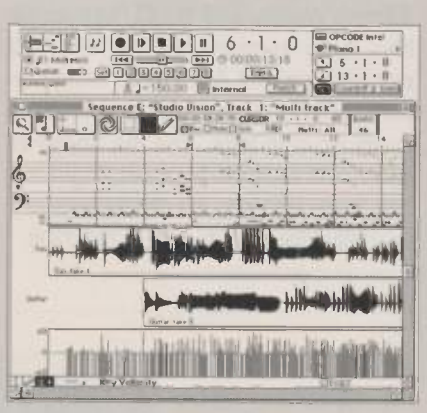

▲ E-MU SYSTEMS

E-mu Systems announced Emulator IIIx Operating System 2.0, a free upgrade. An Import function loads Emax II and S1000/S1100 samples from SCSI storage devices, including the loop points, keymaps, and all program parameters that have EIIIx equivalents. According to E-mu, S1000/S1100 sample-load and translation times are comparable to that of the S1000 itself. New DSP functions include dynamic compression and expansion, parametric EQ, real-time sample-rate conversion, and real-time digital tuning. Previously available DSP functions have been enhanced to run up to 500% faster.

E-mu also reintroduced the SP-1200 Sampling Percussion System ($2,495). The SP-1200 is a digital sampling drum machine with touch-sensitive pads, SMPTE read/write capability, eight programmable outputs, and programmable pitch and volume. E-mu and third parties offer a library of percussion sounds. Only a limited number of SP-1200s will be available. E-mu Systems; tel. (408) 1921; fax (408) 438-8612.

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▶ NOVATION MIDICON

Novation's MidiCon ($169) is a 1-out, 25-key, velocity-sensitive (no aftertouch) MIDI keyboard controller designed for computer multimedia projects. Controls include transpose buttons (±4 octaves); dedicated pitch bend and modulation wheels; and a polarity-sensing, sustain-pedal jack. The keyboard can be powered by an external DC supply ($14.95) or batteries. Music Industry Corp. (U.S. distributor); tel. (800) 431-6699 or (516) 352-4110; fax (516) 352-0754.

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NEW 05R/W Half rack space module with AI² Synthesis • 340 Waveforms, 100 programs, 100 combinations, 128 GM programs plus 8 drum kits • Built-in MIDI interface for Macintosh® and PC compatibles • Dynamic Digital Multi-Effects with Real Time Control • 32 voices with 2 polyphonic outputs

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The Seriou

The TASCAM DA-88 The Digital Multitrack Deck For Serious Production

It's true. The first machine designed specifically for low cost digital multitrack production is now available. And it comes to you from the world multitrack leader, TASCAM. It's simply the most advanced, well thought out and heavy duty digital 8-track deck you can buy. The best part is, it's incredibly affordable.

The DA-88 is built for production. The integrity of TASCAM's design is evident in every facet of the deck. From its look and feel — to its exceptional sound, unsurpassed features and expansion capability.

Goes Faster, Lasts Longer And Takes A Beating

While we admit that it's an elegant looking machine, it's tough to see its finest asset. The tape transport. Designed and manufactured by TASCAM specifically for the DA-88, it's fast, accurate and solid. And that's what counts in production — in personal studios, project studios or in those demanding high-end facilities.

You'll notice it uses superior Hi 8mm tape, giving you a full 108 minutes of record time. What's more, the transport is lightning fast and yet so quiet you'll barely hear it blaze through a tape.

We didn't stop there. Because production environments are notorious for constant, if not abusive, shuttling, punching, 24-hour operation — you get the idea — the transport was designed and built to take a beating.

Even more impressive is the transport's responsiveness. Take a look at the front panel. Notice the shuttle wheel? Turn it just a bit and the tape moves at one fourth the normal play speed. Turn it all the way and it flies at 8 times faster. Do it all night if you want. It's quick, smooth and it's precise. Need to get to a location quickly? Accurately? Shuttle a bit and you're there. The location is easily viewed on the DA-88's 8-digit absolute time display — in hours, minutes, seconds and frames. With the optional SY-88 sync card it displays timecode and offset, too.

Adding the optional SY-88 synchronizer card is as easy as changing a Nintendo® cartridge. With it you're SMPTE and MIDI compatible. And no matter how many DA-88s you have locked up, you need only one sync card. Other optional accessories include AES/EBU and SDIF2 digital interfaces allowing the digital audio signal to be converted for direct-digital interfacing with digital consoles, signal processors and recording equipment.

You Already Know How To Operate It

Unlike other digital multitrack decks, the DA-88 works logically and is simple to operate. Like your analog deck. All functions are familiar and easily operated from the front of the deck.

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World Radio History

s Machine

Take punching-in and out, for example. You have three easy ways to do it. You can punch-in and out of single tracks on the fly. Just hit the track button at the punch-in point. Hit it again to punch-out. You can use the optional foot switch, if you like.

Or, for multiple tracks, simply select the track numbers you want to punch, push play, and when you're ready, hit record to punch-in, play to punch-out.

Finally, for those frame accurate punch-ins, you've got auto punch-in and out. In this mode you can rehearse your part prior to committing it to tape.

No matter which way you choose, your punch-in and out is seamless and glitch free due to TASCAM's sophisticated variable digital crossfade technology.

That's not all, you also can set your pitch (± 6%), sample rates (44.1 or 48K), as well as crossfade and track delay times. All from the front of the DA-88.

Complete Synchronicity

There's more. Add the optional SY-88 synchronizer card to just one of your DA-88s and you've got full SMPTE/EBU chase synchronization. The best part is, you can record time-code without sacrificing one of your audio tracks. You also get video sync input, an RS-422 port to allow control of the DA-88 from a video editor, and MIDI ports for MIDI machine control.

A Digital Recording System That Grows With You

The DA-88 is truly part of a digital recording system. Start with 8 tracks today — add more tomorrow.

Adding tracks is as simple as adding machines — up to16 for a total of 128 tracks. They interconnect with one simple cable, and no matter how many DA-88s you have, they'll all lock up in less than 2 seconds.

Controlling multiple machines is made simple with the optional RC-848 remote. With it you can auto locate and catch 99 cue points on the fly. It comes complete with shuttle wheel, jog dial, RS-422 and parallel ports, and it controls other digital and analog machines, too.

Listen To The Rest

Of course, the sound quality is stunning. With a flat frequency response from 20Hz to 20kHz and dynamic range greater than 92dB, it delivers the performance you expect in digital recording.

So get to your authorized TASCAM dealer now. Check it out. Touch it. And listen to it. Once you do you'll know why the TASCAM DA-88 is the serious machine for digital production. The TASCAM DA-88 is the choice of studios worldwide. And at only $4,499, it should be your choice.

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DO ✦ IT YOURSELF

Build the EM TubeHead

This versatile tube-based preamp delivers that warm tube sound.

By John Simonton

If you love the sound of vacuum tubes, here's a perfect DIY project for you. The EM TubeHead is a low-cost, 2-channel, vacuum-tube preamplifier with a twist: The circuit is adjustable from crisp, solid-state transparency to an exaggerated caricature of tube warmth. Between these extremes are tonal variations you've never had before and sounds that mimic every tube amp you've ever heard. This circuit is so versatile you can use it in place of compressors, limiters, and sustainers, even though it is none of these.

TUBE SOUND

Nearly everyone agrees that audio circuits with vacuum tubes sound different than solid-state circuits. The "vacuum-tube sound" is often described as "warmer" or "more full," or in certain anatomical terms.

Not everyone agrees why this is so, but the prevailing opinion maintains that the differences arise from the way tubes and transistors respond to overload conditions. Solid-state amps overload by clipping the peaks of a signal, while tube amps respond by gracefully compressing the peaks (see **Fig. 1**). Both of these responses produce distortion, but whereas clipping generates largely odd harmonics at fairly high multiples of the fundamental, compressing results in mostly even harmonics, concentrated in only a few octaves. There seems to be something about low-order even harmonics that human ears and the brains attached to them like better than high-order odd harmonics.

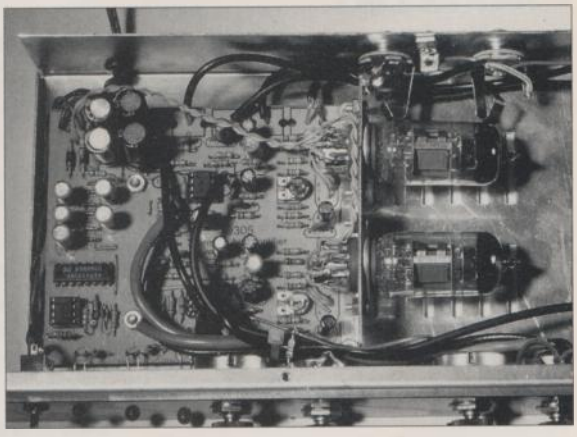
The compression of an overloaded vacuum tube isn't exactly the same effect as a normal studio compressor. Compressors act on the average level of a signal over a relatively long time and affect the envelope of the signal without altering the harmonic structure (theoretically, at least). Tube compression acts on a cycle-by-cycle basis. This produces a more-or-less subtle harmonic distortion, but other effects are similar. In particular, the average level of the signal remains more constant, adding sustain and "presence" to the sound.

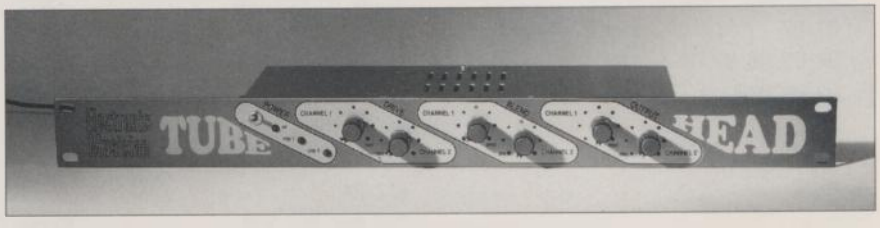
DESIGN OVERVIEW

Let's take a look at the circuit (see **Fig. 2**). Power from the 12 VAC transformer is positive half-wave rectified by D1 and filtered by C1, C2, and R1 for a +15V supply rail. A -15V supply is provided by D2, C3, C4, and R3.

Most tube circuits operate at high voltages, frequently in the hundreds of volts; components for these voltages can be expensive and difficult to find. But the tubes in the TubeHead are "starved" with a low plate voltage to make them sound even more like tubes, which also helps solve the high-voltage problem.

Still, the 45 VDC used in the TubeHead is higher than you typically find in solid-state circuitry. Rather than use an exotic, multiwinding power transformer, the tube's plate supply is produced by a voltage multiplier like the one in the EM Phantom Powered Mic Preamp (April 1992 **EM**). As shown in





PHOTOS BY PETER DIGGS

In the EM TubeHead, the tubes are mounted horizontally to fit in a single-rackspace case.

World Radio History

Fig. 2, C7, R4, and R5, together with three of the six inverters in IC1 (D, E, F), form a 60 kHz, 15V peak-to-peak, square-wave oscillator. The remaining three buffers in IC1 (A, B, C) are wired in parallel to provide greater output current to drive the network of diodes (D4 through D8) and capacitors (C5, C6, C8, C9, C10) that multiply the 15V square wave up to 45 VDC.

DESIGN SPECIFICS

The 2-channel TubeHead consists of two identical preamp/tube/final amp sections. We'll discuss the channel that includes V1 and IC2, which also applies to the V2/IC3 section.

The signal path begins with an adjustable gain stage built around one of the two low-noise op amps in a 5532 (IC2:A). Input signals are capacitively coupled by C17 and appear across R26. When the Drive control (R15) is fully counter-clockwise, the ratio of R12 to R21 sets the minimum voltage gain to ½ (2:1 attenuation). At the clockwise extreme, the ratio of R7 to the sum of R15 and R7 sets the maximum voltage gain to 25. Capacitor C14 rolls off the high-frequency response at a corner frequency of about 30 kHz. An op amp wired as a comparator (IC4:A) turns on LED D9 when the output of the gain stage approaches its clipping point.

The output of the gain stage is coupled by R19 and C18 to the grid resistor of the first tube stage (R27). Two tube stages are used to optimize the symmetry of the output waveform. A single tube stage would compress the tops of waveforms, but leave the bottoms unchanged. With two stages, the first can compress the top of the signal, invert it, and send it to the second stage to compress what was originally the bottom.

Both tube stages are contained within V1, a 12AX7 dual triode. The output of the first tube stage appears across the plate load resistor R10 and is coupled by R14 and C15 to the Symmetry trimmer (R23), which sets the amount of signal applied to the grid of the second tube stage. The output of the second stage appears across plate load resistor R11.

A final output buffer stage built around op amp IC2:B converts the relatively high-impedance output of the tubes to a lower impedance consistent with contemporary audio-processing gear. It's operation is similar to that of the circuitry around IC2:A.

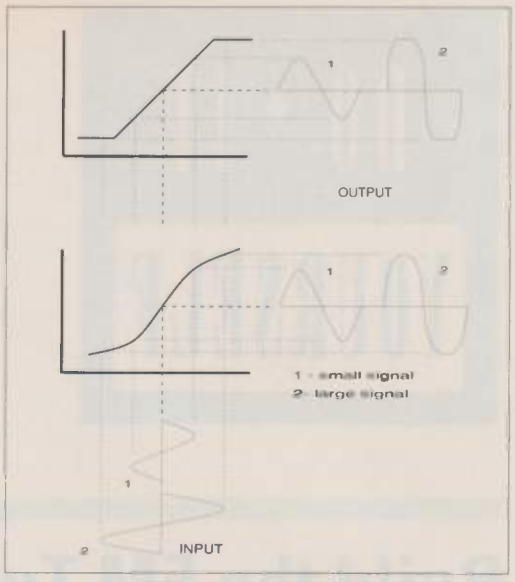


FIG. 1: Transfer curves show how an input signal is transformed into an output signal by a solid-state preamp (top) and a tube preamp (bottom). A solid-state circuit is linear throughout its range, beyond which it is flat. This clips a high-level input signal, such as waveform 2 in the diagram, leaving a low-level signal, such as waveform 1, alone. A tube circuit is never completely linear, which results in more compression at high levels and less at low levels.

PARTS LIST

Capacitors

C1, C2, C3, C4	100 µF/25V electrolytic
C5, C6, C8, C9	33 µF/25V electrolytic
C10, C19, C29	33 µF/25V electrolytic
C12, C13, C15, C18	1 µF/50V electrolytic
C22, C23, C25, C28	1 µF/50V electrolytic
C17, C27	2.2 µF/25V electrolytic
C7	220 pF ceramic disk
C11, C21	0.01 µF ceramic disk
C14, C24	20 pF ceramic disk
C16, C26	5 pF ceramic disk
C20	0.05 µF ceramic disk

Diodes

D1, D2	1N4001 power diodes
D4, D5, D6, D7, D8	1N4148 signal diodes
D3, D9, D10	red LED

Semiconductors

IC1	4049 CMOS hex inverting buffer
IC2, IC3, IC4	5532 dual low-noise op amp

Connectors

J1, J2, J3, J4	¼-inch open-circuit phone jack

Potentiometers

R15, R18, R20	10 kΩ panel-mount
R43, R46, R48	10 kΩ panel-mount
R23, R51	100 kΩ horizontal-mount trimmer

Resistors (5%, ¼ W)

R1, R2, R3, R22, R50	330Ω
R4, R5	33 kΩ
R6, R30, R33, R34, R61	10 kΩ
R7, R8, R35, R36	220Ω
R9, R37, R62, R63	100 kΩ
R10, R11, R38, R39	270 kΩ
R12, R40	22 kΩ
R13, R14, R41, R42	82 kΩ
R17, R25, R45, R53	470 kΩ
R19, R21, R26	47 kΩ
R47, R49, R54	47 kΩ
R27, R55	150 kΩ
R28, R56	8200Ω
R29	1 kΩ
R31, R32, R59, R60	2700Ω
R57, R58	100Ω

Tubes

V1, V2	12AX7 dual triode

Other Components

S1	SPST switch
PWR1	12V, 500 mA AC transformer
Tube sockets	
Circuit board	
Case	
Knobs	
Wire	

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Op amp IC2:B also provides for mixing the dry signal (pre-tube) with the post-tube, processed signal, using the Blend pot (R20). At the clockwise extreme of this pot, the final amplifier is fed exclusively with the output of the tube. At the counter-clockwise end, it's fed by the buffered input signal from the first gain stage. At intermediate settings, a mix of the dry signal and tube output drive the final buffer. The relative values of R9 and R33 compensate for the additional gain of the tube so the overall level is fairly constant as the Blend control is varied from Pre to Post.

BUILDING THE TUBEHEAD

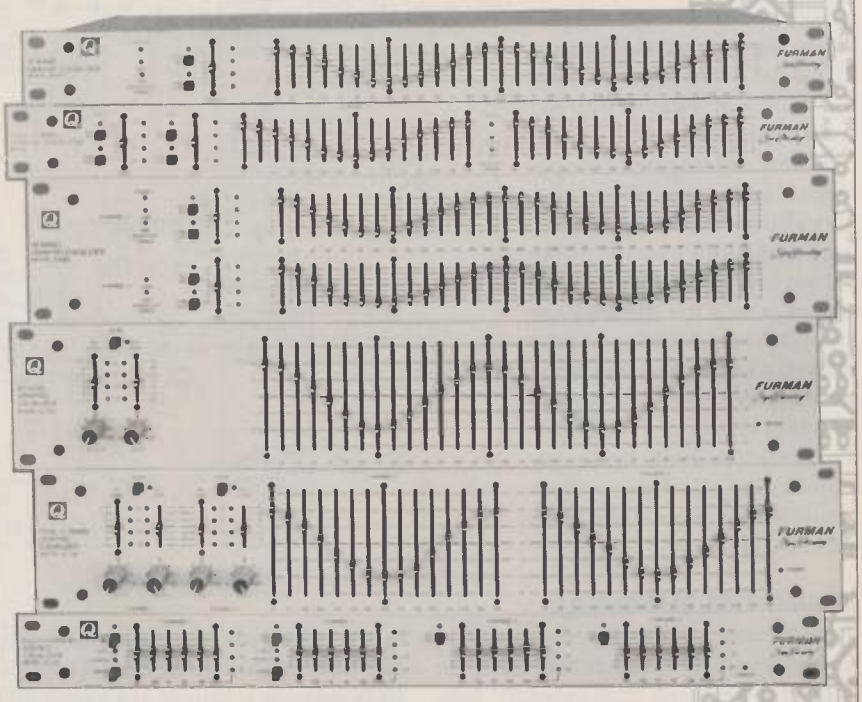
As you can see from the photos, the TubeHead is squeezed into a single rackspace by mounting the tubes horizontally. A right-angle, aluminum bracket attaches the tube sockets to the component board, and individual wires connect the socket's solder lugs to the rest of the circuitry. Many of the EM DIY projects have no need for a full enclosure around the electronics, but we've elected to protect the tubes in the TubeHead with a fully enclosed case. If you do the same, don't forget that tubes throw off a lot of heat. In the prototype, twelve 1 × ⅛-inch slots were cut in the metal above and below each tube to allow a free flow of air.

Any convenient assembly platform, such as a printed circuit board or perfboard and wire-wrap, can be used for the electronics. While the drawings are too extensive to include here, a set of plans that includes full-size, circuit-board foil patterns, dimensioned drawings of the case and front panel, and detailed wiring diagrams for the complete unit is available from PAiA Electronics (see sidebar, "PAiA Kits").

If you're going to build the TubeHead from scratch, here are some things to watch out for. In the best of all possible worlds, every ground in the system would return to a single point, but this is not always practical. *It is very important to use separate wires for the ground of the audio circuitry and the power ground to IC1.*

The 60 kHz square wave that runs the voltage multiplier is above hearing range, but if it leaks into the audio path, it can cause unpleasant distortion. It is also a good idea to separate the voltage multiplier from the audio

Graphic Details



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components (particularly the tubes and their support elements) by placing them at opposite ends of the component board.

Use separate wires to connect the tube filaments directly to the points where the transformer wires meet the component board. Be careful that none of the filament power passes through any part of the signal ground. Twist the filament wires together and route them away from the audio components.

When installing components, make sure the polarities of the electrolytic capacitors and diodes match those shown in the schematic. In addition, watch the pin-number indicators on the ICs and tube sockets to make sure the proper pins are used. A single-channel version of the TubeHead can be built by simply eliminating all of the components within the dashed lines on the schematic.

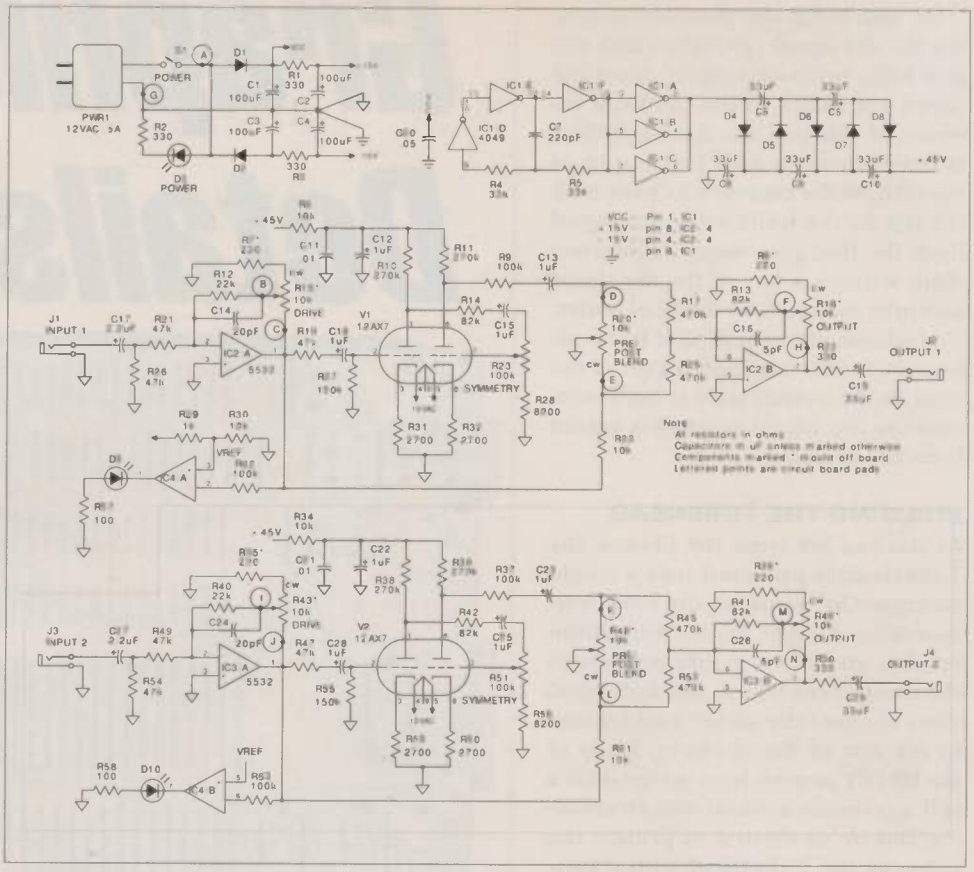

FIG. 2: The schematic for the EM TubeHead.

USING THE TUBEHEAD

Each channel has three controls. The Drive control determines how hard the tube is driven and, consequently, how much it compresses the signal. With Drive set to minimum, the tube begins its non-linear response at about 0 dBV. With Drive at maximum, non-linearity onset occurs at about -28 dBV.

The Blend control sets the relative amounts of clean and tube sound in the output. With the control fully counter-clockwise (the "Pre" setting), only the clean signal appears at the output. Turning the control fully clockwise (the "Post" setting) sends only the tube sound to the output. It's common to work with this control set all the way to Post and adjust the coloration of the signal with the Drive control, but it's also handy to be able to turn down the heat by mixing in a little dry signal.

The final control for each channel is the Output Level. After setting the coloration of the signal by using the Drive and Blend controls, set the Output Level as needed for the best balance and lowest overall noise in the signal path.

The clip LEDs light when the first op-amp gain stage is clipping; they are not meant to indicate distortion in the tube. If the clip indicator for a channel comes on, reduce the Drive setting until it goes off. Overloading the tube produces the effect we're after; overdriving the op amps does not.

The nominal input impedance of the TubeHead is about 20 kΩ, which is consistent with most audio gear. This is a little low for a proper match with high-impedance sources, such as guitar pickups, but a few minor changes will take care of the incompatibility. If you want to use the TubeHead as an instrument-pickup preamp, remove R26 and C14 and change R21 to a value of 680 kΩ and R12 to a value of 100 kΩ.

The TubeHead is an ideal companion for the EM Phantom Power Mic Preamp, adding warmth and personality to everything from high-end condenser microphones to synthesizers to CDs. Any time you want to add a little something extra to a sound, reach for your TubeHead.

John Simonton *writes by throwing thousands of words at the page. When half have fallen off by themselves and half of those remaining have been tossed out by an editor, the result is a magazine article.*

PAIA KITS

Complete kits for this project are available from PAiA Electronics, Inc., 3200 Teakwood Ln., Edmond, OK 73013; tel. (405) 340-6300; fax (405) 340-6378.

Complete kit of parts and circuit board, except case and rack panel (9305k): $78.25

Punched and formed case including anodized, 2-color rack panel (9305c): $24.75

Etched and drilled printed circuit board w/tube mounting bracket (9305pc): $22.50

Please add $4 to each order for shipping. For a free copy of the circuit board, case, and wiring plans, send a large SASE with $0.52 in postage (or three International Reply Coupons, for overseas readers).

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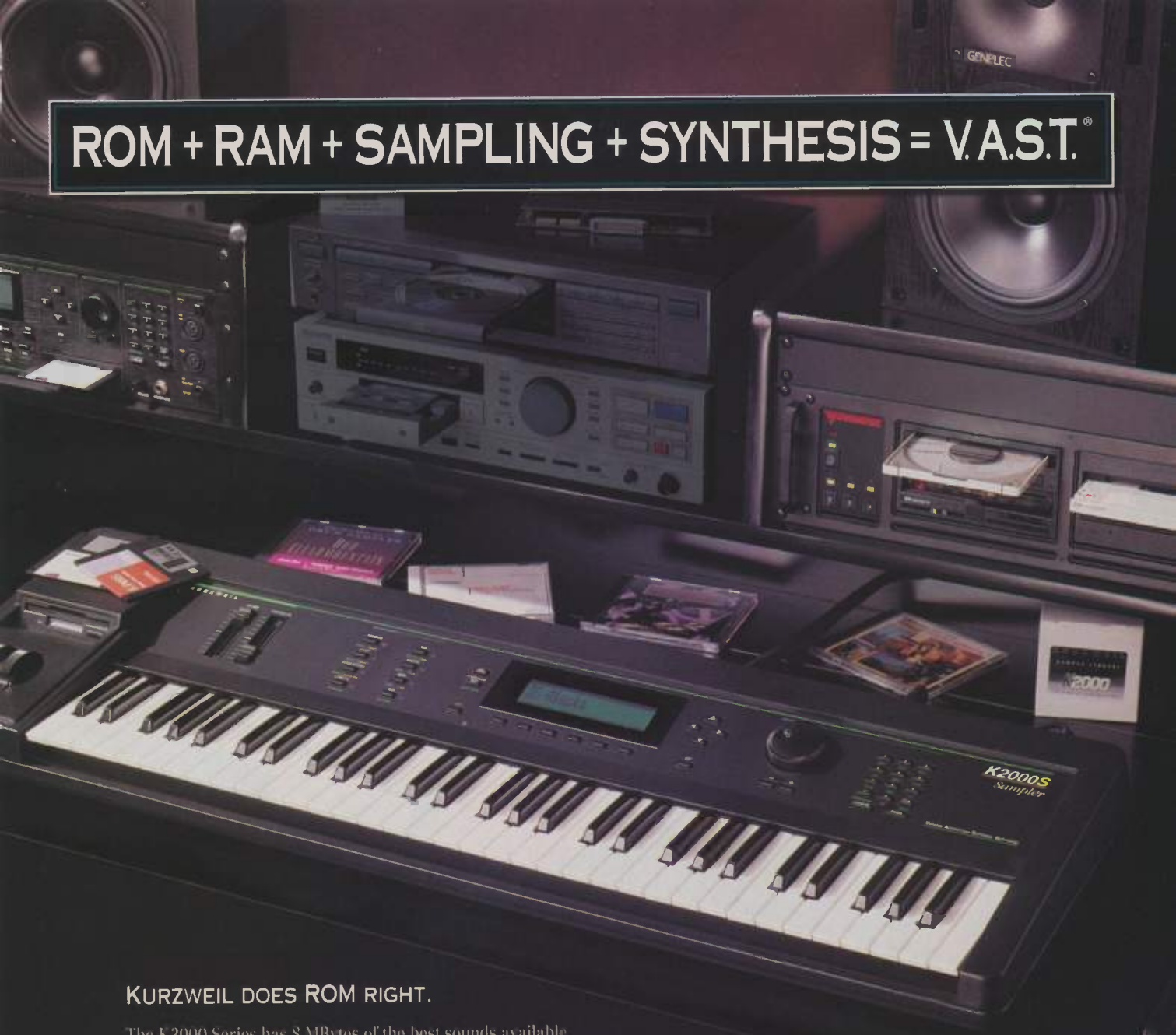

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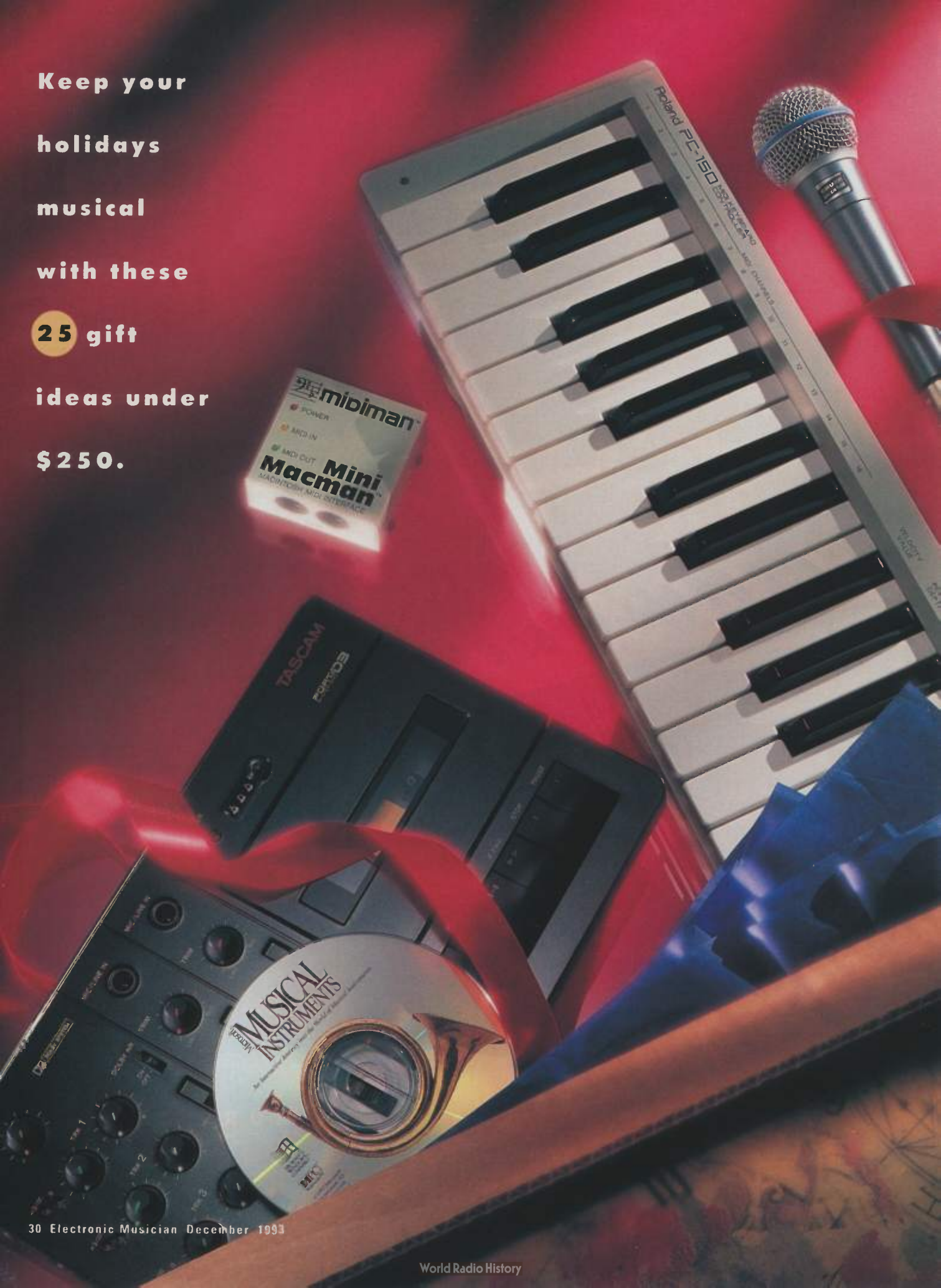

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SOUND Bargains

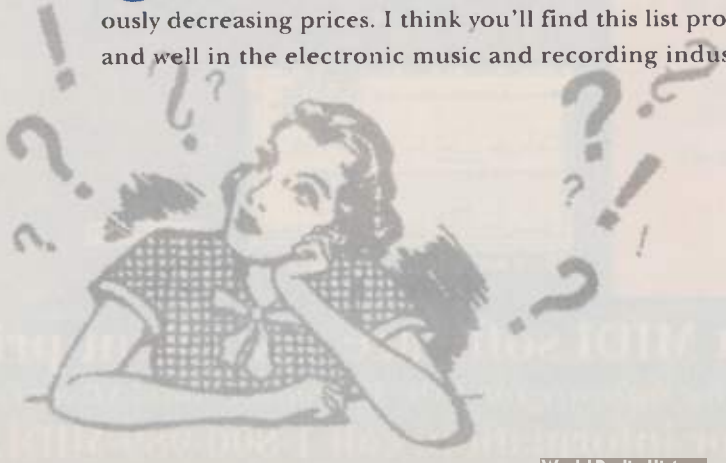
For many musicians, equipment-buying trips to the music store can turn any day into Christmas. However, the desire to add more toys to your studio toy chest grows particularly strong as the holiday season approaches. Boys and girls of all ages dream of receiving new instruments, multitrack recorders, software, computers, and other goodies from their families and loved ones.

To help get your dreaming started—and to give you gift ideas for electronic-musician friends on your list—we've written up 25 types of products from different manufacturers, all of which have a suggested retail price under $250.

As our editorial staff compiled this list, we were amazed at how much you can get for your money these days. Except for a power amp and a MIDI sound module, you can outfit a complete multitrack, personal-recording environment with pieces that fall below our price limit. We were also able to include product categories that, in previous years, would never have appeared at this price level. Now, if we could just get real-estate prices to follow these technology-driven price curves....

If you want additional information on any of the products, we compiled a phone and fax list of manufacturers mentioned in the article for your convenience. To complete your shopping needs, we also put together a stocking-stuffer sidebar with five gift suggestions under $25.

Common knowledge tells us that technology-based products follow the consumer-friendly path of continuously increasing value at continuously decreasing prices. I think you'll find this list proves that maxim is alive and well in the electronic music and recording industries. Enjoy the toys.



By Bob O'Donnell with the EM Staff

Photograph by Robert Perry

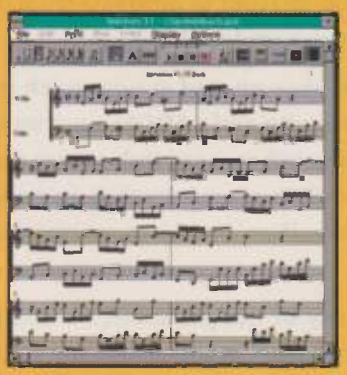
World Radio History

QuickScore DELUXE™

Fast and Easy Music Notation for Windows or DOS

QuickScore Deluxe gives you easy-to-use sequencing, traditional music notation, and superb score printing at a great price. You immediately see and hear your score play back.

- Realtime and steptime MIDI input
- 16 stave full-score or single stave display
- Easy text and music symbol entry and placement
- Multiple time signature and key signature transcription and entry
- Transpose chromatically or in key, adjust enharmonic note spellings, insert and display tempo and program changes
- Cut, copy, paste, insert and undo via range-highlight and global editing
- Auto-scrolling during playback
- Supports page and bar numbering
- Change the time, velocity, channel or duration for single events, a range, or a complete track



- Page preview with many score formatting options
- High resolution printing on most popular printers including Epson FX and IBM Proprinter (9 pin) and compatible dot matrix, HP LaserJet Plus and Series II, DeskJet, and Adobe Postscript
- Supports Sound Blaster (all), Media Vision PAS (8-16) and Thunderboard, ATi, KEY MIDIator, AdLib, and MPU-401 compatibles
- Windows $79.95
- DOS $79.95

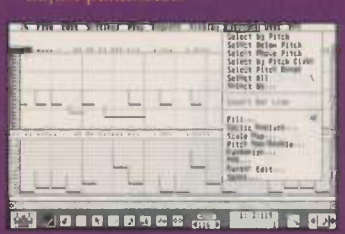
OMEGA II™

MUSIC COMPOSITION SYSTEM

Fast, Powerful, Flexible Composing and Sequencing for Atari

- 48 track recording on up to 64 MIDI channels
- Fully interactive multi-track Graphic Editor. Lightning-fast piano roll and drumgrid editing with velocity stems
- 'One-touch' note editing, click and drag note drawing, graphic paste and fill, realtime controller and tempo editing
- Integrated MIDI Mixer with Groups, Snapshots and Cross-fades
- MIDI Machine Control and MIDI Time Code Synchronization
- Numerous interactive editing, algorithmic composition and performance tools, from simple Transpose and Quantize to complex Fill operations. Hear the results of an edit AS you adjust parameters

- Event List Editing with powerful block editing tools including unique Scrunch and our famous Programmable Variations Generator
- Powerful interactive Graphic Song Editor for 'object-oriented' composition. Remote song start and stand-alone song playing for live performance
- OPEN mode event-oriented structuring with interactive performance and the power of a programming language. The most flexible musical structuring in ANY sequencer
- A personal commitment to the weird and wonderful!
- Not Copy Protected
- Price $99.95



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MUSIC SOFTWARE
124 Crescent Road
Needham, MA 02194
(617) 455-1454

Great MIDI software. Excellent prices.

Interactive software for IBM, Macintosh, Atari ST, and Amiga

For information, call 1-800-989-MIDI.

World Radio History

SOUND Bargains

Casio VA-10 Voice Arranger Keyboard: $199

It's hard to imagine a more fun toy under the tree than this remarkable little product. In addition to 100 good-sounding presets, 60 *editable* stereo effects, twelve rhythms, a 1,300-note sequencer, and intelligent auto-accompaniment, this 32 mini-key instrument features a headset mic that can be run through an onboard pitch shifter or used to play the keyboard. (Yes, you read that right.) If you turn on the instrument's Pitch Sensor, it determines what note you're

Casio VA-10

humming (or singing) and plays the appropriate note on the keyboard. You need good, steady pitch for the system to track well, but it definitely works. At this price, and with all these other features, it's amazing.

dbx 163x Compressor/Limiter: $169

Compressors will never be confused with truly fun products, so their gift value may be arguable, but there's no arguing with the fact

dbx 163x

that this half-rackspace processor is a great value for a home studio on a budget. It features dbx's famed OverEasy Compression in an extraordinarily easy-to-use package (one slider and a set-and-forget knob). If you need in-depth control over attack and release time and compression ratios, this isn't the box for you. But if you just want a simple, good-sounding unit to punch up your holiday tracks, look no further.

Shure SM58 Dynamic Microphone: $189

Check out any stage or studio in the world and you'll probably find a Shure SM58. It's *the* classic dynamic vocal mic. Also, the SM58 is built like a tank: I've seen them hurled across stages, dropped from equipment vans, and run over by trap cases. They never stop working. The mic is not only a bargain at any price, it will probably still be working when your grandchildren start recording.

MIDIMAN MiniMac: $39 (Macintosh)

PowerBook owners rejoice! Apple has finally fixed *MIDI Manager* to work on your machines, and MIDIMAN's offering a diminutive, self-powered, 1-In, 1-Out MIDI interface that's perfect for MIDI on the go. The MiniMac MIDI interface is also an excellent value for budget-constrained desktop Mac users, music hobbyists, or anyone who wants to simplify their musical life.

Furman PL-PLUS Power and Light Module: $229

Electronic musicians obviously need electricity, but mischievous electrons can damage or temporarily stun gear. A power conditioner ensures that your delicate keyboards, amps, signal processors, computers, and recording equipment get safe voltage levels. The PL-PLUS protects against power surges and RFI/EMI interference and filters out noise from fluorescent lights and electric motors. (Ever try recording when your neighbor is doing home improvements with a power saw?) Two handy lamps offer subtle illumination for your stage or studio rack.

Tech 21 SansAmp Bass DI: $195

Picture the scene: You're an in-demand bass player who's sick of lugging around a heavy amp to every session, but you're not willing to live with the flat, lifeless sound of

SansAmp Bass DI

your instrument run through a simple DI box. On top of that, you're feeling a little jealous of your guitar-playing friends, who have ditched their amps for one of the many lightweight guitar preamps now available. Then a friend mentions he's heard that SansAmp makes something for bass players, too. "Miked cabinet sound without the amp, mic, and cabinet?" you ask yourself. "What's the catch?" That's the great part; there isn't one. The moral of the story: There really *is* a Santa Claus.

ART FXR Multieffects Processor: $199

The sparkle and glitter that signal processors add to your sound isn't unlike the holiday decorations you plaster all over your house. They both make things seem a

ART FXR

World Radio History

Automatic Accompaniment has arrived – ...and just got better with Version 5

BAND-IN-A-BOX™

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

Type in the chords to any song, choose the style you'd like and Band-in-a-Box does the rest...

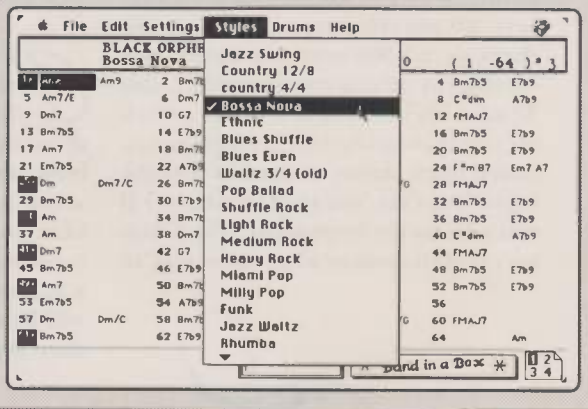
Automatically generating professional quality five instrument accompaniment of bass, drums, piano, guitar & strings in a wide variety of styles

24 Styles built in...

Jazz Swing • Bossa • Country • Ethnic • Blues Shuffle • Blues Straight Waltz
Pop Ballad • Reggae • Shuffle Rock • Light Rock • Medium Rock • Heavy Rock
Miami Sound • Milly Pop • Funk • Jazz Waltz • Rhumba • Cha Cha • Bouncy 12/8
Irish Pop Ballad 12/8 • Country (triplet)

Version 5: 2 more instruments + built-in sequencer...

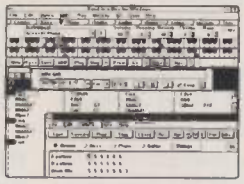
The built-in sequencer lets you record melodies (or buy our MIDI-FAKE-BOOK disks which include chords & melodies). Also make your own 5 instrument styles using the StyleMaker™ section of the program – or edit our styles to your tastes. Now there are 5 accompaniment instruments (including guitar/strings). General MIDI standard implementation (even for old synths). Plus 70 other new features!



NEW! Band-in-a-Box Pro for Windows $88

The award winning Band-in-a-Box automatic accompaniment program is now available for Windows 3.1. All of the features of the DOS version, plus much more including...

- *The "Wizard" (intelligent playalong features)*
- *background playback in other programs*
- *support of all MultiMedia drivers (Roland MPU401, Soundblaster, MultiSound, AdLib, TG100, etc.)*
- *copy MidiFiles to Clipboard to paste into other Windows music programs*
- *onscreen toolbar, full mouse support*
- *fully featured Windows interface*
- *all files fully compatible with DOS, Mac & Atari versions!*



UPGRADE OFFER FOR EXISTING BAND-IN-A-BOX USERS:
Basic upgrade to Band-in-a-Box Pro for Windows – $29
Complete Upgrade including new 5 instrument styles disk #4 – $49

BONUS!! Band-in-a-Box IBM version now includes BOTH the Windows AND DOS version for the same price!!

STYLES DISK #4 (Mac/Atari/IBM) $29

34 Hot new styles for Band-in-a-Box

We've made our best styles disk ever, most utilizing 5 instruments at a time. (bass/drum, piano, guitar and strings) This disk Supercharges your Band-in-a-Box program!!

9 NEW JAZZ STYLES !
(Charleston, Dixieland, Fats Waller, Jazz Quintet, Jazz Fast, Lui Prim Style, Tango, Jaco 5, ChaCha 5)

8 NEW COUNTRY STYLES !
(Chet, Cryin, Country Ballad, Country Contemporary, Floyd Piano, Ozark, Folk, J Cash 5)

7 NEW POP STYLES !
(Breezin, Larry, Grover, Kladrman Piano, St. Elmo, Yesterday, Georgia Style, On BoardWalk)

4 NEW "OLD POP" STYLES
(Supremes,"Sam Cook" Style, J B Goode, Fats D)

6 NEW ETHNIC/MISC. STYLES
(Gumbo, Klezmer1, Klezmer2, March_12, March_16, Mozart)

WE DIDN'T SAY IT... PC MAGAZINE DID!

– FINALIST –
PC Magazine Award for Technical Excellence

AFTER HOURS / ENTERTAINMENT
Band-in-a-Box
PG Music

"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

DownBeat – the #1 Jazz Magazine says...

"Band-in-a-Box is the most significant contribution to Jazz Education since Jamey Abersold Records."

"Band-in-a-Box is an amazing program"
Keyboard Magazine Aug. 1992

"I am in awe. I didn't think that such an incredible program could even exist. This software is a dream come true."
PC Journal Sept. 1992

Band-in-a-Box Prices

New customers

Band-in-a-Box Standard Edition (24 styles).....$59
Band-in-a-Box PRO version (75 styles).....$88
(BONUS!! Band-in-a-Box IBM version now includes BOTH the Windows AND DOS version for the same price!!)

Upgrades & add-ons

Upgrade or Crossgrade (Windows/DOS/MAC/ATARI).....$29
("CrossGrades" are for users who need a version for a different type of computer)
Midi-FakeBook with melodies (100 songs on disk).....$29
Styles Disk #2 (25 new styles for Version 5).....$29
New! Styles Disk #4.....$29
Any 2 of Above.....$49
Any 3 of above.....$59
(eg. Upgrade to Windows + Styles Disk #4 = $49)

Requirements:

IBM-DOS: 640K, MIDI interface or soundcard (MPU401 SCC1, Midiator SC 7, TG100, Yamaha C1, Voyetra VAPI, AdLib)
IBM-Windows 3.1: 2mb memory. Any MIDI interface or soundcard.
MACINTOSH: 2mb memory, system 6 or 7 (reduced version for 1mb available)
ATARI: 1040ST/STE/MEGA/TT (reduced version for 520 users available)

From PG Music... *The makers of The Jazz Guitarist, Band-in-a-Box, PowerTracks, The Pianist*
Phone orders: 1-800-268-6272 or 1-905-528-2368 VISA/MC/AMEX/cheque/mo/po# Fax 1-905-628-2541
(to hear recorded demo 1-905-528-2180)

PG Music Inc. *266 Elmwood Avenue Suite 111 Buffalo NY 14222*

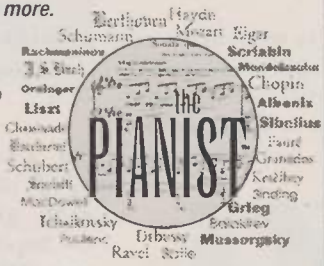
World Radio History

5 hot new software programs from PG Music...
& great deals on Roland hardware bundled with software

The Pianist™ (Windows, Mac, Atari) $49

A MUSIC PROGRAM CONTAINING A HUGE COLLECTION OF OVER 200 OF THE WORLD'S MOST POPULAR CLASSICAL PIANO PIECES, PERFORMED BY WORLD CLASS CONCERT PIANISTS!

Plus... Music Trivia Game, "Guess the Song" Program Notes, Biographies, Music Dictionary (all on disk) & much more.



PERFORMED BY CONCERT PIANISTS!
All the pieces have been recorded "in real time" by concert pianists on an 88 note weighted MIDI piano keyboard. They are never quantized or step recorded. All pieces are complete performances professionally performed, recorded & saved as Standard MIDI files. You therefore hear the music playing with CD-quality through your sound card or MIDI system.

ALL YOUR FAVORITE MUSIC...
Moonlight Sonata, Sonata Pathétique, Minute Waltz, Claire de lune, Mephisto Waltz, Hungarian Rhapsody, Fantasie Impromptu, Military Polonaise... and over 200 more !!!

SEE THE MUSIC WITH ON-SCREEN KEYBOARD!
Play/Stop/Pause/Rewind/Tempo change/transposition/Volume/panning/patch changes & more.

OUR CUSTOMERS LOVE THE PIANIST...
"Incredible... amazing... terrific... masterful... fabulous... love it... my favorite program!"

NEW! The Jazz Guitarist™ $49
(Windows, Mac, Atari)

THIS PROGRAM MAKES IT "TOO EASY" TO LEARN TO BE A GREAT JAZZ GUITAR PLAYER!

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!

the Jazz guitarist from PG Music Inc.

LEARN TO BE A GREAT JAZZ GUITAR PLAYER!
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!

PLUS MANY MORE FEATURES...

- *Jazz Trivia Game & Guess That Song Game, Program Notes, Biographies (all on disk)*
- *Over 60 Top Jazz Standards with Complete Guitar Arrangements*
- *Listen to the music while you work in other programs*
- *Special support for Roland GS or General MIDI Modules*
- *Standard MIDI files can be copied & used in other programs or presentations*
- *Use your existing sound card or MIDI synthesizer*

NEW! Music Printout!
PowerTracks Pro™ $29
SEQUENCER/NOTATION/PRINTING FOR WINDOWS (IBM)

"Solid sequencing at an unbelievable price" Electronic Musician Sept. 93

PowerTracks Pro 2.1 is a professional full featured MIDI sequencing, notation and printing program, and is so easy to use! And we include versions for Windows AND DOS, so you'll be able to use PowerTracks PRO on all of your machines!

PRO RECORDING, PLAYBACK, SYNCH, EDIT & SYS-EX OPTIONS
48 tracks, real-step/punch record, sound on sound, MDI File support, sync. (SMPTE, Midi Time Code, MDI) edit (quantize/cut/copy/paste/undo/data filters/transpose), multi-port support, 480 ppq timebase, sys ex editor librarian, patch names, banks & much more.

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

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

DELUXE WINDOWS INTERFACE
Multiple Windows – Music Notation, Staff Roll (piano roll), Event List, Tracks, Bars, Meter, Tempo, Piano keyboard, Guitar fretboard.

AND MUCH MORE...

- *Juke Box built in to play back sets of songs*
- *Comprehensive guitar support (on-screen fretboard, record/enter/edit/play guitar music)*
- *Built in mixer /sound editor for Roland Sound Canvas/SCC1/GS series.*
- *Comes with Pro quality MIDI files (piano, guitar, combo music by studio musicians)*

POWERTRACKS FOR DOS VERSION INCLUDED FREE. Yes! We include the DOS version for free in the same package. NOTE: The DOS version doesn't support music notation, or other graphical features.

EXISTING POWERTRACKS USERS CAN UPGRADE TO POWERTRACKS PRO 2.1 FOR ONLY $10.

Sound Canvas Pro Editor/Librarian for Windows $29

Mixing/editing/storage of EVERY feature on Sound Canvas & other Roland GS & GM modules

You'll never need to touch your Sound Canvas front panel or open the manual again! Edit/design new sounds, new scales, tunings... YOU CAN EDIT EVERYTHING!!! Also plays MIDI files (hear changes as you make them)

Multi-MPU401 Driver for Windows $19

- *allows 8 music programs to use the same MPU401 at the same time!*
- *a "must have" driver for all MPU401 Windows users (Roland Music Quest, CMS, etc.)*
- *easy to use, installs as a driver in Windows to replace your current MPU401 driver*
- *NEW! Allows inter-program communication!*

The current MPU401 Driver for Windows only allows one music program to use the port at a time. You need to close down all music applications before running a new one. But the new "Multi MPU401 Driver" allows up to 8 programs to use the MPU401 at the same time. So you can use all of your music programs at the same time.

Roland SCC1 Card $389

Incredible Low Price • PowerTracks Pro Sequencer & SoundCanvas Pro Editor included!

The Roland SCC1 is a half sized card that contains a built in General Midi (GS) compatible synthesizer, MPU401 MIDI interface, & RCA audio output to stereo or headphones. The state-of-the-art quality of the sounds on this card makes it the hottest piece of MIDI hardware on the market! We use the SCC1 card in all of our computers, & make all of our Band-in-a-Box songs & styles using the SCC1 card. Band-in-a-Box directly supports all features on the card (reverb/chorus/volume/panning/patch etc.). SCC1 makes Band-in-a-Box to sound like a "live band"!

Roland SC-7 General MIDI Module $389

128 General MIDI Sounds • Built in MIDI interface connects to your PC or Notebook
Includes PowerTracks Pro Sequencer, SoundCanvas Pro Editor & Windows Driver for SC-7!

Roland's newest product for IBM, MAC or ATARI computers. This external module has the 128 General MIDI sounds (same sound quality as the Sound Canvas/SCC1), and also a direct connection to the serial port of your PC or MAC. This means that you can use the SC-7 with your notebook/laptop and don't require a MIDI interface!

REQUIREMENTS FOR ANY OF THE PROGRAMS:

IBM (DOS versions) *require 640K, MPU401/ MIDIATOR/SoundBlaster/SC-7, TG100*

WINDOWS *versions require 2mb RAM + any soundcard or MIDI interface*

MACINTOSH *versions require 2mb RAM, system 6 or 7*

ATARI *versions require 1040ST or better*

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Buffalo NY 14222

30 DAY UNCONDITIONAL MONEY BACK GUARANTEE ON ALL PRODUCTS

World Radio History

SOUND Bargains

bit more special. With ART's new FXR series effects processors, you can adorn your audio at a previously unheard-of price. For less than $200, you get discrete stereo processing, 250 different 16-bit effects—including combinations of up to five effects at once—and simple, 2-knob operation. You can't edit the FXR's effects—you'll need the slightly more expensive FXR Elite for that—but with this many choices and this kind of price, why nitpick. Just enjoy.

Sample Libraries: $20 to $249

Jingle bells, jingle bells, sampled all the way. Even if you sample your own sounds, don't be shy about buying into that fast-growing garden of sonic delight known as third-party samples. An incredible number of companies—OSC, Sound Ideas, and even our own Mix Bookshelf, whose offerings include sounds from the immortal British Broadcasting Corporation (BBC)—offer collections of raw samples on audio CD and CD-ROM.

Of course, because we're talking about gift ideas, you might not want the recipient (probably you) to work hard setting up loops and programs. In that case, check out the many collections of looped and preprogrammed samples for your particular sampler or synthesizer. (Five CDs of samples for the Akai S series samplers are reviewed on p. 117.)

Your first option might be to check out what your instrument manufacturer offers. Akai, E-mu, Ensoniq, and Roland offer extensive libraries for their samplers. But a lot of the action comes from third-parties, such as Eye & I Productions (Ensoniq EPS-16, ASR-10), Kid Nepro (Akai S900-series, Casio FZ), Prosonus, which is now distributed by Big Fish Audio (EPS-16, Akai S1000/900/950, Digidesign SampleCell), Q Up Arts (S1000, SampleCell, E-mu E-III), Sound Source Unlimited (EPS-16, ASR-10, SY99, T-Series, E-mu Emax), and Syntaur Productions (Mirage, EPS-16). A great source of sampler-specific sounds is Stratus Sounds, which supports the Kurzweil K2000 and K250, Akai S1000, and Roland S-770.

Sony MDR-7506 Professional Headphones: $135

Whether you're working late at night in an apartment studio, cutting vocals (or tracking live) in a pro facility, or checking the stereo spectrum of a final mix, headphones are the umbilical cord to your music. Sony's MDR-7506 headphones sound amazing (frequency response is 10 Hz to 20 kHz), are comfortable, and can take getting tossed around without self-destructing. But the coolest feature is that the MDR-7506's earcups fold into the head strap. The collapsing design allows you to toss the phones into a gig bag, store them in a guitar case, or stuff them into the pocket of a leather jacket on your way to sessions.

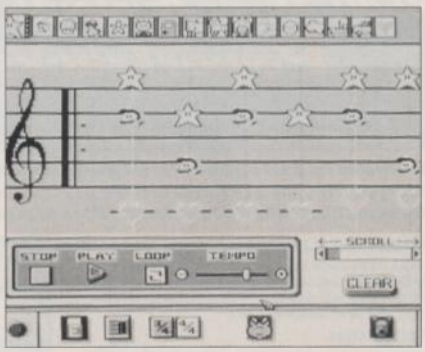
Sony MDR-7506 Headphones

Opcode Musicshop: $149 (Macintosh)

If you're new to Macintosh sequencing and notation software, Opcode's *Musicshop* offers a cost-effective way to get your feet wet. This integrated package is derived from *EZVision* and offers a 16-track sequencer with limited notation capabilities. Although the program only transcribes notes and rests, and doesn't support lyrics or chord symbols, the Notation view is great for editing notes in a manner that is more familiar to most musicians than event lists or graphic "piano-roll" displays. If you already have *EZVision*, you can upgrade to *Musicshop* for $50. Reviewed September 1993.

Nintendo Mario Paint and Mouse: $60 (Super NES)

Here's a product for the kid in all of us. *Mario Paint and Mouse* is a graphics and music package for the Super Nintendo Entertainment System (NES) that lets users create and combine their own still graphics, animations, and musical compositions without a desktop computer. The package includes a mouse to control the icon-based paint, animation, and music sections of the software. Projects can be saved in 32 KB of battery-backed RAM within the cartridge and transferred to video tape. Unlike most video games, *Mario Paint and Mouse* encourages individual creativity, in addition to hand-eye coordination. If you have a Super NES in your house (and few parents don't), check it out.



Nintendo *Mario Paint and Mouse*

Music Quest MIDIEngine 2Port/SE: $199 (PC)

If you're fortunate enough to receive a notebook PC as part of your holiday stash (or even if you're just dreaming about one), you'll need to outfit it with a MIDI interface. Music Quest's tiny, parallel-port model will let you dress it up with style and oomph. The 2Port/SE includes two

World Radio History

H I G H - T E C H

MUSCLE

BECAUSE PERFORMERS "LIVE OR DIE" BY THEIR SOUND SYSTEMS, WE'RE PROUD TO ANNOUNCE THREE NEW TOUGH GUYS TO THE PEAVEY POWER AMPLIFIER LINE...THE PV SERIES. THIS NEW LINE COMBINES THE LATEST SEMICONDUCTOR TECHNOLOGY ALONG WITH THE MOST CONTEMPORARY APPROACH TO TRANSFORMER DESIGN FOR HIGH PERFORMANCE, BRUTE POWER AND UNMATCHED RELIABILITY WITH SPECIFICATIONS, SOUND, AND PRICES THAT CAN'T BE BEAT.

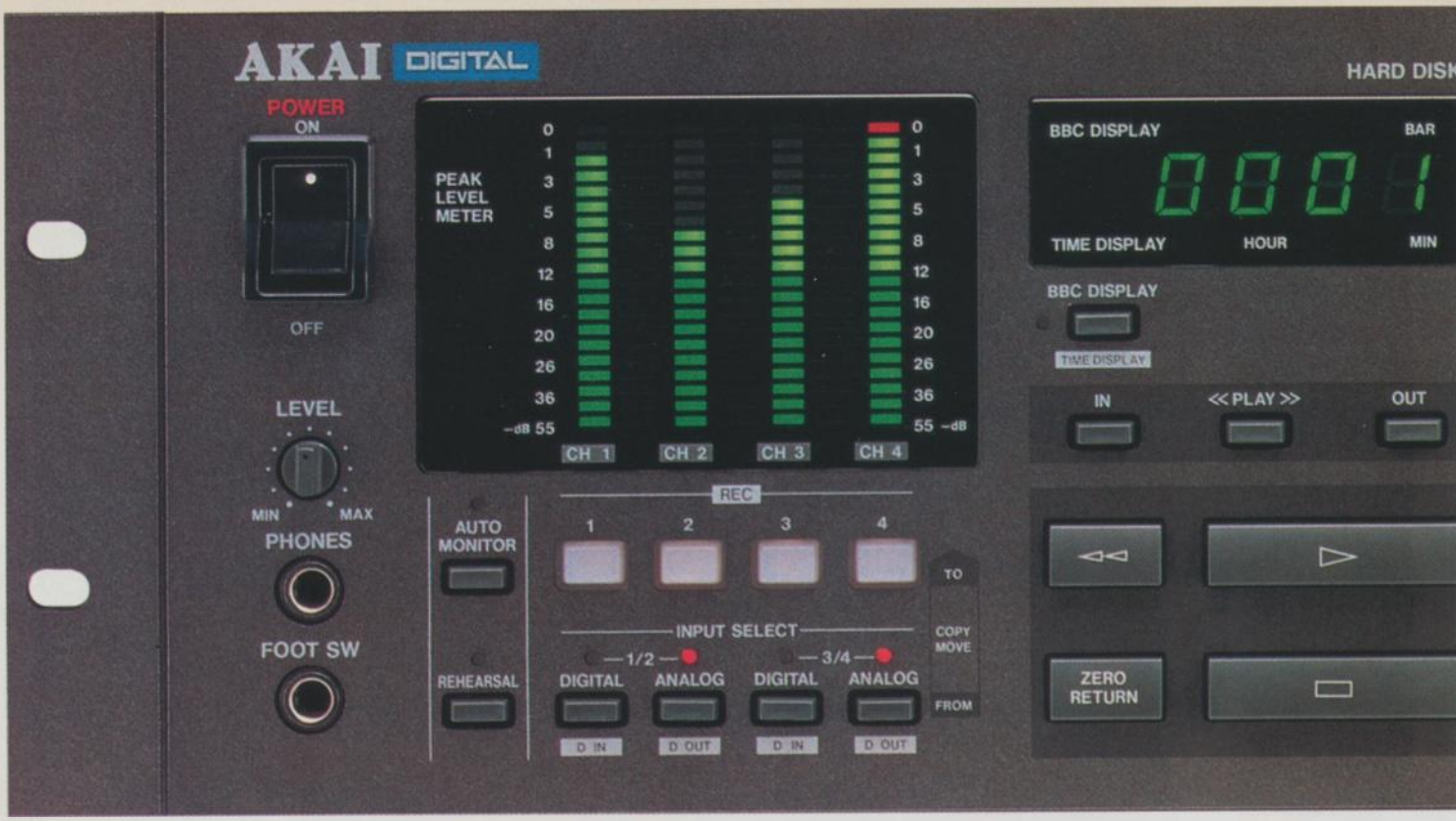
PV®-4C (250 W X 2) $399.99
PV®-8.5C (550 W X 2) $499.99
PV®-1.3K (1000 W X 2) $669.99

SUGGESTED U.S. RETAIL PRICES*

PEAVEY

PEAVEY ELECTRONICS CORP.
711 A Street Meridian, MS 39302-2898

*PRICES MAY VARY IN DIFFERENT LOCATIONS. PRICES WILL BE DIFFERENT OUTSIDE THE U.S.



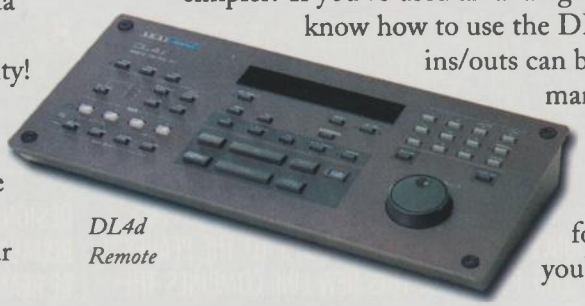
Ten Reasons Why You Should Cho

1. TAPELESS EDITING The DR4d can simultaneously record 4 tracks directly to standard SCSI-compatible hard disks, not tape. Tape recorders which use a cassette format (VHS, 8mm, etc.) have a huge problem: without at least two machines, you can't edit. But even a single DR4d allows random access editing that tape recorders just can't offer. Move, Copy, Insert, Copy + Insert, Move + Insert, Erase, and Delete with ease. Edit with complete confidence, because if you try an edit but change your mind, the Undo function will instantly restore the previous arrangement. It's a breeze to copy any part of a track and paste it anywhere on any track, even with a specified number of repeats. Or perhaps use the Insert commands to instantly slide track data in time against other tracks. This editing power encourages experimentation, and thus, your creativity! Imagine it. Do it.

2. NO WAITING Another problem with tape is the time required to physically move from one point on the tape to another. Concentrating on your music is what's important, not waiting for tape to shuttle back and forth. Never again waste such precious time: the DR4d allows you to instantly move to 108 different locations. Set up repeat sections, jam along with your tracks, then drop into record to capture it all while it's still immediate, fresh.

3. JOG/SHUTTLE Another cool DR4d advantage is the ability to offer scrubbing of audio, like "reel-rocking"on analog decks - only with much better quality. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. So finding precise editing points is only as complicated as using your ears.

4. FAMILIAR OPERATION One concept we *did* want to carry over from tape recorders is the user interface. Friendly, tape machine-style controls make the DR4d by far the easiest hard disk recorder to use. With dedicated buttons for Play, Stop, Rewind, Fast Forward, and so on, what could be simpler? If you've used an analog deck, then you know how to use the DR4d. Punch-ins/outs can be performed manually or automatically from the front panel, or via footswitch. Like you'd expect.



DL4d Remote

5. EXPANDABILITY Up to four DR4ds can be chained together to create a 16-track system, simply by plugging an optional cable between units! And the optional DL4d Remote makes it a snap to

World Radio History

ose the DR4*d* Hard Disk Recorder

control all of them. An optional, factory-installed 200 MB internal hard disk offers 32 track minutes of recording right out of the box. The DR4d can handle up to seven hard disks and supports seamless overflow recording across multiple disks. With enough disk storage space, you can actually record on all four tracks for an incredible 24 hours!

6. EXCELLENT CONNECTIONS Four balanced TRS 1/4" Input and Output jacks, easily switchable between -10 and +4 dBu levels, simplify interfacing with any type of console. The DR4d's pair of digital I/O ports allow communication with other digital devices in the form of both XLR and RCA connectors (AES/EBU or Type II selectable), as well as provide DAT backup. And then there's the supplied SCSI port for access to external hard disk drives. Just plug and play!

7. YOU'VE GOT OPTIONS And affordable ones, at that. For digital access to all four channels simultaneously, the IB110D provides the two additional AES/EBU ports. For SMPTE timecode applications (slave or master), the IB112T is installed in seconds. The IB113M interface gives you MIDI In, Out, and Thru, and the IB111S is a second SCSI port which will allow connection to computers for visual waveform editing and magneto optical drives for data backup.

8. DEDICATED DESIGN The DR4d is a dedicated digital audio product, rather than an add-in board for a computer. It's a tool designed for a single purpose: to record and edit audio precisely, effortlessly, and affordably. We think you'll agree that it succeeds on all counts beautifully.

9. SOUND QUALITY The DR4d contains Akai's own advanced digital technology, including super-clean 18-bit 64x oversampling A/Ds and advanced single-bit 8x oversampling D/A convertors with 18-bit resolution. Industry standard sample rates include 48, 44.1, and 32kHz. In short, the quality is superb and with a full 96dB dynamic range, you can rest assured of always sounding your best.

10. $1995.00 Simply put, the DR4d is the best value in digital recording today. For the first time, the nucleus of a professional quality 4-track hard disk recording system can be yours for only $1995.00! Just add internal or external hard disks, and you're ready to use our latest masterpiece for creating your next masterpiece.

DR4d

AKAI DIGITAL

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Consult your Akai dealer for information on compatible hard drives

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MAJOR MIDI

Jam Man is a lot more than just another "Been there, done that" effects box — it's a whole new Cool Idea Factory.

Technically, Jam Man is a Digital Delay/Sampler (with MIDI too). Just play a line and then get crazy with multiple sound loops – 8 secs worth (up to 32 secs optional). Grab riffs on the fly and create instant loops and then switch between 'em. Jam Man even lets you lock your loops to your tempo. You'll be doing grooves so cool they just might be illegal. Of course, MIDI heads can sync-up a sequencer too. You can also s-s-sample s-s-s-sounds and play 'em backwards.

Jam Man is from Lexicon, the same techno-gurus who make Alex and those serious studio processors. Wanna' know more good news? Jam Man doesn't cost big bucks. Get into a Lexicon dealer today 'n CHECK. IT. OUT. Ye-e-ow!

Lexicon

HEARD IN ALL THE RIGHT PLACES

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SOUND Bargains

pairs of independent MIDI I/O jacks, MIDI message filtering, and SMPTE I/O, complete with freewheeling and

MIDI Quest MIDI Engine 2Port/SE

regeneration. It also comes with its own *Windows* and *Cakewalk* drivers. Now, how much was that notebook, again?

Anatek Pocket Mapper: $99

If you celebrate the holidays in the Jewish tradition, there's a different Anatek Pocket product for each of the eight days of Hanukkah and then some. The Pocket Mapper is among the coolest members of the family, providing the ability to convert incoming Control Change, Aftertouch, and Pitch Bend messages from one type to another. For example, if your synth doesn't respond to Breath Controller messages from your wind controller, this handy little gem converts them into Aftertouch or Mod Wheel messages. Pretty cool for something you don't have to plug in. Reviewed January 1992.

Anatek Pocket Mapper

Tascam Porta03 Ministudio: $259

Oops! We fibbed. The retail price of Tascam's 4-track Porta03 is not under $250. However, we *really* wanted to include a multitrack recorder on the list. In our defense, the 2-input Porta03 used to go for $249, but a recent price increase edged the cassette ministudio over our cost ceiling. So what do you do when desire overtakes reality? You go into denial and cheat! The Porta03 doesn't offer any frills whatsoever, but as an inexpensive audio sketchpad, it does the job.

PG Music PowerTracks: $29 (Windows, DOS)

There aren't enough stocking-stuffers in the world, particularly when it comes to software sequencers; most are candidates for the Big Gift under the tree. But PG Music has broken this barrier with *PowerTracks,* a sequencer for *Windows* and

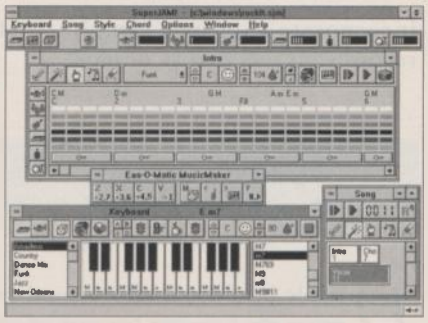
▼

$250 buys a lot these days.

DOS machines that's big on features but small in price. Did I say small? How about minuscule? For $29, you get a full-fledged, 48-track MIDI sequencer with most of the features found in the big guys. At this price, you can't afford *not* to put one in your favorite PC-based musician's stocking. Reviewed September 1993.

Blue Ribbon SuperJAM!: $129 (Windows, Amiga)

Jamming with friends is one of the most satisfying experiences you can have as a musician. But what if there's no one around when you feel the urge? One excellent solution is The Blue Ribbon SoundWorks' *SuperJAM!,* an algorithmic composition and accompaniment program that now is



BlueRibbon *SuperJam!*

available for *Windows* 3.1 and Amiga. The Eas-O-Matic Music Maker feature (don't you just love that name?) automatically creates chord progressions and melodies in a variety of musical styles with up to six "players," including keyboard, bass, drums, rhythm guitar, strings, and lead. You can also create your own progressions and styles to play along with while you wait for Santa. Who knows, he might even sit in for a chorus or two. Reviewed December 1992.

Dr. T's Boom Box: $59 (Windows, Amiga)

Most music software is serious, powerful stuff. Thankfully, the operative term there is *most* (not all). If you're in the mood to give yourself or a friend a fun software toy, *Boom Box* might be right up your alley. *Boom Box* turns you into a remix master

Dr. T's *Boom Box*

by letting you play any combination of pre-recorded, rap-style grooves through your PC's sound card and create your own tunes. You can also jam along via the computer keyboard, add effects,

World Radio History

SOUND Bargains

incorporate your own samples, and record your mix to disk or tape.

DOD 830 Series II Graphic EQ: $249

People into visual effects tend to enjoy the holidays because of all the eye candy provided by lights and decorations. Those folks are also

DOD 830 Series II

good candidates for graphic equalizers, which give you a visual representation of the frequencies you choose to affect. Units such as this dual 15-band model from DOD offer particularly powerful sound-shaping capabilities. Tie one into your system with a patch bay, and you can easily use it both while recording individual tracks and creating the final mix.

Roland PC-150 MIDI Keyboard: $249

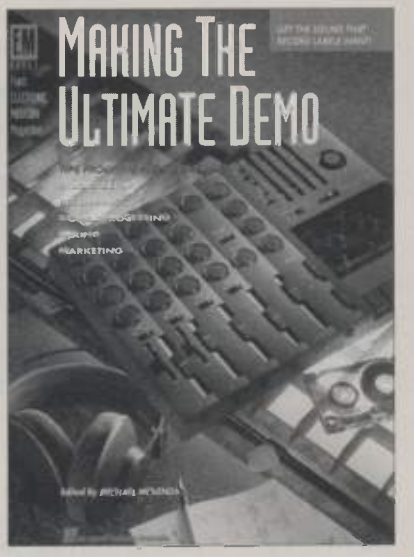
As more musicians and music hobbyists have pursued music-notation and sequencing software, the need for an inexpensive way to enter MIDI data into a computer has increased. Roland recognized this several years ago with the original PC-100 computer MIDI keyboard. The battery-powered PC-150, which is particularly well-suited for sound-card owners, offers 49 full-size keys and access to a host of other MIDI functions, including Program Changes, MIDI controllers, and Roland GS parameters. If you don't want to invest in a keyboard synth or an expensive dedicated controller, this is a good way to go.

Microsoft Musical Instruments CD-ROM: $79 (Macintosh, Windows)

If you've been looking for an excuse to pop for a CD-ROM drive, consider your request fulfilled. This beautifully designed, well-written, electronic coffee-table book provides a graphic and sonic encyclopedia of acoustic instruments from around the world. It includes multiple views of single instruments, examples from different types of musical ensembles, and an overview of different musical styles. More important, this is a great example of multimedia done right. Put it on your shopping list for musician and non-musician friends alike.

FIVE PRODUCTS UNDER $25

If you're really on a budget this year, or if you're in need of a few stocking-stuffers, you may want to consider some of the following shamelessly self-promotional items, all of which are available from Mix Bookshelf (tel. [800] 233-9604 or [510] 653-3307).



EM's new *Making the Ultimate Demo* book

- **EM Subscription:** $19.95

If you want a friend (or yourself) to stay on top of the constantly changing world of electronic music and recording, you need a top-notch source for product info, reviews, and applications. We think we make the best. (I told you this was shameless.)

- **EM Books:** $9.95 to $17.95

Whether you're interested in learning more about the recording process, computer applications for music, or basic terminology, we have a book to fit your needs. The newly released *Making the Ultimate Demo,* the popular *Making Music With Your Computer,* and the compact technical dictionary *Tech Terms* give you the kind of depth and breadth of information that only a book can provide.

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The EM hat

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Show your friends how hip you are by donning a jet black EM T-shirt or cap. They're bound to be the fashion accessories of the 1990s.

- **Hearing Protectors:** 10 for $3.98

Save your ears and those of your loved ones by picking up a pack of these comfortable, lime green, foam pads. Just don't mix them up with the Christmas candy.

World Radio History

It's nice to know an AKG studio standard isn't over anyone's head anymore.

Even among pros, there are times when your talent exceeds your budget. That's why we created the new AKG C3000. It has the warmth, clarity and character of the most popular AKG studio mic in the world — at about half the price. In fact, when you hear it you'll be amazed what a large, gold-coated diaphragm will do for your sound. The C3000 gives you all the quality of an AKG without having to pretend it's an AKG. It is.

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Bean, from D'Cückoo, whose new "Umoja" CD is on RGB Records.

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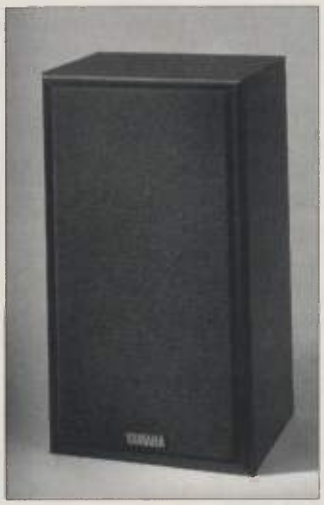
SOUND Bargains

Yamaha S8M Studio Monitors: $199/pr.

To complete your studio-on-a-budget, you need a decent pair of monitor speakers. This 3-way, bass-reflex set from Yamaha offers most of what you'd want in a smaller, home environment: decent frequency response, good power-handling, compact size, 5-way binding-post connectors, and, best of all, good sound. Like many close-field monitors, these aren't designed for blistering levels, but reggae versions of "Rudolph" above 90 dB probably shouldn't be shared with others anyway. Reviewed October 1991.



Yamaha S8M Monitors

AKG C 410/B Headset Condenser Microphone: $249

If you're a singing drummer, keyboardist, or dancer, the value of a headset mic is obvious: The mic is always where your mouth is. But I've discovered that these mics are also a boon for the solo personal recordist. Finally, a singer can engineer his or her own session without bumping into boom stands, or risking not being able to reach the recorder for a quick punch out. You can sit right in front of your console—the speakers should be off (if you like to monitor with headphones), or played very low (if you hate monitoring on headphones)—and make EQ and level adjustments freely.

AKG C410/B Headset Mic

You can even go wireless if you want to bounce around the studio while you're tracking.

Turtle Beach Wave for Windows 2.0: $149

Now is not the season to look askance at gift programs bundled with PC sound cards, but if you somehow carelessly misplace the basic audio editor that came with your card, you should probably take a serious look at this powerful entry from Turtle Beach Systems. *Wave for Windows* offers sophisticated waveform-editing options, the ability to put together playlists from existing mono or stereo files, and, in the latest version, built-in effects, such as reverb and flanger, that you can apply to your audio. If you want to do serious work with digital audio files on the PC, you may want to spend this holiday at the beach.

Tube Works RT 901 Real Tube Pedal: $165

At a time when affordable digital audio has socialized the recording industry, allowing virtually everyone to produce immaculate sound, it figures that many recordists are now deifying distortion. Suddenly, analog tape coloration is "in," and musicians who own digital recorders are now using tube preamps to make those

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Control Your Rack From The Ground Up.

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Step Up To The Ultimate Foot Controller

It starts with the Ground Control foot controller. Fully programmable, incredibly easy to use, it gives you the ultimate power to access and combine effects because it sends program changes on multiple MIDI channels to control eight different MIDI effects devices at once.

Ground Control even has two expression pedal inputs that let you use ordinary volume pedals to send MIDI Continuous Controller messages for smooth, accurate control of effects parameters while you play.

You can create 100 presets—each with its own name—that include program changes for individual MIDI effects, expression pedal settings, plus GCX™ loop and switch status. Presets are easy to program and easy to access because everything is displayed on a big, bright LED readout.

Expand Your Control With The GCX™ Expander

With the GCX Expander you can also use the Ground Control foot controller to operate your non-MIDI effects and route your audio signal. This single-space rack mount audio switcher even provides power to the Ground Control over the 5-pin MIDI cable.

The GCX has eight audio loops that use the finest gold contact relays sealed in pure nitrogen. The result is absolutely no loss of tone and no degradation of audio performance over time. And each loop is separately grounded to eliminate noise and hum.

In addition to A/B switching and muting parallel effects, you can use the audio loops as latched or momentary switches for control of footswitch functions like amp channel switching.

You also get two front-panel instrument feed-thrus that are buffered to prevent signal degradation when bypassing several loops. And these ultra-low noise buffers are designed to imitate vacuum tube amp inputs for optimum pickup tone quality.

Take Control With Ground Control

Affordably priced, backed by a five-year warranty, the Ground Control System is steps ahead of other effects controllers. It's the one system that gives you instant access to the full range of tonal possibilities your gear has to offer.

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bitstreams sound fat and warm. To this end, the Real Tube Pedal by Tube Works should not be pigeon-holed as a guitarist's tool: In the personal studio, it can be used to add wonderfully ragged edges to keyboards, vocals, and sampled percussion. Even if you're using an analog tape recorder, a warm-sounding tube can make a big difference.

RT 901 Real Tube Pedal

Creative Labs SoundBlaster 16 Basic: $199 (PC)

These days, a computer without a sound card is like a Christmas tree without lights: functional, but not exactly living up to its potential. If you feel the need to enlighten your PC, you'll be glad to know that recent price reductions have brought 16-bit cards down to 8-bit prices. This new, base-level card offers the typical 4-op FM synth and optional support for a MIDI interface, as well as 16-bit audio I/O. In addition, it can be upgraded with the Proteus-based WaveBlaster synth daughterboard and the ASP DSP chip. To complete the package, Creative Labs throws in a hefty collection of bundled software including a basic version of *Cakewalk for Windows*. Reviewed November 1993.

SoundBlaster 16 Basic

CONCLUSION

It's hard to believe what $250 buys you today. Multitrack tape recording, MIDI controllers, 16-bit hard-disk recording, stereo effects processing, and other technologies that only a year or two ago were limited to the upper echelons of high-tech music society are now all within reach of almost anyone. The fact that you can piece together an entire home studio with gear under $250 is astounding. In fact, it's enough to make you believe in Santa. Happy Holidays!

EM *editor* **Bob O'Donnell** *still likes to wake up early on Christmas morning.*

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By Ernie Rideout

A PLACE FOR EVERYTHING

"We were lying on the floor, both of us trying to look at the LCD on a sampler at the bottom of a flight case," recounts studio designer George Hajioannou of Studio Logic in Feasterville, Pennsylvania, recalling a session in a client's studio. "We'd get up to check the computer screen, then back down to look at the LCD again. Up, down, up, down. Finally, I told my client, 'Look, this is a very nice flight case your gear's in, but it just isn't going to work. We've got to organize your studio.'"

...and everything in its place, if you want a comfortable and efficient studio.

It's shocking how often scenes such as this are played out in studios across the country. Many home and project studios are organized according to which flight case was last taken to a gig, rather than how efficiently the various components work within the context of the entire studio. Yet optimizing the ergonomics of your studio is remarkably simple, and affordable solutions to space problems abound.

WORK HABITS

The first step toward studio nirvana is defining how you work. You need to identify the gear used most often and recognize

ILLUSTRATION: NICHOLAS VITACCO

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A PLACE FOR EVERYTHING

the specific tasks you need to perform. For example, if you do your own sampling or sample editing, your sampler must be close at hand. If you only load sounds into it, your CD-ROM player should be as accessible as the sampler itself. In many studios, the computer is the most important piece of gear, so you don't need to have close contact with the gear it controls.

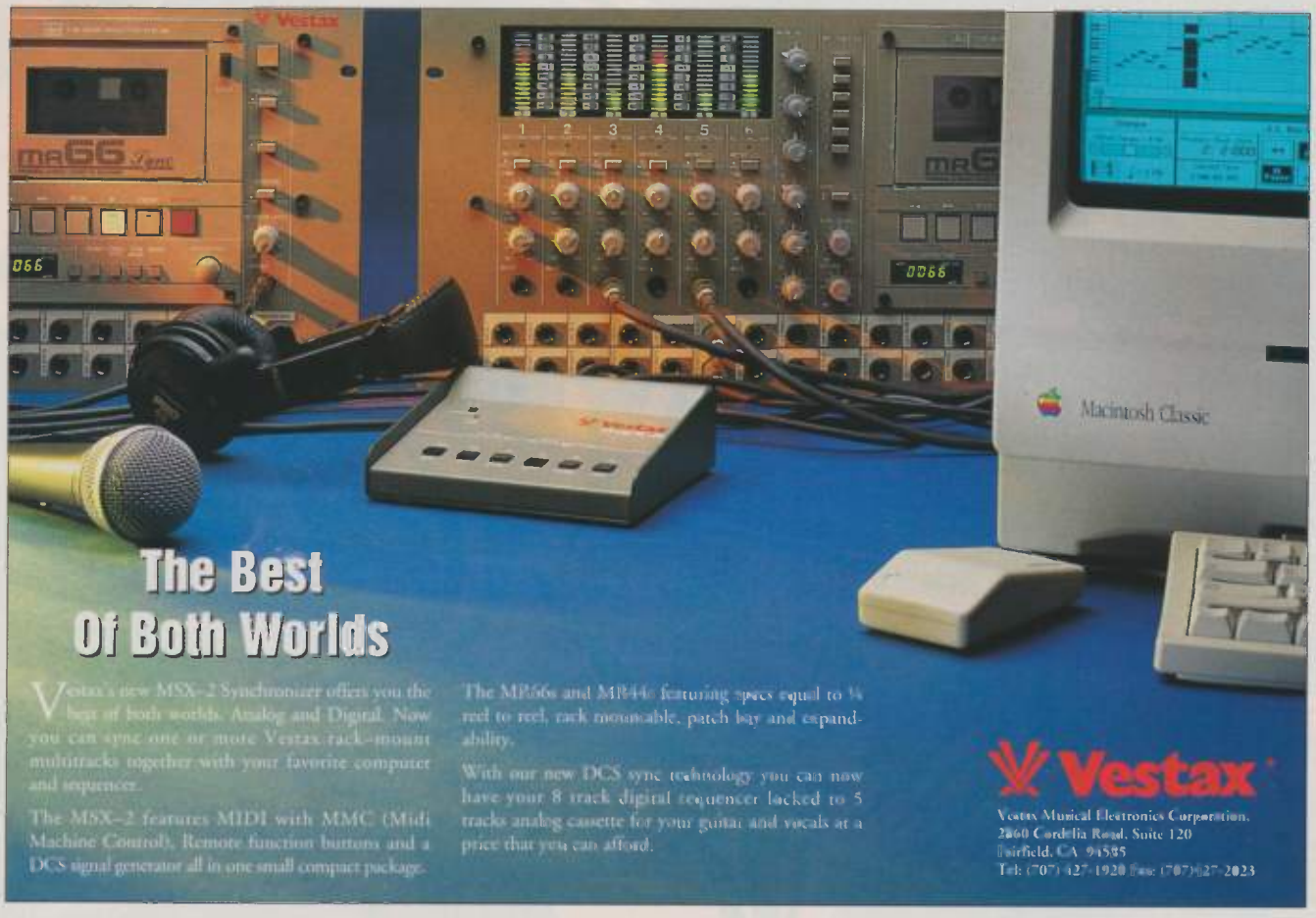
The tasks you perform determine your ideal studio layout. If you spend most of your time going back and forth between your keyboard controller and computer, these two items should be within your immediate grasp. Your MIDI modules can be slightly out of reach, as long as you can visually confirm their settings. If you record your own guitar playing, you'll want your tape-transport controls, outboard rack, and amp head at the ready. Someone who records acoustic instruments and vocals may need to have their mics and console in close proximity.

If this seems like just plain common sense, it is. But rather than avoid organizational problems, take control of your studio and create an efficient and enjoyable working environment. If your gear were easy to access and working perfectly, wouldn't you want to work in your studio even more?

FIG. 1: Wenger's Multimedia Workstation includes two dual-space racks and plenty of room for computer, CD-ROM, VCR, and monitors.

EYES ON THE PRIZE

Although it is possible to work in your studio without seeing everything at all times, your efficiency improves dramatically if you can see the most important readouts without turning your head. If your critical components are at eye level, you can check the status of sound modules, record levels, and other important information at a glance. This setup involves some form of shelving that fits over and around your main tool, whether it's a computer, controller keyboard, or mixing console.



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Omnirax makes shelves called RiserRax ($250) that sit on top of a workstation desk and hold twelve rackspaces worth of modules (or eight spaces and a video monitor) above the controller keyboard or mixing console. Wenger also uses this bridge concept on their Multimedia Workstation ($1,125; see Fig. 1) and Computer/Synthesizer Workstation ($1,275). Each of Wenger's desk systems includes a rack shelf that fits over the desk surface.

Several portable workstations lend themselves to creating efficient sightlines. Instandt America has recently introduced its Computer Music Workstation ($299), which provides two adjustable shelves above the keyboard tier. They also manufacture Utility Shelves that attach to their GP2 Keyboard Stand.

Ultimate Support Systems offers two workstations that provide versatile storage solutions above the main keyboard or computer shelf (HS-26, $215; HS-36, $365 with keyboard extension; see Fig. 2). With the flexibility of the system's tubular construction, you can either keep your eye-level equipment on support bars (CSB-180B, $10/pair), or attach 5- or 10-space rack rails (RL-05B, $50/pair; RL-10B, $75/pair), which can be located anywhere on the main frame.

Standtastic's adjustable MIDI Desk (MD-3, $331) keeps your gear in your face. Their line of portable Pro-Stand keyboard stands can be modified similarly with their Rack Mount Kit (RMK-1, $25/space), or their 36-inch and 48-inch wire Utility Shelves (1236US, $27; 1248US, $30). Quik Lok's QL/624 ($220) provides up to eight rack spaces above a folding keyboard stand.

If you have more gear than will fit above your keyboard controller or mixer, consider a slanted rack to bring low-lying modules into view. These free-standing towers allow better visibility than standard racks, and a wide selection of heights and angles is available. Racks with slight angles are best for sound modules and other self-sufficient devices; those with more of a rake to them put your rack-mount mixer into a console-style position.

FIG. 2: Ultimate Support's HS-36, with keyboard extension, offers plenty of space and flexible tubular construction.

Of the several manufacturers who offer such racks, Omnirax makes models of various sizes and angles in the $200 to $300 range. Middle Atlantic Products has two models, the LRK ($290) and SRK ($260). Ultimate Support distributes two models by Kinig and Meyer, the 28200-55 ($280) and 42020-55 ($310). Quik Lok offers the RS-957 ($70) and RS-959 ($180), in addition to

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fax (818) 769-9965

Omnirax
PO Box 1792
Sausalito, CA 94966
tel. (800) 332-3393
or (415) 332-3392
fax (415) 332-2607

Quik Lok
(dist. by Music Industries Corporation)
99 Tulip Ave.
Floral Park, NY 11001
tel. (800) 431-6699
or (516) 352-4110
fax (516) 352-0754

Rackaccessories
8700 Reseda Blvd., Suite 101
Northridge, CA 91324
tel. (818) 773-9704
fax (818) 773-9203

Standtastic
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Anderson, IN 46016
tel. (800) 876-6923
or (317) 642-5205
fax (317) 641-1205

Ultimate Support Systems
2506 Zurich Dr.
PO Box 470
Fort Collins, CO 80522
tel. (800) 525-5628
or (303) 493-4488
fax (303) 221-2274

Wenger Corporation
PO Box 448
Owatonna, MN 55060
tel. (800) 733-0393
or (507) 455-4100
fax (507) 455-4258

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the RS-955 and RS-950 modular towers ($140 to $180).

EXTENDING YOUR REACH

If keeping your gear within your field of vision saves time, imagine how efficient you would be if you could reach all the controls from your chair. You can waste a lot of time walking back and forth across the studio over the course of a 12-hour job. The more you take advantage of MIDI automation, patch bays, and computer-based recording systems, the easier it is to streamline your movements within the studio. However, by making some ergonomically sound investments and looking at the *physical* aspects of studio design, you can minimize the amount of time wasted by excess movement.

When several large pieces of gear require your frequent attention, a crescent-shaped, or corner layout, is the way to go. With this arrangement, you can easily move from the console to the keyboard controller to the computer just by turning your chair. Nigel B offers an extensive line of workstations, desks, and racks that follow this concept. Omnirax also offers several pieces of studio furniture that can be integrated into a space-saving corner configuration. One combination includes a ProStation desk, connecting desk wedge, CW-30 Console Workstation, and WD-A Angled Desk with RiserRax (see Fig. 3); the entire system retails for $1,750. Ultimate's HS-36B Workstation offers two work areas that can be set at any angle.

Wraparound systems are also helpful for those who have more modest equipment rosters. Quik Lok's WS/500 Workstation ($600; see Fig. 4) features two small shelves that encircle the user, providing quick access to a computer keyboard, mouse pad, drum machine, or hardware sequencer.

Ultimate Support offers a unique system called Thinkertoys that consists of metal tubes, tiers, shelves, rack rails, and various connectors and joints. You simply cut the tubes to the right length with a pipe cutter and construct your own custom workstation that puts everything within your reach and direct line of sight.

Utilizing the space beneath a desk also improves accessibility, keeping things like rack gear, power amps, and removable storage systems within easy reach. Wenger's workstations both feature a shelf beneath the desktop, and Omnirax's ProStation holds fourteen rack spaces on the left and eight spaces plus a sliding shelf on the right of the kneewell. Quik Lok's WS/500 also provides two shelves underneath its keyboard tier.

What about those sequencers and drum machines that litter the tops of your monitors? Perhaps you have a multitude of keyboards that you can't bear to part with. How about that wall right behind you? Standtastic offers wall-mounting kits that accommodate almost any size keyboard, or other gear that must be accessed from the top (WMK-1, $142). Used with a crescent-shaped furniture arrangement, this approach lets you utilize every available inch of your valuable studio space.

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FIG. 3: This Omnirax ProStation corner system includes (left to right) a ProStation desk, connecting desk wedge (plant not included), CW-30 Console Workstation, and WD-A Angled Desk with RiserRax.

Everyone has items in their studio that are used frequently, but not enough to warrant prime real estate. To optimize the space under the desktop, Omnirax's workstations offer sliding shelves for computer keyboards or small mixers that slide out over or under your keyboard controller and then retreat to their hiding place. Wenger's Computer/Synthesizer Workstation also offers a sliding computer keyboard shelf that can be adjusted laterally. The wings of Ultimate Support's workstations are intended for easy adjustment toward and away from the main work area.

If the thought of a desk without drawers makes you nervous, don't panic. Rackaccessories, Middle Atlantic Products, and Quik Lok offer several types of rack-mountable drawers that can accommodate the tools, cables, microphones, cassettes, and CDs that might otherwise mar the pristine beauty of your studio.

No matter how well you organize or

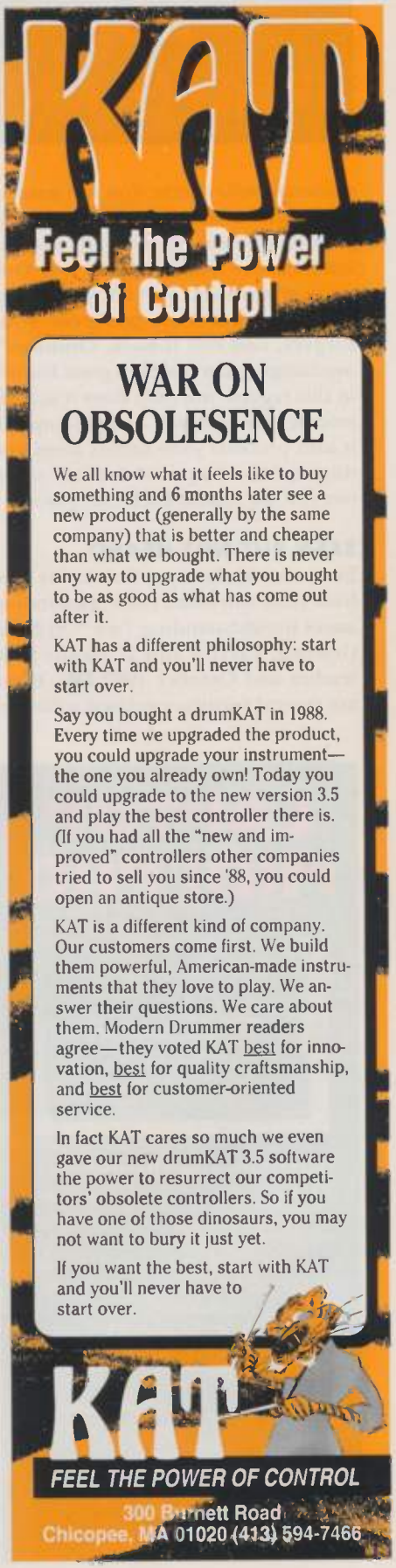
LUST IN THE DUST

Some of the most overlooked items of studio furniture are dust covers for all your gear. These simple but essential items protect your valuable equipment from the ravages that dust can inflict on sensitive electronics. Covers are available in a variety of colors and styles, providing inexpensive insurance against dusty mishaps.

Among the companies that offer dust covers for musical gear is Le Cover (1223 Kingston Lane, Schaumburg, IL 60193; tel. [800] 228-DUST or [708] 980-4475). Prefab covers for many common products and custom covers for anything else are available in three types: Regency (vinyl with nylon exterior) for indoor studios, LeGrande (nylon backed with urethane) for road gear, and LeGrande Plus (LeGrande with ½-inch foam) for the ultimate in protection.

Another cover company is J. Pro (PO Box 41, Champlin, MN 55316; tel. [800] 472-7707 or [612] 427-7707). They offer stock and custom DusKuvirs in a variety of styles, including leather-look vinyl, black 2-ply vinyl, and frosty clear vinyl with anti-static treatment. J. Pro also offers CableKuvir kits, which include cable labels, cable ties, Velcro straps, and corrugated split tubing.

In addition to Quik Lok products, Music Industries Corp. also distributes Keycovers, which are anti-static covers for keyboards. These covers are prefabricated in eight sizes to fit most models and come in translucent vinyl so you can see if the instrument is on or off.



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automate your system, you will need to get behind it and futz. Easy access to your equipment is essential, and the workstations from Instandt and Omnirax offer casters that let you roll the whole system out, perform your surgery, and roll it back. Omnirax's overhanging top shelf is a great feature in this regard; not only does it accommodate monitors with a large footprint, it also protects your cables from getting squashed against the wall when you roll the system back into place.

SEEN BUT NOT HEARD

Everyone wants a studio that is free from hum and other noise. Grounding issues notwithstanding (see "On Solid Ground, Parts 1 and 2" in the September and October 1992 EM), there are several furniture-related solutions to hum problems that you should consider when planning your studio upgrade.

The single most important thing you can do to ensure a hum-free environment is to use wood or insulated rack rails, which isolate each piece of rack equipment. If you already have metal racks, Rackaccessories offers the RACKiso kit ($10), which isolates eight spaces and comes with shoulder washers. If you stack your rack gear on shelves, or (perish the thought) plan to continue using your milk crates as an econo-rack, put a few empty cassette cases between the units.

Keep audio cables as far as possible from power cables, SCSI cables, and transformers. Get Organized offers several Cord Control Kits ($20 to $30) that include different kinds of cable ties, cable labels, and some flexible slit tubing to gather and organize the various types of cable in the studio.

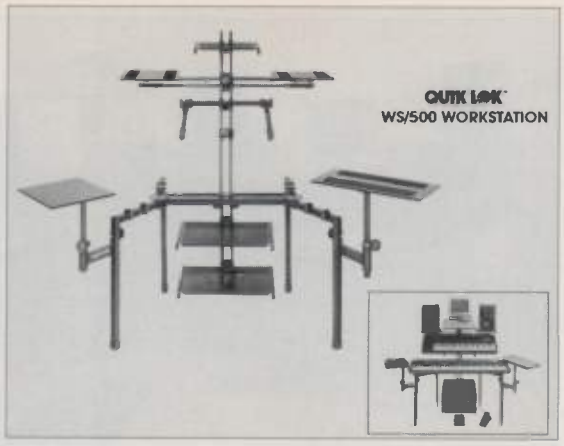

FIG. 4: The Quik Lok WS/500 workstation wraps you in gear for that cozy feeling.

You can also keep audio cables together and out of the evil clutches of the hum monsters with Velcro strips or wire wrap from a hardware store. The desk-style workstations by Omnirax provide grommets that keep cables going in the right direction, and Wenger's desks feature cable troughs and integrated power strips, in addition to grommets.

If you have a hard-disk recording system, you know how much noise those drives can make. Omnirax minimizes this annoyance with baffles and roll-tops that reduce the noise without restricting access to the units themselves.

A less obvious but more insidious source of sonic trouble is dust and dirt. Dust is your gear's worst enemy, and it can attack from the desktop, the back of the rack, or up from the floor. Furniture that provides access to hard-to-reach areas can help you keep this menace at bay. Use dust covers religiously when not using your gear (see sidebar, "Lust in the Dust"), and keep cables as short as possible; tangles of cables on studio floors are storehouses for grime.

The other side of the coin are those items that *must* be heard: the monitors. Just as placing your keyboard at the correct height encourages proper playing technique, placing your monitors at ear level improves efficiency by helping your evaluation process. Without a good stereo field, there's no way to know what your project really sounds like. Workstations from Quik Lok, Ultimate, Instandt, and Standtastic offer adjustable monitor height. The systems from Omnirax and Wenger, while not adjustable, are designed for optimal placement.

LAPTOP MIDI PRO

The MIDIEngine 2Port/SE is the only MIDI interface with pro features for IBM compatible laptops. Includes efficient dual MIDI ports and bullet-proof SMPTE sync. Connects to the parallel printer port of your desktop, laptop, or notebook PC. Multi-client Windows driver & Cakewalk driver included. Priced so you won't have to settle for less.

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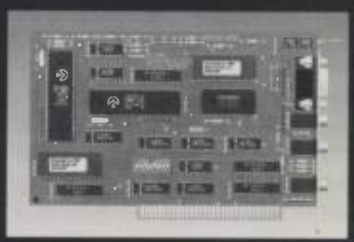
DESKTOP MIDI PRO



The MQX-32M is the multiport MIDI standard for IBM compatible desktop PC's. It features dual MIDI ports and bullet-proof SMPTE sync designed for professional use. With MPU-401 compatibility and the included multi-client Windows driver, the MQX-32M is the interface preferred by serious musicians worldwide for *all* IBM MIDI applications.

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Unless you use shielded audio monitors, keep your video and computer monitors, as well as any magnetic data storage, a good distance from the speakers. This arrangement prevents distortion or damage to CRTs and recorded data.

PLEASE BE SEATED

Studio designers agree: The chair is one of the most critical elements of a studio's efficiency. A good chair facilitates different modes of working by letting you adjust the height, remove the arms, or recline. The chair can also reduce fatigue and back pain by providing lower back support. The result is longer, happier, and more productive work sessions.

Expect to spend upwards of $200 for a chair that provides maximum comfort and flexibility. Designer John Zarra, of Visions in Ridgewood, New York, says his clients beg him to sell his $800 Steelcase chair as part of their studio package. With pneumatic support that automatically adjusts to the user's dimension and weight, it's no surprise they want it and no surprise he won't give it up.

To facilitate the chair's roller movement, many designers suggest a wood floor. If you'd rather have carpet, a small-pile anti-static type minimizes the risk of damaging your gear with a static shock. For more protection and faster rolling, use a plastic anti-static mat on the work area of the rug.

THE BEST-LAID PLANS

Now that you know some of the basics of ergonomic studio design, you can actually start the planning phase. Whether you're adding a simple desk and rack to a small system, or dreaming of an enormous $100,000 remodeling job, plan your moves carefully. Draw up a floor plan of your studio on graph paper and use scale paper cutouts of your existing and anticipated furniture to experiment with different arrangements.

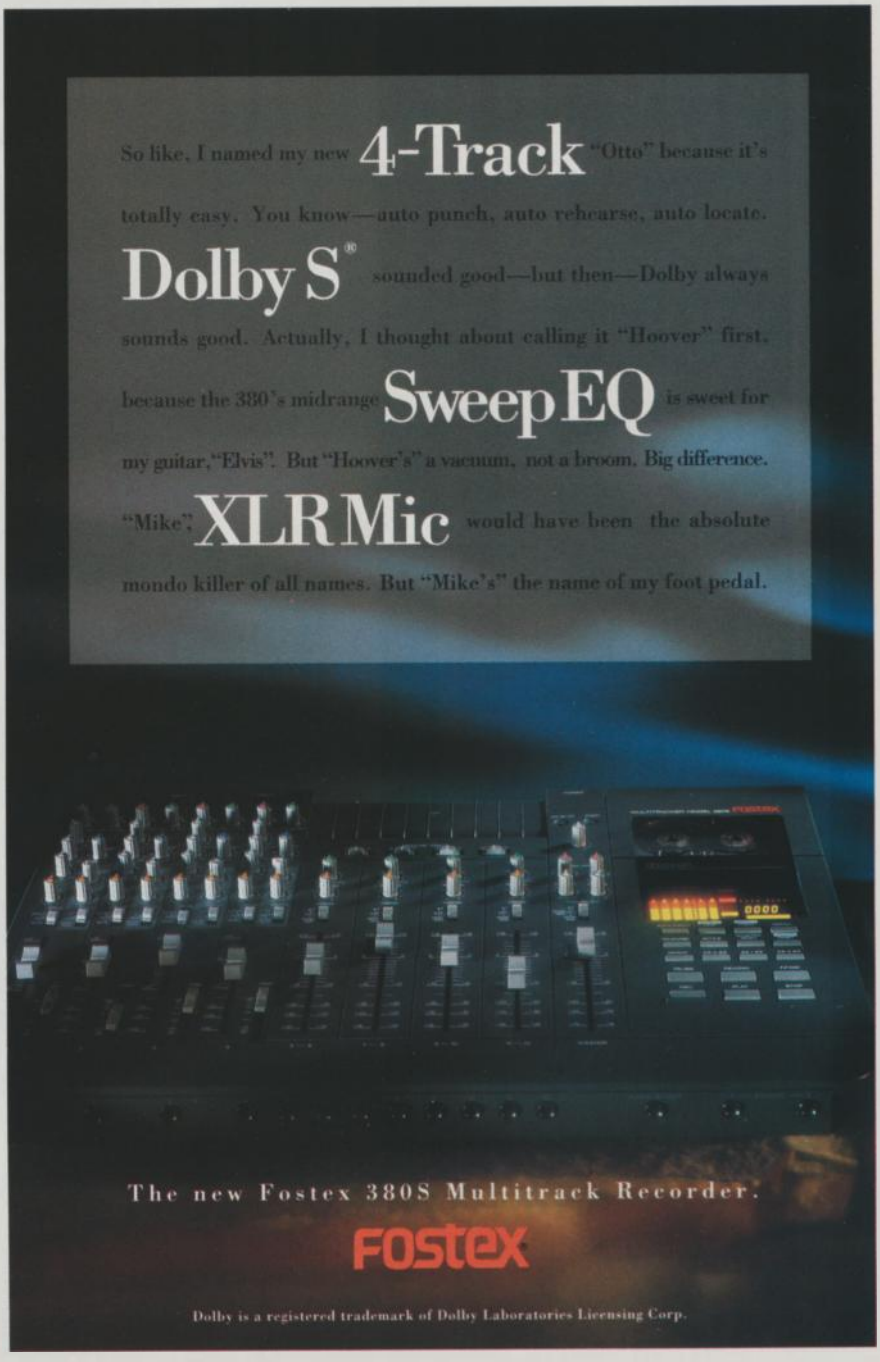
If you have the capability, use a software design or layout program to visualize ideas and alternatives. With a 3D modeling program, you can create a scale object for each piece of gear and furniture you plan to include; this also gives you an accurate idea of the best way to utilize your space.

No matter how you plan, this process helps you anticipate logistical problems before you actually set things up. Once you have installed the furniture and equipment, give yourself a few working days with the system before screwing the gear into the racks or bundling cables. Even with careful planning, you may find it necessary to move a few things around once you have it all set up.

What about George Hajioannou's client mentioned earlier? He's happy with his new workstation; everything's at eye level, everything's where he needs it, everything works. He can hardly wait to get into his studio every morning. Was it worth it for him to totally reorganize his studio? No question. And it'll be well worth your while to do the same.

(Thanks to George Hajioannou, Mark Lacas, Richard Leiter, Bobby Summerfield, Don Walker, and John Zarra.)

When he's not editing the Roland Users Group *magazine,* **Ernie Rideout** *writes, performs, and teaches in Los Angeles.*



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MIDI percussion systems go BIG

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BANG BOOM

"Hit me!" - James Brown

Long before people could write, they had the urge to hit things. For millenia, drums have provided the ideal solution. When electronic instruments emerged, all of this beating around the bush (not to mention the desert, mountains, and coastline) naturally led to a demand for percussion controllers.

Early attempts in the late 1960s included the Moog Percussion Controller and Buchla Touch Keyboard. The early 1980s saw the arrival of the now-vintage Simmons systems. Since then, we have graduated to pads that feel like drums and drums that act like pads. There are also more innocent-looking objects that can be hit, shaken, or stirred to trigger sounds than you can shake a—well, let's just say there's a lot of them.

OVERVIEW

The number of manufacturers making electronic percussion is much smaller than the number of keyboard makers, but there is more variety in approach, cost, and features. Choices include complete electronic kits, add-on pads with trigger-to-MIDI converters, stand-alone pad controllers (both with and without

By Larry "the O" Oppenheimer

Photograph by David Wasserman

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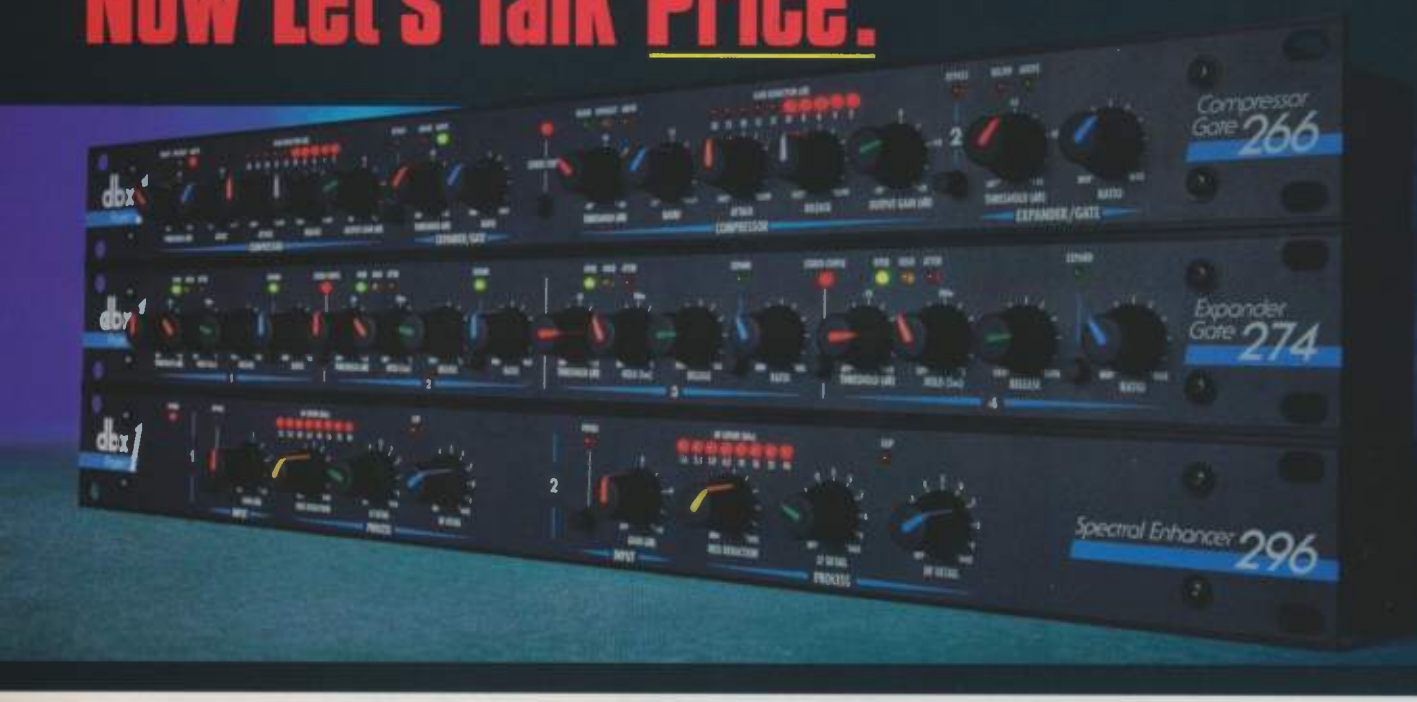
We've Always Talked Performance. Now Let's Talk Price.



266 Dual Compressor/Gate

$299

Uses the newly developed dbx AutoDynamic™ attack and release circuitry which delivers classic dbx compression for a wide range of applications—plus an advanced new gate circuit which overcomes the functional limitations of traditional "utility" gates. Both compression and gating provide superior versatility and sonic performance.

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274 Quad Expander/Gate

$449

Four independent channels of high-performance gating or downward expansion in any combination of stereo pairs or mono channels. Patented dbx VCA and RMS detection circuitry provides ultra-fast attack times to preserve the character of percussive sounds and an incredibly smooth release that won't chop off reverb tails or hanging guitar chords.

Now, with the dbx Project 1 series of signal processors, there's no need to settle for second-tier equipment to save money. Those ever-abundant budget brands have touted great pricing but have never matched dbx quality, reliability and experience.

dbx PROJECT 1

dbx Project 1 is ideal for both studio and sound reinforcement applications. Each unit delivers real dbx sound and reliability, plus innovative new performance enhancements—at the same price of other models with fewer features.

By using the latest technologies, we've streamlined the manufacturing process to reduce production costs. At last, you don't have to forego the quality and features you want to stay within budget.

So now that we've talked price, isn't it time you talked to your nearest dbx dealer and asked for a demo?

dbx

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built-in sounds), keyboard percussion controllers, and a wide variety of percussion triggers, including some that look like cymbals.

Music-industry giants Roland and Yamaha both offer complete systems, but each system has a slightly different emphasis. Yamaha's controllers, built around the TMX trigger converter ($495) or RM-50 sound module ($895), combine pads and triggers placed on acoustic drums. This approach seems appropriate for a company that makes some of the finest acoustic drums around. Their pads have been designed to fit Yamaha drum hardware and are shipped with the WS-820 dual tom stand ($195).

Roland's Compact Drum System, built around the TD-7 trigger converter/sound module (basic kit $1,850; TDE-7K expanded kit $2,795, including all pads, pedals, cables, hardware, and stand; TD-7 alone, $795), and the systems based on their SPD-11 ($895) and Octapad II (also known as the PAD-80, $850) pad controllers are designed to be stand-alone electronic kits.

Alesis's offering in this field, the D4 ($399), is simply a large box of percussion sounds with trigger inputs. It performs rudimentary trigger-to-MIDI conversion, but it is not a MIDI powerhouse and is not intended to be a master in a MIDI system.

The leading light in the field is an unassuming little company called KAT, which makes a wide selection of controller-only products with unique capabilities. Their flagship, the drumKAT 3.5 ($1,099), is also available in scaled-down versions with the same pad surface: the drumKAT EZ ($849) and dk10 ($499).

COOL PAD

All percussion systems start with something to hit, the most common victim being the drum pad. A pad is a flat surface that produces a trigger output when struck. How hard the pad is hit determines the trigger level. When connected to an appropriate input, a pad trigger can play a sound and/or generate MIDI notes.

Despite their apparent similarity, all pads are not alike. Early Simmons pads were made of a hard plastic that gave some drummers a repetitive-motion disorder—often referred to as "drummer's wrist"—after constant impacts against their unyielding surfaces. Today's pads are usually rubber-coated. Some manufacturers go to great lengths to develop pads that feel like acoustic drums.

Some pads, such as Roland's PD-7 ($145), Yamaha's EP75 ($135), and KAT's TK-10 ($214) are capable of generating two trigger outputs: one for the pad and one for the rim. These can be assigned to trigger related sounds (e.g., snare and rim shot), or treated as independent trigger sources assigned to unrelated sounds (e.g., dog bark and marimba). Roland's Compact Drum System and the SPD-11 provide presets in which striking a cymbal pad triggers a cymbal sound and grabbing the rim "chokes" (mutes) the cymbal. The rim pressure is transmitted as Polyphonic Aftertouch. (I was somewhat surprised to find this feature works well.) Both use PD-7s for drum and cymbals sounds. The PD-7 uses a single TRS ¼-inch phone jack to output both triggers, while the EP75 uses two TS ¼-inch phone jacks.

FOOT CONTROL

Because most drummers play with their feet, as well as their hands, several kick and hi-hat trigger pedals are available. Kick pedals come in several configurations: complete pedal with beater and striking surface, such as Drum Workshop's venerable EP-1 ($298); beaterless designs such as KAT's fatKAT ($219); and "roll your own" varieties that let you attach a pedal of choice to a well-anchored trigger pad, such as the Roland KD-7 ($225), Yamaha KP75 ($200), and KAT kickKAT ($259) and miniKick ($169). Some of these user's choice models do not accept double kick pedals.

Hi-hat pedals are a little trickier, because a real hi-hat sounds different when played open or closed. There is also a third type of sound generated

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fax (310) 836-9192

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Berkeley, CA 94709
tel. (510) 528-4446
fax (510) 528-4446

Drum Workshop
101 Bernoulli Circle
Oxnard, CA 93030
tel. (805) 485-6999
fax (805) 485-1334

Electronic Percussion Systems (EPS)
PO Box 7481
St. Cloud, MN 56302
tel. (612) 259-1840
fax (612) 259-8719

KAT
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Longmeadow, MA 01106
tel. (413) 594-7466
fax (413) 592-7987

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tel. (818) 769-9889
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when the drummer opens and closes the hi-hat with a footpedal. Roland's FD-7 ($245) and KAT's hatKAT ($259) both output a continuous voltage that, when plugged into the proper controller or sound module, can be programmed to alter several parameters simultaneously. This allows you to achieve a more realistic hi-hat sound. These pedals can also double as expression pedals, which permit you to do things such as generate Pitch Bend for a timpani sound.

Triggering sounds from acoustic drums is useful for augmenting drum sounds, recording a performance as a MIDI sequence, or triggering samples instead of miking the drums. There are as many kinds of triggers for acoustic drums as there are pads. Although there are differences between the various makes (durability is a prime factor), pickup placement on the drum and proper trigger-to-MIDI conversion are the real issues. Triggers can also be placed on any number of other objects (household items, siblings, etc.), which can then be played as percussion instruments.

Whether you are triggering from drums or pads, consider the impact of cabling. An unruly mess of cables looks bad, is prone to snagging, and takes a long time to set up, tear down, and troubleshoot. It is worthwhile to have a snake or semi-permanent bundle of cables running from the pads and triggers to the trigger converter. Be sure both ends of the cables are marked for quick setup and identification.

GET CONVERTED

Once you're wired up, you need a trigger converter to turn your impacts into music. The trigger converter takes the incoming trigger signals, processes them, then outputs MIDI notes and/or internal sounds. KAT's midiKITI ($499) is a dedicated trigger converter; the Alesis D4, Yamaha TMX and RM-50, and Roland TD-7 combine trigger conversion with an onboard sound module; the Roland Octapad II, and drumKAT EZ and drumKAT 3.5 incorporate trigger-to-MIDI conversion into a pad controller; and Roland's SPD-11

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Roland TDE-7 Compact Drum System

combines all of the above (trigger conversion, built-in sounds, and a pad controller) into a single box. Sound-shaping capabilities vary widely between units with onboard sound modules. Yamaha's RM-50, in particular, offers a lot of programming flexibility.

Pads and acoustic triggers translate vibrations into electrical signals, which is a tricky business. Consequently, trigger converters have several processing parameters that should be optimally adjusted for reliable triggering.

Gain or *sensitivity* compensates for a trigger's output level, which often varies with brand. In the case of acoustic triggers, the choice of instrument and trigger placement also produces variable output levels. *Threshold* sets the level above which the converter concludes the signal is a trigger and not just a ringing drum. *Masking time*, or *wait time*, tells the converter how long to wait before interpreting an above-threshold signal as a new trigger. This parameter allows you to avoid unintended double hits. *Crosstalk* or *rejection* is set to prevent false triggers caused by striking nearby pads or drums.

Most percussion sound modules play their entire sound when triggered by a MIDI Note On message and require no Note Off. However, samplers and synthesizers use Note Off to define the sustain time of a sound. The Roland TD-7, Octapad II, and SPD-11 and the KAT drumKAT 3.5 and EZ offer a *gate time* parameter that determines the time that will elapse between Note On and Note Off.

All trigger converters except the older Octapad II offer a special hi-hat mode that lets you use a footswitch pedal to trigger and/or modify open and closed sounds (as well as the sound made by "footpedaling" a hi-hat). The Yamaha TMX, Alesis D4, and KAT dk10 receive a trigger from a pad designated as the hi-hat, then correlate that with the footswitch selection to produce open or closed sounds. They produce the "closed by foot" sound when the footswitch is stepped on without the trigger pad being hit. The drumKAT 3.5, SPD-11 (and, to a lesser degree, drumKAT EZ and TD-7) can correlate the position of a hatKAT, FD-7, or other expression pedal's continuous output, enabling different MIDI data to be produced depending on pedal position. This feature allows the user to closely mimic the behavior of a real hi-hat.

In the case of the Roland products, separate notes for open, closed, splash (an idiomatic technique in which a glancing foot close/open gesture causes the hi-hat cymbals to ring), and foot-close are supplemented by position information sent as MIDI controller data. The drumKAT EZ allows five separate MIDI notes to be specified for hi-hat use: open, closed, foot-close, half-open (struck), and splash, while the drumKAT 3.5 can output up to eight

KAT's drumKAT 3.5

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different MIDI notes depending on pedal position. Any of the drumKAT's sixteen Velocity curves (two of them user-definable) can be applied to pedal position to determine when a different note is sent.

Some trigger converters go beyond the basic functions with features such as the ability to generate more than one note when a pad is struck. Typically, this feature is used to layer sounds in some fashion, but the drumKAT offers the ability to play up to four notes per pad in several modes (Simultaneous, Velocity Switched, Alternating, etc.) and eight notes in special alternating and random modes. In addition, the drumKAT has a Link feature that can trigger a second pad, meaning that sixteen notes can be sounded from a single hit.

The TD-7, drumKAT, and drumKAT EZ have microsequencers. A microsequencer is a recorder intended to receive a relatively short pattern of notes from the pads or triggers, which can then be played back, usually in a loop, and played over. Of these three, the Roland TD-7 is the only one that allows editing of the recorded data, while the drumKAT sports Tap Tempo. All three systems allow the user to hit a pad to trigger playback of small pieces (or "slices") of the sequence. The TD-7 and the drumKAT transmit MIDI Clock messages at the tempo of the sequence and synchronize their sequencers to incoming MIDI Clock messages.

To give the TMX similar functionality, Yamaha gave it the ability to control playback of a Yamaha QY10 or QY20 sequencer (or any sequencer or drum machine that responds to MIDI Start commands), while the RM-50 can generate a click from incoming MIDI Clock.

Yamaha's TMX converter and pads

STICK COMMAND

Unlike stand-alone pads, pad controllers consist of a collection of small pads integrated on a single surface, with MIDI—rather than trigger—outputs. They also have anywhere from three to nine trigger inputs and generally provide more MIDI power than trigger converters. The strength of a pad controller's compact design is obvious: more sounds in less space. The proximity of the pads in a controller enables double-strokes and fast rolls to be distributed between several pads more readily than between drums or single pads.

However, getting used to playing pad controllers requires some reorientation, because most drummers' techniques are built on their personal setups, with the drums being located a certain distance from each other. The bottom line is, learning to play a pad controller takes practice.

As mentioned above, Roland's SPD-11 is a complete solution in a box, with pads, trigger inputs, sounds, and effects. The Octapad II produces up to three notes per pad and sends out a program change for each pad when a new setup is called. It also has some nifty features, such as Auto Pitch Bend on each strike and the ability to send MIDI Pan messages for each pad.

However, the Rolls Royce of pad controllers is the drumKAT. This beauty has ten pads, nine trigger inputs, and two MIDI In and four MIDI Out connectors (with independent datastreams for 32-channel operation), and it can be completely programmed from the pads. The drumKAT does not come cheap, but it has more of everything (except sounds) than any other controller I looked at.

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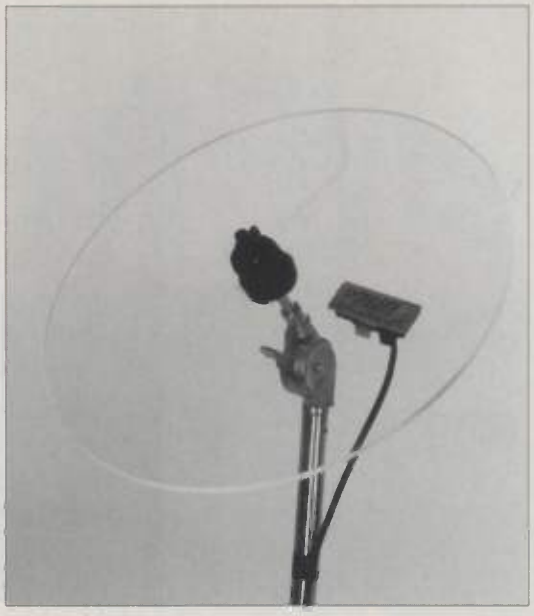
SOMETHING COMPLETELY DIFFERENT

Drums are not the only kinds of percussion, and controllers also stretch beyond the traditional. One of the biggest stretches is from the godfather of alternate controllers, Don Buchla. Buchla's Thunder ($1,990) is a touchpad controller with extremely sophisticated MIDI functions. Thunder is played with fingers, instead of sticks, and its pad configuration doesn't resemble any traditional instrument. It's an unusual design, but a powerful piece of gear. (The August 1990 EM includes an in-depth review of Thunder.)

The best non-drum percussion controller resembling an acoustic instrument comes from KAT. The malletKAT ($1,149 for the master controller, $649 per octave expander) is designed for the vibraharp, marimba, and xylophone players of the world who crave entree to the world of MIDI. The malletKAT features most of the applicable functions found in the other pad controllers and is a product that shows great vision. There were other mallet controllers on the market in the past, but the malletKAT is the lone survivor.

Far more companies make pads than I can list, but it is worth mentioning some of the alternative trigger sources. Electronic Percussion Systems (EPS) and MIDI Cyms make cymbal-shaped triggers that can mount on any cymbal stand ($119 to $230 for EPS; $98 to $178 for MIDI Cyms). Both products offer separate outputs for the main cymbal area and the bell. Like MIDI Cyms, EPS's Visu-Lite cymbals come in many sizes and colors. Although the Visu-Lite's hard plastic composition didn't bother my hands in the short trial I gave them, I was bothered by the Visu-Lite cymbals' wire clip terminals. EPS provides an adapter cable with the pad, but you have to deal with connecting the bare wires to the clips at every setup and tear-down.



Electronic Percussion System's Visu-Lite cymbal triggers

Both companies also make hi-hat pads that you let play open, closed, and

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foot-closed sounds. EPS makes a cowbell-shaped trigger, too, but their most-interesting alternative trigger is called the Shaker ($129). The Shaker outputs three triggers, one for each plane of motion. When connected to three trigger inputs, interesting effects can be obtained. KAT offers the PoleKAT ($169), a clavé-like cylinder with two striking surfaces that produce different triggers. Even EM has gotten into the act, with the FingerDrum ($89.95 unassembled), a DIY project published in the March 1992 issue and available in kit form, or assembled, from John Simonton's PAiA Electronics. The FingerDrum has a small cork pad for each finger and features eight trigger inputs and a MIDI output.

THE FINAL COUNTDOWN

Which system is right for you? The most potent MIDI percussion controller is unquestionably Thunder but many musicians fear systems that are radically different. For serious MIDI drum work, the drumKAT is the cat's meow, but if you don't need tons of features, check out the drumKAT EZ or dK10. The simplest, most compact, and complete solution is the Roland SPD-11, which packs everything in a lightweight package. Roland's Compact Drum System is a better package for a straight, all-electronic drum kit.

If you are supplementing an acoustic kit, most of the trigger converters will work, but special packages are available that combine the RM-50 with Yamaha's discontinued but excellent DTS70 trigger converter (for as long as the DTS70 stock lasts). If you simply need a good sound source with basic triggering, the Alesis D4 is a good value.

There is plenty to shout about in electronic percussion. But why shout? You'll only make yourself hoarse and tick off the neighbors. Why not just hit something?

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Multitimbral MIDI

By Scott Wilkinson

The art of squeezing multiple sounds from a single synth.

People always seem to pine for the good old days, but I much prefer the present, particularly when it relates to technology. For example, I remember the bad old days of MIDI, when you needed a separate keyboard or sound module for each instrumental sound in a sequenced score. Each one was assigned to a different MIDI channel so they could play independent musical parts. This wasted a lot of studio space and required a lot of techno-spaghetti to cable it all together.

These days, most keyboard and rack-mount synths and samplers are *multitimbral*, which means they can play several independent instrumental parts on different MIDI channels. Many of these devices also include an internal sequencer and effects processor. By using these elements together, you can often sequence an entire score with a single instrument. Sounds like the good new days to me.

MULTITIMBRAL MADNESS

A multitimbral keyboard or sound module functions as if there are several synths within one physical device (see **Fig. 1**). Each "virtual" synth within the unit responds to MIDI messages on a separate MIDI channel. For example, if the device can support sixteen independent parts, it is said to be *16-part multitimbral.*

Of course, these multitimbral wonders can also play one sound at a time, like the synths of old; this is often called *Program mode.* In this mode, which you typically use to play a piano patch or other single program, the device responds to messages on only one MIDI channel.

If you are sequencing several different parts, you typically enter *Multi* or *Combi mode,* in which different programs are assigned to different channels. With a sequencer, you can record and play back MIDI messages (such as Note On/Off, Sustain Pedal, Aftertouch, and Pitch Bend) on different channels, and each program in the multitimbral setup responds to these messages independently. In most cases, you can send a Program Change message to one of these virtual instruments and change its sound without affecting the other programs in the setup. However, some older multitimbral synths change the entire setup in response to a Program Change.

You can also use Multi mode to layer several sounds across the keyboard, or split the keyboard to play different sounds in different key ranges. For example, you might assign a bass part to the left half of the keyboard and a piano sound to the right half. These layered or split sounds can be on the same MIDI channel or on different channels. Some instruments let you layer and split two or more sounds in Program mode; you can then layer these compound programs in Multi mode, which results in incredibly rich, fat sounds. However, this also seriously reduces the available polyphony (discussed shortly).

Things can get really crazy when you combine several multitimbral synths into a large system. MIDI specifies sixteen channels, which lets you control up to sixteen physical or virtual devices independently. With a multiport MIDI interface connected to your computer, you can break the 16-channel barrier. For example, you can combine four 16-part multitimbral synths and a computer with a MIDI interface that includes four MIDI In and Out ports. By using software that lets you separately address each port of the interface (most

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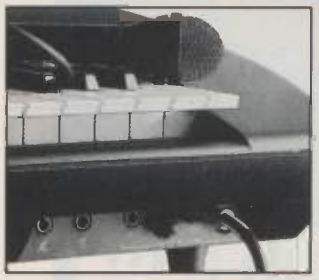

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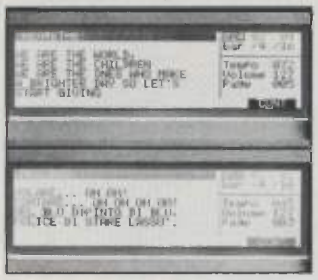
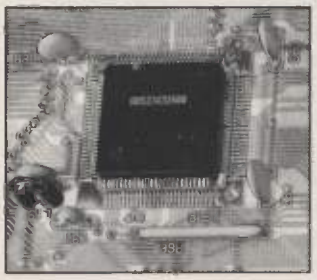


Extraordinarily powerful sequencer. 16-track sequencer to store up to 16 complete songs. You can even load them while you're playing. F5 sequencer is ideal for putting together complete medleys.

Full multisynthesis. Farfisa's exclusive M.S.P. technology gives you true multisynthesis. Each sound is synthesised in the best sound generation technique for that sound, be it FM, PCM, or other.



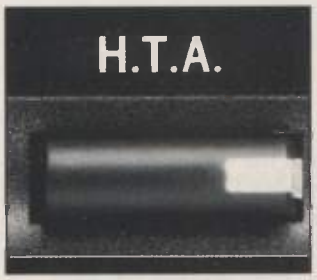
Would you like an instrument that's custom-made, with unique sounds and exclusive capabilities? Farfisa F5 is

FARFISA F5

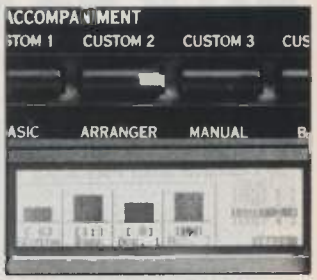
A KEYBOARD AND MUCH, MUCH MORE

all this, and more besides, because it is an open system. And Farfisa F5 goes even further. Wherever you want.

Each poly has its own effects. Sound processors for each section of the orchestra. At one and the same time you can have organ with Leslie® and trumpet with echo on the right hand, strings with chorus and guitar with flanger on the left hand, and general reverb.



Personal arrangements in real time. Accompaniments tend to be very repetitive. Liven them up in real time with the HTA function by simply touching the keys, or striking chords of different complexity.



Four possibilities of variations for each style. Four custom arrangement variations allow all the styles available to be modelled to your own taste to suit the requirements of the music.

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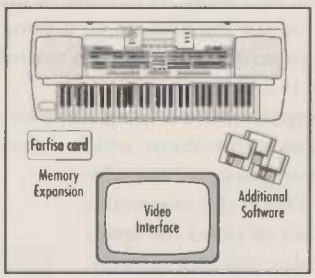
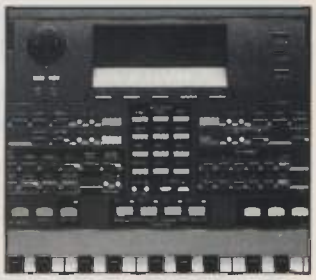


The F5 is an open system. The Farfisa F5 can be continually updated without disturbing any of its basic features, just as a PC acquires capabilities through the addition of new software. Memory expansion (optional) for leading new sound samples. Video interface (optional). The tv screen carries the lyric of the base (karaoke), but can also display messages and announcements.



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medium-to-high-level sequencers do these days), you can control 64 separate MIDI channels and play 64 different parts!

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Imagine you're sequencing a song on a multitimbral synth, with a piano part, bass part, drums, etc. After recording a few parts, you notice some of the parts are not playing properly, and you can't hear all the notes you originally recorded. The problem you've run into is the brick wall of *polyphony*.

Each program in a synth's memory starts with one or more waveforms, usually sampled sounds, that are manipulated in various ways to create the final sound (see "From The Top: Tweaking Synths, Part 1 and 2" in the June and July 1992 EM). Each note you play engages one or more *oscillators*, which are electronic circuits that reproduce the waveforms. Most synths allow programs to use one or two oscillators per note played, and some let you use as many as four or six oscillators in a program. This provides a thick, rich sound, but there is a price to pay.

All synths have a fixed number of oscillators within them, which determines the *polyphony* of the device. This is the maximum number of notes the synth can play simultaneously. For example, if a synth has a total of 32 oscillators and you call up a program that uses only one oscillator, you can play up to 32 notes at the same time. Such an instrument is said to be *32-voice polyphonic*.

However, the polyphony of a synth indicates the maximum *total* number of notes the entire device can play simultaneously. If a program uses two oscillators, you can play only sixteen notes at the same time. In addition, if a 2-oscillator piano program in a 32-voice synth plays a 5-note chord, the other instruments in the setup must share the 22 remaining notes while that piano chord is sounding (see Fig. 1). As soon as that piano chord is released, however, those oscillators are free to be used by other programs on other MIDI channels.

Liberal use of the sustain pedal on one or more parts also reduces the polyphony for other instruments in the setup. If you hold the sustain pedal and play the same note five times, you'll use up five notes of the total polyphony (or more, if the program uses multiple oscillators), even though you hear only one note playing.

Voice allocation distributes a multitimbral synth's available polyphony among the various virtual instruments in a setup. Early devices, such as the Yamaha TX81Z, used *fixed voice allocation;* you had to specify how many notes were assigned to each program in the setup. For example, you might assign one note to the bass part, four notes

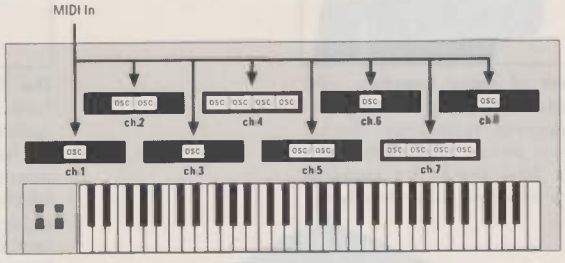

FIG. 1: This multitimbral synth is 8-part multitimbral and 32-voice polyphonic. The programs in the setup use one, two, or four oscillators; if each part plays one note, sixteen voices of the total polyphony are used up.

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The Top 500

Play the D4 with its onboard trigger inputs.

Alesis drum machines are famous for their sounds. The HR-16's natural acoustic drums are still the standard for transparent rhythm tracks. The punchy aggressive samples of the HR16:B redefine how to make rhythm tracks burn. The SR-16 is an instant hit with its sampled reverb and ambience techniques.

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THIS WEEK	LAST WEEK	WKS. ON CHART	TITLE / ARTIST	DRUM PRODUCTION
1	2	208	HONEST SNARE / HR-16	ALL WOOD-BRASS RIM
2	NEW ▶		STUDIO TOM / BRAND NEW D4	16" MAPLE TOM w/VERB
3	NEW ▶		BIG "O" / BRAND NEW D4	DOUBLE HEAD KICK w/VERB
4	5	52	RIM SHOT ROOM / SR-16	BRASS PICCOLO w/VERB
5	10	156	BIG FOOT / HR-16:B	SINGLE HEAD 26" MAPLE
6	NEW ▶		SLAM / BRAND NEW D4	POWER TOM w/VERB
7	23	156	COMBO SNARE / HR-16:B	PICCOLO PLUS WOOD
8	NEW ▶		BIG BALLAD / BRAND NEW D4	WOOD SNARE w/BIG VERB
9	NEW ▶		FAT CITY / BRAND NEW D4	SUPER FAT SNARE
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THIS WEEK	LAST WEEK	WKS. ON CHART	TITLE / ARTIST	
302	NEW ▶		RAW HIDE / BRAND NEW D4	CUSTOM SN
303	450	52	HI ROOM TOM / SR-16	10" MAPLE
304	NEW ▶		WET HALF / BRAND NEW D4	HALF OPEN HAT
305	327	52	RIM 2 CENTER / SR-16	ARTICU
306	123	20	DOUBLE HEAD	DOUBLE HEAD KIC
307	223	15		
308	401	5		
309	NEW			
310	175	1		
311	NEW			
312	171			

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to the piano, etc. Unfortunately, the TX81Z had only 8-note polyphony, so this assignment wasn't easy.

Modern multitimbral synths use *dynamic voice allocation*, which automatically assigns notes to the parts as they need them. Even so, it's easy to run out of notes when sequencing complex music. Many instruments use a scheme called *last-note priority* to decide which notes to cut off if the polyphony is exceeded. In this case, the last note to start has priority over the notes that started before it; the first in a series of sustained notes is generally the first to be cut off if the polyphony is exceeded.

▼

Multitimbral instruments respond to several MIDI channels at once.

In some instruments, such as the Roland JV and Sound Canvas lines, you can reserve a number of notes for one or more parts; this assures a minimum number of notes in that part will not be cut off. If the polyphony is not exceeded, notes are assigned dynamically. Essentially, this is a combination of fixed and dynamic voice allocation. Those parts without reserved notes are the first to be cut off if necessary. Of course, you can't reserve more notes than the total polyphony of the device.

EFFECTIVE OUTPUTS

Most multitimbral synths include one or two effects processors that provide reverb, delay, chorus, flanging, and other effects. Each program includes its own effects settings. However, if you record one part into a sequencer, then record another part, you may be surprised to find the first part's effects have changed to those of the second part. This can be a real problem because many programs rely heavily on their effects settings; if you change the effects, the sound of the patch may suffer considerably.

For multitimbral sequencing, you generally use a global effects setting

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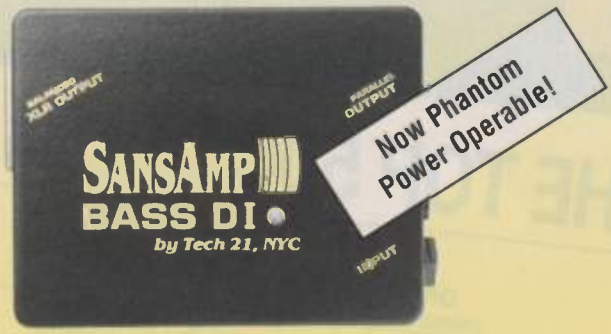

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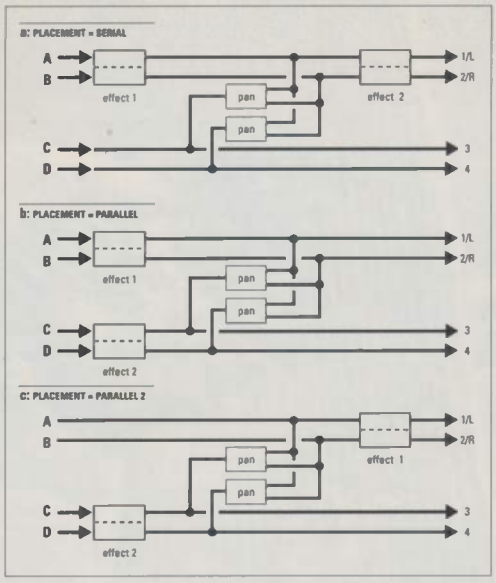

FIG. 2: The Korg 01/W offers three effects configurations and four audio outputs. Each processor can be split to apply different effects to different parts, each of which are assigned to signal path A, B, C, and/or D. In all three configurations, any parts assigned to C and D can be mixed via the pan controls with paths A and B; this sends all parts to the main outputs if the auxiliary outputs are not used.

that applies to all parts. In many synths, you can control the depth of effect applied to each part (this is similar to the effect-send controls in each channel of a mixer), but the type of effect is the same for all parts. Some effects algorithms split the processor into two independent effects that can be applied to two different parts. For example, members of the Korg 01/W family include two such processors, allowing up to four independent effects for different parts (see **Fig. 2**). One of the next long-awaited steps in the evolution of multitimbral instruments is the inclusion of a separate effects processor for each part in a setup.

These days, all synths have two main audio outputs: stereo right and left. Many multitimbral instruments also include two, four, or eight additional outputs. Typically, rack-mount sound modules have more of these auxiliary outputs than their keyboard siblings. The signal from each part in a setup is routed to one or more of these outputs.

The outputs are integrated with the effects processors in several selectable configurations (see **Fig. 2**). In some configurations, several outputs bypass the effects altogether; this lets you send some of the parts to an external processor. Of course, this also requires more inputs on your mixer. If you have no extra mixer inputs, you can send all the parts to the main outputs.

CONCLUSION

Multitimbral synths and samplers have brought a new era of cost effectiveness to the MIDI studio. You can now realize entire orchestrations with a single device that costs no more than single-timbre instruments did when they were new. All it takes is a little understanding, and you will be well on your way to creating your next magnum opus.

Scott Wilkinson, EM *technical editor, is currently working on an album project that uses the multitimbral capabilities of the Kurzweil K2000.*

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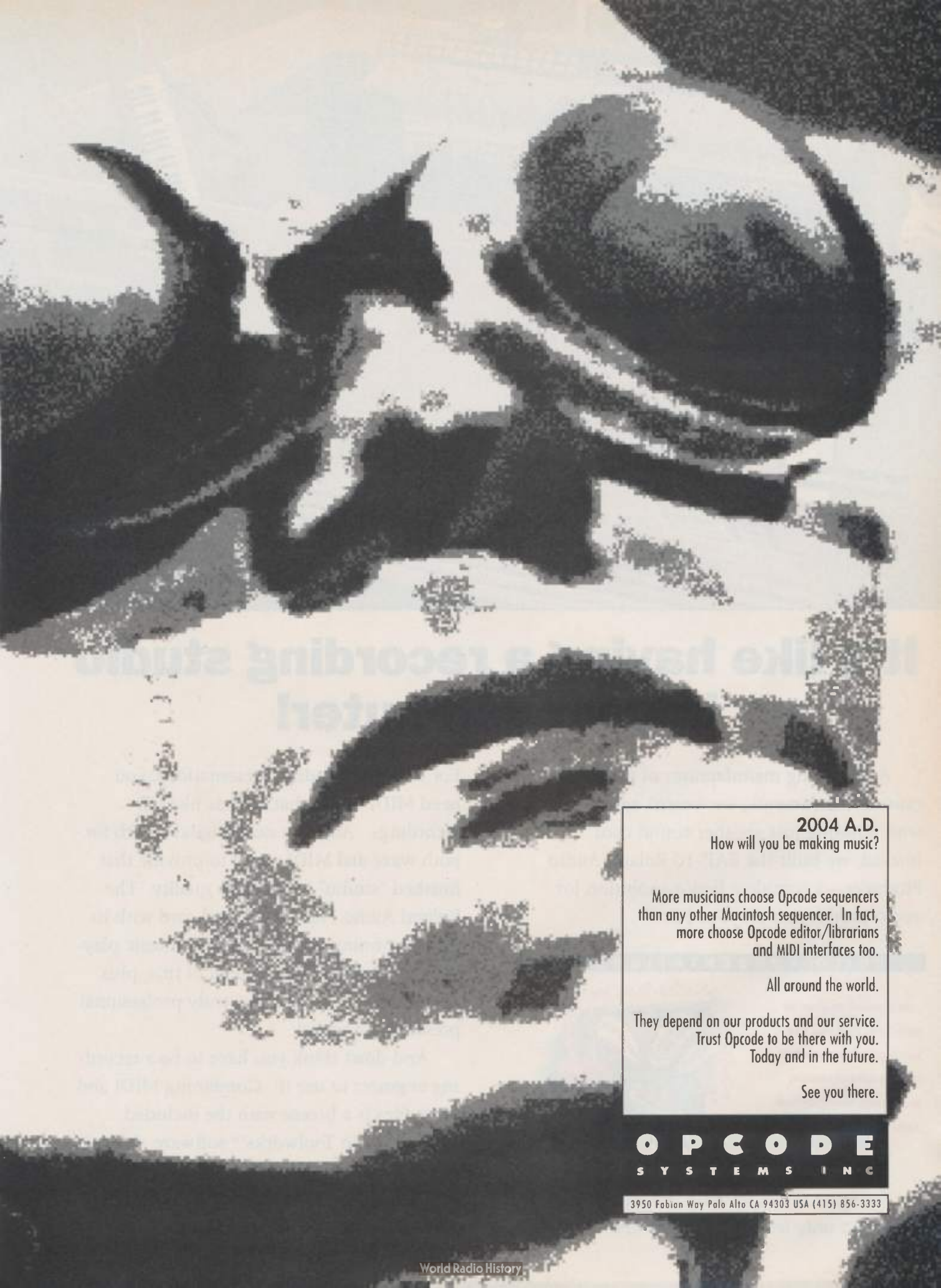

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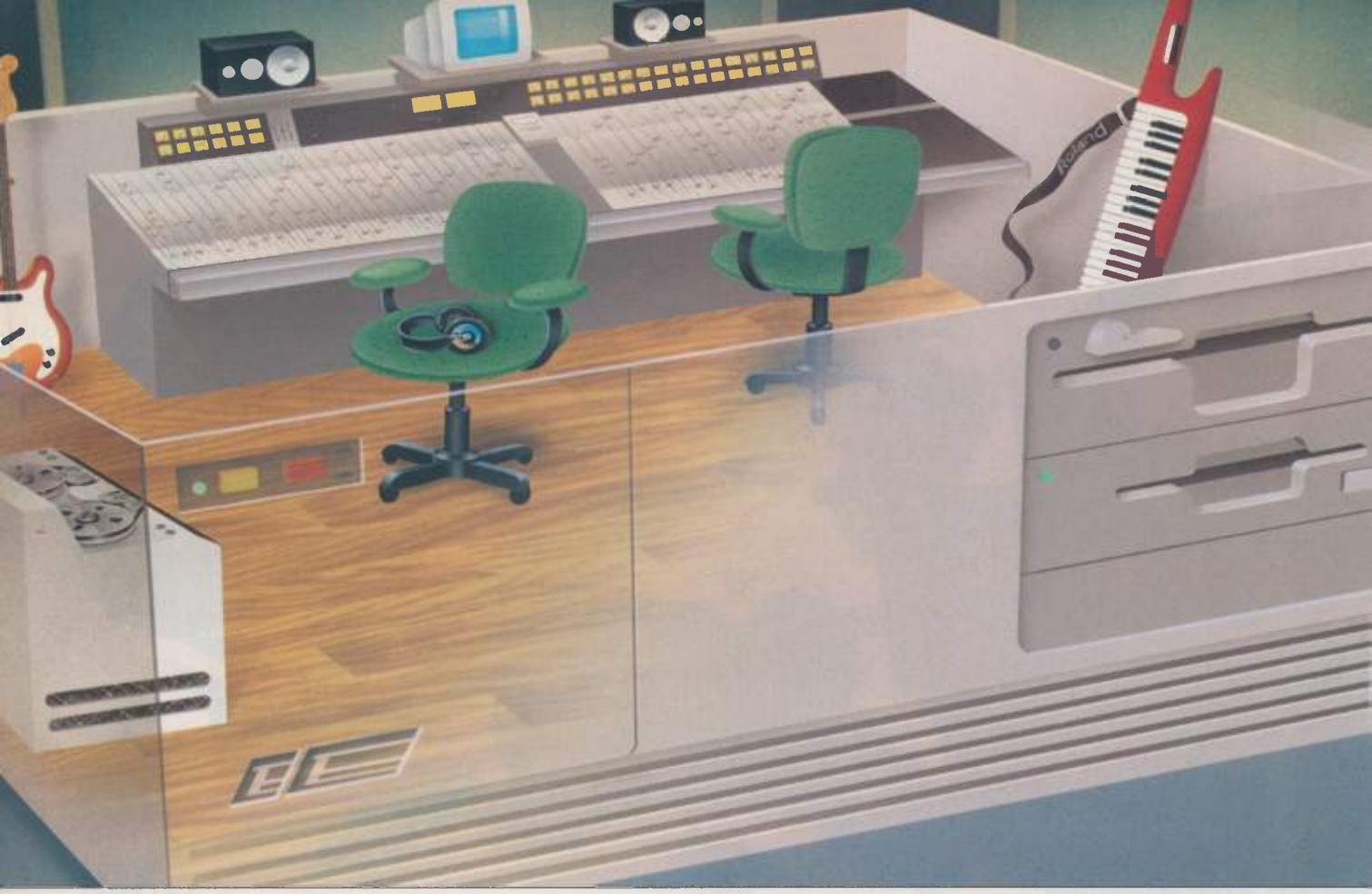

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Ten Ways to Kick Start Inspiration

By Michael Molenda

A few cerebral tools can chip away writers block.

Collaborative inspiration is important to Crowded House's creative process. The band members not only collaborate on music, they work with bassist Nick Seymour (far left) to design their costumes and album covers.

The creative muse is a taciturn entity. Small wonder that new-age channelers would rather seek out ancient warlords and benevolent monks. They're much more talkative—and readily available—than the cruel Fate that pulls the strings of inspiration.

I know some very talented songwriters who claim they have foolproof methods for coaxing the muse into a visit. Ha! Eventually, hubris claims it victims, and these prolific writers can't even manage a lame chord progression, with or without their "foolproof" methods.

So, as someone who freely confesses to being plagued by writer's block, I've assembled ten tips that may help you avoid artistic inertia. They don't always work. But I've found that doing *anything* is better than succumbing to inactivity when ideas don't flow.

GET OUT

It's incredibly difficult to nurture creativity in isolation. Few of us possess the fictional Walter Mitty's talent for inventing spontaneous daydreams. Most artists need outside stimuli. Gauguin went to Tahiti and you can go to the movies. Entire songs can be inspired by an evocative soundtrack, striking cinematography, interesting subplots, and brilliant characterizations. A spoken phrase can be "stolen" for a chorus lyric, or a visual mood can imply an aural sensation.

For example, a stark kick-drum pattern during a chase scene in the French film *Diva* (Jean-Jacques Beineix, director) jump-started a theatrical score I was struggling over. The cinematic tension produced the exact effect I wanted for an ominous section of the play *The Paradise Club.* After speeding home, I programmed my own kick-drum pattern, visualized the chase, and experimented with musical figures that stirred up anxiety. The piece "wrote itself" in 25 minutes. Another Beineix film, the disturbing *Betty Blue,* offered a guitar line that inspired the hook for an advertising underscore. (Those who've seen the film may be amused that the ad was for Oysterbed, a San Francisco platform-bed manufacturer.)

Musical inspiration doesn't have to be limited to a film's soundtrack. I can thank classic tough guys such as Jimmy Cagney, John Garfield, and John Wayne for my song "The Violent Men"; director Orson Welles for inspiring "The Judas Kiss" with his *Othello;* and the plot twist of *The Crying Game* for "She's Got Things (that no one talks about)." I've reaped additional creative benefits from other art forms, such as plays, symphonies, operas, art exhibitions, and pop concerts. Great ideas are everywhere, but you have to leave your ivory tower to find them.

STEAL

Art crimes are surefire cures for writer's block. When inspiration falters, steal riffs from other artists. After all, the British pilfered American blues and reinvented rock 'n' roll. (A veteran producer once said that if you could copyright riffs, Richard Berry could sue every rock band in the world for knocking off the signature figure of "Louie, Louie.") Everybody steals; the trick is to make the stolen property your own, much like professional car thieves repaint the vehicles they "acquire."

For example, I've often raided popular songbooks for ideas. I play through the songs until I find a chord progression I like, then I close the book and use the chords as the foundation for a new song. The chord progression

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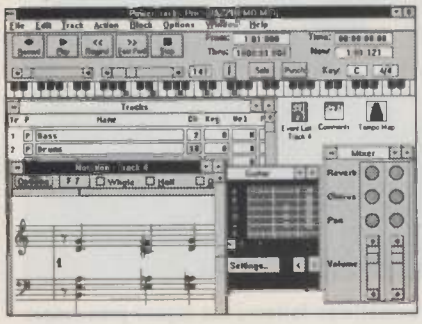

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World Radio History

often changes somewhat as the song develops, so no one can tell that I ripped off "Muskrat Love" to compose an epic on human suffering.

Of course, you don't have to steal actual chord changes to use existing songs for inspiration. Simply try to write a song that feels like another work. Study the structure and arrangement of the model song, and attempt to copy it. Because you've (hopefully) got your own style and experiences to draw from, it's unlikely that you'll produce an exact duplicate of the model song. Usually, an *interpretation* of the original work develops, and that's all most writers need to goose their creative process.

I've also stolen movie names and used them for song titles. This crime solves two creative problems: A great title often inspires a great song, and movie titles—because they're designed to grab your attention—often have the punch typical of effective pop hooks. To avoid detection, I don't steal titles from classic films or movies released after 1950. Don't forget to audition English translations of obscure foreign film titles.

BUCK THE SYSTEM

Humans are creatures of habit, so it isn't surprising that we're prone to stagnation. A well-constructed system can be a crutch that inhibits one's ability to cultivate new ideas. If your artistic methodology is barren, there's only one antidote: Sabotage!

Throwing a wrench into creative complacency forces discovery of new and different ways to work. The little mistakes you make while finding your way through unfamiliar territory can nurture artistic growth. What's the easiest way to sabotage a system? Banish your axe. If you normally compose on guitar, switch to keyboards, or vice-versa. (Peter Townshend, the Who's bash-and-smash guitarist, enjoyed a long period of prolific songwriting after he attempted composing on the piano.) Even if you barely know how to play another instrument, try searching for cogent melodies—a good ear is helpful—and listen for any creative accidents.

PHOTO MR BONZAI

Andy Summers sometimes follows his signal processors down the road to inspiration. The ex-Police guitarist (now solo) may call up a patch and play "to" the effect, then assess whether the interplay suggests a song.

CHANGE YOUR CLOTHES

I'll be the first to admit that I'm a fashion tragedy. My basic attire consists of black jeans, black Doc Martens, and a black, long sleeve T-shirt. What's the one word most used to describe my monochromatic wardrobe? Boring. And it's no different if you "wear" the same keyboard patch or basic instrument setup when you make music. An unwavering aural diet risks tedium, a ruthless killer of inspiration.

Changing your aural ensemble can revitalize your writing process and help you plow through creative blocks. Don't be afraid to try new patches, program custom sounds, or kick in some signal processing. I've written many songs that were solely inspired by the sound of a particular delay or modulation effect. When you're stuck for ideas, variety really *can* be the spice of life. (The unassailable rationale of this concept recently inspired me to buy a teal T-shirt!)

David Bowie has been known to court inspiration by trashing convention. On the album *Lodger*, he allegedly directed his band to switch instruments so they couldn't perform with musical preconceptions.

COLLABORATE

When you're suffering through a creative drought, two heads can be better than one. Go find a writing partner. Although anything is possible within the vortex of creativity, it's rare that all partners in a collaborative effort are simultaneously devoid of ideas. (For how to survive this process, see "Recording Musician: Collaboration Without Combat" in the October 1993 EM.)

GO PSYCHOTIC

Want to fill your head with songs? Just step into a doomed love affair. Dysfunctional relationships provide excellent material for literary works, plays, film scripts, and pop tunes. Heck, no country artists worth their cowboy boots would dare sing a "love gone wrong" song unless they'd survived the hurt themselves.

I'm not being facetious. I don't know why, but misery tends to breed passionate work. For example, Eric Clapton's tortured "Layla" (inspired by an ill-fated affair with his best friend's wife) is a rock classic, while shiny happy songs such as ABBA's "Dancing Queen" are vapid dross.

Unfortunately, I can speak from firsthand experience about the artistic productivity of inner turmoil. Recently, a special (platonic) friendship disintegrated, and I became a walking train wreck. That was a drag. On the good side, however, the episode inspired fifteen of the most honest songs I've ever written.

Obviously, I don't recommend tossing yourself into an emotional abyss.

World Radio History

(The price for those fifteen songs was brutal.) If you've got the hurt, use it; but there's a safer way to write songs about loss and longing. Use your powers of empathy to put yourself in the place of someone who has lost a loved one, ended a relationship, or suffered other personal setbacks. Everyone has supported or counseled a friend through an emotional upheaval. You don't have to detail specific incidents—that can be a bit vampiric—but use your observations to write from the perspective of someone with a damaged psyche. You may be surprised (and even scared) at the intensity of your compositions.

ADAPT

After a few thousand years of humanity, just about every story has been written and every note has been played. The self-imposed pressures of creating singularly unique works can scare away the muse for months. Don't even *try* to come up with something new. Instead of struggling to reinvent the wheel, why not take advantage of the past?

▼

Humans are creatures of habit, so it shouldn't be surprising that we're prone to stagnation.

There are hundreds of old myths, folk songs, opera librettos, poems, and other theatrical artifacts that can be adapted and used as the basis for modern works. The French poet Jean Cocteau adapted the Orpheus myth and produced countless drawings, several plays, and two movies (*Orpheé* and *Le Testament d'Orpheé*) based on the subject. Cocteau updated the myth with contemporary language and settings—in *Orpheé*, Death's messengers ride motorcycles and a car radio serves as the Greek Chorus—and molded the tale to suit his artistic vision. You can do the same.

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Reggae star Jimmy Cliff was frighteningly intense portraying a gangster in the film *The Harder They Come*. His performance of the movie's title song must have been energized by the role, as the track is a strutting bravado of defiance.

I've taken great pleasure adapting poetry into musical works. My two full-length theatrical scores are *Inferno*, based on Dante's *Divine Comedy* and *Fearful Symmetry*, inspired by William Blake's *Songs of Innocence and Experience*. Of course, you don't have to rely on classic literature for adaptable materials. Songwriter Ron Nagle, whose songs have been recorded by Barbra Streisand, The Tubes, Dave Edmunds, and others, mines the rich pages of the *National Enquirer* for ideas. In fact, daily newspapers offer an almost inexhaustible supply of stories waiting to be adapted into hit songs. Once you free yourself from trying to generate "new" ideas, the world can be your artistic database.

GET ON SCHEDULE

Sometimes you can corral a recalcitrant muse by giving it a deadline. For example, when I take an advertising gig, I *always* get the job done on time. I have no choice. (You do not want a stressed-out ad executive calling you every minute of the day and night.) Likewise, a personal productivity schedule may shame you into finishing some of those songs you keep shelving. Even if you don't end up with anything brilliant, upgrading your creative discipline can only help.

I often set of goal of five completed songs per month and mark the deadline date on my calendar. I don't always make my deadlines, but I'm certain that the writing schedule has generated more songs than if I simply allowed inspiration to run its course.

EXPLOIT FAMILY HISTORY

My grandmother danced all over Europe, lived with Hungarian aristocrats, and was a single mother long before Dan Quayle railed against Murphy Brown. (Her husband died before my father was born.) I've always derived inspiration from the greasepaint gypsy in the tattered family photographs. She was my sole link to a grand theatrical era. I've never written a song specifically about her, but her courage has helped me survive many creative and emotional lows.

Every family is a cornucopia of joyous

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The lush audio productions of Kate Bush are often cinematic in scope, so it's no surprise that her recent album *The Red Shoes* was inspired by the Michael Powell film of the same name.

occasions, hushed secrets, fabulous histories, charismatic relatives, and sad plot twists. You've got a microcosm of the world under your roof (or at least between telephone connections). Why not use this abundant material to inspire creative works? Don't frighten

▼

When inspiration falters, steal riffs from other artists.

your mom by stuffing family skeletons into a pop song; use specific people or events as models for romanticized (or *de*romanticized) scenarios that can be transformed into songs.

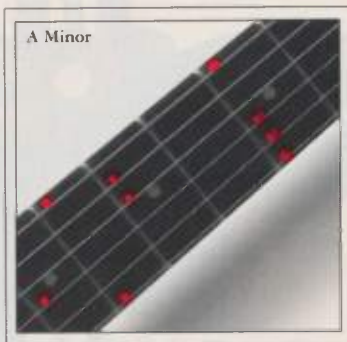
TAKE A BREAK

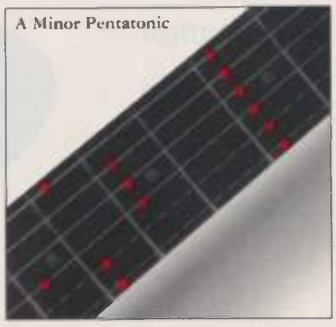
Sometimes the muse comes only when she feels like it, and there's nothing you can do except shake off the creative stress. Take a walk, go on a bike trek, or hit the gym. Maybe you'd rather grab a bite to eat, or just sit and drool in front of the television. But whatever you do, don't even *think* about writing. When you're relaxed—this could take anywhere from a few minutes to a few days—pick up your instrument and start noodling around again.

A FINAL THOUGHT

Many times, a lack of inspiration can be directly attributed to a lack of *perspiration*. You can't sit down, stare at a wall, and wait for brilliant ideas to drop from the clouds. Artistry and genius often go hand-in-hand with craft and discipline. The miracle of inspiration is worthless if you don't take the spark and polish it into the best work that you can do.

EM *managing editor* **Michael Molenda** *has been blessed by rampant inspiration and prolific creativity. Unfortunately, society has deemed that—in his case—much, much less is more.*





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9th	Blues Scale
Major 9th	Lydian Mode
Augmented	Whole Tone
Diminished 7th	Diminished
Minor 7♭5	Locrian Mode
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By Neal Brighton

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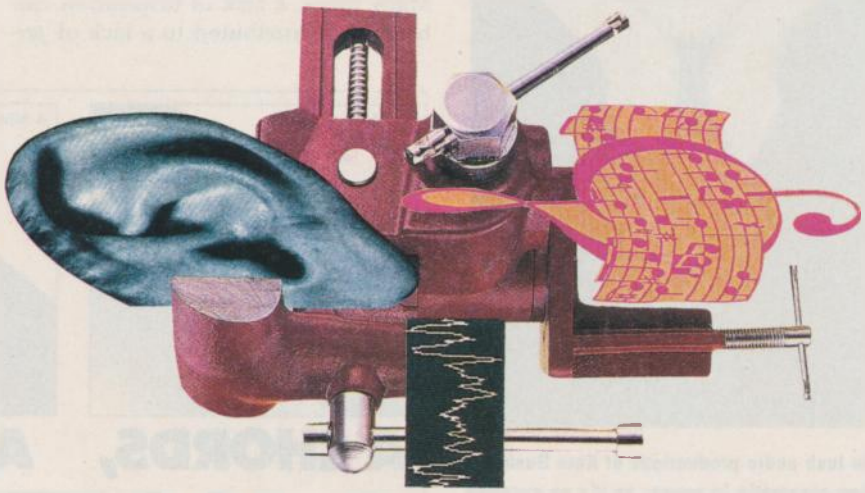

Long ago, recording engineers actually had to "ride faders" to record smooth, consistent signals to tape. In the dark ages before digital audio, analog recorders didn't have wide dynamic ranges, so you had to move fader levels up and down to avoid tape saturation and unwanted distortion. Unfortunately, human hands aren't as quick on the draw as a surprise signal peak. It wasn't long before a smart electrical engineer came up with a voltage-controlled amplifier (VCA) that could rapidly—and automatically—adapt to changes in signal level.

Of course, once recording engineers started messing around with compressors, peak control became only one of many sonic applications. Compressors are used to smooth out rampaging signals, add coloration (if not outright distortion) to boring sounds, make guitars appear brutally loud, and produce ultra-hot stereo masters.

Unfortunately, compression can also suck the life out of a track. A delicate sonic balancing act is necessary to take advantage of compression's benefits without awakening its nasty side.

HELPFUL HINTS

Unless you are using compression as an effect, it's usually best not to go overboard. An important characteristic of recorded music is how the dynamics of different instruments interact with each other. It's seldom appropriate to flatten the dynamic impact of a track, or to crush the life from individual instruments. On the other hand, certain elements might get lost in the mix. Careful compression and EQ adjustments can help sonically obscured instruments sound more up front.

Rather than brutally compress a signal during recording, it's usually better to compress it lightly when going to tape and lightly once again during the mixdown. Remember, any processing recorded along with the fundamental signal becomes a permanent component of the signal's sound. The sound cannot be changed unless the part is re-recorded. Be sure you like the sound you're getting while recording so you'll continue to like the sound when it's time to mix. You may regret extreme compression settings when your tracks get closer to completion.

Also, the harder you make your compressor work, the more it will color the signal. Compression tends to make low frequencies more apparent, so you may have to cut some of the bottom out of the signal (with EQ) to maintain audio clarity.

THE SONIC CRUSH

Compression can be used to smooth out signals, toughen up a sound, or produce the illusion that an instrument—such as an electric guitar played through a signal processor and recorded direct (no amp) to tape—is incredibly loud and powerful. Individual instruments often benefit differently from compression. Let's look at a typical recording session and discuss a few applications.

Lead Vocals. Compression is useful for getting lead vocals to stand out in the mix, especially if the singer had trouble staying on the mic during recording. Normally, I like to record singers without compression, saving it for the mixdown. One trip through compression circuitry—and patch cords and mixer electronics, etc.—produces cleaner sound than two. At the mixdown, I'll hit the singer lightly with a 2:1 ratio at a -10 dB threshold to

JAMIE HOGAN

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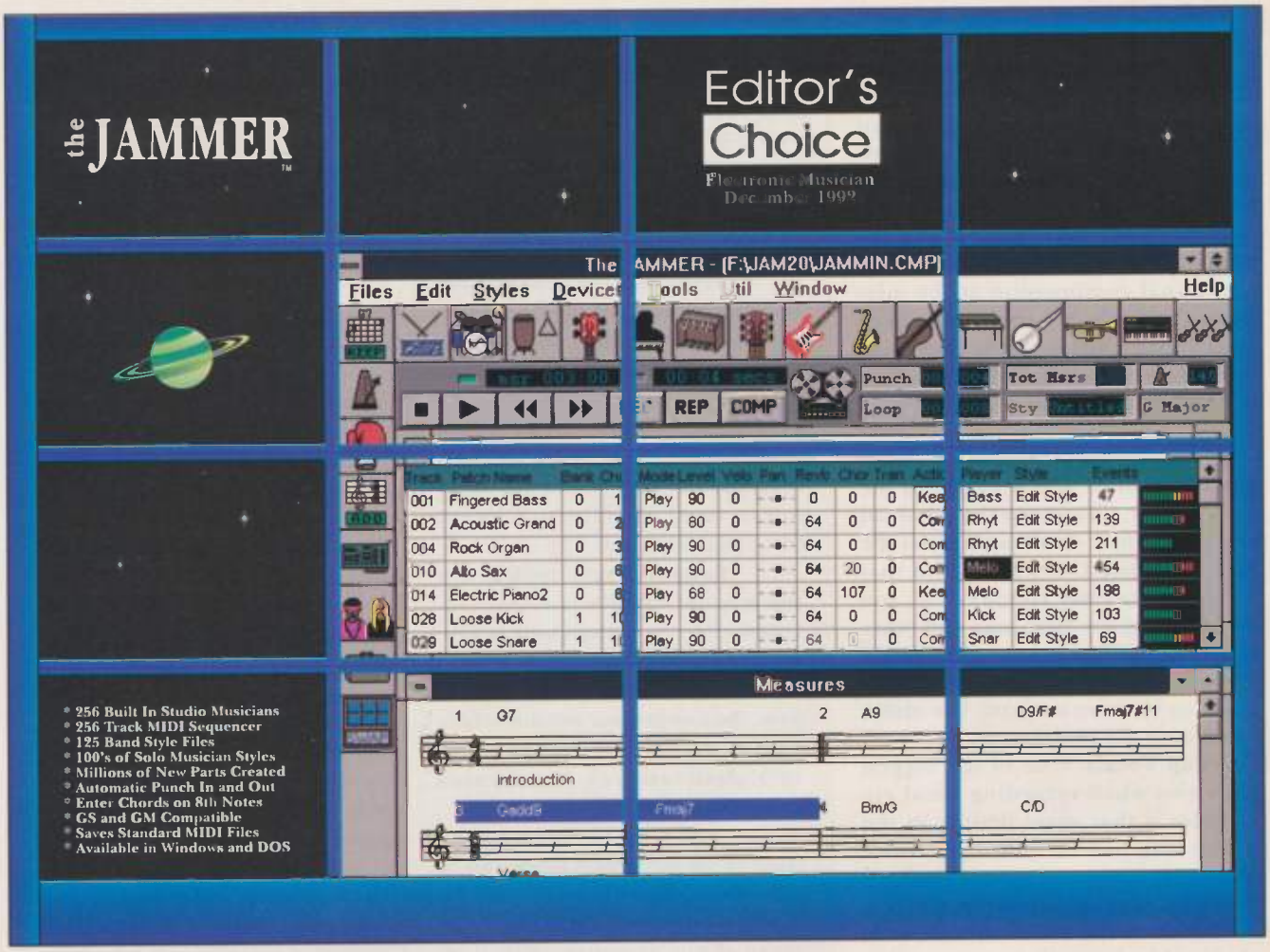

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smooth out the sound and maintain natural vocal dynamics.

Unfortunately, not all singers possess the mic technique to deliver optimum signal levels. For these vocalists, I often record with compression to bring wayward dynamics in line. A ratio of 2:1 or 4:1 at a threshold of -10 dB is usually all that's needed to tame the savage voice. It may still be necessary to use additional compression at the mixdown. Typically, the compression settings during a mix are lower than those used when recording. (After all, much of the level problems should already be solved.)

If I want a vocal effect, such as a whisper that sounds as if it's right in the listener's ear, I'll increase the threshold setting to -15 or -20 dB and adjust the ratio as needed. Keep in mind that when you increase compression, you risk bringing low-level hum and other noises to the foreground. Also, vocal sibilance can increase, requiring a de-esser to be inserted into the audio chain after the compressor.

Group Vocals. One of the biggest problems when recording vocal ensembles is that some people in the group sing louder than the others. Obviously, uneven dynamics make it difficult to achieve a lush vocal blend. To balance the vocal mix, I set a threshold of -20 dB to ensure that most of the lower-level signals are processed. The ratio is usually set at 2:1 or 4:1 to maintain the illusion of an organic vocal blend.

If I want a thick "wall of voices" sound, I increase the ratio to 10:1. Higher ratio settings tend to sound squashed and unnatural, so I always check the compressed tracks against the entire mix to make sure the processed timbres support the other instruments and the lead vocal.

Electric Bass. Whenever I record Robin Sylvester—a local legend and bass monster who has played for everyone from Phil Spector to Ry Cooder—the compressor gets the day off. Robin's touch and dynamics are so consistent and musical that anything except straight documentation seems sacrilegious. Some bassists are like that: They don't need compression to help them deliver full, fluid tone. Other bassists aren't so lucky. A fairly light compression ratio of 2:1 with a threshold of -5 dB can even out a good player's dynamics, while more haphazard technicians may require ratio settings near 8:1 at thresholds of up to -12 dB. Beware that heavy-handed compression may accentuate fret noise and finger sounds.

Keyboards. Why use

COMPRESSION SETTINGS

Before you can start squashing signals, you have to know how to make your compressor do its thing. Here is an explanation of the basic parameter knobs on most pro and semi-pro compression units.

Threshold. The threshold setting sets the signal level at which processing is activated. An extreme threshold setting of -30 dB means that most signals will be compressed. Conversely, if you set the threshold to only process signals that reach a level of +10 dB, many lower level signals will sneak through unaffected.

Ratio. The ratio control sets the amount of gain reduction invoked after the compressor is activated. For example, a 2:1 ratio means that for every 2 dB of input gain, the compressor will allow only 1 dB of output gain. Ratios above 10:1 often take you into an area known as limiting.

Limiting is compression taken to the extreme: A signal ceiling allows only a set output level, no matter how much gain is input. Because of this no-nonsense gain reduction, limiting is often used in live sound to prevent signal peaks or feedback loops from damaging amplifiers and speaker systems.

Attack. The attack knob controls how fast the compressor reacts to a signal once the threshold is reached. This parameter is usually defined by milliseconds.

Release. Once the signal fades under the threshold setting, the compressor's release control determines how long processing continues. This feature allows natural signal decays when set to longer times, from milliseconds to more than a second. Quick release times work best during limiting, where the offending signal peaks are usually very fast.

Slave. Stereo or dual compression units usually have a slave button that puts one channel (the slave) under the control of another (the master). This feature is useful when you want a stereo signal, such as a drum submix or background vocal tracks, to be compressed equally.

Output. Because the compressor works to reduce amplitude, it is often necessary to compensate for lowered signal levels. An output control is quite handy for recording optimum signal levels, or adding gain at the final mixdown.

The dual channel dbx 266 couples a noise gate with compression functions.

Valley Audio's new Model 730 Digital Dynamics Processor allows MIDI control of its fully digital compression, expansion, limiting, and noise-gate functions.

World Radio History

Symetrix's Model 425 is a multifunction, stereo unit that offers compression, expansion, and limiting.

compression on keyboards? Well, because most keyboards are velocity sensitive, certain notes in a performance can "stick out" in inappropriate places. A light touch of compression often smooths out such performances. Usually, a 2:1 ratio at a threshold of -10 dB does the trick. Of course, for percussive samples or the brutal noises favored by industrial and techno artists, maximum compression—at ratios of 10:1 or higher with thresholds of at least -10 dB—enhances sonic mayhem.

Guitars. Usually, the sky's the limit when compressing guitars. Most guitarists like hearing their instrument raging in their face. It's difficult evoking the punch they feel when they're standing in front of their amp, but compression helps the recorded timbre sound tough and loud.

If you are going for slamming rhythm guitars or intense solos, hit the signal with a compression ratio setting between 6:1 and 10:1 at a threshold of -10 dB. Subtle compression for cleaner timbres—or for recording thick acoustic guitar tones—can be achieved with a ratio of 2:1. You should take care that your settings don't squash the sound into sonic mud.

DECOMPRESSION

When used optimally, compression is a powerful tool. But you don't have to use it on every track. Sometimes, it helps to listen to rough mixes *sans* compression before you start patching in compressors for the final mix. If every sound is ripping, don't mess with a good thing. However, if certain instruments disappear in the sonic wash, or don't have enough visceral impact, try using compression to bring them front and center.

Never forget that compression can be a double-edged sword. Extreme applications will destroy all of the wonderful dynamics of your music.

Neal Brighton *is executive producer of Sound & Vision productions' flower-power compilation* The Infinite Summer of Love, *released by Taxim Records (Germany). Featured artists include Henry Kaiser and Harvey Mandel.*

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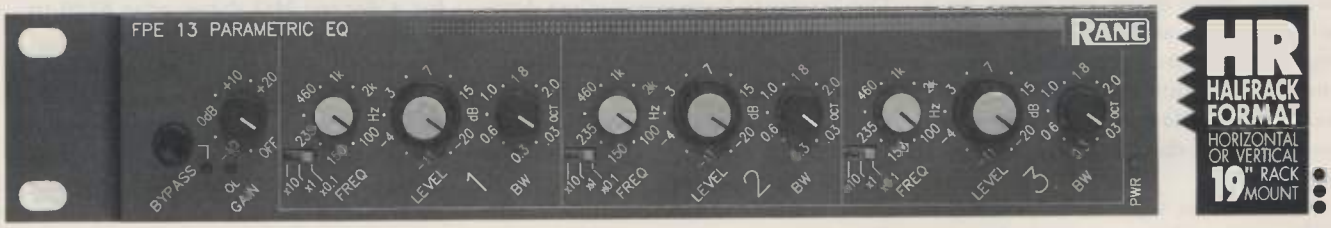

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Covering Your Tracks

By David Kaplowitz

Yes, it's boring and tedious, but backing up digital-audio files is essential to musical life in the '90s.

You've probably heard the story before. It's about a guy in a band who normally backs up his digital-audio files. But one day he says, "I don't have time to back up, I've got to finish this project." Next thing you know, he's using a shareware disk-checker—trying to make sure everything's okay—and the program corrupts his entire hard drive. *Blammo!* Four hundred megabytes of data and five weeks of work vanish.

As with most types of information-rich multimedia data, digital-audio files are mammoth-sized chunks (10 MB/minute for 44.1 kHz stereo) that represent the culmination of days or weeks of hard work. Given the unreliable nature of most hard drives—it's not *if* something will go wrong, but *when*—you will learn about loss the hard way, if you don't back up your files.

Thankfully, several hardware and software options are available to diligent digital recordists or multimedia mavens who want to ensure the safety of their creative efforts. (For a summary of the formats listed in this article, see the table on p. 92) There are pluses and minuses to each approach, but there's no question that any one of them is better than waiting for disaster to strike.

HARDWARE OPTIONS

The hardware format you select determines how quickly your backups and retrievals proceed, how accessible your backed-up files are, if special backup software is required, and how much money you will spend. Because the Macintosh has built-in SCSI support, most of the devices listed here can be directly connected to your Macintosh's SCSI port; PC owners need a SCSI adapter card.

Magneto-Optical (MO). MO devices have recently become a favorite medium for all kinds of data backup, because they offer random access, convenient removable cartridges, and speeds that are a lot faster than tape-based systems (see Fig. 1). MOs come in 128 MB, 256 MB, 650 MB, and 1 GB configurations. You can copy files in their native format, which offers easy access. In contrast, most tape-based systems require you to restore the data before you can access it. Many MOs are fast enough to play back digital-audio files directly, and most can record in stereo, as well. However, multitrack recording is only possible with a few drives.

The main disadvantage of MOs is their price. You'll spend at least $2,000 for a decent MO drive, plus $120 to $150 per cartridge (650 MB). Compared to a $12 to $20 DAT tape that holds more than three times as much data, that's a lot of money. You must decide if the accessibility and speed factors are important enough to justify the added expense.

Audio/Data DAT. DAT machines are so prevalent in professional and project studios that audio DAT backup is extremely popular, primarily because of its cost efficiency. If you already have a DAT machine with digital I/O, several companies offer programs for the Mac and PC that turn it into a backup device. On the downside, there is no way to verify that an audio DAT backup was successful without restoring the data and checking it out.

Data DAT machines are specifically designed for data backup. Their primary benefit over audio DAT systems is their reliability. Data DAT tapes, which can also be used for backup with audio

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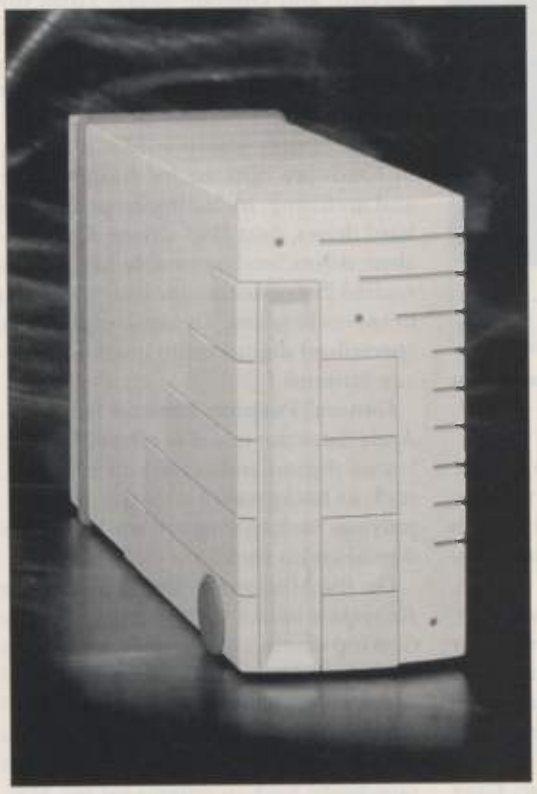

FIG. 1: Magneto-optical drives are becoming popular for backup purposes. Most current drives are also fast enough to record two tracks at once.

DAT machines, are made to higher specifications.

DAT tapes of both varieties can hold up to 2 GB and transfer data at a rate of about 11 MB/minute. (A newly developed compression format for data DAT drives called DDS2 lets you store up to 8 GB on a single tape.) Translating transfer rates into real-world numbers, a 4-track, 20-minute piece (400 MB) would take about 40 minutes to backup to a DAT drive.

8 mm Exabyte Tape. The 8 mm Exabyte tape format combines high capacity—5 GB per tape—with about three times the transfer rate of a DAT-based system, at a slightly higher price (see Fig. 2). In all other respects, 8 mm and DAT (which is sometimes called 4 mm) systems operate in a similar manner.

Thanks to a recent Macintosh program from Optima Technology Corp. called *DeskTape* 1.6, data DAT and 8 mm Exabyte drive owners can now enjoy some of the benefits of other removable media. *DeskTape* lets you mount tapes on the desktop and treat them just as you would any other removable drives, including simple click-and-drag copying. The process is a bit slow, but it eliminates the even slower back-up-and-restore process.

SyQuest Removable (44, 88, 105 MB). SyQuest removable cartridge drives have been popular for some time now, mainly because of their convenience and relatively speedy operation. They are fast enough to play and record stereo digital audio. Unfortunately, they can't hold huge files and are considered less reliable than the Bernoulli, MO, and CD-R formats. But for backing up smaller files such as sound-effects libraries, SyQuest cartridges work well. The 88c drives can read and write 44 MB cartridges. The new 105 MB drives use a smaller, 3.5-inch cartridge.

Bernoulli. The new Bernoulli Multi-Disk 150 from Iomega Corp. uses 35 MB, 65 MB, 105 MB, and 150 MB cartridges and is as fast as many fixed hard drives. The Multi-Disk 150 is rated at 18 ms access time. Recent price reductions on these well-known, rugged units have brought them into closer parity with their competitors, but they're still a bit expensive and too small for large digital-audio files. They make an excellent alternative to SyQuest drives for samples, sound effects, and smaller files, although sample libraries are usually sold on SyQuest 44 MB cartridges.

Recordable CD. Currently, recordable CD devices are emerging at realistic prices. At a cost of around $30 or less per blank disc, this format may become a cost-effective solution as drive prices drop. Current machines are "write-once," which means they're only suitable for permanent archiving or final mastering of audio CDs or CD-ROMs. Pinnacle Micro, Sony, Philips, JVC, and other manufacturers offer CD recorders.

THE SOFTWARE

In general, the choice between dedicated digital-audio and general-purpose backup software is a matter of personal preference. Among the things to look for in any package is the ability to make *incremental backups*, which means backing up only those files that have changed since the last backup (which can save a lot of time). Another important feature is *scheduling*, which allows automatic backups to occur at pre-defined times.

BACKUP SYSTEM MANUFACTURERS

Bernoulli
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fax (801) 778-3460

Central Point Software
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fax (503) 690-8083

Dantz Software
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fax (510) 253-9099

Digidesign
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fax (415) 327-0777

Dynatek
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Fifth Generation Systems
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or (504) 291-7221
fax (504) 291-5453

Grey Matter Response
tel. (408) 423-9361
fax (408) 423-7324

Optima Technology Corp.
tel. (714) 476-0515
fax (714) 476-0313

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

Symantec Corp. (Norton)
tel. (800) 441-7234
or (408) 253-9600
fax (800) 800-1438
or (408) 255-3344

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FIG. 2: Tape-based backup systems, such as this 8 mm drive from Grey Matter Response, offer enormous storage capacity but have slow access times.

Digital-Audio Backup Software. Digidesign products come with a program called *DATa*, which lets you backup and retrieve files to and from audio DAT. *DATa* is a simple program that prompts you to select the file(s) to backup, gives you tape-time information, and prompts you to write a start ID on the DAT. The retrieval process is much the same: Select a destination on your hard drive for the file(s), hit play at the beginning of the DAT archive, and wait. On the PC, *DATa* is built into the Session 8 software, so backing up and restoring files can be done directly from the file menu of the program.

Also for the PC, Spectral Synthesis provides several backup options for users of their multitrack Audio Engine system, including data DAT, 8 mm Exabyte, and MO. The backup routines are built into their *StudioTracks* software.

Grey Matter Response has an integrated backup system (currently for the Macintosh only) called Mezzo that works with any type of data, but it's optimized for digital audio. For example, if you're using Pro Tools with the Digidesign System Accelerator, Grey Matter's backup program *MezzoMedia* will back up your files in the background, letting you continue your work. This is a great feature, especially if you're used to a half hour or more of downtime for a regular DAT backup. *MezzoMedia* recognizes Pro Tools, SampleCell, and Opcode *Studio Vision* file formats; and it catalogs and links session or sequence files with their associated audio file(s). In addition, the program offers incremental backups.

Grey Matter also provides a variety of hardware options for both storage and archiving, including large-capacity hard drives, data DAT drives, 8 mm Exabyte drives, and removable hard drives (called PortaMezzo) for easy transport between sessions. Dynatek also offers specialized digital-audio hardware storage options.

General-Purpose Backup Software. Aside from the benefits offered by dedicated digital-audio backup software, such as background copying, general-purpose backup software works well for digital-audio files.

On the Macintosh, Dantz Software's *Retrospect* backs up to and from any desktop-mountable volume, including all formats previously described, and supports incremental and scheduled backups. *Retrospect* also works with data DAT drives and is often bundled with tape-based backup systems for the Mac. If you're running a network of Macs, *Retrospect Remote* automatically backs up an entire network remotely.

Fastback, from Fifth Generation Systems, is available for both the Mac and PC. It provides incremental and scheduled backups. The user interface for

DIGITAL-AUDIO BACKUP SYSTEMS

	System Cost	Storage Media Cost	Cost per MB	Access Time	HD Playback?	HD Recording?
Magneto-optical 128 MB	$1,000	$40	$0.31	30-45 ms	yes*	yes*
Magneto-optical 256 MB	$1,500	$70	$0.27	30-45 ms	yes*	yes*
Magneto-optical 650 MB	$2,500	$95	$0.15	27-90 ms	yes*	yes*
Magneto-optical 1,000 MB	$3,000	$175	$0.18	27-90 ms	yes*	yes*
Audio DAT	$1,000	$12	$0.006	≈ 20 sec	no	no
Data DAT	$1,000	$25	$0.013	≈ 20 sec	no	no
8 mm Exabyte	$1,700	$25	$0.005	≈ 6.5 sec	no	no
SyQuest 44	$350	$60	$1.50	20-25 ms	yes	yes
SyQuest 88C	$500	$90	$1.02	20-25 ms	yes	yes
SyQuest 105	$650	$60	$0.85	14.5 ms	yes	yes
Bernoulli Multi-Disk 150	$550	$100	$0.69	18 ms	yes	yes
Recordable CD	$3,500	$25	$0.038	300 ms	yes	yes
Fixed hard drive (240 MB drives)	$250	$250	$1.04	10-20 ms	yes	yes
Fixed hard drive (500 MB drives)	$650	$650	$1.30	10-20 ms	yes	yes
Fixed hard drive (1 GB drives)	$1,000	$1,000	$1.00	10-20 ms	yes	yes

* On faster drives

Storage costs for backup systems vary widely. The dollar values in the all-important "Cost per MB" column were determined by dividing the cost of the media by the amount of storage space it provides. (Prices for the drive mechanisms were not included.) The system and media prices provided in this chart are approximate street/mail-order costs.

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Cadenza Windows
MaxPak
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TRAX
Voyetra
Sequencer Plus Jr., Classic, Gold
Twelve Tone Systems
Cakewalk
Cakewalk Professional
Cakewalk Professional for Windows
Magnetic Music
Texture

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Passport Designs
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MusicTime
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Temporal Acuity
MusicPrinter Plus
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Musicator
Musicator GS Windows
Coda
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Songwright 5.1
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Temporal Acuity
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both platforms is essentially identical. Other general-purpose backup packages for the PC include *Norton Backup* from Symantec and *Central Point Backup* for DOS and *Windows* from Central Point Software.

THE BACKUP PROCESS

No matter what format you choose, backing up and retrieving digital-audio files is a straightforward process. When using a random-access device, such as SyQuest, MO, or the like, special software isn't required for backup, although some of the software packages provide convenience and assurance that you won't forget to copy any files with which you are working. With most tape-based systems, the process requires software that writes the data to the specified format, whether it be audio DAT, data DAT, or 8 mm Exabyte.

▼

MO devices offer random access, convenient removable cartridges, and speeds that are a lot faster than tape-based systems.

The exact backup procedure varies between different software packages, but in general, it's as simple as selecting the file(s) you want to back up, specifying the destination, telling the program whether you want a full or incremental backup, and letting it rip.

In the end, all that matters is that you do it. There's nothing worse than the feeling of complete frustration when you lose all your hard work. Trust me, it isn't fun.

David Kaplowitz *is a freelance writer, composer, sound designer, and saxophonist living in San Francisco. He currently enjoys listening to Neil Diamond, eating lots of meat, and watching late-night TV evangelists.*

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PRO STANDARD

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131 • Digidesign SampleCell II (Mac)
135 • Speck Xtramix Synth/Sampler Mixer
140 • Softronics WinSong 3.02 (PC)

Korg X3 Music Workstation

By Charles R. Fischer

Korg's latest keyboard synth has hidden potential.

Keyboard workstations have proven to be extremely popular. Combining a multitimbral tone generator, sequencer, data storage, and two signal processors with a MIDI keyboard controller, the all-in-one approach appeals to anyone who requires portability, or has limited space and income. The tradeoff is that relying on one instrument to handle all of the duties in a MIDI system means living with the limitations of the design.

The latest member of Korg's family of keyboard workstations is the X3. Closely related Korg AI^2 wavetable synths include the 01/W, 03R/W, X3R (a rack-mount X3), 05R/W (see sidebar), and the General MIDI preset-only Audio Gallery (described in the October 1993 "What's New"). The new synthesizer offers a classic tradeoff: It has the big Korg sound, but ease-of-use is a problem.

Korg's X3 keyboard workstation produces excellent sounds, although its GM presets are a mixed bag. It offers two clean, dual-channel signal processors and a sequencer with a solid set of features. The downside: Programming it is not fun.

X3 BASICS

The X3 includes a 32-voice, multitimbral tone generator with 6 MB of ROM-based samples; a 16-track sequencer; and a 3.5-inch, DOS-compatible disk drive for storing Sequences, Programs, Combinations, and SysEx data. A pair of dynamic signal processors provide a variety of effects and can produce up to four effects simultaneously.

The 5-octave, unweighted keyboard is velocity- and aftertouch-sensitive. I found it comfortable and responsive. Instead of the wheels used by most manufacturers, Korg continues to use a programmable X/Y joystick to simultaneously control Pitch Bend, Modulation, filter sweep, and the effects, among other possibilities.

On the back panel are L/R audio outputs; headphone jack; MIDI In, Out, and Thru ports; and ¼-inch jacks for the sustain ("damper") pedal and two assignable footswitches or pedals. The Assignable Pedal/Switch inputs can be used with an optional Korg EXP-2 pedal for functions such as volume, effects levels, and filter cutoff; or with a momentary switch for stepping through Programs, switching the sequencer or effects on and off, and so on. Two slots accept optional memory cards: One is for ROM cards and the SRC-512 RAM card, which adds two user Program Banks; the other supports 2 MB PCM sample cards. The X3 can read the 03R/W PCM and ROM card library.

The 2U rack-mount X3R has four outputs. Aside from the differences in packaging and price—$1,949 for the X3 and $1,699 for the X3R—the two extra outputs on the rack version are the only significant difference. It's too bad Korg didn't include the extra outs on the keyboard version. On the other hand, the left output can operate as a mono out, unlike other recent Korg instruments.

USER INTERFACE

The X3's user interface makes many operations more difficult than they

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should be. Many parameters are hidden behind several pages, requiring you to repeat the same sequence of keystrokes.

On the left of the unit's front panel is a row of eight Function buttons. In the regular Edit modes—Program, Combi, and Sequence—pressing Function 1 takes you to parameter page 1A, Function 2 to 2A, and so on. From there, you can use the cursor keys to step through the pages for each function, marked "1B, 1C, 2A," etc. Alternatively, you can use the Function buttons to jump right to 1A, 2A, 3A, etc.

If you leave Edit mode and then return, the X3 remembers the last edit page you were on (assuming the global Page Memory toggle is on). However, every time you hit a Function button within Edit mode, you go to page A, even if you last worked on page B or C. As a result, you must do a lot of button-pushing when you're trying to check the effect of tweaking several indirectly related parameters.

Furthermore, the regular Edit functions aren't labeled on the front panel, and there are no "soft" buttons under the LCD that point to the next page, so you don't know what's on the various pages unless you have the manual handy. In the right-hand edge of the LCD, you sometimes see a cursor symbol, "<>," which indicates as many as three or four hidden subpages of related parameters that can be accessed with the left and right cursor buttons.

To confuse matters further, the LCD is relatively small, and Korg tends to use cryptic abbreviations. Even when you're in the right place, you must know Korg's shorthand. By constantly referring to the semi-adequate manual, you can figure out where things are and get the job done, and you can move around the pages fairly quickly with practice. But this is by no means a friendly user interface.

In Program Play mode, the eight Function buttons act as quick-access editors for the most-used performance parameters, such as octave, filter cutoff, filter EG, and the effects. The manual doesn't name this feature, but I'll call it "Performance Edit." The Performance Editors help you grab certain parameters in the heat of the action, and they're a lot faster than the regular Edit modes.

In Combination mode, you can see how many timbres are used in a Combi,

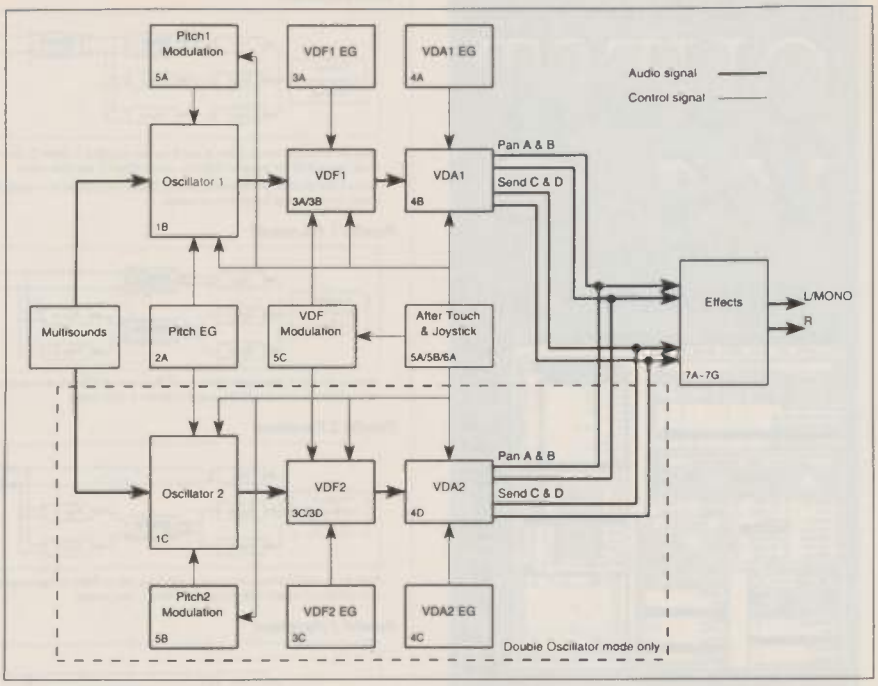

FIG. 1: The X3's voice architecture is the same analog-style layout as the 03R/W. The joystick (center) is an X/Y controller, with the same modulation possibilities as Aftertouch. Up to four sounds, with independent effects, can be mixed to stereo. (Courtesy Korg USA.)

and the Function buttons call up the Program number, volume, panning, and MIDI channel for each Program. The Performance Editor for the sequencer (new on this unit) lets you cue individual Songs and edit the measure, track, channel, tempo, quantization, etc., while the sequencer is running.

The Function buttons' front-panel labels indicate their purpose in Performance Edit, so you can find your way around more easily than in the regular Edit modes. (A few sequencer functions aren't marked on the front panel, though.)

Programming the X3 is often slow, clumsy, and frustrating. There is a Compare button, which also acts as an Undo button in Sequence mode. In addition, you can toggle between the same parameter for oscillators 1 and 2, which helps.

VOICE ARCHITECTURE

The voice architecture of the X3 is nearly identical to that of the 03R/W (see Fig. 1). It's a traditional, simple design: Each of the 32 voices includes an oscillator, Variable Digital Filter (VDF), and Variable Digital Amplifier (VDA), each with its own envelope generator. There are two assignable LFOs per voice. Each Program uses one or two voices per note; many factory Programs rely on two voices, which reduces the available polyphony.

Although the VDF closely resembles the filters on the 01/W and 03R/W, Korg has added a new Color parameter. The manual avoided any description of this parameter, or what it's supposed to do; apparently, increasing the Color parameter sharpens the VDF slope. Unfortunately, going between minimum and maximum Color settings only produced a subtle change in the filter sound. While this provided a slightly thinner midrange timbre, at no time did the X3 filter sound like a resonant VCF.

The three envelope generators for each voice offer an especially powerful design. You have extensive control over the level and time of most segments of each envelope—note number and Velocity can be used simultaneously for this purpose—allowing a serious programmer to create envelopes that subtly differ from note to note, much like acoustic instruments.

SIGNAL PROCESSORS

One of the most powerful and useful features on the X3 is a pair of dynamic, dual-channel signal processors, which were borrowed from the Korg 01/W. They can apply effects to Programs, Combis, and Songs, providing 47 effects

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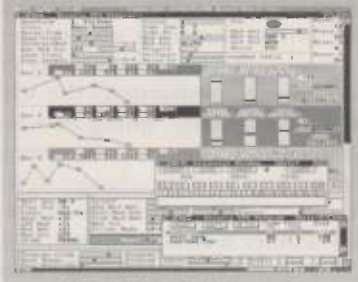

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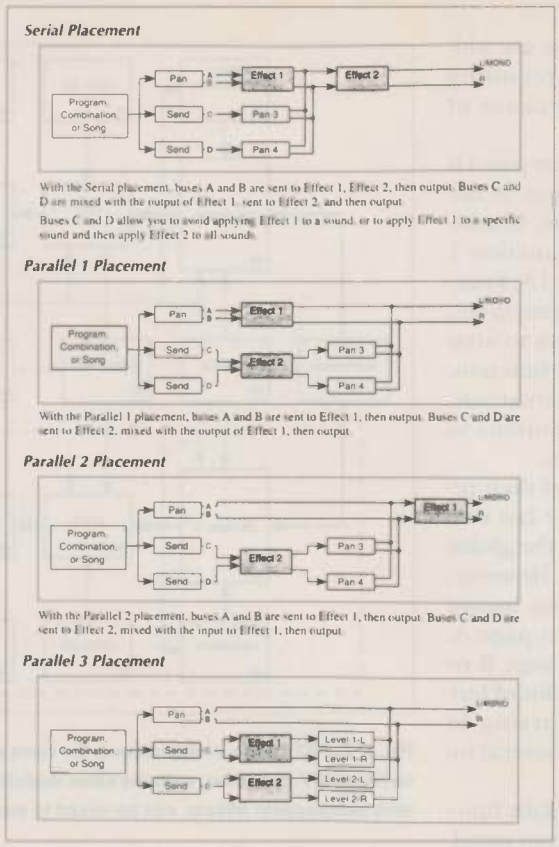

FIG. 2: You can route sounds through the effects in four different ways: Serial, Parallel 1, Parallel 2, and Parallel 3. For the first three placement schemes, if Pan 3 or 4 is turned off, signals sent to buses C and D, respectively, are not routed to the outputs. (Courtesy Korg USA.)

algorithms for an assortment of useful effects, from reverb and chorusing to flanging and rotary speaker. You can even have four independent effects, each on its own bus. In this arrangement, each processor can deliver delay plus either reverb, chorus, flanger, distortion, overdrive, phaser, or rotary speaker. You can route sounds through the effects in four different serial and parallel configurations (see Fig. 2). In the X3R, you can route each of the four individually processed sounds to different outputs.

For the most part, the effects sound fine, and they're quiet and clean. The reverb and chorus algorithms blend well with the X3 sounds, unlike onboard effects I've heard in many synths. The three flangers are too metallic for my tastes, but they're certainly usable. The distortion and overdrive algorithms sound good after some tweaking. Both also offer something special: a bandpass filter that includes variable resonance and real-time frequency control, making it useful for far more than imitating wah-wah pedals. There's also an enhancer, parametric EQ, and an effective and versatile exciter. The exciter worked wonders in many places, adding sparkle to electric pianos and percussion.

The X3 has several useful effects-editing functions. One function swaps (exchanges) algorithms between Effect 1 and Effect 2, while another copies the effects parameters between the processors. Effects can also be copied to and from any Program, Combination, or Song.

The effects processors' real-time control capabilities are equal to most other keyboard workstations. You can choose a controller from a list that includes Aftertouch, the data slider, the joystick, the foot controllers, and the VDA envelope generator. You can't use note number or incoming MIDI Clock messages, though. Each algorithm has only one parameter capable of responding to a controller. Still, that's not such a big deal; in this price category, it's hard to find effects this good.

GLOBAL FEATURES

The X3 offers a number of useful features in the Global pages. There are thirteen alternate tuning tables, one of which is user-programmable, and

Product Summary

PRODUCT:
X3 Music Workstation
PRICE:
$1,949
MANUFACTURER:
Korg USA Inc.
89 Frost St.
Westbury, NY 11590
tel. (516) 333-9100
fax (516) 333-9108

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ●
EASE OF USE	● ● ◖
QUALITY OF SOUNDS	● ● ● ◖
VALUE	● ● ●

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they can be selected by a footswitch. You also get a choice of eight Velocity curves and eight Aftertouch curves. MIDI filters can be enabled separately for Program Changes, Control Changes, Aftertouch, and SysEx messages, allowing you to decide which incoming messages are recognized and which messages are sent out. There's also a Local On/Off control and three modes that determine how the X3 responds to incoming MIDI note messages (Odd, Even, or All) for use with the MIDI Overflow feature.

SEQUENCER

One of the main features of the X3 is its 16-track sequencer. With a total capacity of 32,000 events and up to ten songs and 100 patterns, the sequencer offers enough horsepower to satisfy many users. With a timing resolution of 48 or 96 ppqn, and virtually all of the standard editing features, it is typical of hardware sequencers found in workstation keyboards.

Parts can be recorded one track at a time, in real time or step time, or multiple tracks can be recorded at once. The sequencer can record dynamic effects, which is a great help. However, the sequencer is handicapped by the same user-interface problems described earlier; almost every operation is more difficult than it should be.

Thanks to the DOS-compatible disk drive, I had no problem transferring Standard MIDI Files between the X3 and a PC. (Mac, Atari, and Amiga users can format floppy disks in PC format and convert their MIDI files; see "Computer Musician: Crossing Platforms" in the October 1993 **EM**.) The X3 sequencer is good for live performance, where it can play sequences, send SysEx dumps, and load MIDI files from floppy disk.

EXPOSURE TO X WAVES

The X3 has 340 multisampled waveforms, covering a wide variety of sounds. The great majority of samples are extremely well-recorded and possess great clarity and presence. Most instruments were carefully multisampled and looped to minimize audible artifacts.

Most of the samples cover the usual variety of acoustic and electric instruments. A large number are dedicated to drums and pitched percussion, including nearly 30 rhythm loops, many with debatable musical usefulness. There is also a group of simple waveforms associated with digital and analog synthesis, which are terrific for emulating other synths or fattening up a brass or string pad.

SOUND EVALUATION

The 136 factory Programs in the X3's ROM include 128 General MIDI sounds and eight General MIDI drum kits. There are also two banks of user RAM, which accommodate 200 Combis and 200 additional Programs, including four editable drum kits.

The General MIDI presets are adequate, but then, I've never heard an impressive GM synth. Still, the GM sounds on the X3 (and the 05R/W) are better than those on other GM synths I've heard, apparently because Korg's high-quality synth hardware and signal processors are designed for more demanding applications than most GM synths.

The X3 is capable of generating some expressive, powerful timbres. The RAM-based sounds cover a fairly wide

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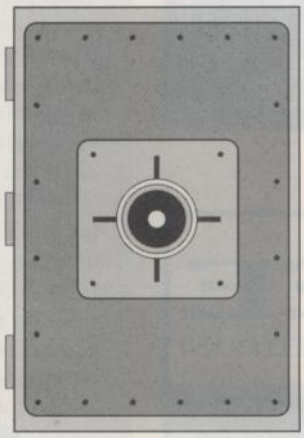

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range, including electric and acoustic keyboards, orchestral instruments, plenty of guitars and basses, excellent tuned percussion, analog synth emulations, and numerous spacey pads and sound effects. There are too many spacey pads and odd patches for my taste, although they might be cool for jingles. I wish Korg had put these patches on a ROM card instead.

There are some killer sounds in RAM, including an expressive electric piano that crossfades between a normal Rhodes and an aggressive tine attack at higher velocities. It sounds better than any FM Rhodes I've heard and responds wonderfully to dynamic playing. There's a great pair of pipe organs that would work well for churches. Several basses are outstanding, and a few decent imitations of analog synths are included. A number of Hammond organ sounds are provided; their quality varies from excellent to fair. The acoustic piano and synthesizer Programs are inconsistent. As with any synth, there are some weak RAM sounds, but not many.

With 164 drum sounds, eight ROM kits, and four user-programmable kits, the X3 is capable of some powerful percussion that can be tweaked to taste.

KORG 05R/W AI² SYNTHESIS MODULE

Take the X3, chop off the keyboard, disk drive, sequencer, and card slots, halve the number of RAM Programs, add a computer interface, cram it all into a half-rack box, and you have the 05R/W sound module. It's not fair to brush this off as just another General MIDI sound module; it sounds identical to its X-series siblings, and the 05R/W Programs and Combis sound far more lively than other GM modules I've endured.

Of course, with this many features in a small space, you expect compromises, primarily in the number of presets and the user interface. a volume control; and a tiny, backlit LCD, with several LEDs for display purposes.

On the back are the MIDI ports and a jack for an external power supply. As with several other recent GM modules, the 05R/W has a built-in PC and Mac MIDI interface, which connects to the computer with a 8-pin DIN connector. (Korg plans to offer Mac and *Windows* driver software that will let most software sequencers address 32 MIDI channels: sixteen with the 05R/W and sixteen independent channels through the unit's MIDI Out jack.) Finally, there's a

For $799, the Korg 05R/W delivers GM compatibility, a computer interface, and all of the sound-production features of Korg's more-expensive X3R and 03R/W.

The 05R/W offers the same 100 Combis and 236 Programs (100 RAM, 136 ROM, including the bank of GM sounds) as the X3.

For some reason, I'm less bothered by the 05R/W's interface than the X3's. Perhaps it's because I knew from the start that everything would be packed into a half-rack box. The front panel incorporates eight switches, which are used to select and edit everything; an on/off switch; pair of line-level audio outputs (which can be used in mono or stereo), along with a ⅛-inch mini-jack for Walkman-type headphones.

The Korg 05R/W is a good buy at $799. If you've considered buying a sound module that could handle General MIDI sequences, but wanted something that could be used for more serious gigs as well, you'll find this module more than adequate for both roles.

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Each drum kit can use up to 60 drum sounds, with different settings on each drum. Most of the drum samples are punchy and well-recorded, with plenty of variations for every taste.

CONCLUSION

The X3 has many useful features, and it is capable of excellent sounds. Sonically, it isn't quite as cool as the 01/W with its Waveshaper, and the Color feature is too subtle. But it has some definite functional advances over the 01/W, too; for example, the X3 sequencer can access card-based sounds in Combi mode, and when you change Programs while holding down a key, the note is not cut off.

I had a hard time "connecting" with the X3. The frustrations of its user interface—including the sequencer and drums—made programming the X3 no fun. Fortunately, editor/librarian support is inevitable with a Korg synth, and Korg includes a free instructional video.

Of course, if you don't want to program, you can just start playing and enjoy the sounds. At its best, the X3 sounds big, fat, and in your face, like a Korg synth should.

Charles R. Fischer *is an electronics technician for AKG Acoustics, Inc. In addition to writing technical articles and designing custom MIDI controllers, he has played and programmed synthesizers for nearly twenty years.*

Circle #437 on Reader Service Card

Coda Finale 3.01a (Mac)

By Bob O'Donnell

Is the third time the charm for this MIDI-based notation program?

I have a confession to make. I reviewed the original version of *Finale* six years ago, and I—uh—gave it a good review. In fact, I gave it a really good review. Even worse, I said it was relatively bug-free. Anyone who used early versions of *Finale* will understand the need for such a disclaimer. A powerful program, yes; easy-to-use, no.

I wrote such a positive review because I was impressed (or, more likely, overwhelmed) by what it was *supposed* to do. In fact, ever since its introduction, *Finale*'s richly deserved reputation as the king of notation programs has been based on its insidiously baffling power. There was a lot the program could do, if you had the patience (and courage) to figure out how. But the program made many procedures harder than was necessary. Slogging through eight or nine nested dialog boxes to make a small change wasn't unheard of, and four or five was commonplace.

Since then, Coda has worked hard to make *Finale*'s power more accessible. It's a testament to Coda's efforts that the latest revision of *Finale* is greatly improved over previous versions, but it's an equally strong testament to *Finale*'s original complexity that they still have a long way to go. In its present state, *Finale* has a split personality: The revised portions of the program are a pleasure to work with, but the other

archlute
bassoon and contrabassoon
celesta
cello solo: sustained, with vibrato; pizzicato; martelé
clarinets: b flat, e flat, bass clarinet, contrabass clarinet
cornett: treble
crumhorns: bass, alto, soprano
double bass solo: sustained, little vibrato; pizzicato; martelé
English horn
flute, piccolo, alto flute and bass flute: with and without vibrato; fluttertongued (flute only)
French horn: with and without mute
guitar (classical): normal position, sul tasto, harmonics, sul ponticello, panned
harp: single notes and harmonics
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oboes: oboe, Baroque oboe
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percussion: agogo bells, alpenglocken, bamboo chimes, bass drum, bongos, brake drum, cabasa, castenets, cencerros, Chinese gong, claves, conga, crotales, cuica, cymbals, finger cymbals, glockenspiel, gongs, ice bells, log drums, maracas, marching snare, marimba, mark-tree, military drum, snare drum, temple blocks, ratchet, sleigh bells, tambourine, temple blocks, timbales, tom-toms, triangles, tubular bells, tumba, tympani, vibraphone, waterphones, whip, wood blocks, xylophone
piano (Steinway grands, 8 and 16 mb): straight, pedalled, harmonics, plucked strings
recorders: Renaissance and Baroque
shawm: alto
trombones: bass, alto, tenor; muted tenor
trumpets: c trumpet, Bach trumpet
tuba
viols: bass and treble
viola solo: sustained, with and without vibrato; pizzicato; martelé
violin solo: sustained, with and without vibrato; pizzicato; harmonics; martelé
violin ensemble: sustained without vibrato; pizzicato; martelé; harmonics

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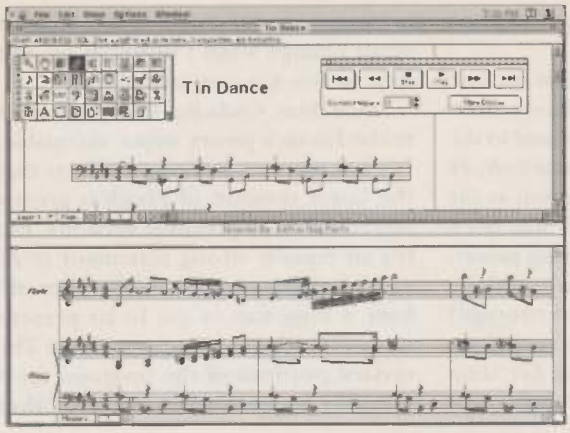

FIG. 1: *Finale*'s main screen includes a handy Message Bar across the top that describes all of the program's many tools. Version 3 also includes dedicated playback controls.

sections are as confusing as ever.

DIGGING IN

Finale's structure is modal. To use the program, you select from one of its numerous tools and perform operations specific to that tool. For example, if you want to add staves, select the Staff tool; if you want to edit notes, select the Mass Mover tool (although sometimes you must use the Note Mover tool instead). Although there is a certain logic to this approach, it's not intuitive. I would much rather see an all-purpose pointer tool with which you could select notes, symbols, lyrics, or staves, and then perform the necessary editing functions.

One of the most prominent features in the new version is a Microsoft *Excel*-type Message Bar located along the top of the active window (see Fig. 1). The Message Bar provides basic descriptions and instructions for each of *Finale*'s tools and helps you remember what each tool is and what it does (not a trivial task with 35 main tools and numerous other "sub-tools"). This version of *Finale* also offers extensive Balloon Help, which I found enormously useful.

Other prominent and welcome additions to the program's interface are floating, reshapeable tool palettes; multiple open files or multiple views of the same file; window stacking and tiling; and a measure/page number status display at the bottom of each file's window. Although they sound simple, these changes make a big difference in the overall feel of the program. They're also the type of features existing *Finale* users will immediately appreciate and potential users will find inviting.

ENTERING NOTES

One of *Finale*'s strengths has been the options it offers for getting notes into the score. Although there aren't any new additions in this version (scan conversion is promised for the future), there have been refinements to the impressive HyperScribe real-time MIDI-entry function. HyperScribe now records all MIDI Velocity and note-duration data, letting you record and play back unquantized performances a track at a time.

This capability is also available in the Transcription Tool, with which you can add beats and bar lines after recording

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THE CR-1604 IS THE ONLY under-$1100[1] mixer that lets you record and monitor eight channels at once. Along with phenomenal headroom and ultra-low noise, it offers true Split Console convenience (which is actually more intuitive than consoles with channel strip monitor sections): Record vocals, instruments and sequences using mixer Channels 1-8 while simultaneously monitoring multi-track output (complete with custom headphone mixes including effects & EQ) using mixer Channels 9-16. Monitor levels on any individual channel at the touch of the SOLO button. And then mix it all down to a 2-track master without re-patching.

Right now, professionals are using the CR-1604 to track and mix network TV show soundtracks, feature movies, major label compact discs, 6-channel digital OmniMax™ films and TV commercials for Fortune 500 companies. They all use multi-track digital recorders. And they all swear by the sonic quality of the CR-1604.

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CR-1604 AS SHOWN $1099 SUGGESTED RETAIL PRICE

LOS LOBOS recently completed the stereo soundtrack for HBO/Showtime's feature film "The Wrong Man" using two Mackie CR-1604s, a MixerMixer combiner and two 8-tk. digital recorders just like this one.

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NOT ALL compact mixers' faders are the same (even if they claim to use the same brand of parts we do). Only the CR-1604 has **extra circuitry** in each channel that gives you smooth control without flat spots or lumps in the taper curve. Compare fades to hear the Mackie difference.

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8-TRACK analog or digital recorder is fed via Channel 1-8 insert outputs. Because they're POST-fader, they double as **Tape Outs**. Most other 16-ch. compact mixers use traditional PRE-fader inserts that are unsuitable for tape outputs during tracking.

Mix down from multi-track digital to 2-track without repatching. CR-1604's **SOLO/MONITOR** feature lets you accurately monitor levels anywhere — inputs, AUXs, tape returns, etc.

CR-1604 **MAIN BUS INSERTS** allow final processing of your mixdown onto 2-tk. without repatching.

RETURN to monitor and mix recorder tracks 1-8 back into the CR-1604 via input Chs. 9-16.

RECORD up to eight mic or line inputs simultaneously. TRIM matches any signal from mic to line to instrument levels (even low ones like older keyboards).

BECAUSE recorder playback returns through CR-1604 channels, you can create custom headphone or monitor mixes with 3-band equalization and reverb, etc.

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ALT 3/4 BUS can be used as 2 mono or 1 stereo subgroups. For example, press MUTE on all drum or keyboard chs. to create a stereo submix to tape that takes up just 2 tracks instead of 5 or 6. Since ALT 3/4 accesses any channel, it also saves patching during overdubs & bounces.

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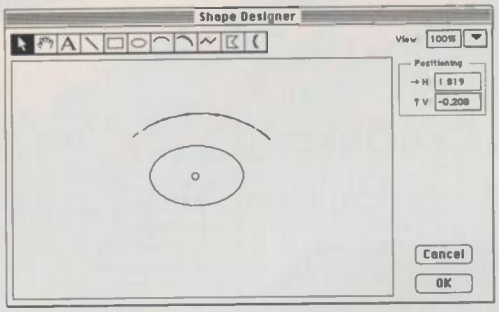

FIG. 2: The Shape Designer is a drawing program within *Finale* that lets you create your own symbols. It was completely redesigned for version 3.0.

a rubato performance. However, this is one of the areas that's badly in need of an overhaul. Unfortunately, you must use it if you want to overdub new parts while listening to previously recorded parts.

To illustrate how tedious this process is, here's a blow-by-blow account of the steps involved: Play the track, add beat markers, align the recorded notes to the beat markers, add measure markers, set quantization parameters, transcribe the part, save it as a playback file, clear the old notes, record the second track, add beat markers to it (these can come from the first track), align it to beat markers, add measure markers, set quantization parameters, and transcribe the part. Hopefully, the next version of the program will combine HyperScribe and Transcription into a single, powerful, real-time entry tool.

On the other hand, *Finale*'s keyboard-based Speedy Note Entry and mouse-based Simple Note Entry are straightforward and complete. To use Simple Note Entry, you select from several palettes of notes and symbols and click in the score. Speedy Note Entry can be used with a MIDI keyboard for fast and efficient step-time entry, or with the computer keyboard alone.

Finale can handle an unlimited number of staves. Each staff can hold up to four Layers, which are new to version 3. Each Layer includes one or two independent musical voices; this arrangement lets you put several separate parts (such as SATB choral music) on a single staff. I'm not entirely sure why voices and layers weren't combined into a single entity; perhaps it was necessary to retain something from the previous organization, in which each staff could include one or two independent voices.

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DOCUMENTATION	● ● ● ● ◖
VALUE	● ● ● ◖

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SYMBOLS

Adding symbols to the score is accomplished with one of several different tools, depending on the function they serve. For example, slurs, crescendos, and first-ending markers are available from the mouse-controlled Smart Shapes palette, while dynamic markings come from either the Score Expression or Staff Expression Tools, depending on whether you want them to affect the entire score or a single staff. Staccato, accent, and other note-specific markings are available from the newly named Articulations Tool. One nice new feature of *Finale* 3.0 is the ability to center articulations on several notes at once. You can even automate the process somewhat by using one of the program's user-definable Metatools, which are simple macros for adding specific types of articulations.

If you aren't satisfied with the choice of text and symbol expressions available within *Finale*, you can edit any existing expressions or create new ones with *Finale*'s completely redesigned Shape Designer (see Fig. 2). This is a basic drawing program within *Finale*, which lets you generate unique graphic symbols that can then be used to affect the score's playback.

MIDI playback options for all symbols can be defined in the Text Expression Designer, Shape Expression Designer, or Articulation Designer, depending on the type of symbol you're working with (see Fig. 3). The available options for playback include adjusting the Velocity and duration of notes and generating just about any type of MIDI message, including Program Changes, Control Changes, and SysEx bulk dumps.

Finale excels at interpreting all the different types of symbols in a score and converting them into appropriate MIDI messages for playback. Putting symbols like crescendos, ritards, dynamics, and other markings into a score can really bring your music to life. And if you don't like the effect of a marking, you can edit it and create the effect you want. *Finale* comes with a number of predefined markings, so you can start using this powerful feature right away, but you're free to create your own set and save them as part of a template. It's this level of musical intelligence that continues to separate *Finale* from its competitors.

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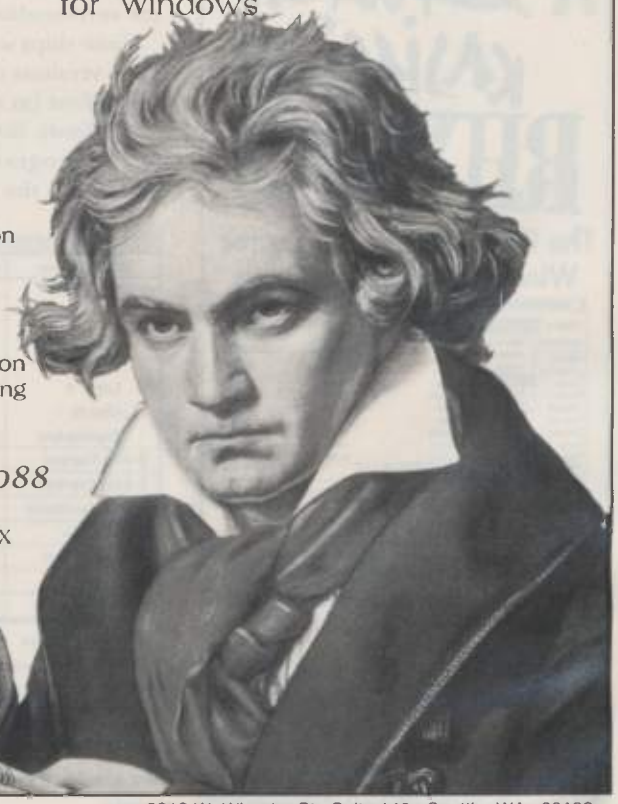

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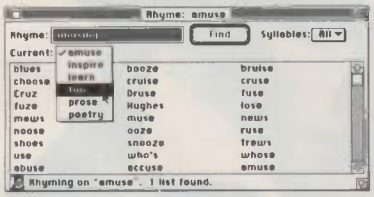

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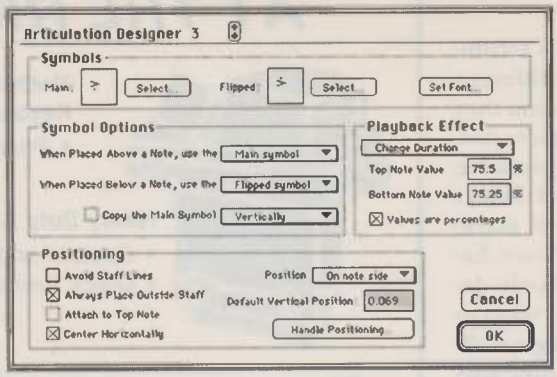

FIG. 3: Note articulations can affect the playback of notes by adjusting parameters in *Finale*'s Note Articulation Designer dialog box.

CHORDS AND LYRICS

There's more to music than notes and symbols, particularly if you're interested in generating lead sheets. Like many aspects of the program, *Finale*'s support for chords and chord symbols (including guitar fretboards) is amazingly thorough. *Finale* can determine chords automatically by analyzing notes in the score or played on a connected MIDI controller. The program recognizes a wide variety of chords, but if you play something it doesn't know, it lets you create your own chord symbol and adds that symbol to its library. Chord symbols in *Finale* have intelligence, which means they automatically transpose if the surrounding music is transposed.

Finale ships with PostScript and TrueType versions of Seville, its guitar fretboard font (as well as Petrucci, its main music font). Seville is not editable within the program, however, so you're stuck with the chord fingerings built into the font. Coda assures me that it's possible to create your own fingering diagrams with the help of the Shape Designer, but the process isn't one I would delve into lightly.

Lyrics can be entered directly into the score or via the outdated, non-WYSIWYG, Edit Lyrics dialog. You can place lyrics one note at a time, or all at once, with the slick Click Assignment feature. Once in the score, you can adjust syllables to the right or left, edit word extensions for melismas and other held notes, and align syllables for multiple verses. *Finale* connects lyrics with their respective notes; if you move the notes, the lyrics move along with them. When you're at the stage of fine-tuning the spacing of your music, you'll really appreciate this feature. Lyrics also follow notes that you copy and paste, although any spacing adjustments you've made between the lyrics and the staff are lost in the process, which is a real drag. The Lyric Tool had several bugs in version 3.0, but they appear to be fixed in 3.01a, which I received from Coda just as I finished this review.

EDITING

If there is one thing you can count on in *Finale*, it is that anything you see on the page can be moved or changed in one way or another. Whether you want to change the shape of note heads, the width of piano braces, the number of lines in a staff, the angle of crescendos, the number of measures per system, or anything else you can think of, *Finale* lets you do it. Most of the tweakier options have been grouped under the Options menu in this version, which makes them much easier to locate.

The main music editing is performed with the Mass Mover Tool, which is used to select beats, measures, or regions to affect with operations from the Mass Edit menu. This menu includes commands to transpose the selected music, change the

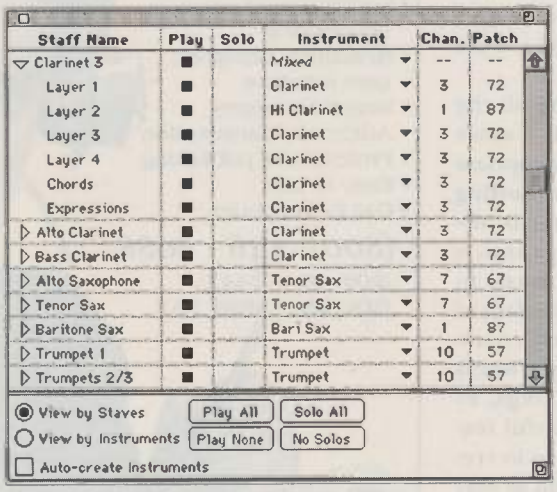

FIG. 4: The new Instrument List window lets you easily assign the playback of different staves to connected MIDI instruments.

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spacing within measures, adjust the beaming, etc. One annoying aspect of this process is that you must update the layout after nearly every function you perform; this should happen automatically. That caveat aside, *Finale* offers a range of editing options and a degree of control that is unparalleled in other notation programs.

The one area in which *Finale* still falls flat on its face is Page Layout. To adjust system indents, page margins, and system spacing, you're forced to use the non-WYSIWYG, Page Layout dialog box. All it offers is a series of blank boxes with handles to grab and adjust. Clicking the Show Music button displays a tiny version of the music, but you can't make additional adjustments. As a result, you have to constantly switch back and forth between the two modes. Given the importance of page layout and all the other changes Coda made to *Finale*, I'm surprised they didn't improve this.

MIDI

With version 3.0, *Finale*'s MIDI support is greatly improved. The most apparent change is the newly designed Instrument List window (see Fig. 4). This window is used to assign staves (or even individual layers, expressions, or chords within a stave) to the appropriate MIDI output channel and program number. You can also define Instruments that correspond to your synth's patches, although the program limits you to 64 Instruments per file for some reason. *Finale* supports Apple's *MIDI Manager* and can play back on 32 MIDI channels at once: sixteen each on the modem and printer ports.

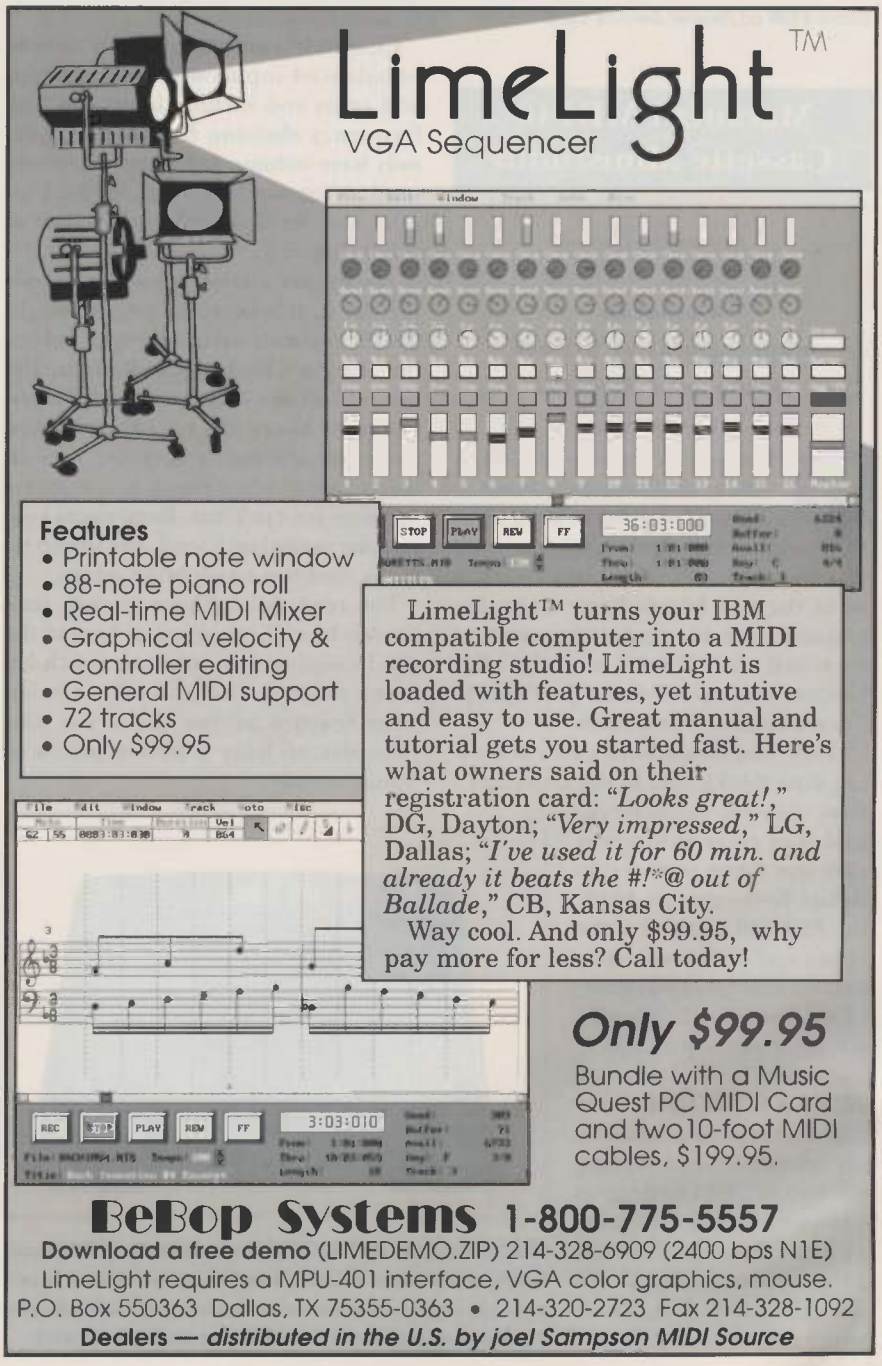
Another greatly appreciated new feature is the Playback Controls window (see Fig. 1), which quickly and easily lets you play back your score from any point in the music. You can set the tempo, turn notation scrolling on or off, play the score through the Macintosh's speaker, and set many other options, as well.

Finale has offered MIDI-event editing since version 2.5. Although it is nice to be able to edit the MIDI data from your performances, the current implementation is only suited for occasional adjustments. The program displays small sections of velocities, note durations, or Continuous Controller data that you select with the mouse and alter with menu commands such as Scale, Add, Limit, Set To, etc. You can't make graphic adjustments, however, so extensive editing quickly gets tedious. Thankfully, you can save your score as a Standard MIDI File (SMF) and transfer it to a sequencer if it needs more work. If you primarily work as a composer or orchestrator, *Finale* offers all the MIDI editing you need.

CURTAIN CALL

Finale is an impressive achievement, even six years after its introduction. It combines extremely sophisticated printing capabilities with accurate, variable-tempo, real-time MIDI input and playback features that many of its competitors are still trying to match. The changes to version 3 make *Finale* much easier to use, but that change is relative. If you come to *Finale* as a newcomer, you'll still be confused and overwhelmed by the program. The new 3-volume set of documentation (which is included with the upgrade) offers an excellent tutorial that will get you thinking in the *Finale* mode fairly quickly.

As a long-time *Finale* user, I'm pleased



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with the developments Coda has made, and I'm sure other *Finale* users will feel the same.

Nevertheless, now that I've seen what can be done, I'm frustrated by the things that still need improvement. I guess I'll have to wait for Coda to introduce version 4 for the complete overhaul. In the meantime, if you want absolute control over all aspects of the printed page, demand expressive playback of your computer score, and are willing to spend some serious time learning the program, *Finale* is still the ultimate choice. ●

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Marantz PMD740 Cassette Ministudio

By Peter McConnell

A veteran manufacturer of 2-track decks goes 4-track.

When you're the new kid on the block, you have something to prove. You need to work extra hard to do things right, learn from others' mistakes, and take a fresh look at what the old hands have taken for granted. To gain acceptance, you have to stand out. That's exactly what Marantz accomplished with the PMD740 4-track cassette ministudio.

While Marantz is hardly new at making tape decks, this is the company's first cassette multitrack, and it is clear that great care was taken to make its debut first-rate. At $949, the PMD740 is aimed at the upper end of the recording market and gives you loads of sophisticated features in a solid, elegant package.

MIXER SECTION

The console-style ministudio offers a built-in, 6-channel mixer. All connectors except the headphone jacks and the Pause and Punch In/Out footswitch jacks are on the rear panel; some users might find this less convenient than front-panel inputs, but it suits me. Input channels 1 through 4 are full-featured, offering both unbalanced, ¼-inch and balanced, XLR inputs, which feed good mic preamps. Trim pots smoothly adjust between mic and line levels. The full-featured channels also have insert points.

One of the coolest aspects of the PMD740 is the 3-band EQ, with sweepable mid-range, on the first four channels. Sweepable mids are relatively rare in this type of machine. In addition, the midrange filter's bandwidth can be switched between "wide" and "narrow" bands, which is almost unheard of in ministudio mixers.

Channels 5 and 6 have only ¼-inch, unbalanced inputs with mic preamps and trims and include high- and low-frequency shelving EQ. All six channels have volume faders and one aux send. A supplemental pair of RCA inputs, with level pot, feeds directly into the L/R bus.

The master section has a single fader for the L/R mix; some people might prefer separate left and right faders, but it didn't bother me. Besides, I'm not sure where Marantz could have fit them, as there isn't a lot of wasted space on the unit's surface. As with many ministudios there is a separate monitor (or cue) mix. Rotary pots control the master aux send, the stereo returns, and two headphone mixes.

You read right: There are two *independent* headphone outputs. One of the two headphone circuits can switch between the tape, cue, and effects buses. This feature allows the artist and recordist to hear separate mixes simultaneously.

Marantz designed the PMD740 4-track ministudio with the user interface and clean, accurate sound as top priorities. It boasts powerful locate and punch-in/out features and 3-band channel EQ with sweepable mids, which is rare in a cassette deck.

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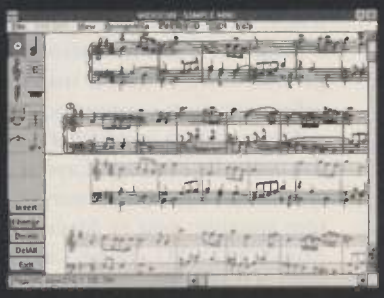

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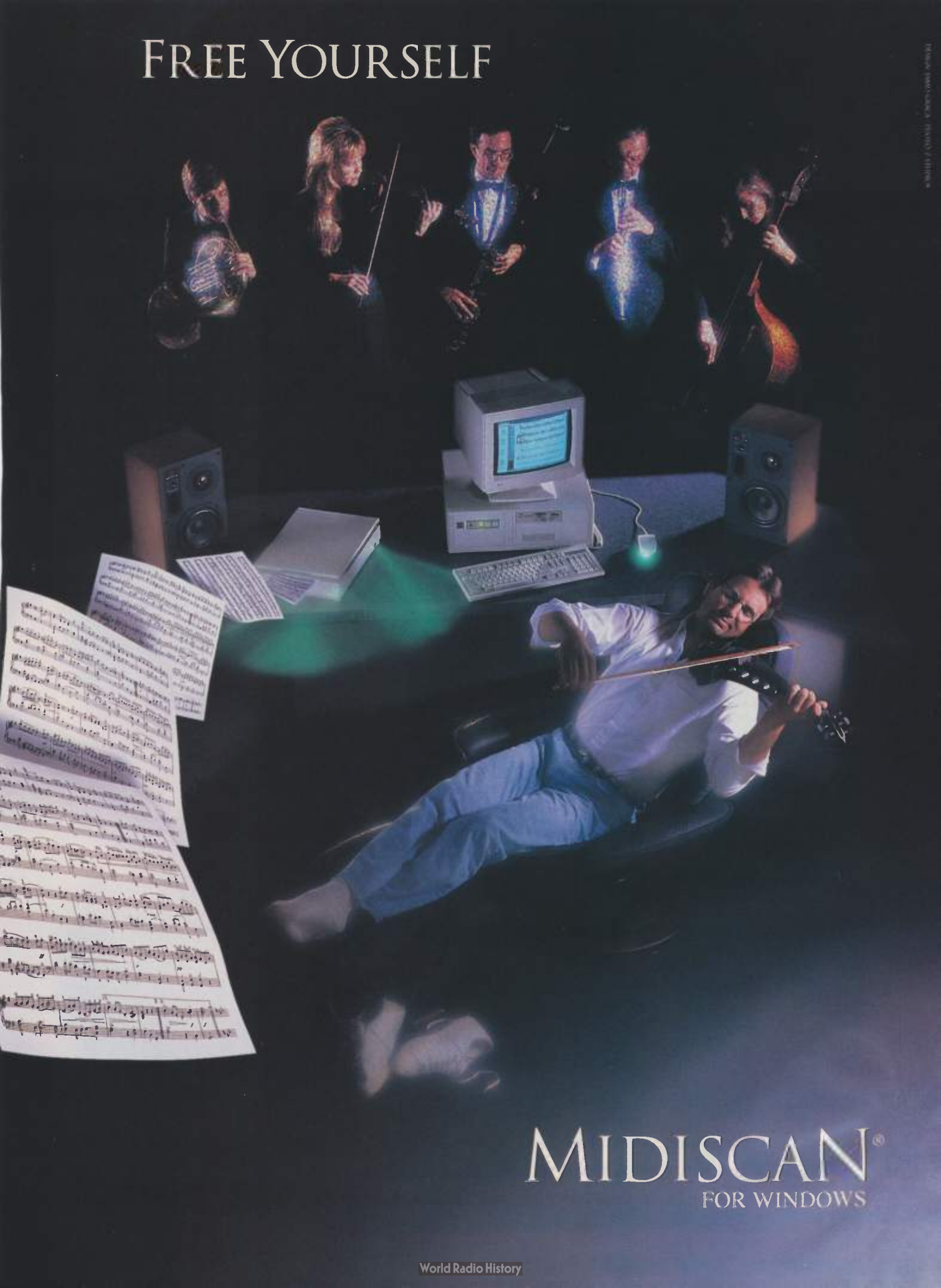

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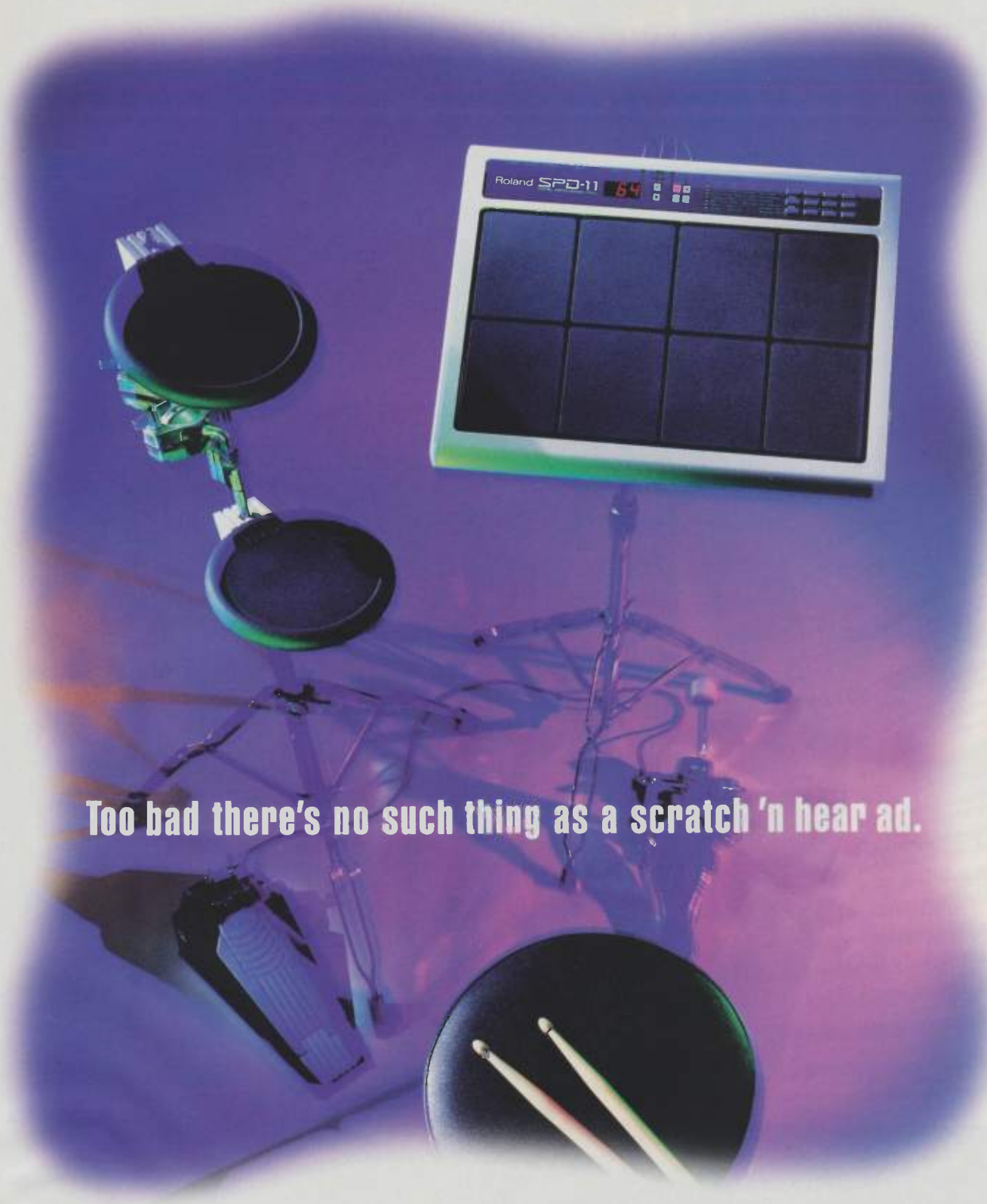

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ERGONOMICS

I'm impressed that Marantz rethought some important details regarding mini-studio design and developed a fresh approach. Put simply, things that are important are large and easy to get at, and things you use less are small and close together. Play and Rewind/Fast Forward are huge buttons, for example, while the Locate and Memory buttons are tiny.

The tape counter is an extra-large digital display that is easily read from anywhere in the room. One minor drawback of this display: Like most digital counters, it resets to zero when you turn the unit off.

Four large VU meters are set in a raised panel for easy viewing. The backlighting for each meter turns bright red when you record, so you always know when you're doing something you can't undo.

The mixer's sliders are also extra large—a full 60 mm—and feel good and stiff. The knobs have definite center detents, and the transport keys feel sturdy. Overall, the PMD740 is well-designed and solidly built.

BONUS POINTS

In addition its ergonomic design, the PMD740 has many bonus features not found on most ministudios. The most sophisticated of these are the automated Locate and Punch-in features. The Zero Return button locates to zero from anywhere on the tape. In addition, you can set two memory points and, with a button push, locate to the first one from anywhere.

The deck can also rewind automatically to the first memory point when it hits the second point. When you combine this feature with the Auto-Play button, which causes the unit to enter Play mode automatically whenever the transport stops, you get an automatic looping feature that is great for rehearsing punch-ins.

You can do even more with punching in. Punch-in points can be pre-programmed. The PMD740 even has an Auto-Rehearse mode, in which it loops and does a *simulated* punch-in at the punch-in/out points. You hear the recorded track mute during the fake punch, just as it would if you were really punching in. You can use this to check the accuracy of your punch points, or to rehearse a punch many times while avoiding the loss in quality that over-recording a section produces.

My results with the Auto-Locate feature were much better than expected: I lost count after twenty repetitions without drift (i.e., the PMD740 consistently located to exactly the same place each time).

A couple of other Locate features bear mentioning. The Zero Return button typically returns the tape to 9999. Thus, you actually *hear* the tape starting at zero. In addition, memory locations, including punch-in points, are automatically adjusted when you reset the counter. This is a nice feature when you accidentally reset the counter, or just want to change reference points. However, the memory and punch points are lost when you turn off the machine.

Finally, the tape deck features 2-speed playback, so you can play standard cassettes (1⅞ ips), as well as the PMD740's double-speed recordings. Frequency response is rated at 40 Hz to 12.5 kHz (±3 dB) at standard speed and 40 Hz to 16.5 kHz at high speed. The signal-to-noise ratio (with dbx) is rated at 85 dB.

SOUND JUDGEMENT

Obviously the PMD740 is packed with features, but how does it sound? For the most part, it sounds very good. Recording quality is excellent, and comparisons between a recording from CD and the original were impressive, with an unusually low amount of noise and good fidelity in the highs.

Some of this improved high end may be due to the Dolby HX Pro circuitry, which extends the high-frequency response by adjusting the bias for optimal headroom at certain key frequencies. Tape *bias* is an inaudible, high-frequency signal, generated by an oscillator in the tape deck, that optimizes the performance of magnetic tape.

However, when you record certain program material that is extremely rich in highs (e.g., cymbals), the high frequencies in the program act as a bias; this is known as *self-biasing*. When self-biasing mixes with a regular bias, the combined signal no longer provides optimal tape performance. Dolby HX Pro constantly monitors the program material and adjusts the recorder's bias oscillator to keep the total effective bias constant. Thus, high frequencies can be cleanly recorded at levels as much as 6 dB higher than with fixed

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biasing. To my knowledge, the PMD740 is the only multitrack cassette deck with HX Pro.

The mixer is remarkably quiet, and the EQ is smooth and clear. But recorded excerpts from a CD revealed that the material sounded best through the mixer mains, as the direct tape outs were noticeably brighter than the original source. This means you can't use the tape outputs to feed either the tape deck or the monitors, because they don't accurately represent the mix. Essentially, the tape outs are only useful as an extra set of sends. Fortunately, using the mixer with the EQ set flat brought most of the beef back into the mix. (Incidentally, both the line outputs and the tape outputs are RCA jacks. I expected RCA tape outs, but ¼-inch line outs would be more convenient in some situations.)

Crosstalk is amazingly low for a 4-track cassette. For example, there was very little sync-tone bleed from track 4, thanks to special Sync Tone Isolation Circuitry (STIC) that phase-cancels crosstalk between track 3 and the sync output. Punch-ins and outs are truly seamless. Low crosstalk came at a price, though. Crosstalk is reduced by padding the audio just as it leaves the heads. This means the playback levels read significantly lower—about 6 dB lower—than the record levels. This can be disconcerting, although it doesn't compromise the sound much. It means you'll use higher mixer levels during playback, adding a bit more noise to your mix. I was told that the playback circuit has been redesigned, and newer models will have low crosstalk without the level drop.

There are some drawbacks, however. One is purely mechanical: The PMD740 motor makes a noticeable chugging, whirring sound whenever a tape is in the machine, even when it isn't playing. I found this distracting when listening to quiet passages on headphones or just trying to think, and it was a troublesome source of ambient noise when recording acoustic instruments (or vocals) near the machine.

THAT SYNCHING FEELING

There are also some issues when using a sync track. The PMD740 provides a sync input and output, but there is only a level control on the output. Unfortunately, I couldn't get a strong enough signal from my JamBox 4+ to use the input, so I ended up having to go through the mixer.

Another problem is that you can't disarm the dbx noise reduction on track 4 alone; it's all or nothing. This means that the sync track is processed

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EASE OF USE	● ● ● ●
SOUND QUALITY	● ● ● ◖
VALUE	● ● ● ●

World Radio History

with dbx if the other tracks are. Theoretically, processing a sync tone could cause problems for the time-code reader; in practice, my sequences slaved reliably, with or without dbx.

I'm not a big fan of dbx NR, because when it falls out of calibration, it distorts brighter tones, such as acoustic guitar sounds. I would have preferred Dolby C or S. However, many people prefer dbx because it's quieter.

CONCLUSION

I liked the PMD740, especially because of its ergonomic advantages and its flexible locate and punch in/out features. I was less thrilled with the bright tape outs and the all-or-nothing noise reduction. If these considerations are paramount, you might want to look elsewhere.

But if you want a great built-in mixer, clean and accurate sound, and precise punches, this is an extremely competitive ministudio. The PMD740 is well-designed and, in some respects, leads the pack with innovative features. Ergonomics count heavily in my book, and this machine reflects a genuine attempt to consider user comfort. As is often the case, the new kid on the block has shown the old hands a thing or two.

When **Peter McConnell** *isn't composing and designing music software for LucasArts Games, he writes, sings, and plays in the Bay Area band Lotus Eaters.*

Circle #439 on Reader Service Card

Akai S2800 MIDI Stereo Digital Sampler

By Geary Yelton

The newest member of a respected line adds polyphony, memory, and modulation.

Akai samplers have a reputation for being solid, dependable, high-quality workhorses on the road and in the studio. Recently, the company introduced four new members of the S series: the S2800, S2800 Studio, S3000, and S3200. In addition, Akai is offering the unique CD3000 CD-ROM Sample Player.

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If you're familiar with Akai's S1000/S1100 samplers, you'll feel right at home with the S2800 and its kin. Improvements abound: up to 16 MB of sample RAM (32 MB in some models), 18-bit DACs, 32-voice polyphony, and flexible modulation routing.

Housed in sheet metal, with cast-metal panels, these rack-mount modules are just as solid as ever. The architecture of the five models is quite similar; this review focuses mainly on the S2800 Studio and CD3000 (see sidebar "Akai CD3000").

The new instruments incorporate several logical improvements over their S-series predecessors, including more polyphony; more memory; 18-bit, 8× oversampling DACS and 16-bit, 64× oversampling ADCs; and more flexible modulation routing. The 32-voice, 16-bit recorders support sampling rates of 44.1 and 22.05 kHz. All five devices have virtually the same user interface as Akai's earlier samplers.

THEMATIC VARIATIONS

The main differences between the four regular samplers (the CD3000 is a special case) are the amount of RAM and the number and type of inputs and outputs. Standard memory in the basic S2800 is 2 MB, expandable to 16 MB. The S2800 Studio comes with 8 MB of RAM, also expandable to 16 MB. Both 2U rack-mount units offer two assignable analog outputs, in addition to the main L/R outs.

The S2800 Studio comes with a SCSI port; switchable, stereo AES/EBU or S/PDIF digital I/O; and fiber-optic digital I/O, all of which can be added to the basic S2800. The AES/EBU-S/PDIF interface is non-standard in that it uses one ¼-inch, TRS jack for both formats instead of an XLR for AES and RCAs for S/PDIF. Akai did this so that a single connector could handle both interface formats, but it violates both specs and requires properly wired adapters. It was a carefully considered decision, but it rates a big, fat Bronx cheer in my opinion.

Unless money is extremely tight, you're better off buying the S2800 Studio ($3,595) than adding the more expensive options to the base S2800 ($2,995). When you consider the cost of the 8 MB RAM upgrade ($374.95) and SCSI ($159.95), the digital I/O upgrade ($599.95) is practically thrown in for free in the Studio version. Memory expansion requires proprietary RAM cards, rather than industry-standard SIMMs, but the cost of the 8 MB expansion is about the same as SIMMs.

The 3U rack-mount S3000 ($4,995) and S3200 ($6,394) have SCSI; AES/EBU digital I/O; and eight independent, polyphonic, analog outputs, in addition to the main outs. Like the S2800 Studio, they both come with 8 MB of RAM, but they can be expanded to 32 MB. The S3200 includes a second multimode filter and third envelope generator, in addition to a SMPTE time-code reader/generator, which is optional on the S3000. To top it off, the S3200 offers stereo direct-to-disk recording and can play a sound file on disk simultaneously with samples loaded in RAM. Clearly, the S3200 is a big step beyond the others.

The CD3000's most outstanding feature is an integral CD-ROM drive. It also includes eight assignable outputs (plus the main outs) and a SCSI interface for attaching mass storage media. All five new devices feature effects, although all but the S3200 lack reverb.

The new models are compatible with sounds from the S1000 and S1100. Akai promises to eventually deliver backward compatibility for those instruments, so they'll be able to read disks created on the newer samplers. The only problem is that the latest generation can save larger directories than the old machines can read. This is only an issue if you want to load an entire, large volume.

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THE CD3000 CD-ROM LIBRARY

So you can enjoy it right out of the box (like breakfast cereal), Akai includes five excellent CD-ROMs from some of the biggest names in sample production, including East-West Communications, InVision Interactive, and Akai's own sample library.

The most useful and varied of the five discs is InVision's *Lightware Stratus Sound Sampler*, an incomplete collection that features excellent Fender and Steinberger basses, acoustic and electric guitars, strings ranging from fiddle to legato violins, concert and Elizabethan harps, trumpet and baritone horn, and three wind instruments. It also has a handful of ethnic instruments, a great Hammond B3 (*sans* Leslie), a variety of percussion (but no drum sets), and a smattering of synthesizers. The grand piano is outstanding, and most sounds are extremely well multisampled.

Almost as worthwhile is Akai's *CD3000 Sound Library*. It offers grand and DX7 pianos, whole orchestra and string sections, nine different woodwinds, a brass section, electronic organs, ten drum sets, hundreds of synthesizers, and several sound effects.

From the Hollywood Edge comes a well-produced library of sound effects, including a variety of crashes and explosions, vehicle noises, animal sounds, cartoon effects, and lots of footsteps.

Two discs of percussion samples from East-West complete the collection. One of these, *Drums + Percussion*, is mostly a compilation of tracks from Bob Clearmountain's acclaimed sample CDs. The remainder are a variety of percussion loops from other sources. The second East-West disc, *Dance/Industrial*, features lots of single hits with tons of effects, including sounds you might find in a well-equipped tool shed. I especially enjoyed some of the loops in this collection, but if techno isn't your cup of tea, this disc may collect dust.

INVESTIGATING THE S2800

The S2800 has no front-panel inputs, only a headphone jack. On the back are the two analog inputs and four outputs (the main L/R pair and two assignable outs). There are no XLR inputs, and the effects-loop jacks found on the S1000/1100 have disappeared. A footswitch jack lets you step through programs and initiate sampling.

The S2800 has only eight Screen Function buttons below its backlit LCD display. The eight Mode Select buttons are to the left, beneath the high-density, 3.5-inch floppy drive. This arrangement takes some getting used to if you're accustomed to the S1000's layout, but it does save space. One of the Mode Select buttons is a Help key, which displays minimal information about the currently selected field.

The most important additions to the front panel are cursor keys, which are a lot more convenient than the cursor knob of earlier Akai samplers. Functions previously accessed with the Drum and Option buttons are now found on the Utilities page.

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Akai's user interface has always been fairly easy to use, and not much has changed. In a way, it's disappointing that the S2800's user interface is so much like the S1000's. Although it's logical, especially to a seasoned Akai user, I hoped user-interface design had improved and become more intuitive in the last five years. For example, I'm not thrilled with the way you have to substitute one sample for another in memory, renumbering and renaming

AKAI CD3000 CD-ROM SAMPLE PLAYER

If you do a lot of sampling from CD, it's never been easier than with the CD3000. That sounds like a commercial, but it's the truth. In almost every respect (except inputs), the Akai CD3000 CD-ROM Sample Player is an S3000-series sampler. There's one huge difference: The CD3000 has a built-in CD-ROM player that reads all CD-ROMs for the S1000 and later Akai samplers and plays standard audio CDs. (It doesn't read computer CD-ROMs, however.)

Like the S3000, the CD3000 has SCSI and eight polyphonic analog outputs, in addition to the main outs. However, its 8 MB of RAM is expandable to 16 MB, as in the S2800. It also includes the same effects, sample-editing features, matrix modulation, and voice architecture as the S2800.

The unique CD3000 samples in the digital domain from its built-in CD-ROM player and saves to SCSI disk. It is a true member of the S2800/3000 series, sharing the same memory configuration, effects, editing features, matrix modulation, and voice architecture.

The CD3000 and sufficient financial resources give you access to vast sample libraries on CD-ROM (see sidebar "The CD3000 CD-ROM Sample Library"). Of course, if you prefer, you can sample sounds from audio discs entirely in the digital domain. For example, if you own one or more sample libraries on audio CD, you have an excellent reason to want a CD3000. You can also use this feature to sample the bridge of your favorite song (but beware of copyright infringements). Just slap in the CD, find the track—and indexes—arm the sampler, and hit Record. Voila! Then hold down middle C; the sound is indistinguishable from the original recording.

It's extremely convenient and natural to control the CD transport with the same user interface, in the same LCD, as the sampling recorder. In fact, now I'm probably going to hate sampling from CDs any other way. And unlike external CD-ROM players, edits can be saved to disk and loaded whenever programs are loaded from CD-ROM.

There's just one catch: The CD3000 has no audio input jacks. The only audio input is the internal CD player. The Akai CD3000 CD-ROM Sample Player isn't just a sample player; it's a full-blown sampler. All the audio-processing software is there. You can save to and load from a SCSI disk, just like any other sampler. But the CD3000 loads sounds from CD in the digital domain; it has no analog-to-digital converters (ADCs) and no record-level controls except the sampling threshold. No converters, no analog inputs; it's that simple.

Dear Akai: Offer optional AES/EBU and S/PDIF digital I/O jacks for this baby, and it could become one of the most popular professional studio samplers in the world. Users who want analog inputs can buy the ADCs they prefer.

Mind you, I'm not griping. Samplers that have built-in CD-ROM drives make even more sense than CD-ROM drives in desktop computers.

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as you go; it's a logical approach, but not elegant.

SAMPLE EDITING

The process of manipulating samples and modifying programs has changed somewhat since earlier models, but not much (see **Fig. 1**). I've always appreciated Akai's many graphic displays, which add considerably to their products' ease of use. There are waveform displays in the Record, Trim, Loop, and many other pages, as well as graphic representations of the envelopes.

The Loop page shows an overview of the entire waveform on the left and a close-up of the loop points on the right. There are six levels of zoom in the Loop Points display, and a Find command locates zero crossings. You can create up to four independent loops, but they must be sequential; nested loops (loops within loops) are impossible. You can specify the length of crossfades to blur the loop points, but crossfading can't be undone. There are no backward/forward loops, which are sometimes used to simulate bowed strings or achieve special effects. (Apparently this is due to hardware limitations and cannot be added in a software upgrade.) A handy Loop Tune parameter can fix short loops that sound out of tune.

Different samples can be infinitely layered or spliced; for example, the first half of one sound can be followed by the last half of another. Any number of sounds can be joined together to create your own wave sequences or wave lists. Again, crossfading can smooth out the whole process.

One new capability is sectional editing. This lets you select any portion within the waveform and cut it out. You can replace the removed sound with silence (Cut), or close the gap with the sample data that follows (Chop). Cutting is useful for removing unwanted pops or extraneous noises without affecting the rhythm. Chopping is good for editing speech.

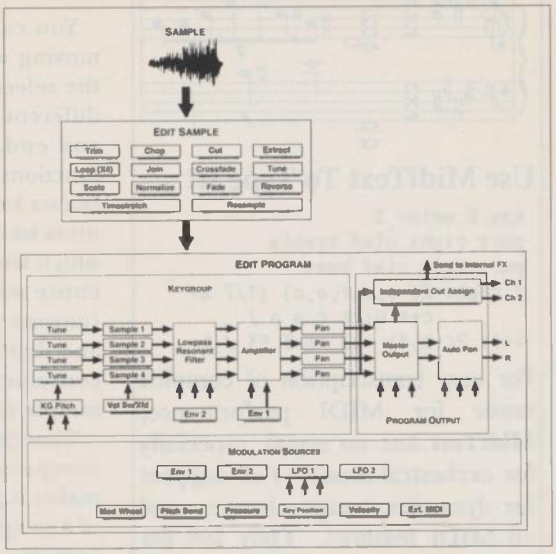

FIG. 1: The S2800's architecture is similar to that of its S-series predecessors, with four samples per Keygroup, routed through an improved lowpass filter. The new instrument has a good selection of modulators and the requisite sample-editing features, although the Time-Stretch algorithm is mediocre.

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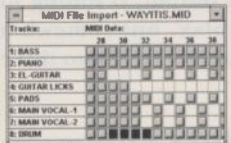

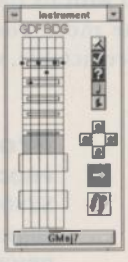

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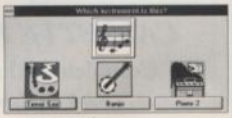

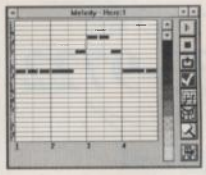

Creative activities round out what this great program has to offer. Kids love trying their skills at melody and drum rhythm creation and enjoy watching Mr. D. or Ms. Keys play their creations.

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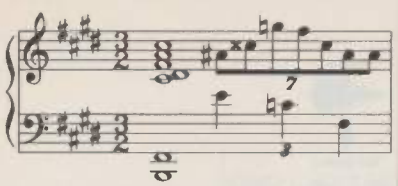

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You can also Extract the data, removing what comes before and after the selected portion, which seems no different than trimming the beginning and end. Other new sample-editing functions include normalization, which boosts low-level signals to their maximum undistorted output; level scaling, which lets you amplify or attenuate the entire waveform by as much as 50 dB (anyone for digital clipping effects?); and digital fading, which is especially convenient for smoothing out abrupt sample starts and endings.

Time-Stretch is Akai's version of time compression and expansion. This makes it possible to change the length of a sample without affecting its pitch. Samples can be lengthened as much as 2,000% or shortened to 25% of their original length. Generally, Time-Stretch works fine on single sounds that don't have abrupt attacks, but when I lengthened a kalimba arpeggio, the attack of each note was repeated, and odd clicks were introduced. An intelligent Stretch mode lets you specify the quality of the result, increasing the calculation time to achieve better quality, but that didn't improve my arpeggio.

VOICE ARCHITECTURE

The S2800 and its new siblings have resonant, 12 dB/octave, lowpass filters, as opposed to the S1000's 18 dB/octave filters. The result is a fuller sound with better low end. If you're reading S1000 disks, you may want to make slight adjustments to compensate for the different filter-cutoff slope. Each voice's filter has three editable parameters: cutoff frequency, resonance, and Key Follow (for tracking key position). The cutoff frequency can be modulated by any three modulation sources, but you cannot modulate the amount of resonance.

Akai is making a big noise about Assignable Program Modulation (APM). The modulation routings aren't hardwired like their older samplers. There are a total of ten modulation sources: two envelope generators, two LFOs, Mod Wheel, Pitch Bend, Velocity, Channel Pressure (Poly Pressure is not supported), key position, and external MIDI controllers. Only three MIDI controllers are supported: Volume (CC 7), Footpedal (CC 4), and Breath Controller (CC 2). The latter is ideal for users of MIDI wind controllers, such as the Akai EWI.

Modulation destinations include the filter, LFO 1, Program and Keygroup amplitude, pitch, and pan position. These modulation routings are welcome, but are not as complex and all-encompassing as Akai would have you believe. According to the manual, "You may get so used to the S2800's versatility as a synthesizer that some of your current synths may be in the classifieds sooner than you think!" I doubt it.

One envelope generator, a standard ADSR, controls amplitude. It has twenty preset envelope templates to speed up programming, ranging from a piano envelope to three flavors of synth bass. The envelope parameters can respond to how you play: The attack and release times can be affected by Velocity and key position, and Release Velocity can vary the release time. In addition to modulating the envelopes, Velocity can also affect the start time of each sample, letting you delay the beginning of each sound.

The filter is shaped with a second envelope generator. With four rates and four levels, the filter's envelope is a departure for Akai. Although Level 3 is always the sustain stage, it's still more flexible than the standard ADSR. Its Velocity and Key parameters are similar to the amplitude envelope generator, and it has 26 templates.

There are two LFOs per voice, each with sawtooth, triangle, and square waveforms. I was able to modulate one LFO with its own output, resulting in some more complex, but somewhat unpredictable, waveforms. Up to three

Product Summary

PRODUCTS:
S2800 Studio MIDI Stereo Digital Sampler
PRICE:
S2800: $2,995
S2800 Studio: $3,595
MANUFACTURER:
Akai Professional
PO Box 2344
Ft. Worth, TX 76113
tel. (817) 336-5114
fax (817) 870-1271

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ●
EASE OF USE	● ● ● ●
SOUND QUALITY	● ● ● ● ◖
VALUE	● ●

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modulation sources can be routed to control the first LFO's speed, depth, and delay. Also, the LFOs for all 32 voices can be synchronized.

EFFECTS

I'm sorry to report that the effects processing available on the S2800 is barely adequate, although it's better than no effects at all. The problem is that the S2800 doesn't actually have a separate effects processor. (There is a DSP chip in the S3200, which lets it perform direct-to-disk recording.) Because the main CPU has to create the effects, you're limited to one effect at a time.

There are 50 stereo effects presets, which incorporate Echo (multitap delay), Delay, Chorus, and Pitch Shift. Nearly half of the presets are Delay effects. There is no reverb. Using Delay limits polyphony to 30 voices, and only 27 voices are available when using chorusing or pitch shifting. The Pitch Shift effect lets you assign different pitches to the left and right outputs, so you can create 3-part chords. Each side can be delayed up to 180 milliseconds, which lets you create arpeggio effects. You can manually edit the parameter values and rename an edited effects file, but unfortunately, there's no way to change parameter values, or even switch effects, by MIDI control.

TUNING

The Tune page lets you establish different temperaments for each program. Only 12-tone-per-octave tunings are possible, which eliminates true quarter-tone scales, 19-tone/octave scales, and many non-Western and hybrid temperaments. Each note can be detuned by as much as ±50 cents. This is fine for retuning instruments such as congas, so they don't play chromatically, but it can't compete with the alternate tuning schemes on some other manufacturers' instruments.

Five preset tunings are included: equal-tempered, orchestral (each note is slightly detuned by a different amount to simulate the inaccuracies within an orchestra), Werckmeister, ⅓ comma mean tone, and ¼-comma mean tone.

CONCLUSIONS

Akai thinks of their S-series as the Mercedes of the sampling world. Because I know computers better than cars, I liken the S-series to Big Blue: solid, dependable, a bit overpriced, no surprises, and very little innovation. These new models are the logical, predictable, next step forward for Akai. Their architecture is clean and simple. The fairly complete manual (but with no index) is under 150 pages, which attests to its simplicity. The word that keeps cropping up is "logical."

There are down sides, of course. Compared to the effects processors in some of their competitors' samplers, the effects in these instruments fall flat. In addition, the S2800 is still a bit pricey for most musicians. With 32 voices, though, it's a much better deal than an S1000.

If the S2800 were truly state-of-the-art, it would easily be worth the cost. Such an instrument might have an improved user interface, more flexible effects with extensive real-time parameter control (a real effects processor would be a good start), support for more

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MIDI controllers, at least twice as many audio outputs, another envelope generator, a 48 kHz sampling rate, and SIMM-based RAM. Of course, you can get some of these things with the S3200, but not all, and you'll have to shell out big bucks.

If you're in love with Akai's samplers, I'm sure the S2800 will be the bargain you've been waiting for. It sounds very good, as Akai's samplers generally do, and the 12 dB/octave filters take its sound a step beyond its predecessors. The sampler's basic performance is solid, with no nasty bugs. I'd love to own one, but only at a deep discount.

Geary Yelton *lives deep in the heart of Atlanta, Georgia, where he's adored by few and despised by even fewer.*

Circle #440 on Reader Service Card

Innovative Quality Products SAW 2.2d (PC)

By Dennis Miller

Construct multitrack, random-access audio using Windows, a sound card, and a SAW.

Software Audio WorkShop (*SAW*), from Innovative Quality Software, is a breakthrough hard-disk recording and editing program for the PC. In conjunction with a supported *Windows* sound card, it provides four stereo virtual tracks of digital-audio playback and performs non-destructive, real-time soundfile mixing. (The virtual tracks are stereo pairs, i.e., you can't use them as eight independent tracks.) Packed with numerous innovative features, including SMPTE and MIDI triggering, *SAW* gives you multitrack capabilities currently found only on dedicated hardware systems costing thousands more. And best of all, its operations are extremely fast.

Don't throw your multitrack tape recorder away yet, however, because the program doesn't let you listen to existing tracks while you overdub. Instead, it's designed to work with separate pairs of tracks.

SAW combines the multitrack model of a sequencer with the waveform-

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editor approach found in programs such as Turtle Beach's *Wave for Windows* and Sonic Foundry's *Sound Forge*. Although it resembles OSC's *DECK II* for the Macintosh, or Spectral Synthesis' *Digital Studio* for the PC—without the latter's dedicated hardware—it really is in a class of its own.

The program allows you to work with hundreds of small segments of stereo audio, called "Regions," which you can combine in a stereo soundfile, or organize in a PlayList. Up to four PlayLists can be used in a multitrack mix, giving you four virtual stereo tracks. The supported sound cards offer two outputs, so the final mix is stereo.

FIG. 1: *SAW*'s opening screen. The Full View window provides an overview of the entire active soundfile, while the SoundFile View provides a standard waveform display. You assemble the Regions in the EditList View, while Time View indicates your cursor position's location in time.

REQUIRED TOOLS

For professional work, you'll be happiest with a fast 80486 PC, though the company claims a 40 MHz 80386 is up to the task. As with any hard-disk recorder, a large hard drive is a must, and a good graphics display is also important.

At present, *SAW* supports sound cards in three different price categories: the Turtle Beach MultiSound card, which I used in my testing; The CardD from Digital Audio Labs; Promedia Technologies' XA16; and Creative Labs' Sound Blaster 16 ASP. To use the MIDI or SMPTE options, a Music Quest MQX-32M or MQX-16S MIDI interface also is required. (The MXQs are the only interfaces supported.) The MIDI interface must be dedicated entirely to *SAW* and cannot double as your system's basic interface, i.e., it should not be installed under *Windows*.

The program lists for $599; when you add the cost of the sound card, you'll get four stereo tracks of 16-bit, 44.1 kHz audio (up to 48 kHz on some sound cards) for approximately $1,000, not including the PC and disk drive. A 2-track (one stereo pair), "junior" version of the program lists for $249, and a complete upgrade path is available.

SAW installs easily and provides generous amounts of information about optimizing your system for hard-disk recording. The program demands most of your computer's resources, however: You must either delete or comment out (place a semicolon before) all references to your sound card in the *Windows* SYSTEM.INI file so *SAW* can communicate with the card directly. The software imports stereo files only, but a utility to convert mono files to stereo is included. Sample-rate conversion, which is required when mixing files recorded at different rates, can be done directly in the program.

There are no tutorials in the manual—they should be added by the time you read this—but many of the program's operations will be familiar to anyone who has used a multitrack tape recorder or sequencer. A few of the features, such as the mixer, could use better documentation, however.

THE FOUNDATION

SAW's opening screen consists of several windows representing the program's main working modes (see Fig. 1). A Full View window that displays the entire active soundfile always appears at the top of the screen. Next is the SoundFile View, a standard, stereo waveform display with zoom in/out; here, you define the Regions that comprise your edit list. The EditList View shows the list of Regions you've defined and the sequence in which they'll be played, while Time View includes a running indicator of your cursor position. Because nearly all the windows can be moved or resized, it's easy to control the appearance of the screen. Things can easily get cluttered when you're deep into a session, though. An autotile feature would be handy.

When you select the Record function, a dialog box containing VU-type meters and setup options appears. You can choose one of three sample rates (11, 22, or 44.1 kHz with the Sound Blaster and MultiSound and 32, 44.1, and 48 kHz with the other supported cards) and toggle between line- and mic-level inputs. Other indicators show the total elapsed time of your recording and the free time remaining on the disk. Peak lights appear if your audio clips.

Unlike a sequencer or other hard-disk recording systems, you can't play back a track while you're recording (for overdubs), which is a major drag if you want to use the system as a replacement for a multitrack tape recorder. Apparently this is a restriction of the supported sound cards; *SAW*'s developers hope to have a workaround in the future. In the mean time, you can get around the limitation by synching a tape recorder to *SAW* (via the MXQ interface's SMPTE jack) and recording a copy of the tracks you first record into *SAW* onto the tape recorder. Then you mute the first two tracks on *SAW*, listen to the original tracks off the tape, record new tracks into *SAW*, and repeat the procedure again as necessary. When you're finished recording, you line up everything in the MultiTrack window for editing. It's a convoluted hack, to be sure, but it should work. I hope this limitation gets a proper fix soon.

ASSEMBLING MATERIALS

Once you've got audio on disk, you can use the stereo SoundFile View to create Regions from up to forty different files. To create a Region, load a file and highlight the desired area in the SoundFile display, using the Mark Begin and Mark End buttons. (Keyboard shortcuts are available for these and several other common functions.) Next, select Create New Region from the Regions menu, and name the Region. You can repeat this process as many times as needed; when you're done, you'll find all the various Regions listed in the EditList View.

Regions from any soundfile can be pasted, or mixed "manually," into a stereo file, or can be added to the playlist (called a "sequence") for a

World Radio History

multitrack production. You can add Regions to the sequence in any order, using each Region as many times as desired. By default, Regions from the first sequence appear on track 1 in the MultiTrack window, but it's simple to assign a sequence to a different track.

Before you move to the MultiTrack window, you may want to fine-tune some of your stereo audio files. There are some useful processing tools in *SAW*, but you won't find the full range of effects available in a dedicated waveform-editor such as Turtle Beach's *SampleVision* (for DOS) or *Wave for Windows*. The Process menu contains options to change the gain of a Region, or create a fade. You can easily build customized slopes for the fades, using Begin and End Volume sliders. A Preview option lets you hear the result before permanently altering any data. You can pitch-shift a marked area in 0.1-semitone increments up to the first semitone, and 1-semitone increments thereafter. (Echoes and flanges can be created by simply duplicating a file and offsetting its position in time, though there's nothing automatic about it). The program does not offer EQ or other advanced DSP functions.

One final option is to reverse a Region, though I've never understood exactly why anyone would want to (except to hear that Paul is dead).

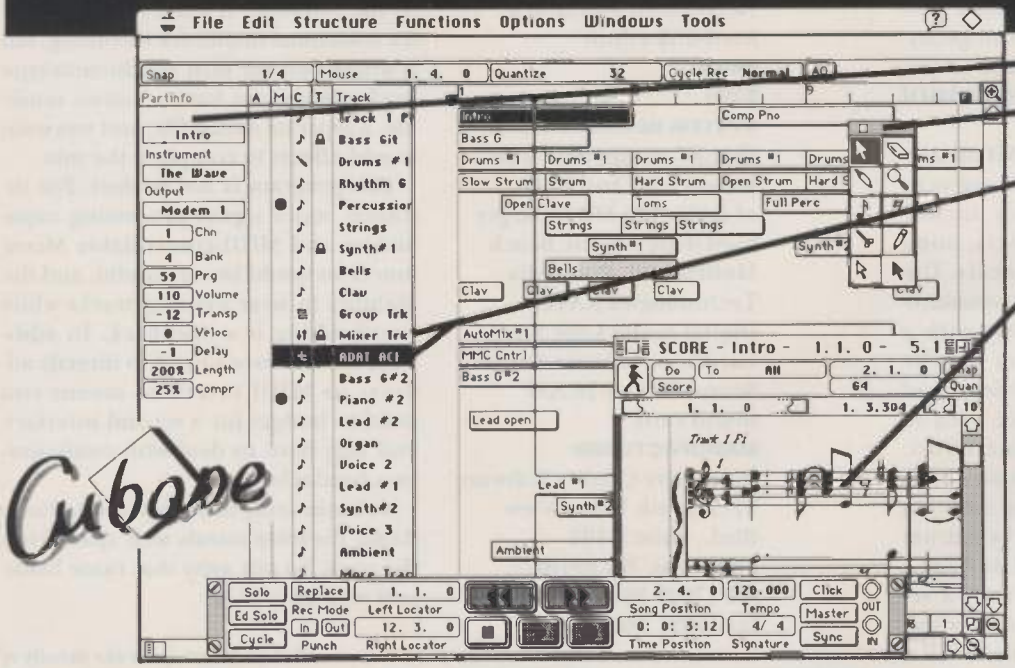
BUILDING A MIX

Like an enlarged sequencer piano-roll screen, each of the four tracks in the MultiTrack window displays Regions as small, horizontal bars (see Fig. 2). These bars can be moved to any starting point, but you can't overlap successive Regions in the same track, or move Regions across tracks. By adjusting the zoom levels, you can see a huge sequence displayed in its entirety, or view just a fraction of a second on the screen. The exact time position of your cursor can always be seen in the Time View window, though it would be useful to have a timeline displayed right in the MultiTrack window.

There are lots of nice touches that make the MultiTrack window easy to use, such as snapping a Region to a SMPTE time, or muting a track. My favorite is the Volume Adjust feature: *SAW* lets you build "stand-alone" fades that you can slide around and place anywhere in a track. Here's the real kicker: If you decide you want the whole fade to start earlier or later, simply "grab" it, and drag it to a new location. If the fade is too short or too long, just extend it in either direction to alter its duration.

You can move to successive volume changes using a Next button on the Mixer. Because the changes are nondestructive (unlike those in the Sound-File View), you can clear one or all of the changes with a single command. The whole process is extremely flexible and, most important, produces smooth volume changes. Unfortunately, the program doesn't let you create fades over multiple tracks, nor does it let you copy a fade from one track to another. This makes global fades a bit difficult to create. Hopefully, these capabilities will show up in a future release.

"Cubase is just so damn fast, it has become real difficult to work with any other sequencer..." CRAIG ANDERTON



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INSPECTING YOUR WORK

Clicking anywhere with the right mouse button starts playback from that point. *SAW* takes several seconds to compile the mix and then starts playing. Unlike some programs, it does not create a new, composite mix file on your disk by default, though you can do that by pasting all or selected tracks into a new soundfile. If you need to make adjustments, you can stop play and move some Regions around; then click again, and you'll hear the new mix almost instantly. Keep in mind that the entire multitrack production is nothing more than a series of pointers that direct *SAW* to portions of data on your hard drive. Because this series is saved as a separate file from the actual audio, you could easily store hundreds of different versions of your material.

There are additional play options for the other work areas. For example, in the Soundfile View, you can loop playback of a marked Region. In the Full View, Start and Stop function like a Pause button: You always resume playback from the point where you stop.

SAW can slave to a SMPTE trigger, but it will not continuously chase-lock. A nifty SMPTE "calibration" feature compensates for timing inaccuracies coming from a tape recorder by automatically repositioning all recorded digital audio events by a specific percentage. The program also can generate and stripe time code to tape (if you have the SMPTE-equipped MQX MIDI interface).

The program's flexible MIDI triggering of Regions or entire sequences is great for live performance, including supplying sound effects, song playlists, or even backup vocals. Unfortunately, because it must communicate directly and exclusively with a MIDI interface, *SAW* cannot use the MultiSound's MIDI capabilities; I had to install an MQX interface card to accommodate it. After some effort, though, I was able to design an elaborate triggering system using nothing more than MIDI notes sent by a drum machine. I suspect you could do quite a bit more by driving *SAW* with a sequencer, but again, you'll need a second MIDI interface (actually, a third one, if you count the sound card's unavailable built-in interface) that is set to a different interrupt. To send sequencer data to the program, you would have to connect the second interface's MIDI Out to the MQX's MIDI In. This is a kludge, but it's not *SAW*'s fault—it's the state of MIDI on the PC—and it works.

SAW AND FILES

SAW has excellent file-handling features and lets you assign different default directories for the various types of files it creates. It can read and save stereo, 16-bit Wave files, in addition to offering its native SND file format, which is a raw PCM-capture format used by such products as DAL's The CardD. The program is smart enough to inform you if you've deleted a soundfile that's referenced in an EditList and will simply skip the Regions it can't find, rather than choking on the whole project.

The program also supports full-session archiving (backup) and restoration to and from DAT, using either analog transfer, or digital I/O (if you have that option with The CardD). If you don't have digital output, a better backup solution would be a data DAT drive (see "Computer Musician: Covering Your Tracks" on p. 90). This allows you to keep your audio in the digital domain.

FIG. 2: In the MultiTrack View window, Regions appear as small, horizontal bars that can be moved to any starting point. You can't overlap Regions in the same track, or move them across tracks.

Product Summary

PRODUCT:
Software Audio WorkShop (*SAW*) 2.2d multitrack hard-disk editor

PRICE:
$599

SYSTEM REQUIREMENTS:
IBM PC-compatible with *Windows* 3.1 and 8 MB of RAM; 170 MB or larger hard drive; Turtle Beach MultiSound, Promedia Technologies XA16, Digital Audio Labs The CardD, or Creative Labs Sound Blaster 16 ASP sound card

MANUFACTURER:
Innovative Quality Software
3111 South Valley View Blvd., Suite F 102
Las Vegas, NV 89102
tel. (702) 368 2213
fax (702) 368 2470

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ●
EASE OF USE	● ● ● ●
DOCUMENTATION	● ● ◖
VALUE	● ● ●

A QUALITY TOOL

SAW is a new type of IBM software for the under-$1,000 price class. It provides highly flexible digital-audio editing and playback and breaks new ground on the PC by integrating waveform-editing and multitrack capabilities. At the moment, it's not ideally suited for traditional multitrack recording, but it works well for post production-type work, where you have a stereo music file, a separate dialog file, and you want to add effects to complete the mix.

The program is not perfect. For instance, more signal-processing capabilities and MIDI-controllable Mixer functions would be very useful, and the inability to hear existing tracks while overdubbing is a drawback. In addition, the software's need to directly address its MIDI interface means you need to budget for a second interface and may have to deal with configuration headaches.

Nonetheless, Innovative's *Software Audio Workshop* stands well apart from the pack. So put away that razor blade and pick up a *SAW!*

Dennis Miller *is on the faculty of Northeastern University in Boston where he teaches courses in music theory and music technology.*

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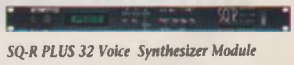

SQ-R PLUS 32 Voice Synthesizer Module

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Samson MPL 2242 Mixer

By Neal Brighton

A small board delivers strength in numbers.

Samson Technologies has long been associated with wireless systems. The company has other interests, of course; for example, it distributes Soundtracs consoles and Behringer and Zoom signal processors. But wireless is Samson's calling card. Imagine the surprise when Samson announced the MPL 2242, its first entry in the competitive field of compact mixers.

The MPL 2242 is a well-designed mixer that packs ten mono channels and six stereo channels (with discrete left and right inputs) into nine rackspaces. The jack panel on the rear can be conveniently rotated down for easy access when the mixer is rack-mounted. Each of the 22 inputs have ¼-inch line inputs (balanced on the ten mono channels, unbalanced on the others); rotary trim pots; 4-band EQ; and six aux sends. Ten channels also have XLR mic inputs, TRS channel inserts, and 48V phantom power (with global on/off switch). Four stereo aux returns are provided.

Samson's MPL 2242 offers ten mono channel inputs and six stereo channels in a 22 x 4 x 2 configuration. It provides 4-band EQ, PFL or in-pace solo, and impressive audio quality, but lacks mutes.

THE BASICS

The MPL 2242 can be mounted in a standard 19-inch rack, or placed on a tabletop. Like other boards in its class, it mounts all electronic components on one printed circuit board, which is securely attached to the metal frame. The mixer is ruggedly constructed of heavy-gauge sheet metal and is clearly roadworthy.

The mixer is ergonomically well-designed, too: All features are positioned exactly where a mixer-experienced musician would expect them. The knobs have a solid feel, and the pan pots and EQ knobs have center detents that make it easy to "zero" the settings. This feature is especially welcome on the MPL 2242's EQ section, because there is no on/off switch. If you want to compare your tonal tweaks to the unfiltered signal, you have to twist the knobs back

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to their flat position.

The only ergonomic glitch that plagued me was the front panel's gray color, which obscured the position of the MPL 2242's light gray Aux Send knobs and assignment switches. In the low light of a night club, the gray buttons almost completely disappeared, and I had to feel around to confirm whether the assignment switches were up or down.

AUDIO PATHWAYS

The first ten channels of the MPL 2242 offer microphone preamps with 50 dB of gain; the remaining channels offer line-level preamps that deliver 30 dB of gain. Both gain structures are more than adequate, as long as you're not running ridiculously long cables that can sap input-signal levels. Input-overload LEDs are provided on each input channel.

The mixer offers four bands of good-sounding EQ, fixed at 12 kHz (±15 dB), 2.5 kHz (±12 dB), 800 Hz (±12 dB), and 80 Hz (±15 dB). The silk-screened labels on the mixing surface display the peak frequencies of the two middle bands; the top and bottom shelving bands are simply labeled "High" and "Low."

The six aux sends for each channel are controlled by four knobs. Aux 1 is pre-fader, and sends 2 through 6 are post-fader. A button located under Aux 4 lets you select either sends 3 and 4, or 5 and 6. Below the aux sends are the channel pan pots and subgroup-assignment switches. Signals can be assigned to the subs by turning the pan pot left for subgroups 1 and 3, and right for groups 2 and 4. The solo button is just under the group assign switches; a button selects between PFL and in-place soloing.

The MPL 2242 has a 7-segment LED meter that monitors either pair of subgroups, but you can't monitor the stereo bus, which is odd. A separate LED flashes when the Solo or PFL button is depressed, and an indicator lights up when 48V phantom power is active.

COMPLAINTS

I was perplexed by a few design decisions. First, the stereo-bus output is controlled by a rotary pot, not a fader. I felt as if I had been teleported back to the early 1970s. It's not really that big a deal, but it was a shock at first.

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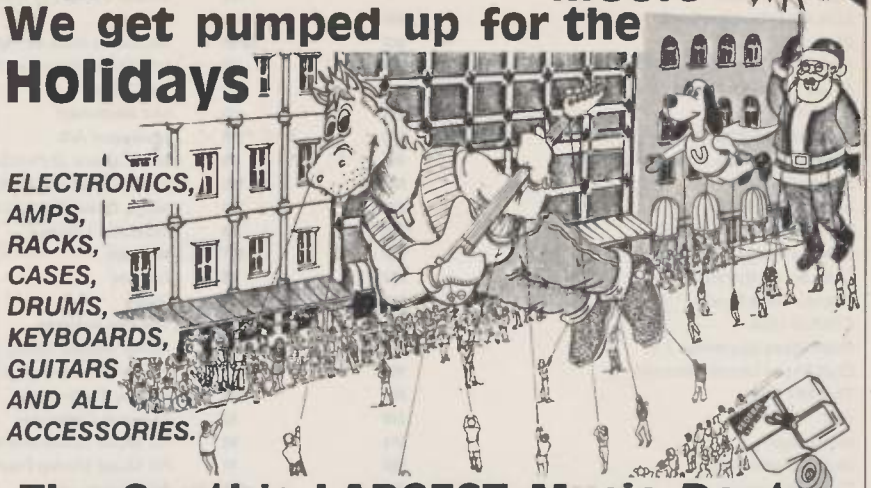

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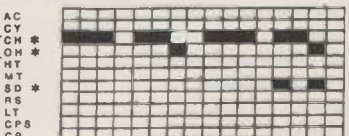

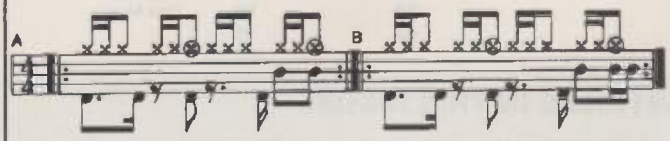

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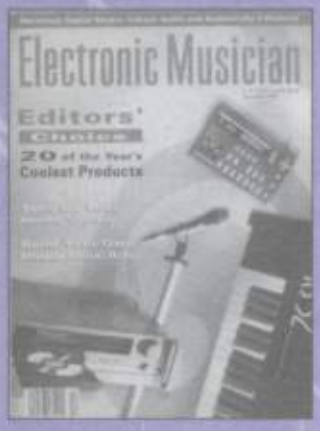

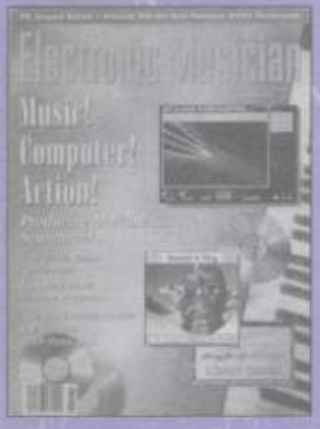

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A bigger problem, however, is the lack of channel mutes. It was annoying that I couldn't just reach over and mute an input channel when I wanted; I had to pull down the fader. Like the majority of engineers, I use mutes constantly while mixing, so the lack of mutes is a major drawback.

There is a workaround, though: Forget for the moment that this is a 4-bus board and use two subgroups as the master bus. After all, how many compact mixers have four groups to begin with? Now, you have master faders, and if you don't assign a channel to a subgroup, the channel is effectively muted. Well, it's almost muted; you still have to turn down the channel effects sends, especially effects send 1, which is prefader. Of course, this workaround negates some of the advantages of buying a 4-bus board, but it eliminates several limitations.

CONCLUSION

The MPL 2242 is an extremely clean mixer, with robust headroom and good-sounding EQ. The manufacturer claims a 15 Hz to 30 kHz frequency response and a S/N ratio of 128 dB. Although I didn't have an opportunity to test the specs, I recorded everything from grand pianos to acoustic guitars and was impressed by the board's sound quality. Not all compact mixers can handle instruments with complicated harmonic structures.

Although I didn't like the lack of a master fader and mutes, the other features are comparable to similarly priced boards. The MPL's 4-band EQ offers more control than the 3-band fixed EQ offered by many competitors, though some compact mixers offer sweepable mids. Overall, this is a competitive product with just a few noteworthy limitations. ●

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MANUFACTURER:
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EASE OF USE	● ● ● ●
AUDIO QUALITY	● ● ● ●
VALUE	● ● ● ◐

Digidesign SampleCell II (Mac)

By Joel Fox

The premier sample-playback card gets a facelift.

Digidesign is not a company that rests on its laurels. The company's SampleCell, a 16-bit, RAM-based sample player for the Macintosh, became popular because it provided high-quality audio output, extensive MIDI control, and integration with a variety of software that brought the Mac a step closer to being a true sonic workstation. A large sample library quickly became available for the instrument, hastened by its support of Digidesign's industry-standard *Sound Designer II* soundfile format. SampleCell II is the much-anticipated sequel.

The package contains the SampleCell II NuBus card; *SampleCell Editor* 2.0 control software; *Sound Designer II SC* sample-editing software; and two CD-ROMs of sampled sounds, with bank and instrument files. As with the earlier system, multiple cards can be installed in the Mac's slots, or in a NuBus expansion chassis.

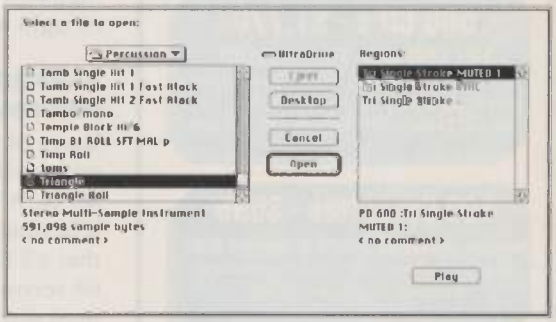
SampleCell's basic features and operation were covered in a previous review (April 1991 EM), so I'll focus on the major new features in SampleCell II.

HARDWARE IMPROVEMENTS

The SampleCell II NuBus card has been improved in several significant ways. It is 32-voice polyphonic and 32-part multitimbral, up from sixteen voices in SC I. One MIDI-controllable lowpass filter (per voice) can be used for "synth" effects or to alter the timbre under modulator (e.g., Velocity, Pressure, etc.) control.

SampleCell I had one 5-point Tracking Generator; there are two 9-point Trackers in SC II. The Trackers are modulation sources that alter other control signals according to the height on a graph of nine evenly spaced points, with user-defined levels. The Trackers themselves can be modulated by a control source, so you can get sophisticated setups where a control source modifies a control source that modifies a control source, which modulates a destination. Whew!

Serious sampling enthusiasts understand that you can't have too much sample RAM. A 32-part multitimbral sample player has limited appeal if you don't have enough RAM to load more than three or four sounds (especially if you want that 6 MB Mondo Piano). Fortunately, Digidesign understands: Whereas the original SC card could handle up to 8 MB of RAM, the new card can be configured with up to 32 MB of RAM, using 4 MB SIMMs (eight SIMM slots, filled in banks of two). Eight MB is the minimum RAM required. The card is provided without sample RAM, however, and each 4 MB, 80 ns, Macintosh-type SIMM costs between $125 and $150. A full load of RAM can dramatically increase the cost of the system.



Digidesign's SampleCell II boasts sonic quality and extensive modulation capabilities. Its flexibility and ease of use are shown in the Play dialog. Clicking on a Bank or Instrument name in the main directory (left) calls up the names of all its member Regions (right). Clicking on an item in the latter list displays the item's last known location. The Play button lets you audition the sound.

It's almost axiomatic that a high-quality sample player should have multiple outputs to allow external signal-processing and mixing. SampleCell I had

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FIG. 1: The Bank window shows MIDI channel, note range, output assignment, mix level, and panning and provides access to SampleCell Editor's other functions.

eight mono outputs: two ¼-inch, TRS stereo main outs and two pre-post master fader (switchable), ¼-inch, TRS stereo Auxiliary Send outputs. Instead, the SC II card has four ¼-inch, TRS stereo main output jacks. This arrangement is actually less flexible than SC I. As before, each output has individual digital-to-analog converters, for a total of eight mono outputs.

PERFORMANCE IMPROVEMENTS

Users of the original SampleCell will notice a faster sample-loading time with SC II. While Digidesign suggests that it is roughly six times faster, I found that a 5.8 MB Grand Piano took about 68 seconds to load into SC I from a hard disk and took 26 seconds to load into SC II (using a Mac IIfx).

Another improvement over the previous version is that sample memory is now maintained during a computer restart. The Grand Piano mentioned earlier was ready to use instantly after restarting and opening the Instrument file. Of course, if your computer never crashes, or you never have to restart for any reason, you will not need this feature. But if that is the case, you probably aren't using Macintosh.

SAMPLECELL EDITOR

The *SampleCell Editor* is the card's virtual "front panel," from which you program its many parameters. You don't edit raw samples in this program; that's done in *Sound Designer II SC.* In *SampleCell Editor*'s Bank window, the user can assemble a group of up to 50 mono, or 25 stereo, multisampled instruments (generally used for pitched musical instruments) and ten single-sample instruments (which is useful for sound effects, or even dialog and vocal parts, triggered via MIDI).

The *Editor* software has been given a facelift and has several new features that make the system more flexible and efficient. The Bank window has been consolidated: Buttons that were duplicated on all instruments (e.g., Sample Map, Envelope, Matrix Modulation, Miscellaneous) have been moved to the top of the Bank window (see Fig. 1), where they function for whatever instrument is selected. Also in this row of controls are buttons for creating new files, opening files, and bypassing the program's File menu. Other new buttons open the Modulators (LFO 1 and 2) window and the Tracking Generator window.

With SC I, you had to load an entire Bank of samples, not just specified instruments. Now, when you open a Bank, a new Load dialog box is presented (see Fig. 2) that gives you the option of opening only selected Instruments in the Bank. This is a great time-saving feature, as you no longer have to wait for unneeded samples to load. This dialog box also shows the location of the Instrument file, so you can mount the appropriate CD-ROM or disk before the software prompts you to locate it.

The most annoying aspect of the original software was that it played dumb when it couldn't find a file. It wouldn't even give you a clue where to

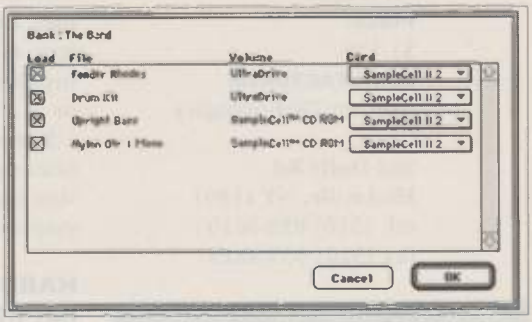

FIG. 2: The Load dialog box lets you load selected Instruments, or an entire Bank. If you have multiple SampleCell cards, this dialog box also lets you choose which card will load a given Instrument.

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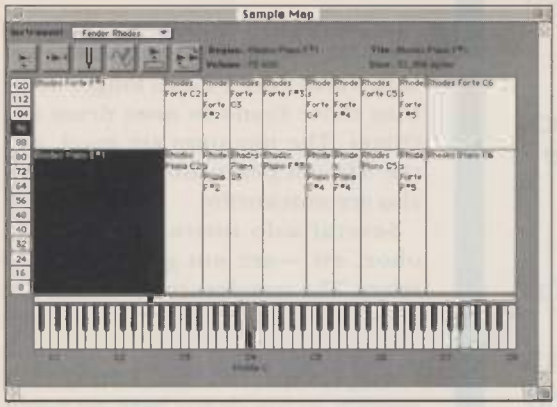

FIG. 3: Samples are assigned to Keygroups and Velocity Zones in the Sample Map window. The example shows twenty samples, assigned to ten Keygroups and two of the six possible Velocity Zones.

look. Now you have the ability to find instruments and samples that have been moved, or are on drives that are not mounted. When a file is not found, the Directory dialog box still asks you to locate it, but it shows you the path that was previously followed to find it (e.g., "SampleCell CD ROM:Upright Bass"). There are also buttons to "Look" for the file in a selected folder, or "Find" on the selected drive. The search is fast, and after you have confirmed that the correct file has been located, all additional files needed from that location are loaded automatically.

A second directory displays a list of all the instruments or samples associated with the Bank or Instrument. Simply click once on a bank or instrument name in the main directory, and the names of all its member Regions appear in the other list. Clicking on an item in this list displays its last known location. If the selected item is a sample, the Play button becomes active, so you can audition the sound before loading it.

In the original SampleCell, you could assign samples to trigger within a range of Velocity values labeled a "Velocity Zone." Up to three Velocity Zones could be created per Instrument, letting you Velocity-switch between three samples. A significant improvement in SC II is that there are now six Velocity Zones per Instrument, so different MIDI Velocities can trigger a far wider variety of timbres (see **Fig. 3**).

By the way, the new software works with the original SampleCell hardware. If you have SC I and don't want to purchase the improved hardware, you can just upgrade your software for $40. This is a bargain you should not pass up.

SOUND DESIGNER II SC AND MORE

SampleCell II is a playback-only card. New SC II sounds can be recorded using Digidesign's various Macintosh hard-disk recording systems, or created using the company's recently upgraded *Turbosynth SC* 2.2 synthesis software. The system also supports Jupiter Systems' *Infinity* sample-looping software (reviewed in the November 1993 issue). It can import and export samples in AIFF format and Digidesign's widely supported *Sound Designer* and *Sound Designer II* formats.

While you can't record samples with SampleCell II, you can edit and loop existing samples (recorded at up to 48 kHz) using the powerful *Sound Designer II SC* software included with the system. Essentially, *Sound Designer II SC* is functionally identical to the version of *Sound Designer II* for Pro Tools. Sample waveforms can be displayed onscreen and manipulated through copying, cutting, pasting, and even redrawing the wave with the Pencil tool. Many other powerful tools are available that have been discussed in past articles about *Sound Designer II* (e.g., see "Using Hard-Disk Recording in the Studio," in the October 1990 **EM**).

Many users will be satisfied (at least at first) with the thousands of samples provided on the two CD-ROMs included with the package. Disc 1 (which is slightly updated from the original SC disc) includes Bass, Brass, Guitars, Keyboards, Percussion, Sound FX, Strings, Synths, Voices, and Woodwinds. Disc 2 is a hodge-podge of instruments and seems primarily designed to provide the sounds for the SampleCell II demo. Each CD-ROM contains approximately 600 MB of samples.

The overall quality of the sampled sounds are quite good. As with any collection, there are excellent, mediocre, and virtually useless sounds. The Nylon Guitar sample is absolutely gorgeous.

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The percussion sounds are excellent, particularly the ride and crash cymbals, which have a much longer decay than those found in most drum machines. The tom-toms are good, and the African percussion instruments also are noteworthy.

Several solo instruments—flute, oboe, etc.—are not great by themselves. The samples are clean enough, but in some cases, the vibrato changes speed from note to note, or the multisamples are not matched closely enough, so you clearly hear the points where one sample's range ends and the next begins. These sounds, and many of the ensemble sounds (such as brass and string sections), work best when they are blended with other instruments to smooth out the inconsistencies. The electric basses are mediocre; you can do as well with many synths.

Still, most of the sounds are quite acceptable, and even if SampleCell is your only instrument, you will have a broad palette of usable colors. Many additional SampleCell libraries are available from a variety of third-party sources, which are listed in the accompanying literature.

CONCLUSIONS

As a long-time user of the original SampleCell, I found six weeks of working with SampleCell II to be nothing

Product Summary

PRODUCT:
SampleCell II
PRICE:
$1,995 (without RAM)
SYSTEM REQUIREMENTS:
NuBus-equipped Macintosh, running in 32-bit mode; System 7.0 or later; 8 MB of RAM; CD-ROM drive (to access sample collection)
MANUFACTURER:
Digidesign
1360 Willow Rd., Suite 101
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tel. (415) 688-0600
fax (415) 327-0777

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ● ●
EASE OF USE	● ● ● ● ●
AUDIO QUALITY	● ● ● ●
VALUE	● ● ● ● ◖

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but a pleasure, with one notable exception. Intermittently, while loading or deleting samples, I encountered ugly, digital noise from the audio output. While not damaging, these sudden outbursts can disrupt the creative process.

The manual is quite good, although primarily directed at the novice. Some of the more powerful (though esoteric) functions could use more theoretical and practical explanations, but most information is presented in a logical, easy-to-understand manner. This merits attention because of the infamously poor manuals still provided with many far more expensive instruments. In addition, Digidesign has devoted a whole page to methods of recycling the SampleCell packaging, a fine example of corporate conscience.

▼

Serious sampling enthusiasts understand that you just can't have too much sample RAM.

The product's sonic quality is excellent, and its matrix-modulation capabilities (up to twenty controller paths, each with a source and destination) add tremendous flexibility. Its eight analog, audio outputs let you add custom outboard processing, and you can use as many cards as you have NuBus slots. If you are using a Mac-based sequencer, communication with SampleCell II is fast and transparent.

Clearly, SC II is a class act. The package is listed at $1,995 and can probably be found for less. If you already have a NuBus-capable Mac and a CD-ROM drive and are looking for a sample player, SampleCell II is an obvious first choice, based not only on cost, but on performance and ease of use.

Joel Fox *is a 10-year veteran of music production who is currently on the staff at Libman Music in Chicago.*

Circle #443 on Reader Service Card

Speck Xtramix Synth/Sampler Mixer

By Steve Oppenheimer

Everything on its bus, and a clean bus for everything.

Among the legions of dedicated electronic musicians thrives a special type: the gear magnets. These beleaguered beings attract a melange of instruments that must fight for signal pathways to and from stacks of signal processors and a multitrack recorder.

If this isn't you, it could be someday; gear magnetism is an occupational hazard for the electronic musician. For the sake of argument, let's say you're infected. Now, are you sick of trying to integrate all this stuff in patch bays and a conventional 16- or 24-channel board? Tired of the noise all these extra cables and connectors add? Are you ready to spend a considerable chunk of change to solve it? Well, my friend, Speck may have the medicine for what ails you.

THE TREATMENT

The Xtramix Ultra Compact Synth/Sampler Mixer is a specialty product that can treat the symptoms of gear magnetism. (It's not a cure; you'll have to see a doctor for that.) Its main purpose is to accept and route all those signals to myriad places, while adding as little noise as possible.

To this intent, the 4-rackspace line mixer contributes twenty stereo input channels (with separate, unbalanced, ¼-inch L/R jacks), which can be directed in various combinations to eight subgroups and eight effects sends. There are eight stereo effects returns (with separate jacks); eight L/R pairs of line inputs, suitable for tape returns; and an assortment of special inputs and outputs I'll discuss later. If you used them all, you could configure a 76-input mixer/router. In fact, you could configure several separate mixer/routers.

Best of all, Xtramix delivers big-time audio quality. Speck provides extremely detailed specifications, and although I didn't have the opportunity to check the claimed specs, I have every reason

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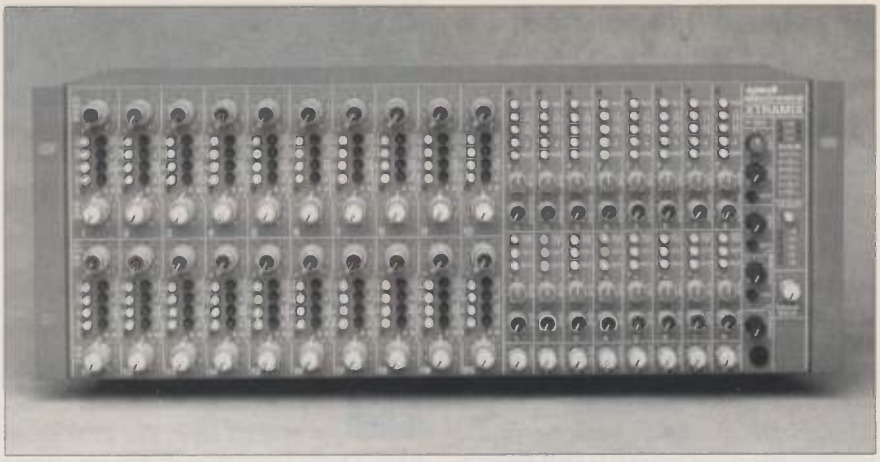
to believe them. The most amazing figure is the frequency response: 6 Hz to 154 kHz (-3 dB). If you find this a bit over the top, consider that it reflects a widespread pro philosophy that frequencies considered ultrasonic actually can add subtle coloration to some sounds. Signal-to-noise is rated at -95 dBu (A-weighted) and THD+n is .0037 (A-weighted; 22Hz to 22 kHz).

Although these figures are very good, keep in mind that Xtramix is a line mixer, so it doesn't have EQ or microphone preamps to add grunge. The emphasis is on clean mixing and routing, period.



Speck's Xtramix routes and mixes an impressive number of signals, while maintaining outstanding sonic performance.

LAYOUT

The front panel is subdivided into four sections: two rows of ten input channels each; the eight Monitor channels, which control the subgroups; the eight effects returns; and the master functions, such as headphones and Program (main L/R output) level. All connectors except the front-panel headphone output are rear-panel, ¼-inch jacks.

Two 10-segment LED meters (-20 to +3 dB) can monitor the Program bus, or the odd/even subgroup pairs, which are the outputs you would feed to recording devices. The meters can be internally calibrated for anything from 0 VU = -10 dBV to 0 VU = +4 dBu.

Power is provided by a hefty, in-line, external supply. The multipin, plastic connector between the power supply and mixer seem fragile, which could be a drag if you are a session player or freelance engineer and plan to move the mixer around.

CHANNEL BASICS

Xtramix channel-routing is a bit complicated, but once you understand it, the rest of the mixer starts making sense. The channel inputs have a rear-panel Low/High level switch to accommodate signals between +22 dBu and -20 dBu. You can route a given channel to four subgroups and the solo bus. Each channel also can access your choice of two effects sends, one odd-numbered and one even-numbered; a set of concentric pots controls the odd and even send levels. The channel solo is in-place, meaning it sends true stereo signals to the solo bus, maintaining the sound's placement in the sound spectrum.

A set of Concentric pots controls channel pan (the odd/even subgroup assignments) and volume. Unfortunately, it's difficult to tweak the former without moving the latter, and I lost my carefully balanced level settings whenever I changed these group assignments

CHANNELS AND SUBGROUPS

You can send each channel to between one and four subgroups, configured as two odd/even pairs. This is accomplished with just three buttons and a pan pot (see Fig. 1). Depressing the top Subgroup Assign button routes the channel to a pair of groups, either 1 and 2, or 5 and 6. The second Subgroup Assign switch, when depressed, sends to either 3 and 4, or 7 and 8. If neither Subgroup Assign is depressed, the channel is not assigned to a group, and it does not go through the signal chain unless you solo it.

▼

Jamming this many sources and routing schemes into four rackspaces must have been a real challenge.

The third button is the Assign Changeover switch. When it is in "up" position, the first Subgroup Assign button selects groups 1 and 2, while the other Subgroup Assign sends to groups 3 and 4. When the Changeover switch is "down," the channel can be routed to groups 5-6 and 7-8. The channel pan pot determines the mix between the odd and even groups. If the input signal is stereo, the channel pan pot sends the left input to the selected odd-numbered groups and the right input to the even-numbered groups.

Often, you don't need to record an instrument in stereo, or a given synth patch is mono. The sound is going to end up on one tape track anyway, so it makes sense to sum the L/R inputs to mono and route the summed signal to one subgroup. Each stereo input pair can be summed to mono using a rear-panel switch. The pan pot assigns the mono signal to the odd (hard left) or even (hard right) groups. A yellow, front-panel LED indicates mono status. (If you just plug into the left channel input, the channel is automatically in mono, *sans* LED indicator.) If you're really an over-the-top gear magnet, you can also use this feature to combine two sound sources into one channel.

Thus, you can send any channel input to between one and four groups. It's not possible to feed one channel to any four groups you choose, though; for instance, you can't send the same channel directly to 1-2 and 7-8, because the Changeover switch has to be up in one case and down in the other. Similarly, you can't send one channel to 3-4 and 5-6. Of course, with external patching, nearly any workaround is possible.

These are just fancy ways of letting you route and mix the channel inputs to the eight subgroups, which usually go to the inputs on an external mixer,

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a multitrack tape or hard-disk recorder, or both. It gets rid of one patch bay and a lot of hassle.

EFFECTS BUSES

The Xtramix offers eight mono effects sends, but only two sends are active per channel. Their levels are controlled with odd/even, concentric level knobs, and rear-panel trims help match levels for effects boxes that lack input controls. The sends are set to operate at +4 dBu.

The effects sends normally come after the Subgroup Assign matrix, which means if you haven't routed the channel inputs to a subgroup, you can't access the channel's effects sends. You can change the channel effects sends to

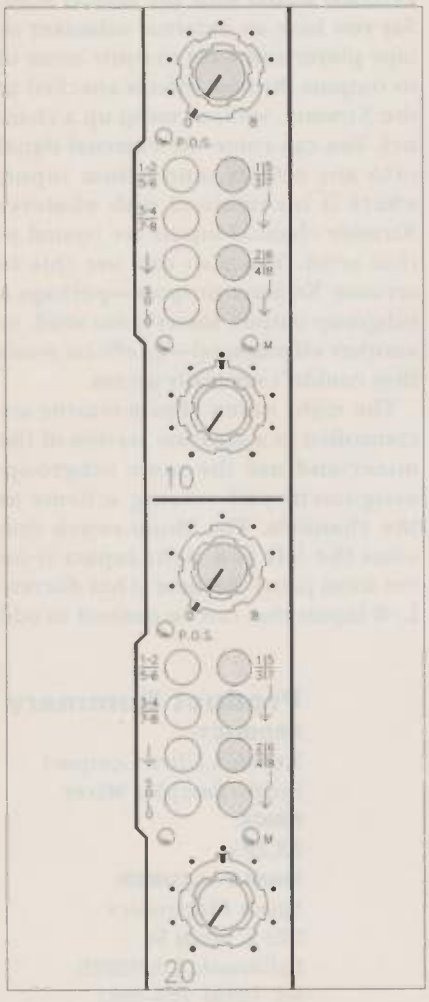

FIG. 1: The Xtramix's input channels route signals to two subgroup pairs, two effects sends, and the solo bus. A green LED in the upper-left corner indicates a signal is present (P.O.S.), while the two at the bottom indicate solo and Stereo/Mono (M) status. (Courtesy of Speck Electronics.)

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pre-Assign switch with an internal jumper, though, which makes the sends active regardless of the channel group assignment.

The two channel effects sends are selected by four small buttons: The Odd Effects Assign button selects between send 1 and send 3 if the Odd Effects Changeover switch is up, and it chooses either send 5 or send 7 when Odd Effects Changeover is depressed. Thus, two buttons select one of the four odd effects buses. Similar buttons (Even Effects Assign and Even Effects Changeover) select one of the four even effects buses. Two effects sends are always active, though; the only way to turn them off is to lower their level pots.

One nice bonus here is the Sum input jack (see Fig. 2), which mixes an external signal with the effects send. Say you have an external submixer or tape player and want to route some of its outputs through effects attached to the Xtramix, without using up a channel. You can route the external signal into any effects send's Sum input, where it is combined with whatever Xtramix channel inputs are routed to that send. You also can use this to reroute Xtramix outputs—perhaps a subgroup output, insert-point send, or another effects send—to effects sends they couldn't normally access.

The eight stereo effects returns are controlled in a separate section of the mixer and use the same subgroup-assignment and soloing scheme as the channels. The Mono switch that sums the left and right inputs is on the front panel. Because it has discrete L/R inputs that can be panned to odd

Product Summary

PRODUCT:
Xtramix Ultra Compact Synth/Sampler Mixer
PRICE:
$3,295
MANUFACTURER:
Speck Electronics
925 S. Main St.
Fallbrook, CA 92028
tel. (619) 723-4281
fax (619) 723-3294

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ● ●
EASE OF USE	● ● ◖
AUDIO QUALITY	● ● ● ● ●
VALUE	● ● ● ◖

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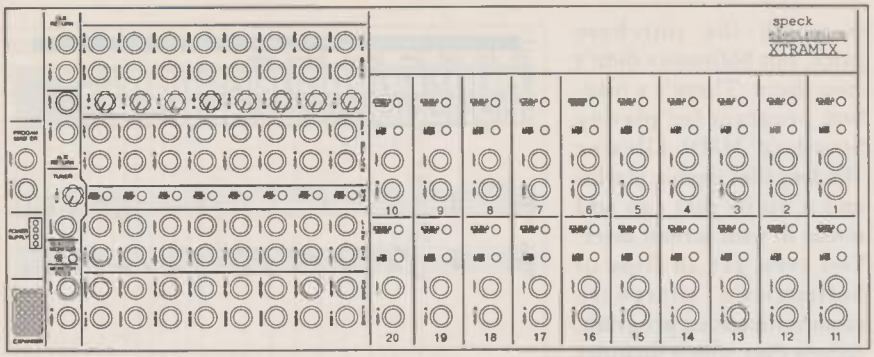

FIG. 2: The Xtramix's rear panel contains all connectors except the headphone out. The Cue Returns, Tuner Feed, and effects send Sum inputs (at left) are especially nice touches. (Courtesy of Speck Electronics.)

and even buses, you could make this section serve as sixteen mono returns.

SUBGROUPS AND MONITORS

The Xtramix provides eight subgroup (Buss) outputs, each with pre-"fader," TRS inserts for adding VCA automation, outboard EQ, compression, or other processing. Generally, these go to a multitrack recorder and/or external mixer. A set of eight pots just below the Monitor section controls the subgroup output levels.

Most of the serious mixing action takes place in the Monitor section, which lets you solo and mute the eight subgroups and control their panning and level in the Monitor, Headphone, and Program outs. The Monitor Pan simply assigns the mono subgroup or stereo Line Ins to the L/R monitor and Program outs, which makes it the most straightforward pan pot in the Xtramix.

A rear-panel Pre/Post switch for each Monitor bus puts the Monitor level control before or after the Buss (subgroup master output) level pot. If Pre, the monitor level comes before the subgroup master level, so you can independently set monitor level (to the sound system) and subgroup output level (usually to the recorder). If Post, the monitor feed level depends on the subgroup's level pot.

The Xtramix has eight additional stereo line inputs, with discrete, ¼-inch jacks. These inputs feed directly to monitors 1 through 8. Buss/Line switches let you listen to everything assigned to their subgroups, or to the same-numbered line inputs. Thus, Monitor 6 can carry either subgroup 6, or Line In 6, to the Monitor, Headphone, and Program outs.

The L/R Program outs, controlled by a level pot, normally feed a 2-track mixdown deck. The L/R Monitor outputs (for a sound system) are regulated by a pot in the Master section; a Kill switch mutes the Monitor outputs, but doesn't affect the Headphone or Program outs, so you can mute the monitor system. I used this for overdubbing vocals, when I wanted to track on headphones but playback on near-field monitors.

ADDITIONAL FUNCTIONS

In case you haven't figured it out yet, the Xtramix does indeed have a ton of extras. I like to keep a tuner online to ameliorate a variety of pitch-related mishaps, so I was delighted to find a tuner output, with trim pot, that eavesdrops on the Program and Solo buses.

When playing in sessions, I love to combine a custom mix of my setup and a monitor mix from the main console, called a *cue* mix. The cue mix usually includes rhythm tracks and, with luck, scratch vocals. The Xtramix's Cue Return accepts the outside mix, lets you control level and pan, and mixes it with the signals destined for the line mixer's Monitor and Headphone outs.

There is a pair of Aux inputs, with front-panel level and mute, but no pan. Like the Cue Return, the Auxes feed only the Headphone and Monitor outputs. I used this to rehearse along with a CD, an application for which I didn't need a pan pot.

One of the more interesting jacks is a 24-pin connector for an as yet-unreleased, 9U rack-mount expander that will include 24 stereo inputs, faders, and EQ. It will integrate with the Xtramix's various buses to make the system a full-blown, monster recording mixer.

THE SHOEHORN EFFECT

Jamming this many sources and routing schemes into four rackspaces must have been a real challenge for the designers, and learning the Xtramix proved a challenge, too. With a mixer/router this complex, you can make a lot of dumb mistakes, and it's easy to route signals to never-never land, or screw up the gain structure. It took me a long time to feel totally in control. The concentric pan pots' nasty habit of sticking to the channel volume pots was the only real "flaw," though.

The myriad mutes and solos, aside from their conventional applications, were great for troubleshooting, and in the end, I always was able to do what I wanted. But the unit's complexity is exacerbated by a front panel that is tightly packed with tiny buttons, the status of which is hard to discern at a glance. The manual explains most features, but it could be more clear; then again, I struggled trying to describe the features, too.

All these complaints are minor compared to the pluses. You just have to live with this mixer awhile to get the picture.

THE CLEAN MACHINE

The Xtramix proved an incredibly flexible submixer, especially for sequencing and recording electronic instruments. I used the Xtramix in my personal studio, but it would be killer in a mobile setup for session work, or as the nerve center for a rack-mount studio built around a modular digital multitrack recorder. I'm also certain that the Xtramix could be the darling of staff engineers in pro studios, once they've conquered its steep learning curve. (This isn't a board most pros would choose to face cold.)

However, I wouldn't recommend the Xtramix for complicated live applications. Its front panel is so tightly packed and hard to read that I'd worry about punching the wrong button or messing up a setting in the heat of action. Onstage, the mixer would do best in a set-and-forget situation.

Xtramix costs more than most small boards, especially if you add EQ, phantom power, and mic preamps. The issue of value is tough here, because what you're paying for is lots of routing, combined with high-quality sound. And if sound quality is your major consideration, the Xtramix is worth every

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penny. It was literally the quietest device ever to grace my studio. Speck gives you what you pay for.

EM *products editor* **Steve 0** *deserves the Nobel Peace Prize for helping recalcitrant reviewers, angry advertisers, demanding readers, and nervous publishers achieve peaceful coexistence.*

Circle #444 On Reader Service Card

Softronics WinSong 3.02 (PC)

By Robert Kendall

This basic MIDI sequencer/notation package goes for a song.

In these days of comprehensive music software costing hundreds of dollars, you don't expect blockbuster power from a sequencing and notation package with a price tag of $79.95. MIDI programs in this price range generally fall into the category of hobbyists' playthings. Yet Softronics's *WinSong* is a surprisingly capable *Windows* program. It has some significant limitations, but it proves that useful software doesn't have to cost an arm and a leg.

WinSong includes two core modules: one for notation and the other for sequencing. The notation program alone is worth the purchase price, but Softronics didn't stop there. There's a jukebox program for playing Standard MIDI Files or *WinSong* files from a playlist and a utility that can add music to your screen saver. You even get an copy of Softronics's shareware communications program, *Softerm Plus*, which includes an autodialing directory of BBSs that cater to musicians.

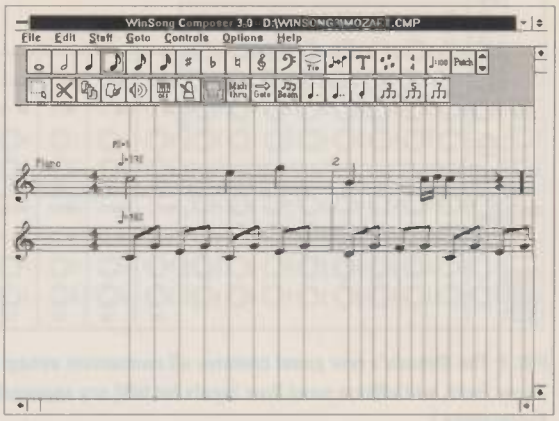

FIG. 2: *Composer* requires you to place each note on the correct line of a metrical grid. The number of grid lines in each bar is determined by the smallest note value.

The version I reviewed (3.02) didn't include a printed manual. This was not a problem, though, because the package offers excellent, context-sensitive, online help, and the user interface is clear and consistent. A particularly nice component of the help system displays an image of the main screen and pops up explanations of various items when you click on them. The latest version (3.02.06) includes a complete manual file that you can search through onscreen or print; other improvements are primarily bug fixes.

The notation and sequencing functions of *WinSong* aren't as closely integrated as they are in more expensive hybrid programs. The notation module (*Composer*) and the sequencer (*TapeDeck*) are completely independent programs, although you can run them simultaneously. If you want to move your work from one to the other, you must save it within one module and import it into the other. You can also cut-and-paste between the two modules, but only one track at a time. If you want to work with several songs at once, you can run multiple copies of *Composer* or *TapeDeck*.

FIG. 1: If you don't like the arrangement of icons in *Composer*'s toolbar (shown at the top of the screen), you can change their arrangement by dragging them around in the Palette Editor. The arrow buttons at the top right scroll the toolbar through its five different layers.

THE NOTATION END

To create a new score within *Composer*, you select note durations or expression marks from a toolbar and place them on the staff. You can scroll the toolbar through five different levels, making it easy to look for different notation options without cluttering the screen with floating palettes. If you don't like the way the icons are laid out, you can even rearrange them by dragging them around in the Palette Editor (see Fig. 1).

Unlike other notation programs that automatically position successive melodic notes as you place them in a bar, *Composer* requires you to put them on vertical grid lines that represent rhythmic positions. You can toggle the grid on and off; the number of grid-lines depends on the smallest note value in the bar (see Fig. 2).

Placing notes correctly can be a chore, because the program doesn't make a visual distinction between grid lines that represent the beat and those that represent subdivisions. It's easy to put notes on the wrong portion of the beat, as the program does nothing to prevent placements that make no sense notationally. You can end up with music that looks correct but sounds wrong when you play it back. For example, you might place two half notes on beats 1 and 2, instead of beats 1 and 3.

The step-record feature is easier to work with. It lets you use your MIDI keyboard not only for entering pitches, but for selecting durations with the aid of a cardboard keyboard template. The sustain pedal or pitch wheel toggles the keyboard between Pitch and Duration mode. Alternatively, you can select durations from the PC keyboard, or with the mouse.

You can move notes with the mouse and delete them by dragging them off the staff. You can cut-and-paste blocks of notes on one staff at a time. There are no global editing functions for transposing or changing durations.

One notable weakness is *Composer*'s inability to create slurs. Its support for

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advanced notational elements is also spotty, as you might expect in this price range. It accommodates quintuplets, septuplets, and unusual time signatures, but not durations shorter than thirty-second notes. There's a double-dotting tool, but this inserts tied, rather than double-dotted, notes. It can handle tremolo, harmonics, percussion noteheads, bowing marks, and accent marks, but only a few types of ornaments and grace notes. You can also add text anywhere in your score, but there is no way to automatically align lyrics with notes.

Composer provides an unusually straightforward method for handling several contrapuntal voices on a single staff. You simply notate each voice on a separate staff and drag the staves so they're on top of each other (see Fig. 3).

The program makes you work harder than most to get nice-looking output. For example, it doesn't beam notes automatically as you enter them. You must select the beaming function to beam a group of selected notes or all the notes on a staff (which breaks beams either at the beat or the barline). To avoid notes overlapping with accidentals, you must manually change the spacing by dragging grid lines to the left or right.

The program offers few tools for fine-tuning the look of the notes. For example, you can't adjust stem lengths

Product Summary

PRODUCT:
WinSong 3.02
PRICE:
$79.95
SYSTEM REQUIREMENT
80286 or better PC, 1 MB RAM, DOS 3.1 or higher, *Windows* 3.1, hard disk, mouse, graphics display
MANUFACTURER:
Softronics
5085 List Dr.
Colorado Springs, CO 80919
tel. (800) 225-8590
or (719) 593-9540
fax (719) 548-1878

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ◖
EASE OF USE	● ● ●
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or beam angles, although you can manually flip the direction of note stems.

Composer's laser-printer output is readable, but not elegant. The TrueType font it provides for musical elements such as notes and clefs doesn't measure up to the engraver-quality, PostScript fonts offered by high-end packages. The program gives you options for spacing staves vertically on the page, adjusting the number of measures per staff, and scaling the overall size of the notes by a percentage. It automatically places title, subtitle, composer name, and copyright notice when you type them into a dialog box. You can set margins, but you have no control over text fonts.

Unfortunately, there's no preview of how the printed page will look, so you may have to waste time and paper printing your score to see the results of each layout adjustment. If you want to extract parts from a full score, you can print only selected staves.

Composer has a respectable repertoire of MIDI capabilities for playing back your scores. It treats each staff as a track, allowing a total of 64 staves/tracks. You can assign a MIDI channel and volume level (using a Velocity offset, not MIDI Volume) to each track, as well as mute it or set a playback transposition that doesn't affect the notation. MIDI Volume support is planned for a future version.

One of *Composer*'s most sophisticated features is its live expression-mark capability. Any dynamic marks you enter—including crescendos and diminuendos—affect the playback by adjusting the Velocity of the notes appropriately. However, this feature tends to behave a little erratically when you alter dynamic markings; for example, if you enter a *piano* followed by a *crescendo*, then change the *piano* to a *mezzo piano*, the *crescendo* doesn't work correctly until you replace it. Pedal markings send Sustain Pedal messages, staccato dots shorten a note's duration, and octave markings transpose the pitch. You can also add Program Changes anywhere you like, although *Composer* is one of the few *Windows* MIDI programs that doesn't let you select patches by instrument name, as well as number.

The biggest weakness in *Composer*'s MIDI capability is its crude handling of imported files. When you import

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Standard MIDI Files or *TapeDeck* files, *Composer* quantizes everything to the nearest sixteenth note, and it can't preserve triplets. Any duration longer than a whole note is truncated to a whole note. This can make a real hash out of complex music. More sophisticated, MIDI-aware notation programs let you quantize the appearance of the notes on the page while preserving the music's original sound. Another limitation is *Composer*'s inability to automatically truncate the ends of melody notes that overlap slightly so they can be notated as a single voice.

THE SEQUENCING SIDE

The other primary component of *WinSong* is *TapeDeck*, a basic 64-track sequencer. It offers the standard tape-deck-style transport controls for recording and playback, as well as a track-sheet screen for setting track parameters, including MIDI channel, transposition, and level (again, a Velocity offset). The rhythmic resolution is 120 pulses per quarter note.

The only editing facility is an event-list editor, which seems primitive compared to the piano-roll and graphic-controller editors offered by most sequencers. Limiting flexibility even further, the event list can't restrict its display to selected event types (such as notes only) or scroll during playback. *TapeDeck* also lacks the usual window that gives you a graphical birds-eye view of all tracks at once, so there's no way to cut, paste, or edit more than one track at a time.

You can apply a number of simple, global editing options to blocks you select in the event list. You can quantize note starts or durations to values down to thirty-second note triplets, specifying the number of ticks a note must be from the chosen division of the beat before it is quantized. Note lengths can be adjusted by a percentage or number of ticks (see **Fig. 4**), but you can't set them all to a specified duration. You can scale key Velocity up or down by a fixed amount, but you can't create crescendos or diminuendos. You can also transpose, but only chromatically.

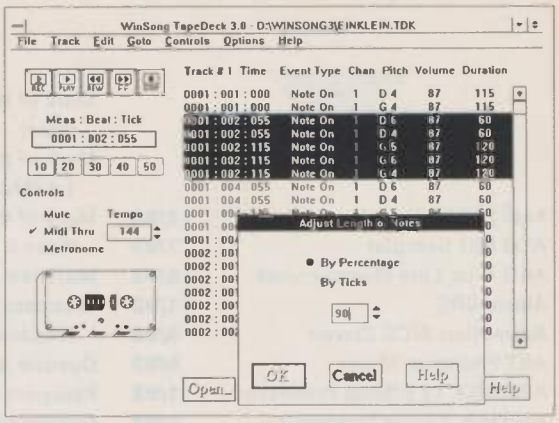

FIG. 4: The only editing tool *TapeDeck* offers is an event list. You can perform global edits, such as changing note lengths, on any block of selected data.

A simple event filter helps with cutting, copying, and all global editing operations. This lets you apply edits only to selected pitch and Velocity ranges, MIDI channels, and data types (Note On, Aftertouch, Control Change, Program Change, or Pitch Bend messages). *TapeDeck* also provides an editable tempo map, but this takes the form of a text list, rather than a graph, so it is awkward to work with.

You can record in real time or step time, but it's not always easy to re-record portions of a piece. There's no support for punching in and out, and you can't set a metronome countoff. If you record over an existing track, you can only mix the new data with what's already on the track rather than replacing it. If you don't start recording right at the beginning of a beat, the metronome will be thrown out of sync.

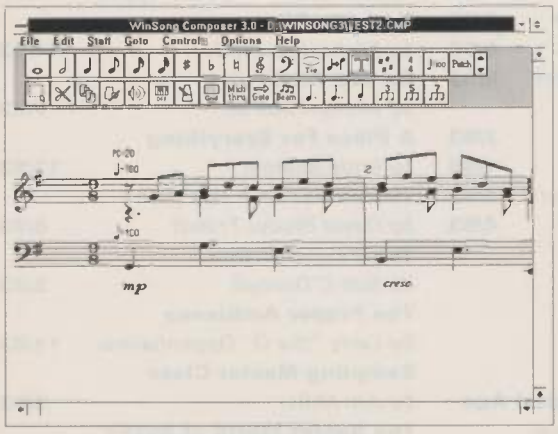

FIG. 3: The counterpoint in the treble staff was notated by putting each voice on a separate staff and then superimposing the two staves.

THE OVERALL PICTURE

The interfaces of *Composer* and *TapeDeck* are similar and share the same menu commands whenever possible. Both modules let you establish and jump to five position markers, although you can't name them. Both modules let you access the *Windows* MIDI Mapper from their Options menus. They both offer a Sync function for locking playback to MIDI Clock messages from an external source, but there's no support for SMPTE or MTC. Both can import and export Standard MIDI Files. Conspicuously absent from the Edit menus of both *Composer* and *Tape Deck* is an Undo option.

Its relative simplicity makes *WinSong* easier to learn than many of its more elaborate competitors; however, it can sometimes require more effort to use. *Composer*'s duration grid can make it cumbersome to place notes with the mouse, and the program's lack of automatic formatting and print-preview features can cause headaches.

Anyone trying to do serious work with *TapeDeck* will soon find there's nothing more aggravating than editing a sequence without graphic aids, such as a piano-roll note editor. Bringing a *TapeDeck* file into *Composer* doesn't serve as a satisfactory alternative to using the event-list editor, either; it takes too many steps to move material back and forth between the two programs, and *Composer*'s forced quantization eliminates the nuances of your playing and may distort some rhythms.

Although I've pointed out many of the limitations in this package, I remain impressed with what it can do, especially for its paltry price. Softronic's *WinSong* stands out as an entry-level notation program with limited sequencing abilities.

Robert Kendall *is a composer, writer, and multimedia artist. He has published many articles on MIDI and computers, and his multimedia displays have been widely exhibited.*

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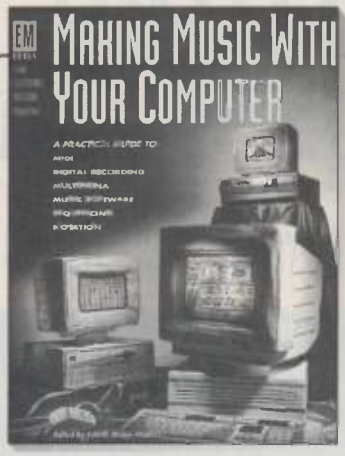

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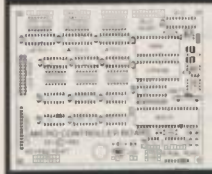

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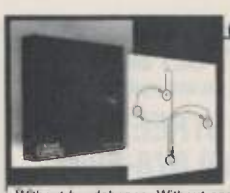

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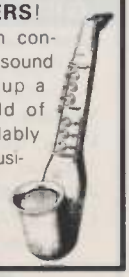

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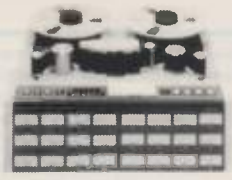

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World Radio History

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Send coupon & payment to: **Electronic Musician Classifieds:** Attn: Robin Boyce, 6400 Hollis St., #12, Emeryville, CA 94608, tel. **(800) 544-5530** or (510) 653-3307, fax (510) 653-5142.

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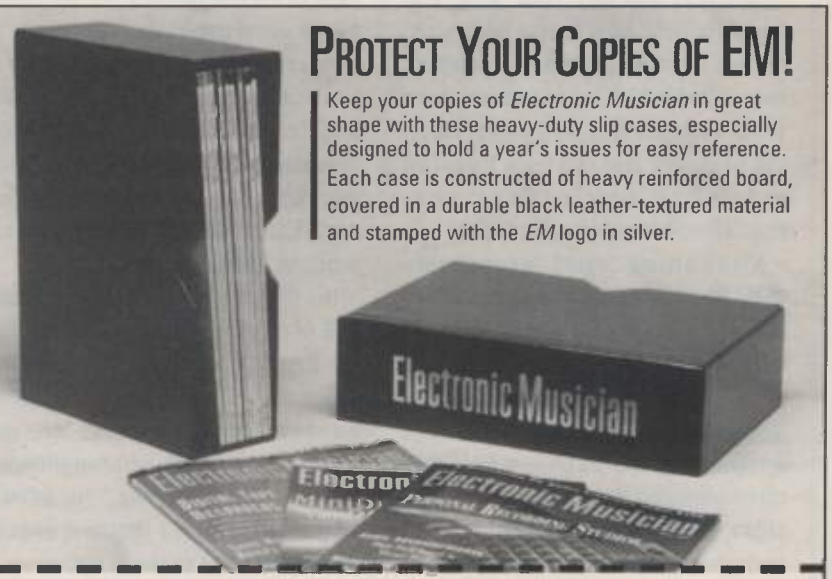

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SATISFACTION GUARANTEED

World Radio History

PRO FILE

Declaring Independence

BossTon does it his way.

By Mary Cosola

Call it a free-form fusion of jazz, hip-hop, and ancient Egyptian prayer cadences. Call it "unlistenable," as one reviewer did. It's actually a combination of free jazz, funk, soul, and the aforementioned prayer cadences, thrown together and spun against its axis. What is it? It's *I was razed round Black Folk, too (but they didnot no it),* the premiere release from BossTon and his label, BossTon Communications (Stone Mountain, Georgia).

Many artists resort to producing their own music due to a lack of interest from record labels. But not only was *I was razed* independently produced, BossTon never sought, nor desired, major-label support. That's a refreshing approach in a field that often puts commerce before art. Besides, you have to love an artist who includes absolutely brutal pans in his press kit, as well as glowing reviews. "One thing I'm proud of," notes BossTon, "is that I have encountered no indifference to my work."

Recording was scheduled between running his own company and teaching computer graphics and advertising. "Owning my own graphic-design firm has made me astute in running a business," explains BossTon. "I have total control in the marketing of my music." He wrote the songs, played most of the instruments, and performed all the vocal tracks for the album.

He credits the pace of technology for finally allowing him to do a project like this. Ten years ago, he couldn't come close to putting together his own studio. With more pro and semi-pro gear now in affordable price ranges, he can produce his own albums.

His first piece of gear was a Fostex 250 4-track cassette recorder. He graduated to a Fostex R8 8-track machine and 450 mixing board, on which he recorded all the tracks for *I was razed.* "I am *totally* self-taught when it comes to recording," he admits. "By reading EM, I learned enough about different techniques, such as mic placement and track bouncing, that I was able to produce a big sound from minimal equipment."

Producing his own album was a lesson in itself. BossTon explains, "The changes I'll implement for the next album are more logistical than stylistic. The hardest part was the mixdown, which took me about a month and a half. I learned the hard way that there's a big difference between digital and analog distortion."

Just as he has no desire to release his music on any label but his own, he has no need for huge recording studios. But he doesn't entirely eschew high-tech tools. BossTon says of his wish list, "I would ultimately like to do everything from recording to digital editing, mastering, and replication under one roof. I have three Mac Quadras in my design studio. I want to run Sound Tools on each of them, with 4 GB hard drives."

For now, BossTon doesn't have much time to dream; he and his band, MuthaWit, are touring to support the album, to enthusiastic response. In addition to write ups in national music magazines and radio airplay, he has received fan letters from Latvia and Slovenia.

BossTon emphasizes that he wants to build grass-roots support for the arts. "The tour was organized mostly through universities. When we get to a new community, we set up workshops in multitrack recording, graphic design, marketing, modern dance, and other fields."

Music and art for and by the people. Isn't that what it's all about, anyway?

Mary Cosola *is assistant editor of* **Electronic Musician.**

BossTon

World Radio History

TSR-24: THE POWER OF S-DISC™ CONTINUED...

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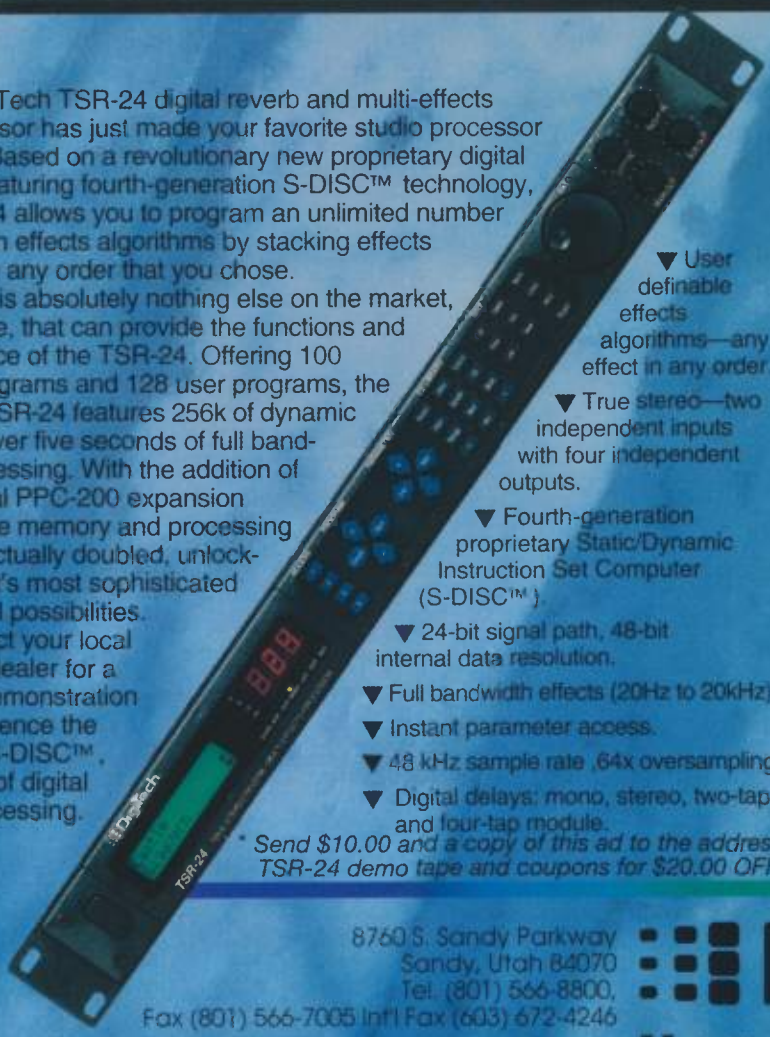

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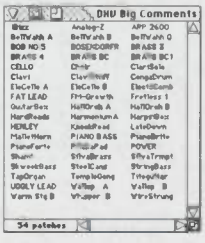

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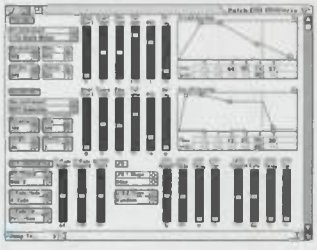

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