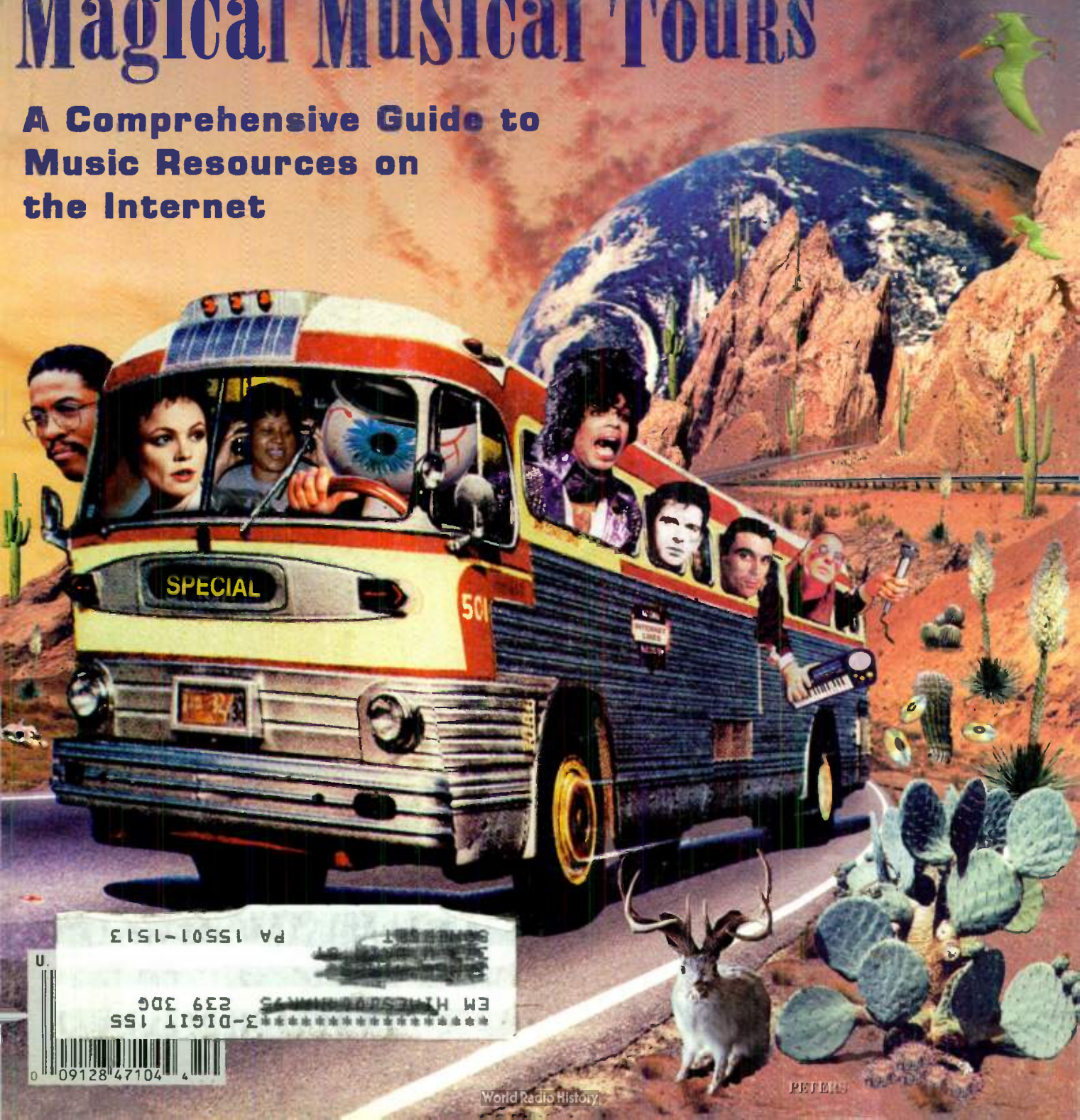
Prep Your PC for Digital Audio • Release Your Own Single

Electronic Musician

October 1994

Magical Musical Tours

A Comprehensive Guide to Music Resources on the Internet



World Radio History

OUR 8•BUS REALLY

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

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

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

The names in this ad represent a cross section of current 8•Bus users. They range from platinum supergroups tracking new albums to high school choirs, from bar bands to sound designers working on network TV series and feature films. There'd probably be more names but we didn't want to make the type any smaller than it already is — or keep tying up our already clogged phone system.

As our production of 8•Bus boards increases, so does this list.

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

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

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

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

Sound design & mixing of commercials for G.I. Joe, Kenner Toys, Hasbro Toys, Transformers ½-hour show, infomercials.
Lawrence Wakin • Tapestry Productions Inc. • New York, NY

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

Recorded Grammy-Nominated "Sunday Morning" off of the album Millenium on 24•8, currently working on new album exclusively on console. "The 24•8 survived the 7.1 San Fernando Valley earthquake. It's definitely built for rock 'n' roll."
Sheldon Reynolds • Earth Wind & Fire • Los Angeles, CA

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

Recording and mixing of acoustic music & sounds from the American West. Recent albums include "Charlie Russell's Old Montana Yarns" by Raphael Cristy and "Where the Red-Winged Blackbirds Sing" by Jim Schulz.
Bruce Anfinson • Last Chance Recordings • Helena, MT

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

[1] *Former posts include quality assurance with Warner Brothers, Sheffield Labs, Rainbow Records, Chief Mastering Engineer at JVC. Quote: "It's a great board, dude. Buy it!"*

Concert sound reinforcement at the Showcase Theater.
Bob O'Neill, Manager of Entertainment • Six Flags Great Adventure Theme Park • Jackson NJ

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

Jazz choir sound reinforcement and recording.
Dwayne Pedigo • Plano East Senior High School • Plano, TX

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

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

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

Wide range of multimedia projects including major motion pictures (the names of which can't be divulged).
John Acoca[1] • Oracular Multimedia San Francisco, CA

Albums for alternative groups Twenty-Two Brides and The Cucumbers, demo for Freedomland.
John Williams • Ground Zero Studios • New York, NY

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

Sound design for Pepsi Cola TV spot aired during last January mondo-bowl.
Hans ten Broeke[2] • Buzz, Inc. New York, NY

Sound reinforcement for theater presentations and concerts in a 300-seat theater.
Centre Culturel Franco - Manitobain • Winnipeg, MB, Canada

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

World Radio History

CONSOLES WORK.

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

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

MB•E Meter Bridge $695[4]

The Side-car $395[4]

Skittles TV commercial, demo for new artist Nita Whitaker, original music for Terpsicorps modern dance company.
Lincoln Adler
Are We Famous Yet? Productions
Los Angeles, CA

DNA sampling CD with mega-drummer Bernard Purdie (3000 + album credits)!
Frank Heller[3] • Weasel Boy Recording • Brooklyn, NY

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

Scoring for two Fox Televison NFL promos, theme & scoring for PBS children's series Storytime, song demos & album tracking, TV commercials, infomercials & demos.
John E. Nordstrom II
Love Den Productions
Pacific Palisades, CA

Album/CD tracking and mixing for the groups Mean Solar Day and Product.
Ramsey Gouda • Onion Head Studio of Chicago • Chicago, IL

Worship service and in-house con-cert sound reinforce-ment, recording of sermons.
New Life Assembly of God
Lancaster, PA

Sound reinforcement in a live blues club showcasing live, regional & national acts such as Savoy Brown, Jr. Wells, etc.
Manny's Car Wash
New York, NY

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

[4] *Suggested retail price. Slightly higher in Canada.*

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

Dave Abbruzzese, *drummer for Pearl Jam*

Slash, *guitarist/songwriter, Guns 'N Roses*

Steve Brown, *guitarist/producer for Trixter*

Natalie Cole, *solo artist*

Greg Droman, *Grammy-nominated engineer for Linsey Buckingham*

Gregg Field, *drummer for Frank Sinatra*

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

Bill Gould, *bassist for Faith No More*

Bashiri Johnson, *percussionist for Whitney Houston, Madonna*

Mick Jones, *producer for Van Halen, guitarist for Foreigner*

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

David Frangioni, *MIDI specialist/Engineer Aerosmith, Elton John, and Extreme*

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

Bruce Kulick, *guitarist for Kiss*

Kyle Lenning, *President Asylum Records, Nashville*

Clair Marlo, *Artist, Producer*

Queensryche

Dave "Snake" Sabo, *guitarist for Skid Row*

Ben Sidran, *producer*

Leo Sidran, *songwriter for Steve Miller*

Steven Tyler, *singer for Aerosmith*

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

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

R&B radio remix of Boz Scaggs' "I'll Be The One" for Virgin Records, recording solo album for the Japanese Go Jazz label.
Ricky Peterson, producer, Paisley Park
Minneapolis, MN

MACKIE.

20205 144TH Ave NE • Woodinville • WA • 98072 • 800/898-3211 • FAX 206/487-4337
Outside the US, call 206/487-4333 • Represented in Canada by S.F. Marketing • 800/363-8855

World Radio History

I N S I

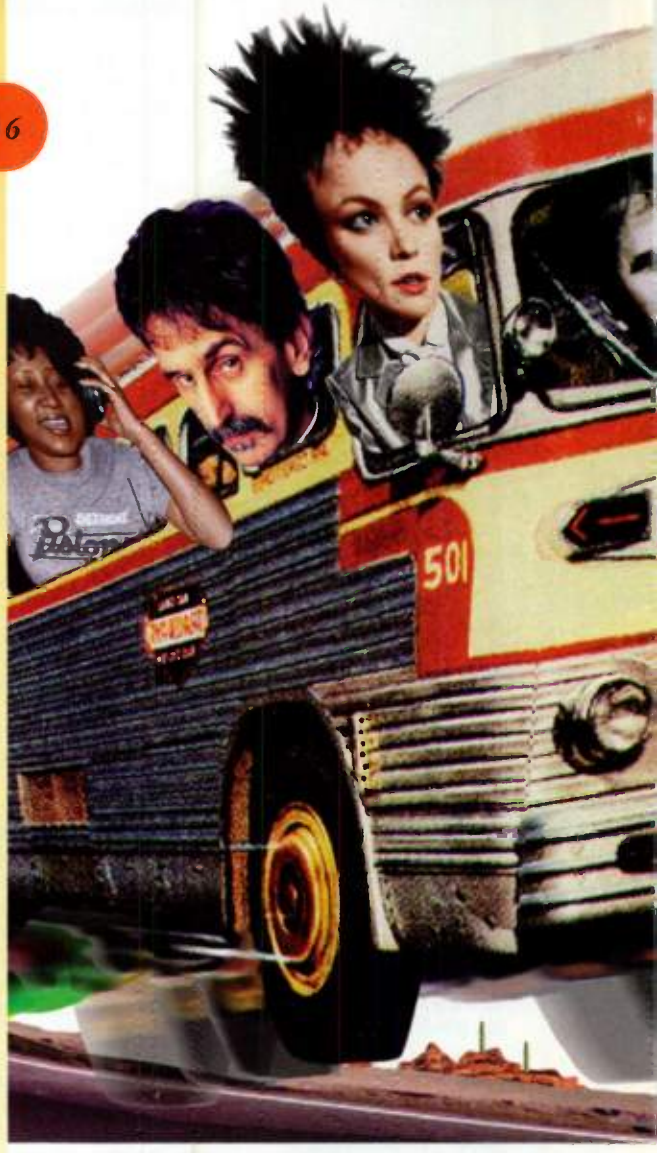
FEATURES

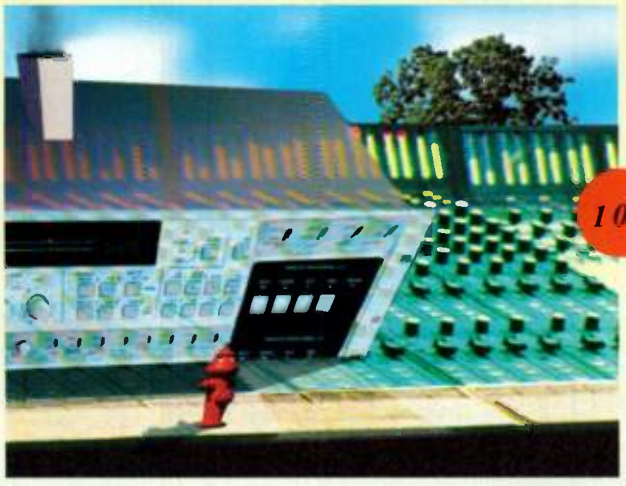
32 CREATIVE SPACE
In the whirlwind, "time is money" world of advertising, Eric Garcia saves clients big bucks by prepping their tracks before the final mix. See how Garcia's digital-audio chops make him a post-production hero.
By Michael Molenda

46 COVER STORY: MAGICAL MUSICAL TOURS
Despite all the annoying hype, the Internet is an astounding resource for musicians. Step on EM's "data bus" for an expedition to music-related info sites. Our tour guide reveals all the hot spots and tells you what it costs for a ticket to ride.
By Scot Gresham-Lancaster

64 DIVING INTO DIGITAL
Digital socialization finally embraces *Windows* users. Two-track recording programs now cost less than $200, with multitrack systems available for under $1,000. Here's how to optimize your PC for affordable hard-disk recording.
By Zack Price

78 NOISE KILLERS
"They never knew what hit them," said the audio dick. "Hiss and Hum were doing the big sleep in the sonic morgue before the faders hit unity gain. There's no room for noise in the home studio. If they had read this article, they would have known their days were numbered."
By Michael Gore





DEPARTMENTS

6 THE FRONT PAGE
10 LETTERS
18 WHAT'S NEW
146 AD INDEX
154 CLASSIFIEDS

World Radio History

D E Electronic Musician®
OCTOBER 1994 VOL. 10, NO. 10

COLUMNS

30 **PRO/FILE: Loop The Loop**
Ian Broudie emulates the live vibe with sampled drum loops.

88 **SQUARE ONE: Shift Happens**
Promote musical harmony by deploying positive pitch shifting.

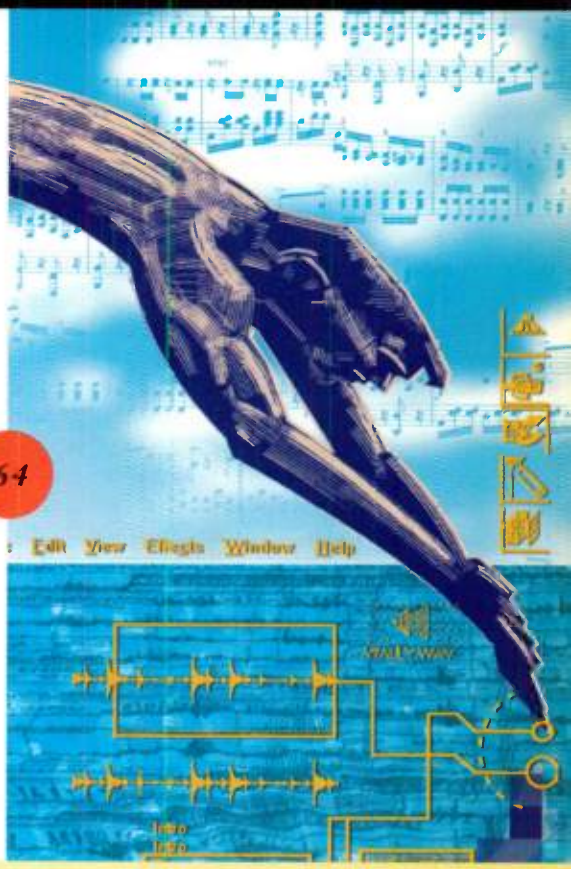
98 **MULTIMEDIA MUSICIAN: QuickTime 2.0**
Apple invites musicians to sit in on the multimedia bandstand.

106 **RECORDING MUSICIAN: DAT Mastering at Home**
Take sonic control of record production's critical final step.

114 **WORKING MUSICIAN: Singles Going Steady**
Release a 45 rpm single and own a small piece of music history.

120 **SERVICE CLINIC: Questions and Answers**
Dr. Know counsels techies on education and protects your FETs.

162 **TECH PAGE: Sixteen Will Get You Twenty**
A new encoding process softens digital audio's harsh reputation.



REVIEWS

124 **ALASKA SOFTWARE DigiTrax 1.0 (Mac)** hard-disk recorder

130 **NOVATION BassStation** analog bass synth

133 **TURTLE BEACH MultiSound Monterey** sound card

138 **ADA MP-2** MIDI tube guitar preamp

140 **KAWAI KC20** synthesizer

144 **APHEX 105 and 106** noise gate and compressor

147 **TECH 21 SansAmp PSA-1** amp simulator

149 **ALTECH GMS 1.1.1 (Mac)** General MIDI sequencer

Cover: Illustration by David Peters.

World Radio History

Too Much Information

Data dissemination crashes into media saturation on the infobahn.

PEGGY SUE AMISON

Although the photo at the top of this column has a somewhat sinister quality (my wife calls it "evil"), I am not the heir to Boris Karloff's empire of menace. I could never coldly plot the extermination of the human race, because I can't even plan the contents of this magazine without suffocating in self-doubt.

Case in point: After I distributed an interoffice memo previewing this month's cover story, **EM** Marketing Manager Elise Malmberg cautioned me about the subject matter. "Everyone is doing cover stories on the information superhighway," she warned. "Even some *guitar* magazines!" That tidbit alone was enough to send my intestinal tract into a sickening free fall. But suddenly, I couldn't pass a magazine kiosk, flip through a newspaper, or channel surf across cable broadcasts without "Information Superhighway" flashing before my eyes.

Then, the Aerosmith "download debacle" resounded across cyberspace, MTV, and the good, old-fashioned wire services. You may recall that Geffen Records decided to embrace the information age by uploading one of the popular rock band's songs to the Internet. It was the first time a major artist had offered free music to 'net heads and it bombed. Fans with basic home computer systems discovered it took hours to download a four-minute song. Yipes. So not only were we about join the chorus of hype, we were going to promote an info system—indeed, for some, a way of life—that was still being beta tested for practical music applications. (Pass the cherry-flavored antacids, please....)

However, after all the hullabaloo, we still felt the Internet merited a cover story. So what if you can't utilize the Internet as a virtual record store, *yet?* What you *can* do is access a storehouse of knowledge, and since when is that a drag? Isn't that one reason you buy this magazine—to learn everything you can about optimizing your tools and making better music? Right now, hype aside, the Internet offers resources that can energize your creativity and massage your intellect. You can download data at your leisure and literally have a world of musical tips and applications parade across your computer screen. We think that's totally cool.

But rather than tossing another "gee whiz" overview into the media stew, we've given you the keys to the kingdom, so to speak. "Magical Musical Tours" (p. 46) tells you where to find pertinent music data and how to get it. Chock full of charts and tables, this feature is essentially an applications article for the Internet. I'm excited that author Scot Gresham-Lancaster and our marvelous staff found a way to turn a potential hype-and-fluff piece into something you can use to enhance your work. (Now I can stop gobbling up all these tummy tablets!)

However, it would also be shortsighted of us to dismiss the superhighway hype entirely. Although the Internet is still taking baby steps as a music-distribution network, it's just a matter of time and technology before it becomes a truly democratic means of creative access and delivery. The current socialization of recording (via affordable tools) will be an even more powerful movement when artists can bypass entertainment conglomerates to get their music to a vast public. We'll keep you posted.

Michael Molenda

Electronic Musician

Publisher Peter Hirschfeld

Editor Michael Molenda
Senior Editor Steve Oppenheimer
Technical Editor Scott Wilkinson
Associate Editor Michael Brown
Senior Assistant Editor Mary Cosola
Editorial Assistant Diane Lowery
Contributing Editors Alan Gary Campbell, George Petersen, Lawrence Ullman

Art Director Linda Birch
Associate Art Director Patsy Law
Graphic Artist Dmitry Panich
Informational Graphics Chuck Dahmer

Associate Publisher Carrie Anderson
Southwestern Advertising Manager Dave Reik
Eastern Advertising Manager Angelo Biasi
Marketing Manager Elise Malmberg
Event Coordinator Jane Byer
Marketing Assistant Diana Sergi
Sales Administrator Joanne Zola
Advertising Sales Coordinator Christen Pocock
Sales Assistants Jennifer Hauser, Jessie Paolucci
Classifieds Advertising Manager Robin Boyce
Classifieds Assistant Mitzi Robinson
Classifieds Sales Assistant Shawn Langwell

Director of Operations and Manufacturing Anne Letsch
Production Manager Ellen Richman
Advertising Traffic Coordinator Shawn Yarnell
Production Assistants Michele Alaniz, Teri Stewart
Computer Systems Coordinator Elizabeth Wyatt

Circulation Manager Steve Willard
Circulation Associate Karen Stackpole
Circulation Assistant Peggy Sue Amison

Business Manager Benjamin Pittman
Receptionists Carrie Gebstadt, Angel Alexander

Music and Entertainment Group
Group Publisher Hillel Resner

National Editorial, Advertising, and Business Offices
6400 Hollis Street #12, Emeryville, CA 94608
tel. (510) 653-3307, fax (510) 653-5142

East Coast Advertising Office
tel. (212) 909-0430, fax (212) 909-0431

Subscription Services Office
(Address changes and customer-service inquiries)
PO Box 41525, Nashville, TN 37204
tel. (800) 888-5139 or (615) 377-3322

Cardinal Business Media, Inc.
1300 Virginia Dr., #400, Fort Washington, PA 19034

President and Chief Executive Officer
Robert N. Boucher, Jr.
VP and Chief Financial Officer
Thomas C. Breslin
VP and Chief Operating Officer
James S. Povec
VP, Publishing Services
R. Patricia Herron

Electronic Musician: (ISSN: 0884-4720) is published monthly by Cardinal Business Media, Inc., 1300 Virginia Dr. #400, Fort Washington, PA 19034. ©1994. This is Volume 10, Number 10, October 1994. One year (12 issues) subscription is $24; outside the U.S. is $49.95. Second Class postage paid at Oakland, CA, and additional mailing offices. All rights reserved. This publication may not be reproduced or quoted in whole or in part by any means, printed or electronic, without the written permission of the publishers. POSTMASTER: Send address changes to Electronic Musician, PO Box 41525, Nashville, TN 37204. Editeur Responsable (Belgique): Christian Desmet, Vuurgatstraat 92, 3090 Overijse, Belgique. Canadian GST #129597951. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No.0478741.

Cardinal Business Media, Inc.
Also publishers of *Mix*® magazine.
Printed in the USA.

BPA INTERNATIONAL

World Radio History

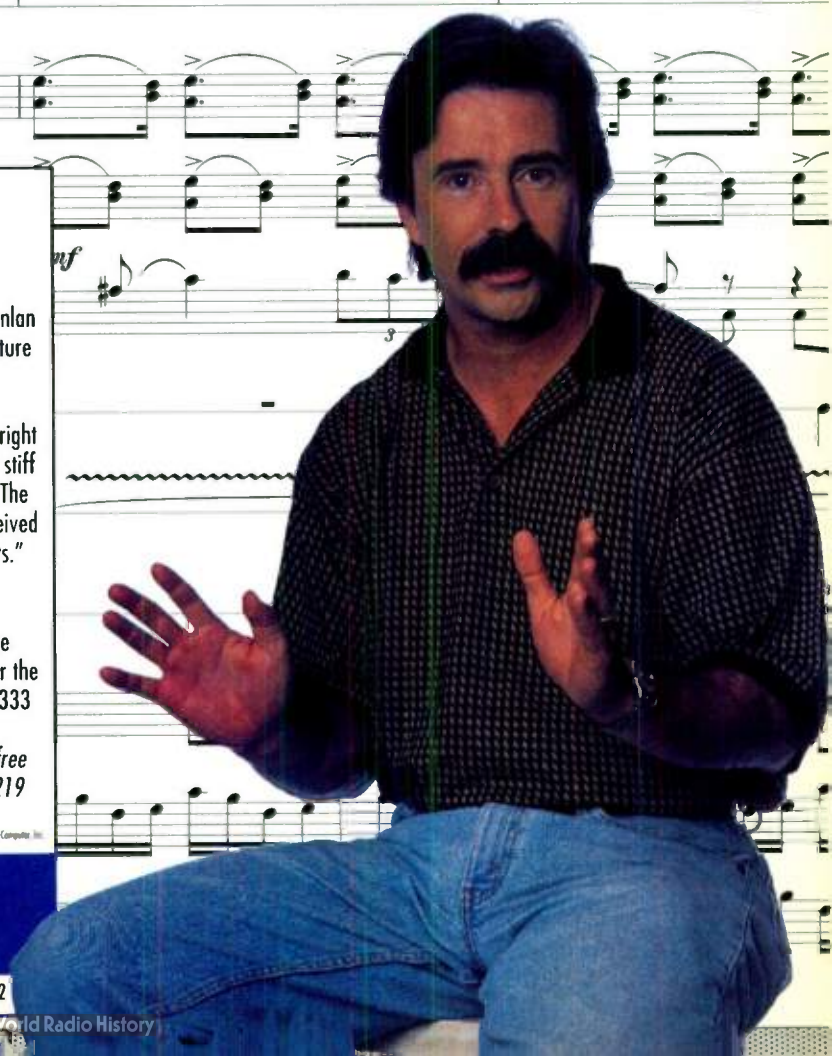
Overture Outscores the Rest

File Edit Score Measures Notes Options Windows

OMS/S5 pgm

Stravinsky Petrushka.1

Ob.IV.
Cl.I.
Cl.II.
Cl.III.
Fag.I.II
Cont.F.
Cor.I.II.
Cor.III.IV.
Pist.I.II. e Tr.I.II
Piatti
Trgl.
Tamb. de Basque
Camp.
Arpa I.II. a 2.



Overture™

Professional Notation Software for Macintosh®

After scoring two TV movies of the week with Overture, Joe Conlan told us it was better than the competition—even though Overture was still in beta testing!

"Overture is fast and very flexible—I can play music quickly right into the score. Other notation software I've worked with feels stiff in comparison, and those programs have been out for years! The printed scores look great too. From the very first session I received compliments from top studio players on the quality of the parts."

Don't start your next masterpiece without Overture, call Opcode for the dealer nearest you (415) 856-3333

Or try our 24 hour hot-line for free literature (800) 557-2633 ext 219

TM Overture Opcode System, Inc. Macintosh Apple Computer Inc.

OPCODE

SYSTEMS INC

3950 Fabian Way, Palo Alto, CA 94303 fax(415)856-3332

World Radio History

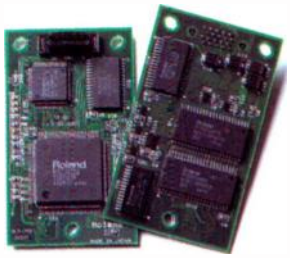
You'll love the Roland JV-90 expandability to 56 voice poly 18 megabytes of memory, its 76 capabilities, expansive sound

TEC
TECHNICAL EXCELLENCE & CREATIVITY
1994 NOMINEE

Okay, okay. We put enough technology and features into the JV-90 to make it the synthesizer equivalent of the space shuttle. But you don't have to understand the technology.

All you have to do is listen.

Nor does it matter that the JV-90 has an open-ended architecture, voice and wave expansion boards, enormous sound library, PCM and data cards. Or the fact that you can have a massive 18 Mbytes of memory with 56-voice polyphony and up to 24 multitimbral parts.



Expanding with the VE-GS1 Voice Expansion Board adds an entire GS synthesizer that doubles the JV-90's polyphony to 56 voices, adds another effects processor and makes the JV-90 24 part multitimbral.

The VE-JV1 Voice Expansion Board contains a JV Series sound engine, doubles polyphony to 56 voices, adds new patches, another effects processor and makes the JV-90 16 part multitimbral.

Instead, just remember that the JV-90 can expand when you're ready.

And don't forget that the JV-90 comes standard with 4 Mbytes of

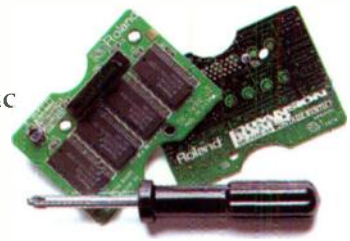
World Radio History

synthesizer because of its phony, 24 multitimbral parts, note keyboard, MIDI controller library and incredible sound.

memory holding 256 preset patches and 64 user patches, including realistic acoustic sounds, dynamic percussion, and fat synth textures.

Which, in less technical terms, means you get a lot for your money from the very start.

To hear how great the JV-90 and the other JV Series keyboards sound, call us at (800) 386-7575 to get our Roland *'94 New Product Video* (Vol. I) for only $9.95. Call now. Because once you hear the JV-90's sounds, you'll cross every other synthesizer off your list.



The SR-JV80 Wave Expansion Board Series *contain an abundance of high-quality waveforms and patches. Each board contains 8 Mbytes of wave memory. Currently available are* ***Pop, Orchestra, Piano*** *and the new* ***Vintage Synth*** *board containing legendary synth sounds from the Minimoog,® Oberheim,® Sequential Circuit's Prophet,® Mellotron® and Roland's classic synths such as the Jupiter,® Juno,® and D-50.® All expansion boards are user installable and we've even included the screwdriver.*

Roland

Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141
Roland Canada Music Ltd., 5480 Parkwood Way, Richmond, B.C. V6V 2M4 (604) 270-6626. COMPUSERVE®: GO ROLAND; 72662,376
All trademarks are registered by their respective companies.

World Radio History

LETTERS

WHAT'S NEW?

Thanks for your "Synth Patches and Samples" reviews ("What's New") in the August 1994 issue. I hope you continue to do more reviews on patches and CD-ROMs. They give excellent guidance to someone like me, afloat in a sea of third-party sounds and not sure which to choose. Keep up the good work.

Bill Groener
Tualatin, OR

AN AMIGA AMIGO

I am writing in response to your article "The Handwriting on the Wall" (August 1994). My chosen platform for music, as well as video and data, is the Amiga. I also use MS-DOS and, to a lesser extent, the Mac.

The Amiga, since its beginning, has out-performed the other two platforms in all areas, including music. Although my Mac-using friends struggle with the latest hardware that will not run their expensive, limited software, I've been able to keep up with *Music-X*. This program has not seen a major upgrade in four years, but it offers something the Mac will never offer: an open-ended design. I can still write my own modules to enhance the original program's capabilities. With the Mac, and even MS-DOS, it's pay up or drop out.

Why anyone would embrace this 1980s trend is beyond me. My rule of thumb is this: Use the best platform for the job, regardless of slick ads or public opinion. The Mac is a great system to get noncomputer people up and running, but for real "get it done" power, it has let me and many others down.

If the new owners of the Amiga put any kind of backing into the product, I think you will soon be able to buy Apple stock very cheap.

Randy Williams
Medford, NJ

Randy—I wholeheartedly agree with your rule of thumb. You should always use the best platform for the job. Ideas, however, are much more important than the tools you use to express them. I write using a computer, because I find it easier than using a typewriter or a pen; other writers are more comfortable using a typewriter or pen. But even if I have nothing more than a piece of chalk and a slate tablet, I can still express an idea.

Like you, I think the Amiga will reemerge under the banner of a stronger manufacturer. I don't think, however, that reemergence will come at Apple's expense (or at the expense of any other personal computer manufacturer). Although Commodore never figured it out, the Amiga was always, and will always be, a niche computer for niche markets.

If the Amiga is the right tool for what you're doing, go for it! Commodore didn't fail because the Amiga was a poorly designed computer. Commodore failed because its management didn't have a clue how to market its key product. Given the number of companies bidding for the rights to the Amiga technology, that technology obviously holds some value in the marketplace.—Michael B.

DANCE TO THE MUSIC

I would like to thank you for publishing the excellent article on composing for dance ("Dance Partners," July 1994). I have worked as a musician for twenty years in the Dance Department of Florida State University, and I have never read a better article on working with choreographers, outside of a professional journal. As I was reading the article, I would think of an aspect of composing for dance only to find it covered in the very next paragraph!

Readers may want to know of another gateway to working with dancers: playing music for dance classes. Almost all academic dance programs and professional companies hire musicians to accompany technique classes. Playing for dance classes can prove to be a rewarding career, as well as providing entrée to many famous choreographers and dance companies.

There is even a nonprofit professional organization for dance musicians, the International Guild of Musicians In Dance, comprised of musicians all over North America and Europe. The Guild may be contacted through Larry Attaway, 33105 Santiago Road, #23, Acton, CA 93510.

Ray Brooks
Tallahassee, FL

WELL DONE

I'd like to express my complete approval for the articles "The Grand Illusion" and "Square One: The Tower of TechnoBabel" (July 1994). I think these difficult subjects could not have been written about more intelligently.

Giorgio Bertoli
Villa Carcina, Italy

LIMITLESS POSSIBILITIES

The main reason I subscribe to your magazine is for articles such as "The Grand Illusion" (July 1994), "The Electronic Orchestra, Parts 1 and 2" (September and October 1993), "Masters from Ministudios" (June 1994), and "Virtual Pop" (August 1994). In other words, articles that suggest creative uses for modest equipment. Too often, music magazines cater to gearheads who want the next toy rather than to electronic musicians who want to further their craft.

Can you suggest other articles or resources that expand upon your "Riding the Waves" segment of "The Grand Illusion"? I'd like to learn more about acoustics as applied to synths. Also, what's the most comprehensive and helpful source for synth programming?

ROBERT PRINCE

World Radio History

If you've been puzzled about choosing the best synth workstation, a TS keyboard is the answer to all your questions.

Where do I get great sounds and General MIDI compatibility? When it comes to range and quality of sound, the TS is second to none. There are over 700 onboard sounds for every style of music including all 128 GM sounds *(as well as all 9 GM and GS drum kits)* for spectacular sounding playback of any General MIDI input.

Okay. But what about wave expansion? You can load, play, and even edit ENSONIQ's huge library of sampled sounds. With our optional SCSI, you have access to hundreds of Megabytes of samples on CD-ROMs from ENSONIQ and third-party companies. It's easy to get not only new waveforms, but also new sounds.

Can I get great effects without buying more gear? No other keyboard has better effects. The same 24-bit internal effects processor as our acclaimed DP/4 provides the highest quality effects, complete with extensive real-time control.

Solve the Workstation Puzzle

The ENSONIQ TS-10 and TS-12 have all the right pieces.

What about sequencing? Our powerful 24-track sequencer has many recording and editing functions that are exceptionally user friendly. It's the perfect tool for capturing and producing your musical ideas.

Sounds good. But is it easy to use? You bet! The TS continues ENSONIQ's commitment to design instruments that are easier to use and play than any comparable keyboard.

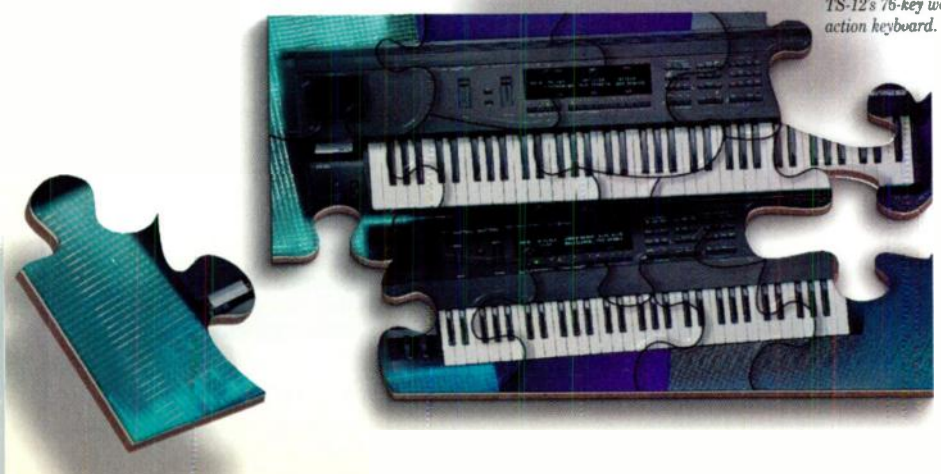
Where can I find out more about the TS? Visit your Authorized ENSONIQ Dealer for a demo, or call ENSONIQ at **1-800-553-5151**. Once you compare its great sounds and features to the competition, there'll be no question that it's the best music workstation — the complete answer to your musical needs.

ENSONIQ™

LEADING THE WORLD IN SOUND INNOVATION

Buy today & receive 10 free sample disks!

Choose from two keyboards to suit your playing style: the TS-10's 61-key synth action Poly-Key™ keyboard; or the TS-12's 76-key weighted action keyboard.



☐ Yes, I'm puzzled. Send me more on the TS Series.

☐ Also, please send info on:

☐ ASR-10 ☐ DP/4
☐ KS-32 ☐ SQ Series

Name _____

Address _____

City _____ *State* ____ *Zip* _____

Phone (____) _____

Mail to: *ENSONIQ, Department E-49*
155 Great Valley Parkway, P.O. Box 3035
Malvern, PA 19355-0735

World Radio History

I've read Dean Friedman's *Synth Basics* but want more detailed, current information. Also, your synth articles often refer to "sweeping the filter." What exactly is the meaning of this?

Mitch Finegold
Chevy Chase, MD

Regarding resource materials, Chris Patton of Mix Bookshelf responds: *About acoustics as applied to synths, might I suggest* Recording Synths: Hit Sound Recording Course #9 *by Bill Gibson. It's an audio cassette course with recording techniques for synths and samplers. One of the techniques mentioned is for EQing string pads, brass, and bell-like patches. It also has an extensive section on signal routing.*

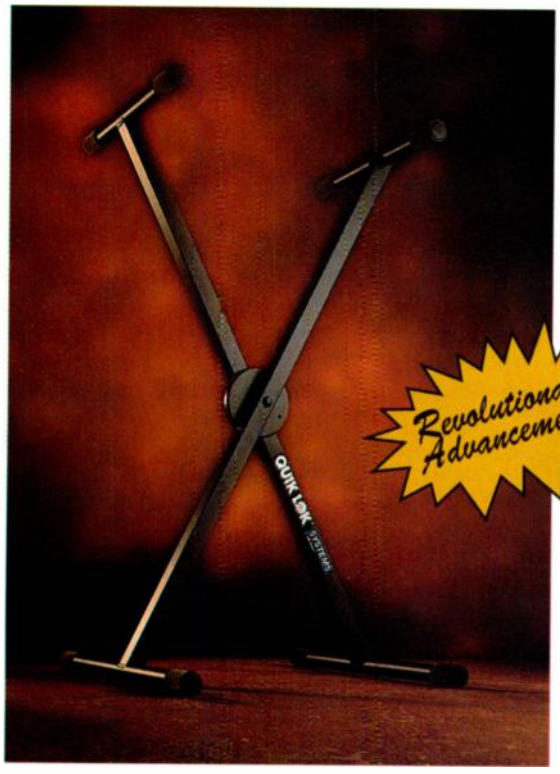
If you're only interested in the properties of sound reproduction, you might want to check out Master Handbook of Acoustics *by F. Alton Everest. It covers digital and analog sound processing and synthesizer acoustics. The third edition has comprehensive text. There is very little I can add to Dean Friedman's* Synth Basics *that hasn't been covered in* Elements of Computer Music *by F. Richard Moore. It has detailed coverage of digitizing; additive, subtractive, and nonlinear synthesis; spatial hearing and reverberation; and DSP techniques. It even has an extensive section on filtering. You can order these books and a catalog from Mix Bookshelf; tel. (800) 233-9604 or (510) 653-3307.* The Synthesist's Guide to Acoustic Instruments *is also an excellent source, if you can find it. Unfortunately, it's out of print. Ask one of your friends if they still have a copy.*

Regarding "sweeping the filter," Senior Editor Steve Oppenheimer responds: *"Sweeping the filter" refers to opening and closing a filter by continuously changing its cutoff frequency. (In a lowpass filter, the cutoff is the highest frequency that can pass through the filter without being attenuated; in a highpass filter, frequencies below the cutoff are rolled off.) For example, a wah-wah pedal uses a lowpass filter; moving the pedal up and down alters the cutoff frequency, closing and opening ("sweeping") the filter. In a synth, the filter cutoff usually is swept with a modulation source, such as an LFO or modulation wheel. This classic technique continuously changes the sound's spectral content in a manner determined by the LFO waveform or mod wheel movement.*

TAILS OUT

I've been feeling a little defensive lately about using my analog tape deck (a Tascam 238), especially in the face of all the new digital technology. So I was pleased to read your article on cassette multitracks ("Masters From Ministudios," June 1994). It was great to read that there are folks who believe you can still do a good job with analog gear. It has long been my opinion that the vast majority of listeners (other than **EM** readers, of course), do not have those "golden ears" we've all heard about and can't hear the difference between analog and digital recordings. And, as you point out, there is no reason for a huge difference to exist.

I have always believed in tails-out storage, except that I've always let the tape *play* to the end, rather than fast forwarding to the end as you suggest. My assumption was that the tape would be wound onto the take-up spool more evenly, and thus reduce any tendency to print through. Secondly, I've always used the shortest tape I could get my hands on (60- or 30-minute cassettes)



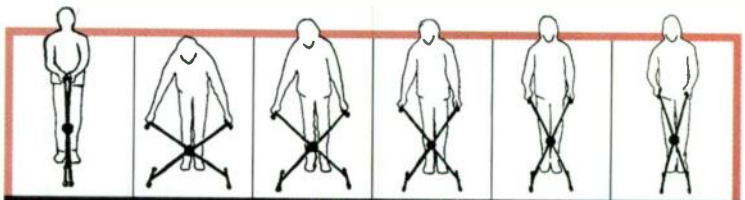
The "QUIK-er" than ever stand!

NEW QUIK LOK QL/609 KEYBOARD STAND OPENS AND CLOSES INSTANTLY...

No chains, No bolts, No tightening knobs!

Revolutionary Advancement!

- Automatically sets up and click-locks in a snap to the sitting or standing height you want!
- Supports keyboards or controllers up to 180 lbs.
- Solidly constructed with heavy duty steel and arc welded joints for years of strength and reliability.
- Five year limited warranty.



To adjust, simply open the stand to the widest position, then just slowly reclose it. Click-lock the stand to the most convenient height.

†Patent Pending

Send $2.00 for complete color catalog.

MUSIC INDUSTRIES CORP. • 99 Tulip Avenue, Floral Park, New York 11001 • (516) 352-4110 • FAX: (516) 352-0754

World Radio History

A Sound Module Should Do One Thing: SOUND GREAT

When we designed the new **S4™ 64 Voice Sound Module**, we realized that when you put aside all the bells and whistles, only one feature makes the difference between a decent sound module and a great one. It's the sound.

Great sound starts with a superior synthesis engine. The S4's sound engine was created by the design team that was responsible for some of the greatest and most popular synths in keyboard history. It's one of the most powerful synthesis engines ever offered at any price.

Then, we made a list (and checked it twice) of the best sound programmers in the industry. Alesis formed its own top-notch sound development team specifically for the S4. We also got help from InVision, an incredibly innovative group of sonic designers, to fine-tune the S4's patches. InVision has provided more world-class, usable sounds to the keyboard industry than any other independent developer.

The result? The S4 provides 256 brilliant programs out of the box. Programs you'll really use. In fact, you'll find that every sound on the S4 was carefully designed to be inherently musical and expressive. You'll also get 200 multitimbral mixes that will make the multitimbral stuff on your old synth sound like...well, sound old. Plus, the S4's 64-voice polyphony will let you sequence those programs and mixes and avoid the hassles of voice robbing more than ever before. On each of the 64 voices, the S4 provides three LFOs, three envelope generators, a tracking generator, and many more tools to personalize your patches. Also, the onboard Alesis effects give you the opportunity to create a CD-quality mix from a single rack-space unit. All in all, you can't find more useful, hard-working sounds.

Now let's put the bells and whistles back. The S4 gives you a massive 16 megabytes of onboard sample ROM, which expands to 24 meg via the PCMCIA RAM/ROM card slot on the front panel. This card slot also provides access to a great selection of pianos, ethnic instruments, and other sound banks that our in-house team and 3rd party developers continue to create. Also, with its virtually unlimited modulation routing matrix, the S4's sonic versatility both in studio and live performance is nothing short of incredible. By providing the power to route almost any controller to any target parameter, the S4 puts all the options in your hands.

The S4 also offers the ADAT™ MultiChannel Optical Digital Interface™, so you don't have to leave the digital realm when recording direct-to-ADAT. As you can see, the S4 provides a lot more than one thing. But you can't see the one thing that the S4 does the best: the sound. Alesis is committed to the keyboard industry, and nothing reflects that commitment more powerfully than the sound of the S4. Listen carefully to the S4 at an Authorized Alesis Dealer today.

S4™

QUADRASYNTH 64 VOICE SOUND MODULE

S4 and ADAT MultiChannel Optical Digital Interface are trademarks of Alesis Corporation.
® Alesis and ADAT are registered trademarks of Alesis Corporation. All other trademarks are the property of their respective holders.

Alesis Corporation Phone: 1-800-5-ALESIS (In North America Only) / E-mail: ALECORP@Alesis1.usa.com
3630 Holdrege Avenue Los Angeles CA 90016

ALESIS
STUDIO ELECTRONICS

World Radio History

No one's actually been here. But everyone's heard the sounds coming out.

The Korg Power Plant, Long Island, NY.

© 1994 Korg USA, 89 Frost St., Westbury, NY 11590. Korg is a registered trademark, "The power company" and Power Music Workstation are trademarks of Korg USA.

World Radio History

You won't find it on any tourist map. In fact, if you're not looking real hard, you won't find it – period.

Here at the Korg® Power Plant, we don't get many visitors. But musicians everywhere are familiar with the kind of electricity we generate.

Last time New York City went through a blackout, the Korg Power Plant was testing its most advanced keyboard. Coincidence?

For years, our keyboards and sound modules have been putting power in the hands of people who know exactly how to use it.

The power to bring an audience to their feet. Or drive them to delirium. Or, even better, drive them to their nearest record store.

We could list all of the technical reasons why the name Korg shows up at just about every major concert, and in every major recording studio.

But the best reason isn't technical at all: Korg has great sounds.

And that's all due to the type of people who clock in and out of the Korg Power Plant every working day and night. Real musicians. With real ears. Players who agonize over Korg sounds for months before we ever let them out. (The sounds, that is.)

It's also due to the great respect we have for your musical brain. The way we look at it, when you're playing, our job is to get out of your way – so you can get the sound you want when you want it. That thinking has helped us create the 01/WFD Power Music Workstation.™ Which, having set all the standards for great sound and intuitive control, has to be the most heard, most acclaimed and the most (unsuccessfully) imitated keyboard in the musical world today.

It also helped us develop the X3 Power Music Workstation, delivering the legendary 01/WFD-quality sound at an even more affordable price.

Of course, deep inside the Korg Power Plant, the work goes on. If we had windows, you'd see the lights on every night – as we devote our energy to finding tomorrow's hit sounds.

But since you're not about to visit, go hear what we're talking about at an authorized Korg dealer – it's the one source of power that's always nearby.

It's all about power: the 01/WFD and X3 Power Music Workstations.

KORG®

The power company.™

World Radio History

on the theory that shorter tapes are thicker. Thicker tape should assist in minimizing print through, and it also should be less fragile, thereby making fast forwarding and rewinding less risky. Lastly, in the final mix, I've gone to the extent of using the automated muting capability on my board. Any track that doesn't have a sound on it gets muted. When I first began doing this, I was surprised at how much cleaner my mixes became.

Bruce Nolen
San Jose, CA

HEAT WAVE

My Prophet T8 synthesizer locked up recently and refused to tune or make a 'peep,' as a result of playing it during the recent hot temperatures. It ended up requiring expensive repairs. Have you ever thought of running a brief article analyzing the damage/idiosyncracies that temperature problems can inflict on both older and newer synths?

Bob Durham
Kawasaki-shi, Japan

Bob—Although we have not presented this in an article per se, related topics have been covered. Ambient temperature considerations for equipment storage were discussed in the September 1992 "Service Clinic"; equipment heat-sink operating temperatures in the March 1993 "Service Clinic" (and again in the May 1994 "Q & A's Greatest Hits"); and heat-sink radiative characteristics, in the February 1994 "Service Clinic." Safe ambient conditions for equipment operation were addressed in the 1994 edition of the Digital Piano Buyer's Guide.

Overheated equipment will usually return to normal function after it cools. But if overheating causes one or more power-supply outputs to shut down, or causes thermal runaway in an output stage, damage may result.—Alan Gary C.

ADD ON AND ON AND ON

I am rather a newcomer to the world of MIDI and was uneducated when I bought my first keyboard. Although it's Velocity sensitive, it doesn't have a Modulation or Pitch Bend wheel. I have come to realize the benefits of such items, but I am not keen on spending five or six hundred dollars on a keyboard or MIDI controller. Does anyone make something that would attach to my computer or my current keyboard?

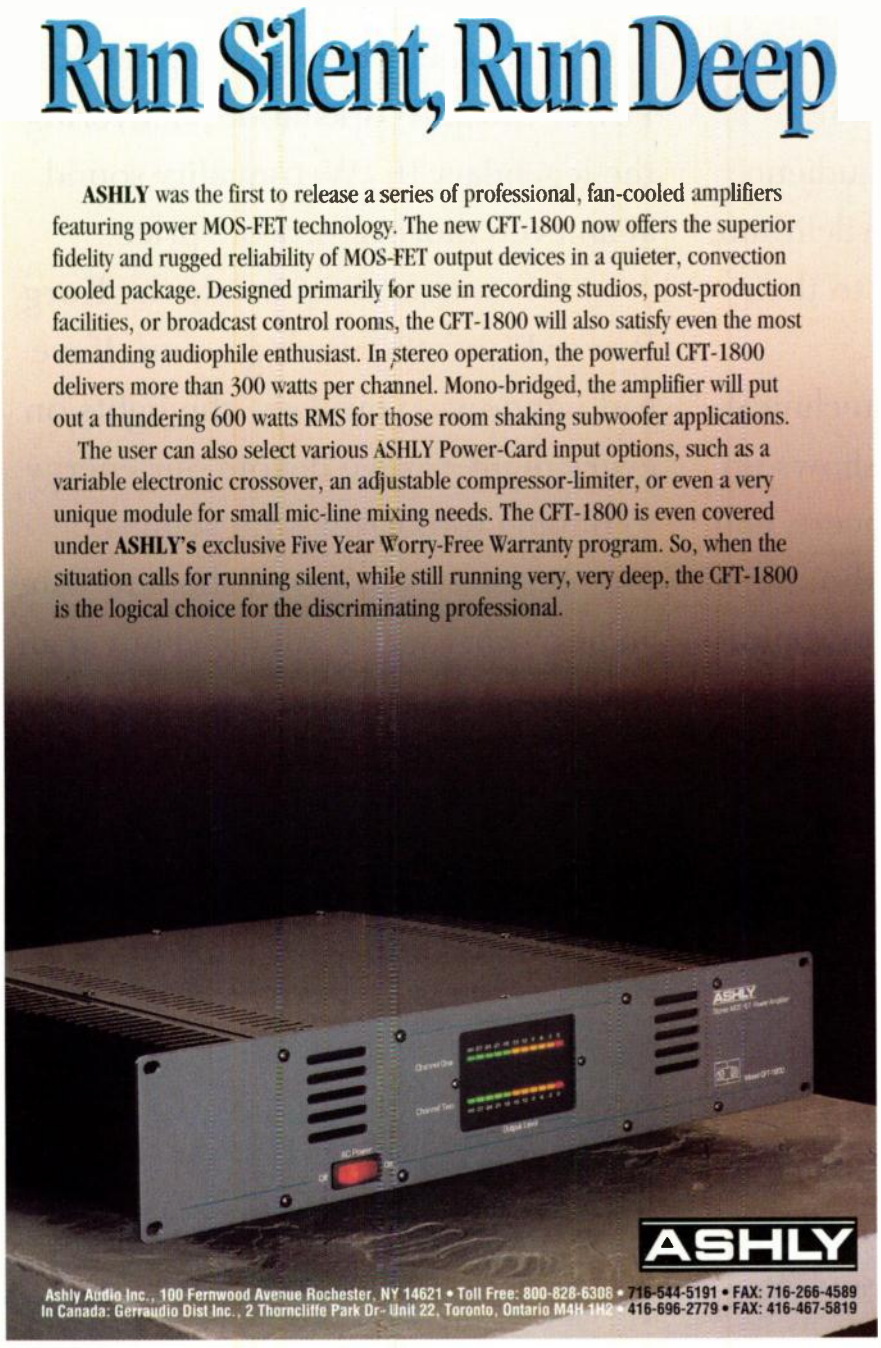
Robert Schafish
Denver, CO

Robert—At one time, Yamaha made such a product (the MCS1), but it's long gone now. To my knowledge, nobody currently makes just a set of add-on control wheels. However, there are inexpensive, small keyboards that would give you wheels and could be stacked above your existing keyboard. For example, the Novation Midicon ($169 plus power supply) is a basic, 25-key, Velocity-sensitive keyboard with wheels. It's available from Music Industries Corp.; tel. (800) 431-6699 or (516) 352-4110.—Steve O.

ERROR LOG

August 1994, "Virtual Pop," p. 71: *Instrumentation/Orchestration,* by Alfred Blatter, is published by Schirmer Books, New York.

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

Sound This Legendary Only Comes Around Twice In A Lifetime.

TEC
TECHNICAL EXCELLENCE & CREATIVITY
1994 NOMINEE

Introducing the AKG Vintage TL. Not since the 1950's has a microphone so faithfully captured the warmth and character of the original AKG C12 mic. Now the legendary presence and openness are back, thanks to an acoustically perfect re-creation of the original C12 capsule. What's more, transformerless C414 circuitry allows the Vintage TL to exceed all of today's digital requirements. So you get the best of two legendary sounds, in one affordable mic. AKG. **It all comes back to the sound.**

AKG

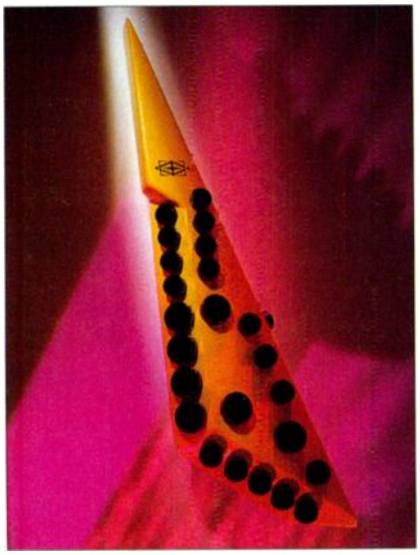
AKG Acoustics, 8500 Balboa Blvd., Northridge, CA 91329 USA
Phone 1-818-893-8411 Fax 1-818-909-9748 Flash Fax 1-818-909-5576

A Harman International Company

World Radio History

WHAT'S NEW

By Steve Oppenheimer



▲ ZENDRUM Z-SERIES

Zendrum Corporation is shipping the unique Zendrum Z-series MIDI percussion controller ($1,350). The strap-on Zendrum sports 24 independent, velocity-sensitive triggers that are struck with the fingertip, much like drumming on a tabletop. The triggers can be mapped to user-selectable MIDI notes, so it is compatible with virtually any MIDI sound source. Parameters are edited via a data wheel and LED readout.

Made of American rock maple, the instrument is offered in two sizes (the full-size Z-1 and ¾-size Z-2), which weigh ten to twelve pounds each. Zendrum Corporation; tel. (404) 874-6824; fax (404) 874-5845.

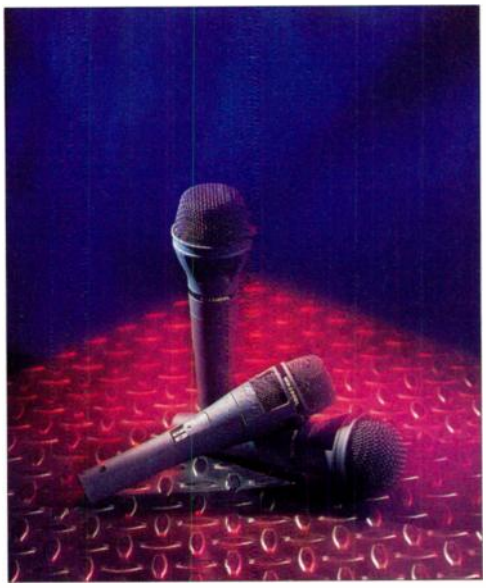
Circle #401 on Reader Service Card

▶ AUDIO-TECHNICA MIDNIGHT BLUES

Audio-Technica is offering its Midnight Blues-series dynamic mics. Named for their gun-metal blue color, the mics have a baked-on finish and Eurostyle appearance. Features include a neodymium element, a thump-proof "silent" switch that can be locked on, and a newly designed shock mount for reduced handling noise.

Four models are currently offered. The MB1000L ($59) offers a 70 Hz to 15 kHz frequency response and 500Ω impedance. The MB1000H ($59) is a high-impedance (10 kΩ) version with an internal transformer; it offers the same frequency response as the MB1000L. The MB2000L ($75) is a low-impedance mic with a 60 Hz to 15 kHz frequency response, while the MB3000L ($99) has a 50 Hz to 16 kHz response and 250Ω impedance. Audio-Technica; tel. (216) 686-2600; fax (216) 686-0719.

Circle #402 on Reader Service Card



▼ ENSONIQ KT-76

Ensoniq introduced the KT-76 synth ($2,495), which features 64-note polyphony; a 76-key, weighted-action keyboard; and a 16-track sequencer. The Fatar keyboard action is the same as in the KS-32 and TS-12 synths. Ensoniq provides fourteen velocity curves and four pressure settings.

The synth offers 308 onboard sounds, including two sampled pianos (a bright Bosendorfer and a warm, 9-foot Baldwin grand) and a full set of 128 General MIDI sounds with ten GM/GS drum kits. The sounds are grouped by instrument family and can be quickly accessed with the SoundFinder feature. The onboard effects processor, which uses DP/4 and TS-series technology, provides thirteen preprogrammed algorithms.

The sequencer records up to 6,500 notes in up to 70 sequences and 30 songs. The KT-76 includes a PCMCIA slot that admits 512 KB ROM and RAM cards. The ROM cards ($99.95) hold 160 sounds. The RAM cards ($179.95 ea.) hold up to 160 sounds and Performance Presets (sound combinations), 140 sequences, and 60 songs and extend sequencer capacity to over 100,000 notes.

Additional features include 34 ROM-based, pitch-tuning tables, a front-panel headphone jack, and a backlit LCD screen. A damper pedal is included. Optional accessories include the SW-10 footswitch ($49.95), CVP-1 continuous pedal ($29.95), and MS-1 music stand ($49.95). Ensoniq Corp.; tel. (800) 553-5151 or (610) 647-3930; fax (610) 647-8908.

Circle #403 on Reader Service Card

World Radio History

Master the Breakthrough Technology That's Changed Forever the Way the World Makes Music

NRI's innovative course gives you everything you need to build your own computer-controlled music studio: a powerful 386sx/25 MHz IBM-compatible computer, 200 meg hard drive, Kawai X50-D professional-level synthesizer, Cakewalk MIDI sequencing software, Sound Galaxy NX Pro sound card, and MIDI interface that links your keyboard to your computer – all yours to train with and keep!

Prepare for an Exciting, Multifaceted Career

In the booming music industry, what you can do with your NRI training is limited only by your imagination. You can work as a sound engineer, recording engineer, or road technician ... even start your own business selling and servicing today's MIDI-based systems. Or unleash your own musical creativity, writing and composing music with the extraordinary digital instruments NRI provides.

Learn State-of-the-Art Music Synthesis

Build your own electronic music center with all this real-world equipment:

- Complete IBM-compatible 386sx/25 MHz computer featuring mini-tower design and powerful 200 meg hard drive
- High-end Kawai X50-D General MIDI synthesizer with touch- sensitive keyboard, digital effects with reverb and chorus built-in, one finger ad-lib, mixing, and more
- Sound Galaxy NX Pro sound card with built-in MIDI interface and speakers to accommodate interactive multimedia applications
- Your own desktop recording studio – the critically acclaimed Cakewalk 256-track MIDI sequencer software that helps you record, edit, and play back multiple tracks of music
- SoundSculptor software that visually demonstrates the operation of FM music synthesis
- Electronic components you use to build up live circuits, including sound generating ones

You discover how to use, program, and service this professional equipment through hands-on projects that make learning both fun and challenging – *regardless of your experience in electronics or music.*

Complete lessons, top-notch equipment, hands-on projects – NRI training doesn't miss a beat!

Gain Expertise and Confidence, Step By Easy Step

Study at your own pace, with the committed support of NRI's instruction team just a letter or phone call away. You begin with detailed lessons that move from electronics fundamentals and music notation to sound generation routines, digital logic, microprocessors, and sampling and recording techniques. Then move on to get first-hand experience with MIDI, waveshaping, patching, sequencing, mixing, special effects, and much more.

Find Out About NRI's Unique, Groundbreaking Training In Electronic Music Technology

NRI's free, full-color catalog has all the details – send for yours today! If the coupon is missing, write to: NRI Schools, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, Washington, DC 20008

IBM is a registered trademark of the International Business Machines Corporation.

SEND TODAY FOR FREE NRI CATALOG!

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, Washington, DC 20008

Name_____ Age_____

Address_____

City_____

State_____ Zip_____

ACCREDITED MEMBER, NATIONAL HOME STUDY COUNCIL 370-1094

- ☑ Check One FREE Catalog Only
- ☐ **Electronic Music Technology**
- ☐ Microcomputer Servicing
- ☐ TV/Video/Audio Servicing
- ☐ Computer-Aided Drafting
- ☐ Basic Electronics
- ☐ Multimedia Specialist
- ☐ Computer Programming
- ☐ Desktop Publishing & Design
- ☐ Fiction/Nonfiction Writing
- ☐ PC Applications Specialist

World Radio History

▶ ARTIC MIDI COOLTOOLS

Artic Software's *MIDI CoolTools* ($59) is a set of custom controls for Microsoft Visual Basic that lets end users script their own MIDI applications for *Windows*. For example, you can drag and drop a MIDI In control onto a form in Visual Basic to set up a MIDI input, complete with time stamping, port selection, and a message queue that allows long and short messages to be received.

Knob Custom Control lets you create knobs with over thirty properties, such as custom tickmarks and colors. The Fader/Slider Custom Control allows horizontal and vertical faders, with multiple tickmark properties, thumb styles, and bevel properties (for a 3-D look).

A VU Indicator Custom Control allows horizontal and vertical, 3-color, LED-style, segmented meters. You can have three separate, color-coded sections, each with up to twenty segments. Finally, a Standard MIDI File Control allows you to read any SMF into a data structure with full access to the MIDI data. Artic Software; tel. (800) 892-0677 or (414) 534-4309; fax (414) 534-7809.

Circle #404 on Reader Service Card

▼ KORG AX30G

Korg USA's ToneWorks division announced the AX30G Guitar Hyperformance Processor ($425), a programmable multi-effects pedal that integrates analog and digital distortion circuitry. The unit offers 28 effects. Up to six effects (plus noise reduction) can be used simultaneously in up to 24 user-editable chain combinations. The AX30G provides seven types of distortion, plus compression, a variety of delay effects, 3-band EQ, phasing, flanging, chorusing, a random step filter, vibrato, tremolo, pedal and auto wah, ring modulation, panning, and stereo pitch shifting. In addition, it offers programmable noise reduction, three types of speaker emulation, and an autochromatic tuner with bypass.

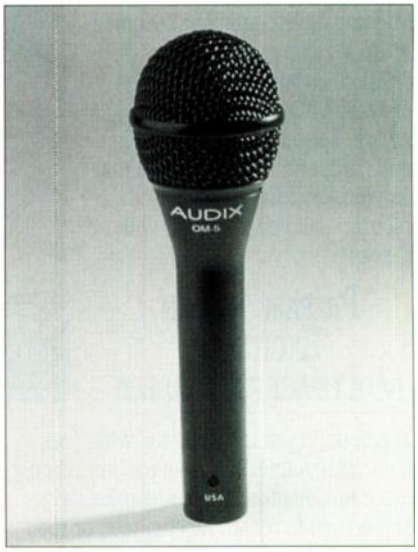
The floor box has 50 presets and sixteen user program memories. A 16 × 2, backlit LCD, user program naming, and an Edit Compare function simplify programming. In addition to its Bank and program-select footswitches, the unit has a user-assignable Pressure footpedal for controlling various effects parameters. Jacks accept two optional footpedals for setting volume and parameter values. An auxiliary audio input (a stereo, ⅛-inch minijack) lets you practice with a CD or tape. Stereo main outs and a headphone out complete the audio connections.

Korg also unveiled the X2 Music Workstation ($2,100) and X5 synth ($1,100). The X2 is based on the X3 synth, but adds a 76-key, unweighted keyboard, a new 2 MB piano sample, and four independent outputs. The X5 is based on the 05R/W General MIDI synth module. It has a 61-key keyboard, a built-in computer interface, 128 GM programs, eight GM kits, 100 programs, and 100 combinations.

In other Korg news, the company's Marshall Amplification division introduced the DRP-1 Direct Recording Preamp ($199), a guitar preamp designed for studio applications. The unit emulates a Marshall guitar-amp sound, with controls for preamp volume and master volume, as well as bass, mid, and treble. The rear panel contains a ¼-inch guitar input, preamp output, line-level output, and a headphone jack. The DRP-1 can be powered by battery or AC adapter (not included).

Finally, Korg's Vox Amplification division announced the Model V941 Valve Effects Loop Buffer ($199), a 12AX7 tube-based, 2-stage gain device that serves as a buffer between effects and amplifier effects loops. Alternatively, it can provide gain and impedance matching between instruments and mixer inputs, or between mixers and power amps. The 1U rack-mount unit also can be used as a tube-distortion device and gain booster. Korg USA/Vox Amplification; tel. (516) 333-9100; fax (516) 333-9108.

Circle #405 on Reader Service Card



▲ AUDIX OM5

Audix Corporation is shipping the OM5 ($329), a hypercardioid, dynamic mic designed for high-output concert applications. The manufacturer claims exceptionally high sensitivity and high output without using neodymium, which is found in many newer dynamic mics.

Instead, Audix uses a proprietary technology that includes a method for winding extremely close-tolerance coils. The company feels that this provides the high output of neodymium, but with superior feedback rejection (off-axis rejection is rated at >30 dB), less handling noise, and better long-term sonic quality. Frequency response is rated at 40 Hz to 20 kHz and maximum SPL at 144 dB. Audix Corporation; tel. (800) 966-8261 or (714) 588-8072; fax (714) 588-8172.

Circle #406 on Reader Service Card

(continued on p. 25)

World Radio History

2:00 a.m. The band just found the sound they've been looking for. Everyone's rockin'. Except you. **You're figuring out how to tell them the HIGH OUTPUT master you were using just "crapped out."**

Of course, you wouldn't be having this anxiety attack if you used new BASF 900 *maxima* High Output Mastering Tape. With 3 dB more output and 2 dB less noise than standard analogue mastering tapes, it is identical to the MOL and the signal–to–noise ratios of other high output masters. But it has the reel–to–reel reliability and consistency of BASF 911. Low rub off. Precision–manufactured. It's classic BASF. The kind of BASF tape studios have been relying on since 1934. As you turn to face the band (gulp), you make a vow. If you survive the next ten minutes, the first thing you'll do is contact BASF, 1–800–225–4350 (Fax:1–800–446–BASF); Canada 1–800–661–8273.

DEMAND IT.

BASF

© 1994 BASF Corporation Information Systems

World Radio History

Announcing a much

Encore's new user-defineable expressions palette lets you give your music the exact coloring you desire.

Not just another pretty face, our new Anastasia font is loaded with symbols and is easily the most powerful and flexible anywhere.

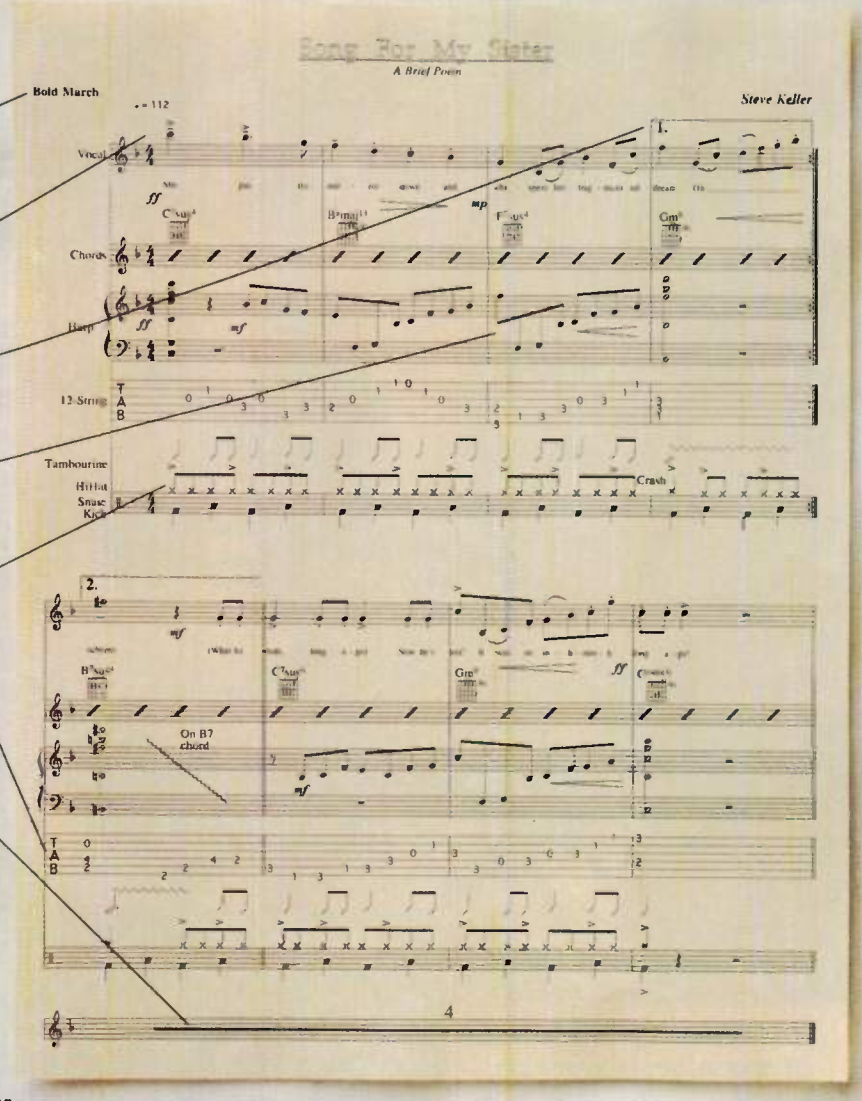
Playback of dynamics and repeats gives students a sound lesson in the nuances and subtleties of music.

Avant garde musicians take note. Encore now supports cross staff beaming.

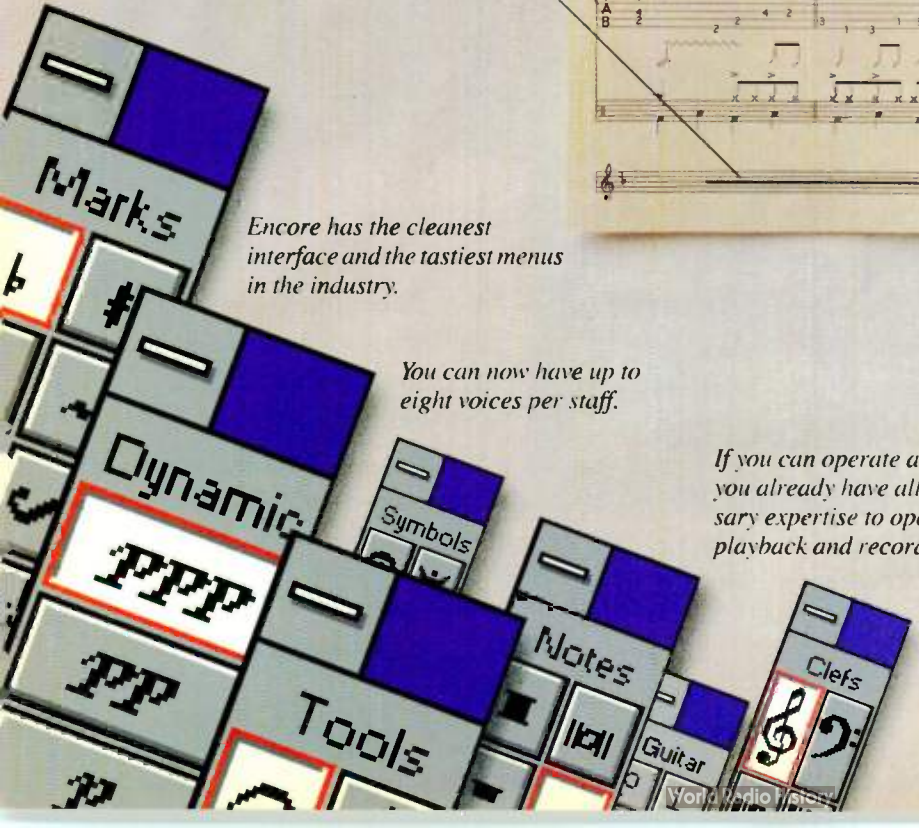
Talk about an unbeatable new feature. Our percussion staff is perfect for marching bands.

Here's something to please even the pickiest guitarist: Any music can be instantly turned into guitar tablature.

Finally there's a simple way to include compressed rests for groups playing from one piece of music.



With EPS support, you can now place your compositions into other applications.

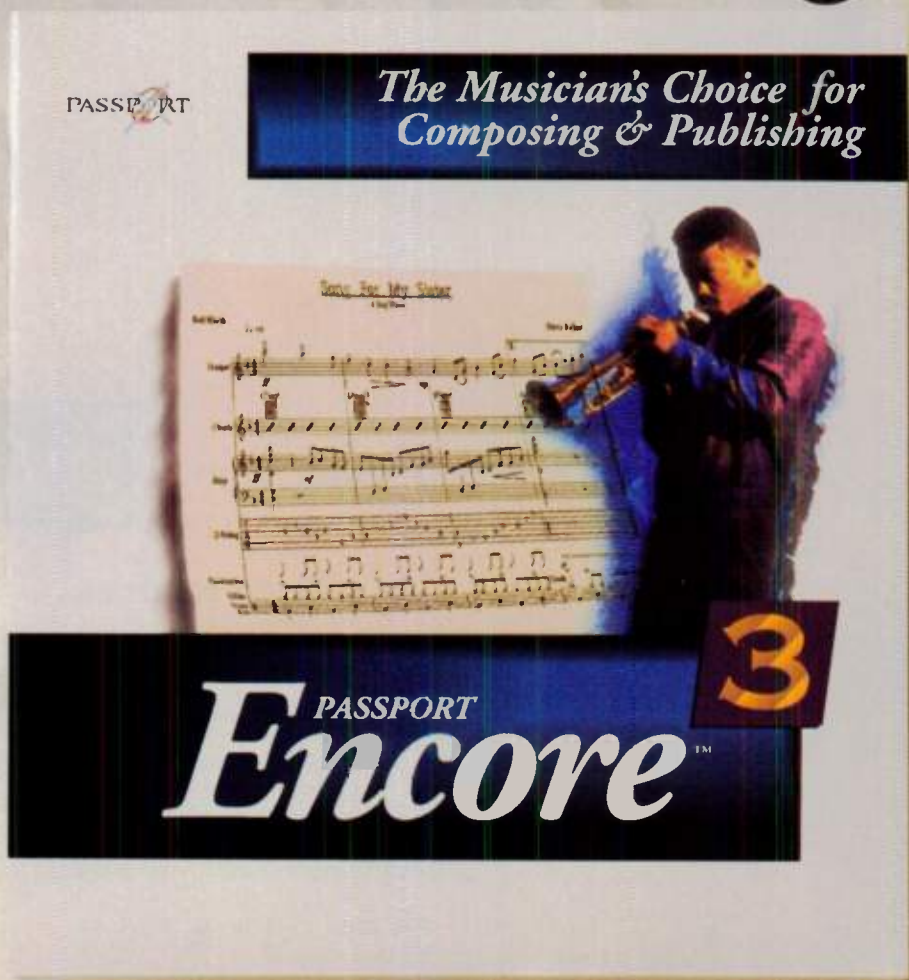


Encore has the cleanest interface and the tastiest menus in the industry.

You can now have up to eight voices per staff.

If you can operate a tapedeck, you already have all the necessary expertise to operate our playback and record.

better arrangement.



When you create music, the last thing you need is notation software that doesn't work in harmony with you.

Strange commands. Endless unappetizing menus and parameters. It's enough to wring the life out of any composition.

What you need is the *new Encore™ 3.0.* The only notation software that takes notes without any interruptions.

So you'll compose faster. And, as a result, finish your music sooner. It's so simple, you may never have to crack the binding of the manual.

The award-winning Encore also has a whole ensemble of noteworthy new features. Automatic guitar tablature right down to the fingering for any tuning. Apple MIDI Manager support. Playback of dynamics and repeats. Up to eight voices per staff.

Encore captures note for note anything you play on any MIDI instrument or sequencer, turning it instantly into beautiful sheet music on your computer screen.

We could go on and on. But compare notes yourself. Call 1-800-545-0775, Dept. P21 for a $9.95 demo disk for Macintosh or Windows.

Whether your music leans toward Bartok or barbershop quartets, Encore's not only a much better arrangement, it's easily the best notation software by any measure.

PASSPORT

1-800-545-0775

100 Stone Pine Road, Half Moon Bay, CA 94019 USA 415-726-0280
Fax 415-726-2254, Ask about competitive upgrades.
BeNeLux: 010/41 90 51, Canada: 1-416-785-3311,
Germany: 07946/776-8, Japan: 06/764-1191

© 1993 Passport Designs, Inc. Encore, Encore 3.0 and Anastasia are trademarks of Passport Designs, Inc. All other products and brands are trademarks or registered trademarks of their respective holders.

World Radio History

With the 286, they'll hear every
pant, whimper, moan, scream and sigh.
so keep it clean.
The dbx 286 microphone processor does things to your acoustic sound you thought only a professional with a rack full of gear was capable of doing. As a mic preamp, it gooses the subtle audio details so they grace your tracks. While the compressor, de-esser, spectral enhancer and expander/ gate work to help you create a recording so clean and tight that it would make any professional studio envious (ticked-off actually). Now if that's not enough to get your heart racing, try taking a peek at its extremely skimpy price tag.
dbx
286 MICROPHONE PROCESSOR
THE VOICE BOX'S VOICE BOX
A Harman International Company
© 1994 dbx Professional Products. 8760 South Sandy Parkway, Sandy UT 84107
Phone 801•568•7660 FAX 801•568•7662 International FAX 803•872•4246
World Radio History

▶ ROLAND JV-1080

Roland's JV-1080 Super JV synth module ($1,695) features 64-voice polyphony; 16-part multitimbral operation; and a 32-bit, RISC-based CPU. The synth comes with 8 MB of samples and accepts up to four SR-JV80 series, 8 MB wave-expansion boards (including the new World Expansion board), and a 2 MB wave card, for a total of up to 42 MB of wave memory.

The JV-1080 has ten Tone structures, an improvement over the six available in the JD-990. Ring modulator and Booster (gain) functions have been added to the synth's architecture.

An onboard effects processor provides reverb, chorus, and 40 insert effects, including rotary speaker, auto wah, time-controlled delay, and 2-voice pitch shifter. The phase shifter and distortion effects come from the JD-990. The reverbs and chorus are global, but can be disabled for each Part, while the insert effects can be applied per Part.

Aside from the Stereo Mix outputs, the unit has two pairs of stereo outputs that bypass the effects. A 40-character by 2-line LCD provides visual feedback.

Roland also unveiled the RV-70 Digital Stereo Reverb ($499), a 1U rack-mount, true stereo reverb processor. The device offers 199 preset programs, many of which are similar to those in the SRV-330. Several reverb parameters can be controlled both from the front panel and via MIDI Control Change messages, and additional parameters can be accessed via SysEx. An input level switch lets the unit operate at -10 or +4 dB.

Finally, Roland announced the DA-400 ($499), a 4-channel digital-to-analog converter for the S-760 sampler. With the OP-760-01 option board, the DA-400 expands the S-760 to eight analog outputs. The unit accepts coaxial or optical digital inputs. The conversion is 18-bit, with 8x oversampling. Sampling frequency is selected automatically (32, 44.1, or 48 kHz). The manufacturer rates the frequency response of the analog output at 20 Hz to 20 kHz, dynamic range >96 dB, and S/N ratio 110 dB. Roland Corporation US; tel. (213) 685-5141; fax (213) 722-0911.

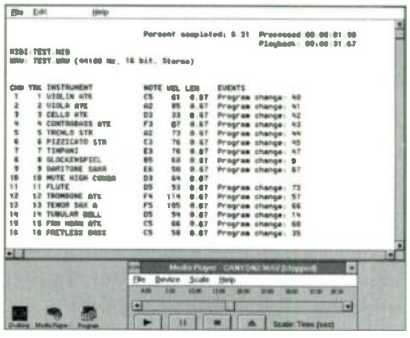
Circle #407 on Reader Service Card

▶ R/AUDIO PS-3010

R/Audio's PS-3010 ($129) is a 1U rack-mount, 2-channel compressor/limiter that is hand-built in Russia. The unit can operate in dual mono, or linked mode. The compression ratio is variable from 1:1 to 1:∞, with thresholds from +15 to -70 dB. The attack time increments from 0.2 to 20 ms and release time from 0.005 to 2 seconds. A side-chain input is provided (e.g., for signal-ducking), as are channel input and output gain knobs. A 5-LED ladder meters each channel. The frequency response is rated at 20 Hz to 20 kHz (±1 dB). R/Audio; tel. (800) 258-8550 or (304) 233-2223; fax (304) 233-2258.

Circle #408 on Reader Service Card

▶ DIACOUSTICS MIDI RENDERER



DiAcoustics' *MIDI Renderer* 1.1 ($129) is a software synthesizer and Standard MIDI File-to-WAV file converter that provides an alternative to sound cards' onboard synthesis. The program uses its own, CD-ROM-based sounds to render a Type 0 or Type 1 SMF into an 8- or 16-bit, mono or stereo WAV file, at selectable sampling rates between 1 and 100 kHz.

MIDI Renderer is 65,000-voice polyphonic. It responds on sixteen MIDI channels, but offers a unique form of 128-part multitimbral operation. DiAcoustics' Channel Instrument Interlacing Technology lets multiple instruments play simultaneously on the same channel by interlacing the instruments so that while one instrument is sustaining, another instrument can sound on the same channel. As long as they don't trigger at exactly the same moment (±400 µs), up to 128 instruments can be active per channel.

The program is packaged on CD-ROM and provides 128 GM-compatible instruments and a GM drum kit, for a total of over 200 MB of samples. You can create your own synth sounds via additive and FM synthesis. You also can build wave sequences using different attack, sustain, and release WAV files that are at different frequencies, sampling rates, and resolutions. *MIDI Renderer* is a sampler, too, creating 16-bit WAV files (44.1 kHz) up to ten seconds long. The ADSR-type amplitude EG offers up to 4,024 points.

The sounds respond to Velocity and MIDI Modulation, Pitch Bend, Channel Pressure, Sustain, Expression, Volume, and Pan messages. In addition to equal temperament, the program supports nine alternative tuning systems, including Pythagorean, mean tone, and quarter-comma mean tone.

Rendering time varies with system configuration. According to the manufacturer, an 80486DX-66 with 16 MB of RAM, a double-speed CD-ROM drive, and *Windows* 3.1 requires 23:18 to render a 6.064 MB, mono, 16-bit, 44 kHz file. Under DOS, the same file can be rendered in 18:23, saving five minutes.

MIDI Renderer runs under DOS 3.1, *Windows* 3.0, or *OS/2* 2.0. It requires 2 MB of RAM, 5 MB of hard-disk space, a sound card capable of WAV file playback, and a CD-ROM drive. A math coprocessor is recommended, but not required. DiAcoustics; tel. (205) 722-0490; fax (205) 722-0490.

Circle #409 on Reader Service Card

World Radio History

REV UP ▲ ▲ ▲ ▲ ▲

▲ PEAVEY

Peavey's DPM C8p (targeted at $1,599.99) is an updated version of the company's DPM C8 MIDI master keyboard. To reduce the controller's size and weight, the manufacturer used surface-mount technology to cut the size of the C8's main circuit board in half. The new unit comes in a portable package, instead of the original controller's attractive, but ponderous hardwood case.

The C8p offers the same weighted, 88-key keyboard and programming power as the C8, but the disk drive has been deleted and the control wheels relocated above the keyboard to reduce its length. Otherwise, the hardware remains the same.

The C8p also introduces Peavey's enhanced version 3.0 operating system (available as a retrofit for the C8), which adds a programmable global aftertouch curve, one-button mute/solo zones, footswitch-controlled mute/solo toggle, numeric entry of parameter values, and MSB Bank Select for compatibility with Roland products. Peavey Electronics; tel. (601) 483-5365; fax (601) 486-1278.

Circle #414 on Reader Service Card

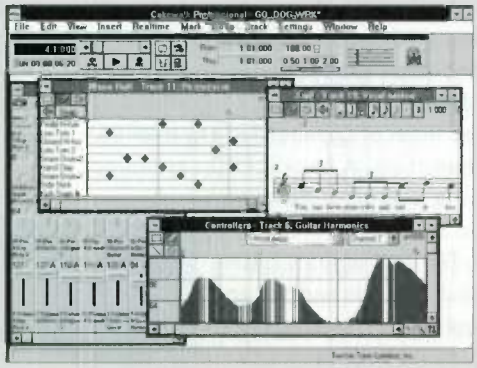
▶ TWELVE TONE SYSTEMS

Twelve Tone Systems is offering *Cakewalk Professional* 3.0 for *Windows* ($349; call Twelve Tone for upgrade info) and *Cakewalk for DOS* 5.0 ($99). *Cakewalk Pro* 3.0 adds Groove Quantize, letting you copy the rhythmic "feel" (timing and note Velocity values) between tracks. A modified Piano Roll view has been added for percussion editing, and MIDI Machine Control is now supported.

Lyrics can be included in printed notation and are automatically matched to existing notes in the selected track. You can indicate syllables that are sustained over more than one note. A separate, scrolling Lyrics view acts as an onstage teleprompter.

There are 96 independently assignable MIDI faders that can send any note or controller message. Faders can be ganged in various linkage modes, including Crossfade and Converge. The fader settings can be imported and exported between *Cakewalk* work files. The Fader view now fully supports the Mackie OTTO-1604 automation package.

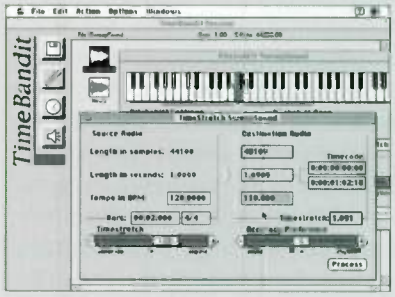
With version 5.0, *Cakewalk for DOS* adds support for SMPTE/MTC sync, Type 1 and 0 Standard MIDI Files, and the Cakewalk Application Language (CAL). Newly supported multiport interfaces include the Music Quest MXQ-32m and 2 Port/SE, Key Electronic Enterprises MS-124, and Mark of the Unicorn MIDI Time Piece. A macro recorder has been added, and the time base is variable from 48 to 480 ppqn. The program comes with *Cakewalk LIVE!*, a song file player that plays set lists of up to 128 sequence files each. Twelve Tone Systems; tel. (800) 234-1171 or (617) 926-2480; fax (617) 924-6657.



Circle #415 on Reader Service Card

▼ STEINBERG

Steinberg is shipping version 1.5 of *TimeBandit* ($399; updates free), a native Power Macintosh application for offline time and pitch correction of *Sound Designer I/II* and AIFF sound files. The program has a smart installer that automatically determines whether your CPU is a Power Mac or 680X0 and installs the appropriate code. The new version adds AIFF support, generates multisamples from a single sample in one process, and saves pitch and harmony settings to disk. A new Link-A-Magic feature lets you load a sound file into any sample editor by double-clicking on the file in *TimeBandit*'s Session window.



Steinberg has also introduced *Cubase Score* 2.0 for Power Mac ($549), which also uses a smart installer. Steinberg/Jones; tel. (818) 993-4091; fax (818) 701-7452.

Circle #416 on Reader Service Card

World Radio History

Imagine Getting Slammed In The Chest With A Sledgehammer.

Now that you know what kind of low end these amps have, let's talk about why. Crown amplifiers are engineered with a damping factor in excess of 1000 (10 Hz to 200 Hz) while most amps are lucky to manage 50 to 100 over the same frequency range. The result of this high damping factor is incredible speaker control for some of the tightest, bone-rattling bass you've ever felt.

Low end isn't the only reason to love these amps. Listen to the other end of the spectrum and you'll hear highs that are crystal clear, revealing every nuance of your music. In other words, sonic purity, with no coloration—as heard only through a Crown.

No other amplifier is as faithful to live and recorded sound as Crown. That's why we're found in the racks of the largest tours and the hottest recording studios worldwide. But don't take our word for it. Compare the sound of a Crown amp head-to-head with the competition and hear it for yourself.

For complete information on Crown amplifiers, including a free copy of our informative brochure *Amplifier Specifications—Facts & Fiction*, see your Crown Dealer or call us toll-free at 1-800-342-6939 ext. 18.

crown
Guaranteed Excellence

P.O. Box 1000 • Elkhart, IN 46515 • (219) 294-8000 • Fax (219) 294-8329

World Radio History

PRO FILE

Loop The Loop

Sampled drums ignite the Lightning Seeds.

By Michael Molenda

How does a band sound like a band when it's not a band? No, this isn't a lost Gertrude Stein poem. It's the problem that Liverpool-based producer Ian Broudie faced during the recording of *Jollification,* the new album from his personal music project, the Lightning Seeds.

Broudie, who made a name for himself producing other acts (most notably Echo & the Bunnymen, Alison Moyet, and The Fall), developed the Lightning Seeds as a vehicle for his own songs—and voice. Working with collaborator and co-producer Simon Rogers, Broudie strives to generate "the slice of atmosphere" that characterizes great records.

"Unfortunately, it's difficult to make the kind of record I want without a band," says Broudie. "Because I'm a working producer, I haven't had the luxury of being in a real group. It's frustrating when I produce my own records, because many of my favorite LPs were made by people who jam a lot. The feel of a tight band that plays together all the time creates the vibe that contributes to a great record."

Of course, there *are* ways of making records if you don't have a band. But the obvious alternatives, such as MIDI production and hiring session musicians, don't fly with Broudie.

"I'm really not into sequencing," he admits. "It's a very boring process, and I've found that sequenced records always lack a little excitement in the end. I'm also wary of using session musicians, because it's difficult to achieve spontaneity."

So Broudie decided to create his own "band vibe" by writing songs to sampled drum loops. The loops were lifted from commercial sample CDs and OPR (Other People's Records). Broudie worked out ideas by strumming an acoustic guitar and humming the melody line while Rogers constructed and played different drum loops for him. When a rough version of a song was hammered out, Rogers sampled Broudie playing it into an Akai S1100. The duo then experimented with arrangements by cutting and pasting musical phrases together.

"Obviously, I'm not the first artist to use loops," says Broudie. "Rap artists build songs with them, and people are always using samples as gimmicks. But I think it's rather unique to use loops to develop the atmosphere of a song. For me, the process really saved the record, because I enjoyed the haphazardness of trying to marry 'feels' to songs; it was just like working with a band."

Broudie's affinity for "vibe" extended to the recording of his vocal tracks. On *Jollification,* he decided against uppity condenser and tube mics, because an inexpensive dynamic mic—the Electro-Voice PL20—happened to sound just fine.

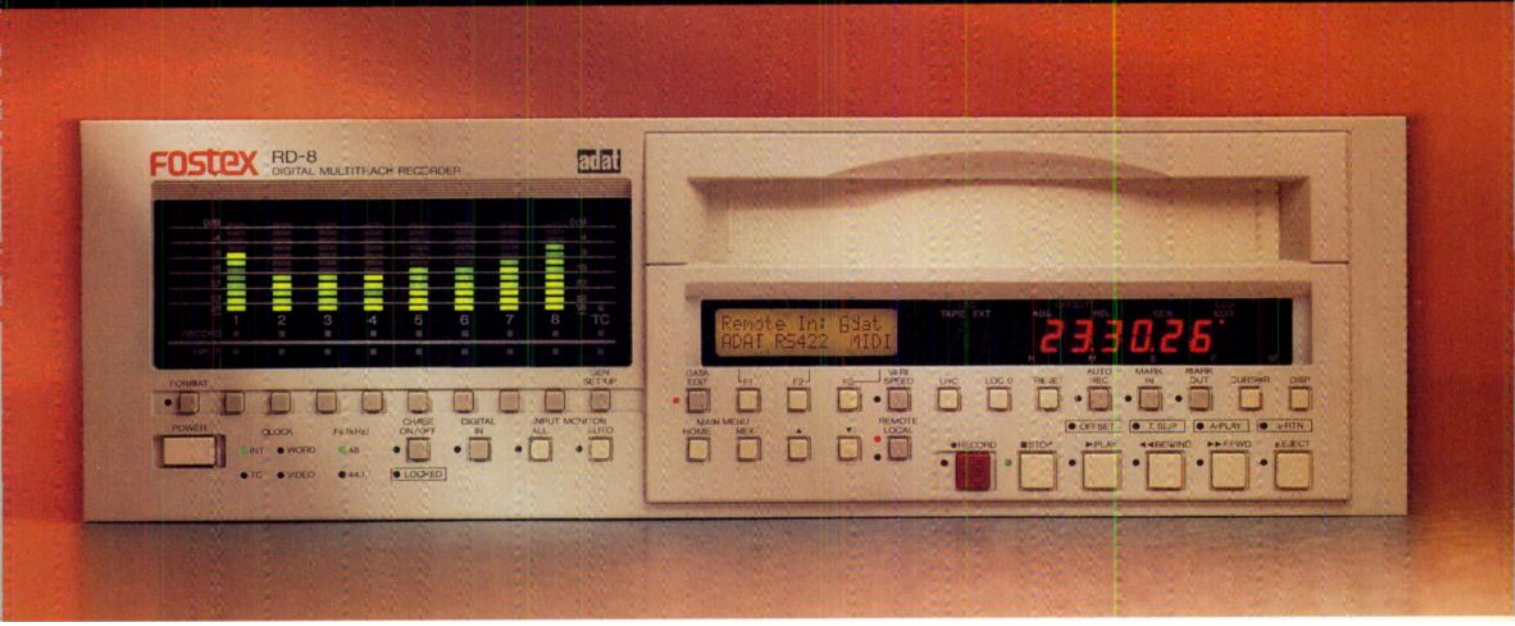
"I was doing a lot of radio interviews," explains Broudie, "and I really loved the sound of my voice through the headphones. The mic the stations used was the PL20. It's really a cheap mic that is typically used to record kick drums.

"But, you know, you do whatever it takes to make a great record," he continues. "I try not to worry about technical issues because they can be a real trap. I don't think it really matters whether you record on digital or analog, or whether you use certain pieces of gear. In the end, it's how the songs hit you that matters. And believe me, there's plenty to worry about when making a record without getting obsessed with technical things."

Ian Broudie, second from left, and the Lightning Seeds touring ensemble.

World Radio History

The RD-8. Now Performing At A Project Studio Near You.



Audio for Video Projects

Chris Taylor–Crossroads Studios

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

Post Production Projects

Brando Triantafillou–Editel, Chicago

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

MIDI Projects

Frank Becker–Frank Becker Music

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

Location Projects

Paul Freeman–Audio by the Bay

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

Composing Projects

Christopher Hoag–Composer

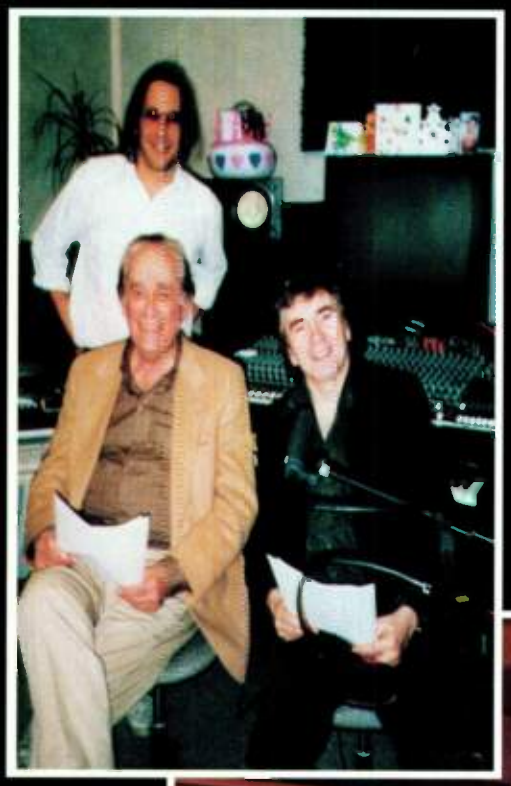
Personally, I believe the Fostex RD-8 is intelligently laid out, easy to use and, more importantly, it sounds good.

The RD-8 Digital Multitrack Recorder

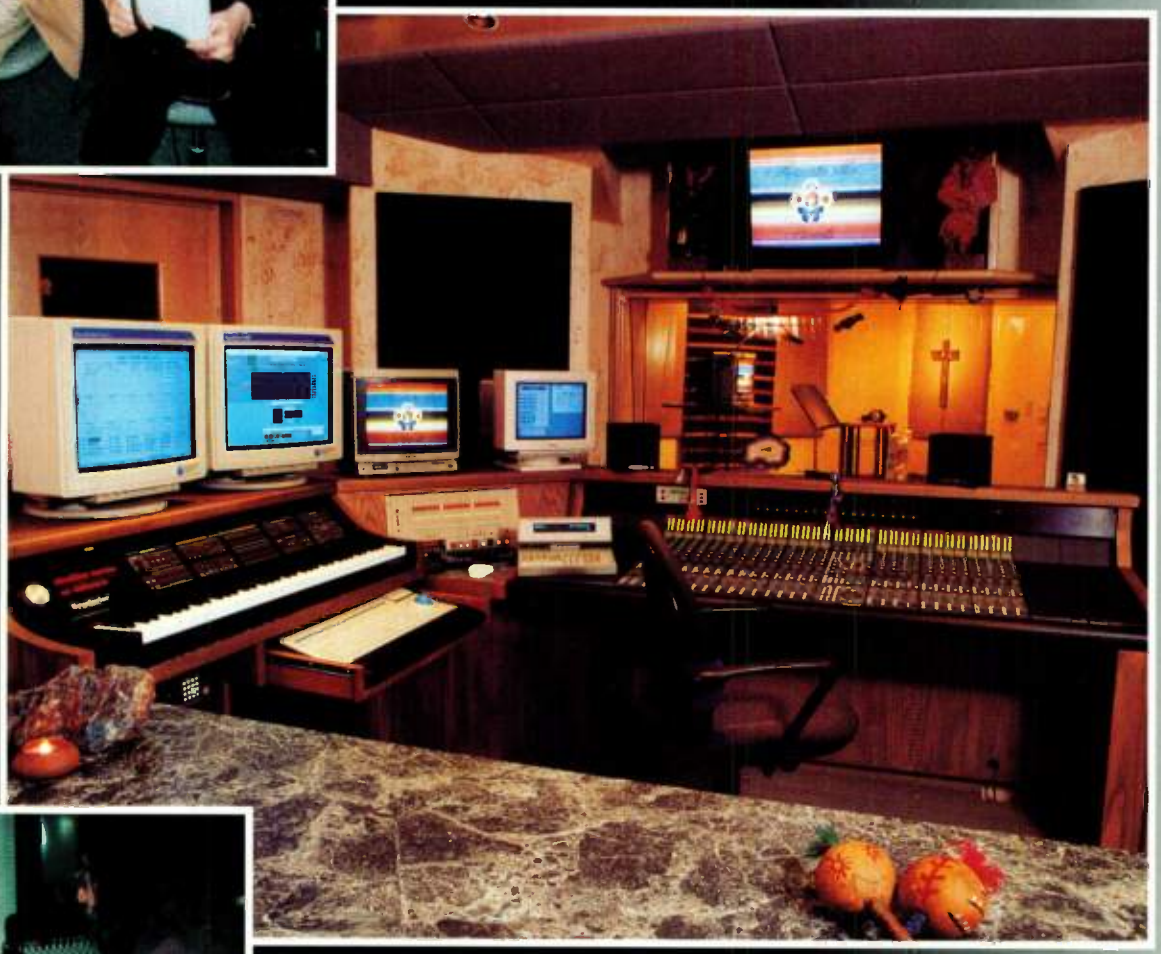
Whether you're working on the next hit movie soundtrack or the next hit, the RD-8 is right at home. Save key settings and locate points in the Table of Contents. Then, when you re-load your tape—into any RD-8—you can begin working right away. And if you're using MIDI, no other MDM gives you the breadth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

FOSTEX

World Radio History



Eric Garcia saves ad execs from a lengthy stay in the big (post-production) house.



World Radio History

creative space

by Michael Molenda

Many musicians split audio production into two camps: making records and doing other stuff. The "other stuff" usually has nothing to do with securing a record contract, so fields such as audio post-production are often invisible worlds to those struggling to climb the *Billboard* charts. Sometimes, however, musicians fall into post gigs, and their musical skills lead them to success in a field previously unknown to them.

Take Eric Garcia. Garcia traveled the well-worn path of the recording artist until fate dropped him into a video post-production house. Before long, he had introduced sampling, MIDI sequencing, and digital audio editing to his company's productions for advertising jingles and underscores. He also found ways to rescue butchered location audio and systematically prepare tracks for final mixing sessions at expensive post-production studios such as Margarita Mix (shown opposite page).

World Radio History

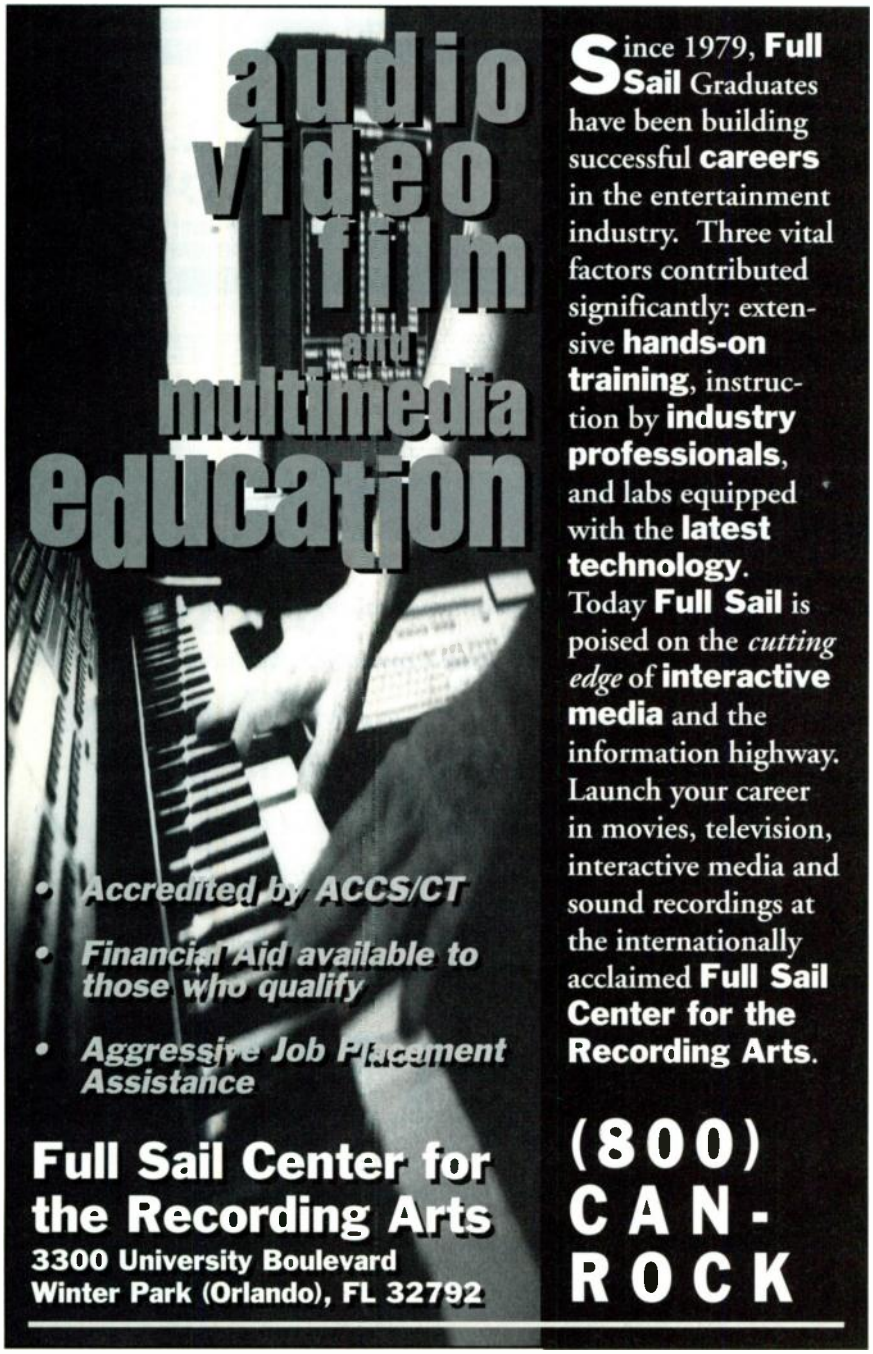
for every market, the recording costs and session musician fees would skyrocket. It is more cost effective to record a full 60-second score and let the individual ad agencies cut the music to fit. An agency usually requests a basic arrangement, stipulating any lyrics that must be included in the final version, and expects the post-production house to stick as close to the plan as possible.

"Cutting all the different versions is like pulling teeth sometimes," says Garcia. "I get the score on a DAT, and half the time I'm struggling to pull elements together to make smooth transitions. If I were brought into a project earlier, I'd request an ADAT master with the complete stereo mix *and* several elements recorded onto separate tracks. A digital multitrack master readily provides me with tracks from the original session—say, a guitar solo or voice—that could be used as musical transitions. This is an ideal situation, but I rarely get it. The composers who give it to me, however, really save my life."

Of course, not every post-production problem is a musical one. In fact, the biggest cost-cutting benefit Garcia's room has provided is the organization of sync lines and edit lists. Although time code is available on the videotape master, the audio elements of many commercials are still synched to picture with "two-pops," which are audible beeps placed two seconds before the commercial starts. The final mix of a commercial involves collecting all the audio elements and lining up the two-pops so that the audio events align with the proper time-code cues on the video master. It's often a time-consuming process that eats up substantial mix time at expensive post-production facilities.

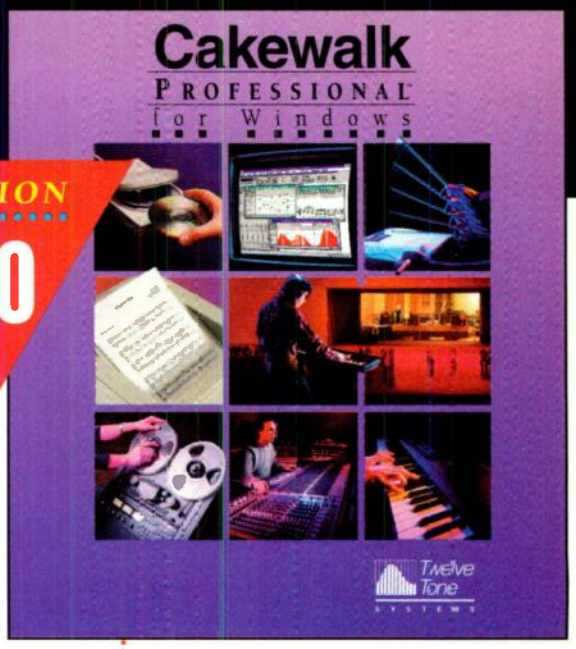
"The audio tracks for a commercial were often delivered to us on ¼-inch master tapes," explains Garcia. "One would have the location dialog, another the music track, and another might have sound effects. Now, to put the final audio track together, we'd have to line up the ¼-inch masters with the time-code events on ¾-inch video. The dialog starts at this time, the door slams at this time, and so on. So we're doing all this searching and cueing at Margarita Mix at a cost of approximately $500 per hour, and it was taking between five and six hours to mix a 30-second commercial. I thought if I could just make a list of all the time-code numbers, then combine all the ¼-inch masters onto a single DAT and recut the two-pops to match the cues, we'd save an hour in the studio. Everything would be on one tape, all ready to line up with the time-code events on video."

Garcia's preparations cut Margarita Mix's billing to his clients down by one-third. Because he "premixes" the audio onto a single DAT, the editor at Margarita Mix simply loads the data into a digital-audio workstation. Usually, the process of loading in the music, voice-over, and sound effects and lining up the two-pops takes ten minutes. Once everything is loaded in, the editor simply pushes up the faders and starts mixing. And believe it or not, Margarita Mix is happy about the swifter sessions.



World Radio History

PLAY HARD.



WORK EASY.

Tired of music software that's hard to work with? Spending more time making tech support calls than you are making music?

Then bring in the Professional.

Cakewalk Professional remains the leading MIDI sequencer for Windows today. It's powerful, fast, stable, and yes — extremely usable.

And while other music software companies scramble to release something on the Windows platform, Twelve Tone Systems is now shipping the third major release of its award-winning sequencer.

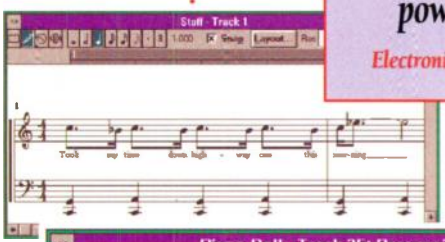
Here are some of the new 3.0 features:

BANG ON THIS

So what *else* is new in 3.0? Plenty.

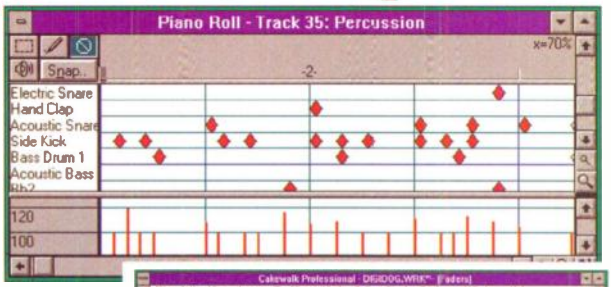
- Percussion Editing
- MIDI Machine Control
- Enhanced Swing Quantizing
- Printing Up to 24 Staves per Page
- Expanded Instrument Definitions
- Bank Select
- Way More

> *"Simply put, it's a professional powerhouse."*
> Electronic Musician, 3/94



GRAB A GROOVE

The new Groove Quantize option lets you "steal the feel" of one track, and use it to quantize another. Cakewalk's own groove format supports note start-times, durations and velocities. Also works with DNA Grooves.

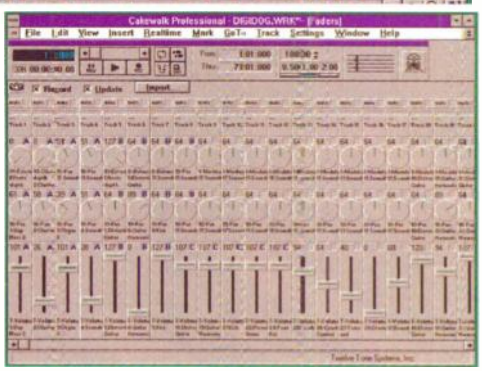


WHAT'S THE WORD

Add lyrics directly into the Staff view, and print in your notation. For on-stage performances, use the Lyrics view to see scrolling lyrics or stage cues in large fonts.

MASTER MIXES

Mix volume, pan and other controllers using 96 assignable faders and 32 Note On buttons. Create fader groups for automated cross-fades and mix-downs. And the Faders view now fully supports the Mackie OTTO 1604 MIDI automation package.



GENERAL MIDI

MPC Multimedia PC

OTHER PROFESSIONAL FEATURES:

256 tracks; rock-solid SMPTE/MTC sync; custom programming language with macro recorder; MIDI remote control; system exclusive librarian and event filters, to name a few.

And with support for MCI commands and digital audio wave files, Cakewalk Professional can be the engine that drives your next multimedia project.

So play all day. Play all night. And let Cakewalk Professional do the hard work for you.

NOW PLAYING EVERYWHERE

Cakewalk Professional 3.0 is just $349, and is available at finer music and computer stores everywhere. For more information, or to order the Cakewalk Professional Demo Pack for just $5, call:

800-234-1171 OR 617-926-2480.

Call today and get a free copy of Twelve Tone Systems' customer newsletter, *QuarterTone*, while supplies last.

Twelve Tone SYSTEMS

P.O. Box 760, Watertown, MA 02272

Cakewalk, Cakewalk Home Studio, Cakewalk Professional and Twelve Tone Systems are trademarks of Twelve Tone Systems Inc. Other products mentioned are trademarks of their respective manufacturers

World Radio History

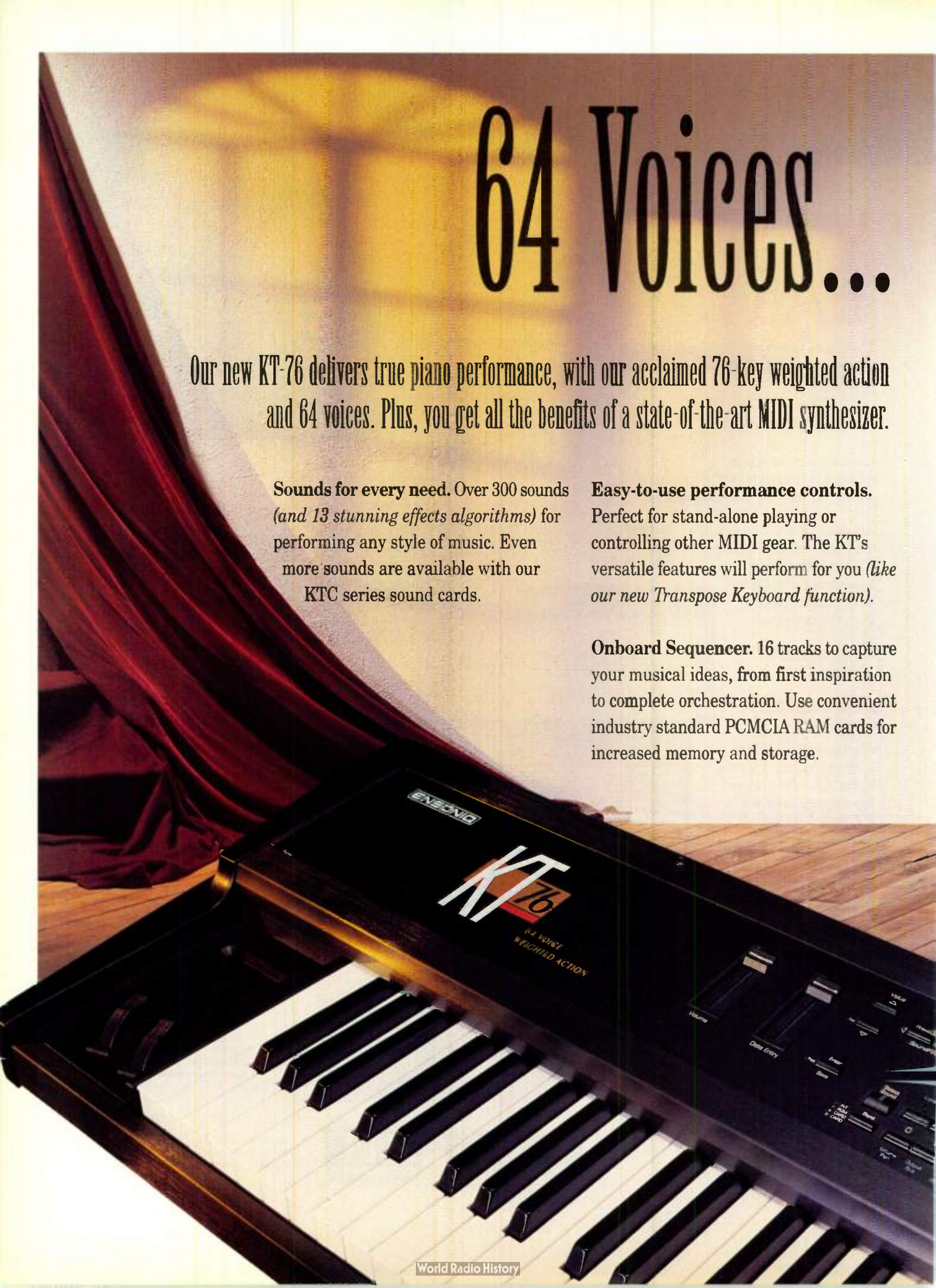
64 Voices...

Our new KT-76 delivers true piano performance, with our acclaimed 76-key weighted action and 64 voices. Plus, you get all the benefits of a state-of-the-art MIDI synthesizer.

Sounds for every need. Over 300 sounds *(and 13 stunning effects algorithms)* for performing any style of music. Even more sounds are available with our KTC series sound cards.

Easy-to-use performance controls. Perfect for stand-alone playing or controlling other MIDI gear. The KT's versatile features will perform for you *(like our new Transpose Keyboard function).*

Onboard Sequencer. 16 tracks to capture your musical ideas, from first inspiration to complete orchestration. Use convenient industry standard PCMCIA RAM cards for increased memory and storage.



World Radio History

Grand Performance

General MIDI Compatibility.
No-compromise GM sounds make the KT-76 the best sound source for General MIDI playback.

The KT-76 is the only keyboard with 64-voices, great sounds, sequencing, and true piano feel. Visit your Authorized ENSONIQ Dealer to experience its grand performance.

KT-76

For more information, call 800 553 5151. Or, call 800 257 1439 to try our new automatic fax system.

ENSONIQ™
LEADING THE WORLD IN SOUND INNOVATION

☐ ***Yes, show me something grand!*** Please send me more on the KT-76.

Please send me *free* information on:

☐ TS Series ☐ ASR-10
☐ SQ Series ☐ KS-32 ☐ DP/4

Name _____
Address _____
City _____
State _____ *Zip* _____
Phone (___) _____

Mail to: ENSONIQ Corp, Dept. E-47
155 Great Valley Parkway, P.O. Box 3035
Malvern, Pennsylvania 19355-0735

© 1994 ENSONIQ Corp

World Radio History

REACH FOR IT!

An incredible performance keyboard controller is out there for you.

The world is full of wonderful sounds, and you can put them at your fingertips with the Fatar Studio Series MIDI keyboard controllers! Since feel is such an important consideration when purchasing a keyboard controller, Fatar, the world's largest keyboard manufacturer, has designed their latest models with a remarkable touch of the keys that mimics the feel of the best synthesizers right through to the authentic feel of a traditional acoustic piano.

Fatar has a full range of keyboards that have a multitude of playing features for every musician from the beginner to the pro, to the multi-media computer user, **starting at only $199.95**. The synth actions are light and responsive without a hint of sponginess. The hammer-actions on the 88-note controllers are rated the best in the business.

Fatar's natural dynamics are due to response curves that have been refined with the help of some of today's top leading players. The possibilities are limitless. So reach for a Fatar Studio controller at your nearest music store and witness the alternative way of control. ***Play it! Enjoy it! Feel the music!***

FATAR®
MIDI CONTROLLERS

Exclusively Distributed in the U.S.A. by
MUSIC INDUSTRIES CORP.
99 Tulip Avenue, Floral Park, NY 11001 • (516) 352-4110 • FAX: (516) 352-0754

World Radio History

creative space

"Margarita Mix actually makes more money if they can run more sessions through the studio each day," says Garcia. "If we cut down the amount of time we spend in there, they might be able to schedule an additional session that day. It's a win/win situation. My clients are happy because they're spending less, and Margarita Mix is happy because they can maximize their studio time."

POST PSYCHOLOGY

Studio-savvy musicians are well aware that exquisite facilities are available for less than $200 per hour and that many of the records music lovers buy are cut in studios that charge half that fee. So what's the deal with these mix rooms in post-production houses that charge upwards of $500 per hour?

"Musicians have to understand that the second you step into the post world, everything changes," says Garcia. "A lot of it has to do with psychology. The mix house is the last place clients can see their commercial looking and sounding great. After that, you only see it on television. At Margarita Mix, the ad executives can sit in this beautiful, fancy environment that screams 'success' with staffers serving them margaritas and chips and hear their commercial on these huge speakers. Although Margarita Mix has the best mixers in town, the post-production scene is very much a service thing."

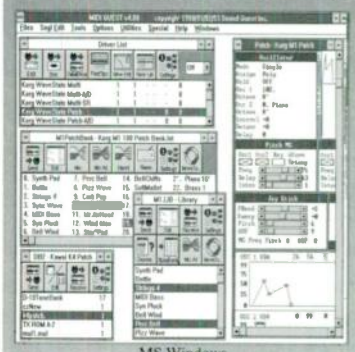
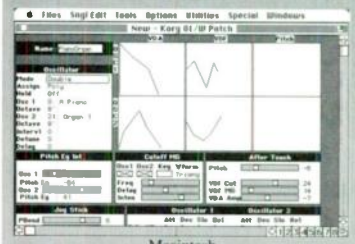
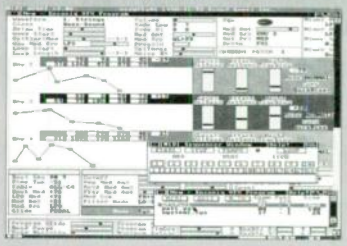
POST TOASTIES

Garcia's skills and ambition have rewarded him with a back-breaking schedule. In addition to his audio post-production work, he still edits videos, along with developing multimedia press kits, producing musical groups, and recording his own work. It's not uncommon for Garcia to log fourteen hour days, seven days a week, for a month at a time. ("In a best-case scenario, I sleep on the weekends," he quips.) But the total work hours are not the most brutal time factor in the post world. The swift deadlines of each project are far more deadly to the spirit.

"I was used to album sessions, where it's not uncommon to spend three months working on a project," says Garcia. "In the post world, a session typically lasts no more than three *hours*. When I do commercial scores, I schedule my musicians in one hour intervals, and we slam things down in one or two takes. And sometimes a client has a mix session scheduled in an hour and needs an audio problem fixed—some noise diminished or whatever—before they get to the studio. I can be sitting around twiddling my thumbs, and the next second it's insanity. This is a great,

GARCIA'S POST HOLE

Mixing Console	Mackie 32•8
Recording Gear	Alesis ADAT (3), Digidesign Pro Tools (8-channel system) with JLCooper CS-10 hardware interface, Fostex E-2 (¼-inch) with center-track time code, Fostex RD-8, JVC CR 850U ¾-inch video deck, Panasonic SV-3700 DAT recorder, Stephens 2-inch, 16-track analog recorder
Monitor Speakers	Auratone cubes, Snell J777, Yamaha NS10M
Microphones	AKG D112, Milab LC-25, Neumann TLM 193, Shure SM57 (3), Sony 37-P
Signal Processors	Aphex Expressor (2), Alesis 3630 stereo compressor, Alesis QuadraVerb Plus, Demeter VTCL-2 stereo tube compressor, Klark-Teknik DN 514 quad noise gate, Neve stereo mic preamp, Roland SRV-3000, Sony MU E-041 parametric EQ (2), Yamaha SPX500, Yamaha SPX900, Zoom 9010 (2)
Sound Modules	Alesis D4, Akai S1100, E-mu Proteus/1, E-mu Proteus/2, Ensoniq EPS-16+, Korg Wavestation A/D
Computers and Software	Macintosh Quadra 950 (24 MB RAM/CD-ROM), 2 GB external hard drive, Opcode *Studio Vision Pro*, Digidesign *DINR*, usWaves *Q-10*
Synchronization	Alesis AI-1 sample rate convertor, Alesis AI-2 machine control, Opcode Studio 4, TimeLine MicroLynx
Sampling/Editing	Digidesign *SampleCell II* and *Sound Designer II*

MIDI QUEST V4.0
Universal Editor/Librarian
MS Windows 3.1 MAC AMIGA ATARI ST PC DOS

MS Windows

Macintosh

PC/XT/AT/C1 ATARI ST AMIGA
THE LATEST
▾ Store, Organize and Create sounds with the latest technology
▾ Now supporting 200 instruments including
Korg: X-3, 05R/W, i-2, i-3, 01/W, 03R/W
Emu: MPS, MPS+, Vintage Keys
Emu: Procussion, Sound Engine
Roland: JD-990, JV-90, JV-50, JV-35, R-70
Yamaha: SY85, TG500, TG100
Ensoniq: TS-10, TS-12
Peavey: DMP3, DPM3SE, DMP V3
Kawai: GMega, K11
▾ MIDI QUEST for Windows: $319
▾ MIDI QUEST: $299 (PC DOS, MAC, AMIGA, ATARI)
▾ MIDI QUESTJr Universal Librarian: $99
▾ SOLO QUEST Individual Editor/Libs: $129
INSTRUMENTS!
Call/write for our complete list of Instruments
Sound Quest Inc.
131 W. 13th Ave. Ste. 2 Vancouver V5Y 1V8 Canada
Phone: (800) 667-3998(US) / (604) 874-9499
Fax & BBS: (604) 874-8971

World Radio History

NEW! **Version 6 for Windows is here.**
Automatic Accompaniment has arrived!

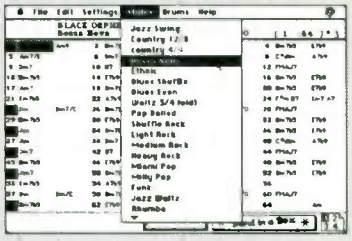
NEW! UPGRADE TODAY!

BAND-IN-A-BOX™

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

Type in the chords to any song, using standard chord symbols like C or Fm7b5, 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.



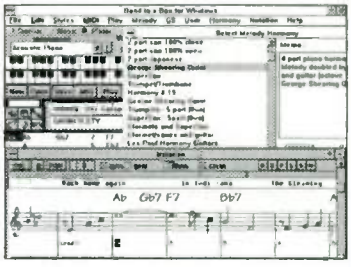
100 styles included with PRO Version. *Jazz Swing • Bossa • Country • Ethnic Blues Shuffle • Blues Straight Waltz • Pop Ballad • Reggae • Shuffle Rock • Light Rock Medium Rock • Heavy Rock • Miami Sound • Milly Pop • Funk • Jazz Waltz • Rhumba • Cha Cha Bouncy 12/8 • Irish Pop Ballad 12/8 • Country (triplet) • AND 75 MORE!*

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

Built-in StyleMaker™. *You can create your own 5 instrument styles using the StyleMaker section of the program.*

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

NEW! Additional features in Windows version 6.0



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

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

AUTOMATIC HARMONIZATION. You can select from over 100 harmonies to harmonize the melody track, or harmonize what you play along in real time. Play along in "SuperSax" harmony, or harmonize the melody with "Shearing Quintet". Create your own harmonies or edit our harmonies.

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

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

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

"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

– FINALIST –
PC Magazine Award
for Technical Excellence

After Hours/Entertainment
Band-in-a-Box
PG Music

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 (IBM/Mac/Atari)
Band-in-a-Box PRO ***$88***
(BONUS! IBM version now includes both Windows & DOS version for the same price!)

ADD-ONS
Styles Disk #4 ..... ***$29***
Styles Disk #5 ..... ***$29***
MIDI-FakeBook (100 songs on disk) ***$29***
SUPER PAK (Pro version + all 3 add-ons) ***$147***

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

"Complete" Upgrade PAK to version 6.0 for Windows ***$69***
In addition to the regular upgrade PAK, this includes the 100 styles in the PRO version, and Styles Disk #4. Order this if you have an older version of Band-in-a-Box or a "bundled version", or are crossgrading from the MAC or ATARI version.

HELP! *I Forgot to send in the Registration Card, but I want to upgrade now!!*
No problem. Since the upgrade checks for any previous version of Band-in-a-Box, you can order the upgrade even if you forgot to register!

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

From PG Music... *Makers of The Jazz Guitarist, 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
E-MAIL ORDERS: Internet:75300.2750@compuserve.com

World Radio History

Hot new software programs created by PG Music!

NEW! PowerTracks Pro Version 2.2 · The Pianist Volume 2 · New Orleans Pianist · Ragtime Pianist · Dare to Compare Audio CD

THE PIANIST SERIES

WINDOWS • MAC • ATARI • DISKLAVIER • SOUND BRUSH

Each program contains a huge library of piano music performed by world class pianists, PLUS memos, trivia questions, biographies, Guess the Song games & more. These programs are ideal for learning to play piano, or for listening to as background music while you work in other programs. The Windows versions also display and print standard music notation & chord symbols for the pieces. They are all available for WINDOWS, MAC & ATARI, & are also available in Yamaha Disklavier & Roland SoundBrush format.

THE PIANIST... OVER 200 OF THE WORLD'S MOST POPULAR CLASSICAL PIANO PIECES, PERFORMED BY WORLD CLASS CONCERT PIANISTS! $49

Moonlight Sonata, Sonata Pathétique, Minute Waltz, Claire de lune, Mephisto Waltz, Hungarian Rhapsody, Fantasie Impromptu, Military Polonaise... & over 200 more!!!

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

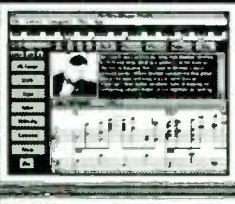
***OUR CUSTOMERS LOVE THE PIANIST...** "Incredible... amazing... terrific... masterful... fabulous... love it... my favorite program!"*

NEW! The Pianist Volume 2

Volume II upgrade - $49 (requires The Pianist) • first time purchase: Volume 1 & 2 - $98

Turn your Pianist into a "SUPER PIANIST" with Volume 2!! We've recorded 200 more fabulous pieces for Volume 2. There are new program notes, new biographies and improved listings. If you thought the quality of the performances was great in the original Pianist program, just wait until you hear these new world-class, live piano recordings – you'll have endless hours of listening pleasure!

The New Orleans Pianist™ $49



Over 65 New Orleans Style piano music standards, played on MIDI keyboard by top New Orleans pianists Henry Butler, Jon Cleary, Tom McDermott, Joel Simpson & David Torkanowsky playing a wide variety of New Orleans, R & B, Blues & Ragtime piano music.

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

The Jazz Pianist $49

from PG Music Inc.

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

Top jazz/studio pianists play 60 jazz standards in a wide variety of styles.

Hear the music with CD-quality through your sound card or MIDI system. Most pieces have bass/drums as well as piano so you get a full sounding jazz trio for the tunes! Jazz Trivia Game & Guess That Song Game, Program Notes, Biographies & Music Dictionary (all on disk).

The Ragtime Pianist™ $49

Over 90 ragtime & early jazz piano standards, played on MIDI keyboard by top Ragtime Pianists... and featuring world-renowned Ragtime performer JOHN ARPIN!

Hear virtuoso performances of every Joplin rag in this program, as well as many other rags, CakeWalks, waltzes & other Ragtime Era tunes by Eubie Blake, Joseph Lamb, Daniels and, of course, Scott Joplin. HEAR... The Entertainer, Maple Leaf Rag, Chevy Chase, Easy Winners, Elite Syncopations, Fig Leaf Rag, Pineapple Rag, etc. (total of 34 Scott Joplin Rags), Indiana, Meet Me In St. Louis, St. Louis Blues, Bill Bailey, For Me and My Gal, & more...

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

A music program containing a huge collection of over 60 jazz standards, played on MIDI guitar by top jazz/studio guitarist Oliver Gannon

the Jazz guitarist from PG Music Inc.

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!

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!

Version 2.2 **PowerTracks Pro™ $29**

SEQUENCER/NOTATION/PRINTING FOR WINDOWS (IBM)

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

PowerTracks Pro 2.2 is a professional full featured MIDI sequencing, notation and printing program and is so easy to use. And we include versions for Windows 3.1 AND DOS, so you'll be able to use PowerTracks PRO on all of your machines!

PRO RECORDING, PLAYBACK, SYNCH, EDIT & SYS-EX OPTIONS
48 tracks, real-time/punch record, sound-on-sound, MIDI file support, sync (SMPTE, Midi Time Code, MIDI clock), 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/minimum rests option / "Jazz Eighth notes" option (this automatically allows jazz swing eighth notes & triplets to be notated properly!!). Reads in any MIDI File & displays it as notation!!

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

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

BUT POWERTRACKS GOES MUCH FURTHER... WITH EXCITING EXCLUSIVE FEATURES!
✔Enter/print out chord symbols in notation ✔Automatic drum tracks (100 drum styles included) ✔Reads in chord symbols from Band-in-a-Box 6.0 MIDI files ✔Patch caching for Gravis Ultrasound ✔Comprehensive support for guitar (on-screen guitar tab printout) ✔Built-in Roland SoundCanvas editor ✔On-screen piano & guitar show notes as they're played ✔Pro MIDI files included

***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 2.2 FOR ONLY $10

"Dare to Compare" audio CD (or cassette) $15

Tired of reading hype about sound cards? We've recorded the 30 top sound cards & General MIDI modules on an audio CD (or cassette).

Forget all the hype and have a listen to the cards yourself – you'll know right away which one is for you. INCLUDES: Roland, Turtle Beach, SoundBlaster, EMU, Kurzweil, Yamaha, Korg, Kawai & many more. (This is a regular CD for your home stereo CD player, no computer required. Also available on cassette.)

Other products...

Multi MPU401 Driver for Windows $19
Windows driver that allows 10 programs to use the MPU401 at the same time.

SC-PRO Editor for Windows $29
mixing/editing of every feature of the Sound Canvas and other Roland GS cards/modules.

Roland Sound Canvas module (SC50) $499
Newest, best sounding Sound Canvas ever (includes PowerTracks and SC-PRO Free).

Roland SCC1 card $349
Sound Canvas and MPU401 on a card for IBM (includes PowerTracks and SC-PRO Free).

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*

☎ PHONE ORDERS:

1-800-268-6272 or 905-528-2368

VISA/MC/AMEX/cheque/mo/po# Fax 905-628-2541 Recorded Demo 905-528-2180
Add $5.00 Shipping/Handling per order ($10 outside USA/Canada)
OPEN LATE NITE: 9 am - Midnight EST
e-mail address – Internet: 75300.2750@Compuserve.Com

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

30 DAY UNCONDITIONAL MONEY BACK GUARANTEE ON ALL PRODUCTS

World Radio History

All Manufacturing In Our Plant!
EUROPADISK, LTD.
• Compact Discs
Deal Direct with the Plant! - Best Price, Best Service!
• Cassettes
Finest European Equipment!
• Vinyl Records
Direct Metal Mastering - HOT!
• Graphics
Custom Layout & Printing Included In Our Packages!
• Mastering Studios - DMM®
Major Label Mastering with Neve DTC & Sony Editing
SPECIALS -"With This Ad Only"
500 - Promo CD's - $995
(1,000 CD's - $1,550)
Delivery in 15 Business Days!
Promotional Package includes:
CD-R Reference, One Color CD Label with Layout, Typesetting & Film
(to 25 Min.)
500 - Color CD's - $1,995
(1,000 CD's - $2,265)
Retail-Ready: FULL COLOR Front & Tray Card, free CD-R Reference, 2-Color CD Label, Graphics Layout & Film, Jewel Case & Shrink-Wrap
(to 58 Min.)
500 - Cassettes - $715
(1,000 Cassettes - $1,025)
Retail-Ready: FULL COLOR J-Card, Test Cassette, Graphics Layout, Typesetting & Film, Cassette Label, Norelco Box & Shrink-Wrap (to 50 Min.)
Call For Our Complete Catalog
EUROPADISK, LTD.
75 Varick Street, New York, NY 10013
☎ (212) 226-4401 FAX (212) 966-0456

but incredibly stressful, gig. It has already blessed me with an ulcer."

There are also nonhuman factors to deal with, such as software bugs and synchronization snafus. To survive the brutal deadlines of post-production work, an engineer must know his or her software tools intimately. Problem-solving must be quick and decisive.

"Having all this digital gear trying to work together creates some serious voodoo," explains Garcia. "Most of the manufacturers don't have the gear available for testing to make sure everything works together, so it's often the working engineers who stumble upon the bugs and problems. For example, I had a lot of problems getting *Studio Vision* to lock up to video. Admittedly, many musicians probably don't use the program with time code; they just sequence and cut a vocal or something. But locking up to video is critical in my work, and for months I was getting wild speed fluctuations whenever I tried to sync sound to picture. Finally, a new [software] version fixed the problem. And when I started working with the first versions of Pro Tools, I was losing data constantly. The program didn't work, period. I'd have a session going on a tight deadline and everything would grind to a halt because some glitch popped up. Believe me, there were times when I'd literally be crying from frustration, asking myself why I ever decided to go digital. Of course, I couldn't do the things I do on analog, so digital audio is basically responsible for my livelihood. I try to remember that when I'm suffering through computer crashes."

To keep his software running as smoothly as possible, Garcia maintains constant contact with tech-support crews. He calls each company weekly to update the technicians on system performance and for help seeking out solutions to reoccurring problems. To avert tragedy, he also makes clone copies of every project and backs up data constantly.

"You can't be too careful," warns Garcia. "I recently worked on the sound design and music for a half-hour television show, and I lost everything to a hard-disk crash. Luckily, I had just done some subtle changes since the last back-up, but I still lost eight hours of work."

POST FADE

Garcia's well-equipped studio affords him the luxury of choosing the best medium for each project. Post-production chores are usually better suited to hard-disk recorders, while music sessions are slated for modular digital multitracks.

"If I'm getting a commercial ready to mix or doing sound design, I'll do the entire project in Pro Tools because it makes much more sense," says Garcia. "I have almost complete control over the audio. I can automate tracks, flip stuff backward, crossfade musical transitions, re-EQ, and so on. All of my music sessions are tracked to ADATs, mostly because all my musician friends own them, as well as just about every recording studio. However, I tend to fly back and forth between Pro Tools and the ADATs. For example, if I'm cutting vocals, I'll record eight performances on an ADAT, slide them into Pro Tools to cut and paste the best bits together, then fly that 'perfect' composite track back to the ADAT."

Garcia relies on Opcode's *Studio Vision* to produce demos for commercial underscores, because the picture that the music is supposed to match can change constantly in the video-editing suite. Editing the audio to fit is obviously easier using a sequencer. If the client likes the demo score and provides a budget to complete the music, Garcia replaces the sequenced tracks with live musicians and records the revised composition on ADATs.

"Now, after finally getting the digital studio to be a reality, I want the best of both worlds," exclaims Garcia. "I've been buying all these great tube preamps, and I just acquired an old Stephens analog multitrack and the Helios console that used to be at the Manor Studios in London. My dream is to incorporate all this state-of-the-art digital gear with classic analog equipment. Then I can really rock!"

Throughout hundreds of sessions in countless studios, no one has ever served **EM** *Editor* **Michael Molenda** *a margarita. And yes, he feels cheated.*

World Radio History

World Radio History

Magical Musical Tours

join our intrepid guide

Illustration by David Peters

on a musician's tour of the Internet.

Psst! Hey, you! Yeah, you. Come over here. Ever been to cyberspace? No? An enlightened musician like you, and you've never cruised the 'net? You don't know what you're missing! You wouldn't *believe* the stuff that's out there. Come on, jump in, crank the stereo. Yeah, that's it. Leave the driving to me. Just sit back and enjoy the trip. I've been surfing the Internet for more than ten years. I'll take you places you ain't *never* been!

Please excuse my alter ego; he tends to get carried away when it comes to discussing the Internet. But he's right, you know. You can use the Internet for everything from publishing press releases about your new album to booking tours for your band to locating new samples for your keyboard. You can even create personal "infobots" and send them out to scour the 'net for information that interests you. I designed one that searched for Internet sites

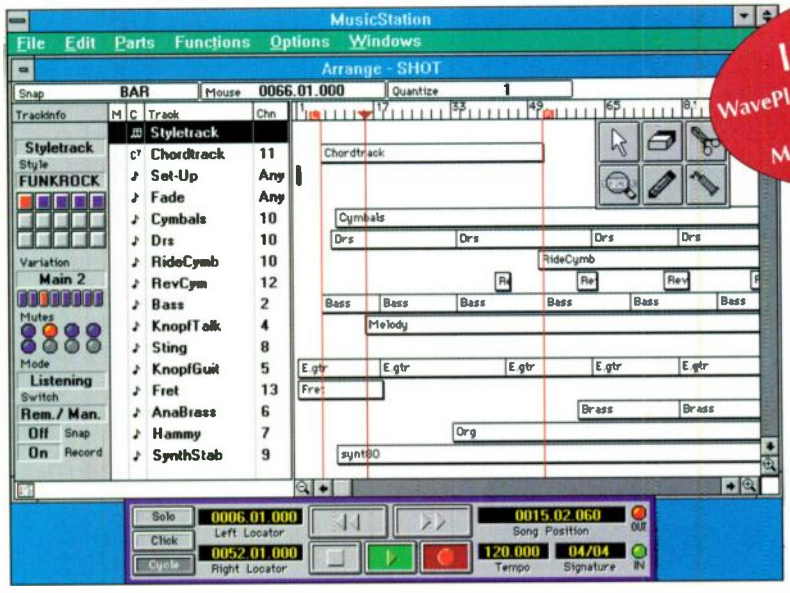
By Scot Gresham-Lancaster

World Radio History

MusicStation

THE MUSIC STUDIO FOR WINDOWS™

MusicStation is something new and has something for everyone, because it has it all! MIDI recording, score printing, real audio and auto-accompaniment.



INCLUDES:
WavePlayer, 10 MIDI Hit-Songs, Style Library, MIDI Xplained Program

JAM WITH THE BAND!

MusicStation has eight 'musicians' waiting to follow every twist and turn of your playing. From Pop to Polka & Country to Techno, they know it all AND are willing to learn new styles.

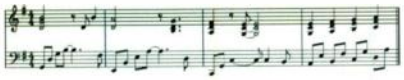
FINE-TUNE THE DETAILS!

Nobody's perfect. MusicStation's piano-roll and notation editors let you easily perfect the bits you wished you'd played a little better. The on-screen GM Mixer gives you extra control over any General MIDI sound source. And MusicStation doesn't need to stop because you want to edit a note. It's a true real time program!

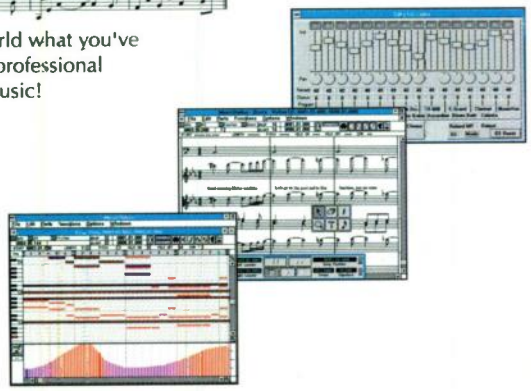
GRAB THE TOOLS!

Forget trying to remember complex key commands. MusicStation's graphic mouse tools do what you expect, cut with the scissors and glue with the glue-tube.

PRINT IT OUT!



Now show the world what you've created. Print out professional resolution sheet music! Lyrics included.



DIGITAL AUDIO!

Steinberg's WavePlayer™ is included too, so you can have real digital audio playback along with your MIDI recordings. Just add a Windows MME compatible sound card.

Steinberg

System Requirements: Minimum of 4MB of free RAM, Windows 3.1 or higher, VGA graphics, Harddisk.
Distributed in the US and Canada by Steinberg/Jones, 17700 Raymer Street, Suite 1001, Northridge CA 91325, Phone: 818-993-4091, Fax: 818-701-7452
Call toll free for a dealer near you, or 24 HR Automatic Fax Info: 1-800-888-7510 Code 7305; Contact Steinberg on Compuserve under 71333,2447 MIDI Vendor C

World Radio History

relevant to music. It periodically informed me of its findings via e-mail while continuing its search. The fruits of its labor can be found in **Tables 1, 2, 3,** and **5**.

Sounds hip, doesn't it? It is. Did you know that an estimated 17 million people worldwide are already on the 'net? Did you know that number is increasing at the astonishing rate of 20 percent each month? The Internet is an incredibly vast universe of people, computers, and—most importantly—information resources. Allow me to take you on a brief tour.

PREBOARDING INSTRUCTIONS

Before I put the bus in gear, though, let's get some assumptions out of the way. Some online services that provide Internet access, including PAN (the Performing Artists Network) and Delphi, put a text-based shell (see **Fig. 1**) in front of the Internet's standard, user-*un*friendly, command-line interface. This makes Internet access somewhat easier, but there is a better alternative that these services do not support.

This alternative comes in the form of either SLIP (Serial Line Internet Protocol) or PPP (Point-to-Point Protocol). PPP is newer and slightly faster than SLIP. If you contract with an Internet access provider that supports either of them, you can use one of the new graphic-interface programs on your computer (see **Fig. 2**). These programs facilitate e-mail, World Wide Web, and *Gopher* activity, all of which will be explained shortly. (**Table 3** reveals where you can obtain these types of programs.)

A detailed discussion of SLIP and PPP is beyond the scope of this article. Basically, these protocols establish a network connection through a modem. Graphic-interface programs such as *Mosaic* and *TurboGopher* operate through your modem and over the phone line as though your computer was connected directly to the network with a network card.

Despite these advances, the examples I'll show are based on the standard UNIX command-line interface. It's ugly, but it's the lowest common denominator when it comes to accessing the Internet. See **Table 4** for a listing of Internet access providers and the cost of a ticket to ride.

I'll also assume that you're familiar with the basics of telecommunications (telecom) software running on Macintosh, DOS, or *Windows*. You may also wish to refer to "Cruising the Internet" in the April 1994 **EM** and "Going Online: A Guide to Electronic Bulletin-Board Systems" in the November 1990 issue. (Back issues are available from Mix Bookshelf; tel. [800] 233-9604 or [510] 653-3307; fax [510] 653-5142.)

One thing's for sure about the Internet: Things happen fast. We're already at the first stop on our tour: Electronic Mail. E-mail is important because it lets you tap many of the resources available on the 'net.

EXPRESS MAIL

The Postal Service—you'll soon find yourself calling it "snail mail"—employs tens of thousands of people to pick up millions of pieces of paper, load them into little trucks, bring it back to the local post office, sort it out, load it into bigger truck, ship it to a regional post office, sort it out again, load it into an even bigger truck...well, you get the picture. At best, it takes four days to get a first-class letter from San Francisco to New York.

With e-mail, your letters get where they're going in minutes, not days. And you don't have to worry about correspondence getting "lost in the mail," because the Internet was designed to ensure message delivery even in the face of severed connections.

I use e-mail for everything from communicating with colleagues at IRCAM (the Institute for Research in Computer Music and Acoustics in Paris, France; e-mail address: info@ircam.fr) to arranging lunch dates with friends and associates. I also use it to communicate with my bandmates in the Hub (the world's only live, interactive, computer-music network group). Since our founding in 1985, we have conducted all of our business, from proposing

TABLE 1: Anonymous *ftp* Sites for Synthesizer Patches

Type of synth	Internet Site	IP Address	Directory
Apple II MIDI Synth	cco.caltech.edu	131.215.6.10	/pub/apple2/music/synthlab
E-mu Emax (I and II)	sweaty.palm.cri.nz	161.66.1.11	/sds
Ensoniq EPS-16+	ftp.reed.edu	134.10.2.20	A list of available samples is in: /eps/docs/samples/sample.index.txt The samples are in: /eps/samples
Kurzweil K2000	ftp.uwp.edu	131.210.1.4	/pub/kurzweil/sounds (maintained by jbuckman@aas.org)
	cs.utk.edu	128.169.94.1	/pub/martin/K2000 (maintained by martin@cs.utk.edu)
MIDI Sample Dumps	alf.uib.no	129.177.30.3	/pub/sds
	sweaty.palm.cri.nz	161.66.1.11	/sds
Roland D-70	kilroy.jpl.nasa.gov	128.149.63.2	/pub/D70
Roland JV-80/880/1000	wagner.musicnet.ua.edu	130.160.156.75	/pub/music/Patches/JV80
Roland Samplers	lotus.UWaterloo.ca	129.97.140.9	/pub/sgroup
Waldorf	ftp.waldorf-gmbh.de	193.98.169.1	/Waldorf
Yamaha TX16W	ftp-ls7.informatik.uni-dortmund.de	129.217.52.140	/pub/tx16w/samples

World Radio History

new compositions to scheduling rehearsals and tour dates, over the Internet. A few years ago, one member of our group temporarily relocated from the San Francisco Bay Area, where the rest of us live, to San Diego. Thanks to e-mail, there was no disruption in our scheduling, and he was able to line up a couple of Southern California gigs for us.

Once you've logged onto the Internet (contact your access provider for the specific procedure), you are greeted with a UNIX prompt, which isn't always the same set of characters; it depends on where you are on the host-system and what you're doing. To send e-mail, type "mail" at the UNIX prompt, the e-mail address of the person you want to correspond with, a subject, and your message.

For example, suppose I wanted to send a note to John Matrocks, product manager at the fictional WonderSynth, Inc. The process would look something like the following. (In all examples, the text I type appears in **bold**; the system's response appears in regular text. In all examples, my first command would be preceded by a UNIX prompt.)

mail johnmatrocks@wondersynth.com
Subject: **release date of Whacko 2000**
cc:
I was hoping that the Whacko 2000 would be ready for the Hub's next wild and crazy road show. Any word on your progress in beta testing?
Scot G-L (scot@csuhayward.edu)

If John isn't a total wank, a response should be forthcoming. How long it actually takes depends on how often he checks his mailbox. If he's working away on the Whacko 2000, I might not hear from him until the next day. But if he's goofing off and surfing the 'net, I might hear from him sooner.

If your access provider charges you by the hour for access time, you can save money by downloading all your e-mail into your computer, using your telecom software's capture mode. Log off the service, read your mail, and draft your responses while you're offline. When you're finished, log back on and upload the new text files.

INFO GLUT

The next stop on our tour is the land of *LISTSERV*s. Imagine receiving a newsletter that's current to the day and composed entirely of contributions from everyone who reads it. That's what Internet mail *LISTSERV*s are like. Unlike conventional newsletters, *LISTSERV* subscriptions are free for the asking, and they're delivered daily via e-mail.

LISTSERV forums (see **Table 2**) run the gamut, from the esoteric (performance techniques for the Australian didjeridoo) to the topical (women's issues in music) to the practical (an online music-theory seminar sponsored by Harvard University). For example, if I wanted to subscribe to the electronic-music forum at American University, I would send the following e-mail message:

mail listserv@auvm.american.edu
Subject: **subscription**
cc:
subscribe emusic-l scot@csuhayward.edu

In a few hours, I would receive a message confirming my subscription, providing me with guidelines for contributing to the forum, and telling me to how to unsubscribe if I lose interest. Once I've subscribed, I can contribute my views to the forum or just sit back and wait for messages to arrive in my mailbox.

*LISTSERV*s are a dynamic, sometimes chaotic, means of staying on top of developments in any area of interest. Some *LISTSERV*s have a moderator, someone who takes ownership of the list and, functioning as an editor, weeds out irrelevant banter. An unmoderated *LISTSERV* includes everything any subscriber sends it.

Subscribe to *LISTSERV*s in moderation—I suggest two or three at first—because any single one can conceivably generate twenty or more e-mail messages each day. If you get excited and subscribe to a bunch of them, you'll find yourself inundated with so much e-mail you'll never get a chance to read it. As with many other aspects of the Internet, there are commercial, shareware, and freeware utilities that simplify e-mail handling chores. On the Mac, look for a program called *Eudora*, and on *Windows*, look for *Pegasus* (see **Table 3** and **Fig. 2**).

We're flying now! Next stop: Usenet.

NEWS YOU CAN USE

Once you have figured out how to use e-mail, and you have subscribed to an e-mail *LISTSERV* or two, check out some of the Usenet newsgroups. Usenet is often called "news," but it shouldn't be confused with a wire-service feed, such as the Associated Press or UPI. Usenet is a collection of 5,000 interactive forums generated by and for Internet users. Like *LISTSERV*s, Usenet newsgroups are dynamic forums for the exchange of information. Unlike *LISTSERV*s, however, Usenet feeds are not automatically delivered directly to your mail box.

Among the music-related newsgroups I follow are alt.emusic, comp.music, and rec.music.compose. There are many other music-related newsgroups, including rec.music.industrial, rec.music.ambient, and rec.music.classical.guitar. Some, such as alt.binaries.sounds.music, contain files you can download to your own computer. In other words, seek and ye shall find.

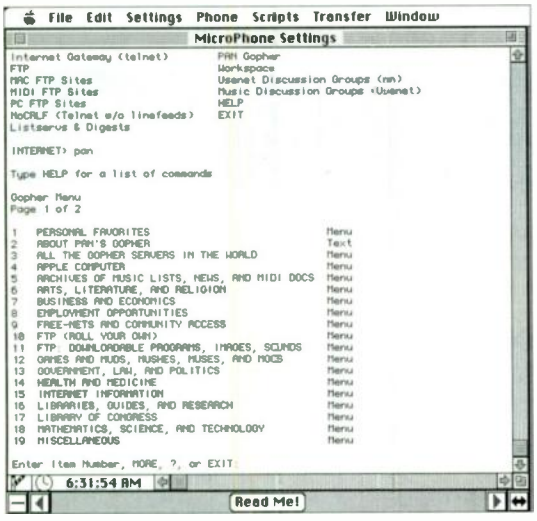


FIG. 1: Some commercial online services, including PAN, provide their clients with gateways to the Internet. The menu shells provided by these services make the Internet somewhat easier to navigate.

World Radio History

THE ONLY AFFORDABLE 8•BUS CONSOLE THAT CAN GROW WITH YOUR NEEDS.

Parametric Hi-Mid EQ ½-oct. boost/cut

Parametric Hi-Mid EQ ½-oct. sweep range (500HZ-18kHz)

Parametric Hi-Mid EQ 2-oct. boost/cut

Parametric Hi-Mid EQ 2-oct. sweep range (500HZ-18kHz)

Parametric Hi-Mid EQ 3-oct. boost/cut

Parametric Hi Mid 3-oct. sweep range (500HZ-18kHz)

Parametric Hi Mid Sweep-O-Rama

Swept Lo-Mid EQ boost/cut (1K center)

Lo-Mid EQ sweep range (from 45Hz to 3kHz)

Hi shelving EQ boost/cut (12kHz)

Lo shelving EQ boost/cut (80Hz)

75Hz, 18dB/octave Lo Cut (Hi Pass) Filter

Interaction of Lo Cut Filter and Lo EQ boost

"The first of the four bands of the EQ section is hi-mid, offering a true parametric design....useful in wideband adjustment for a more natural sound or in narrow-band for specific corrective adjustment. The upper-end frequency range...is particularly useful for adding punch to tracks or brightening up a hi-hat."
MIX February 1994

"I can only say that the 8•Bus sounds incredibly quiet. Crosstalk and signal-to-noise were certainly comparable to my Trident Model 65 console, which cost a ton more than the Mackie."
Electronic Musician February 1994

"Unlike some mid-priced mixers, the clean, quiet, smooth Mackie EQ let me get virtually every sound I wanted. In fact, the EQ was so comprehensive that I was able to get decent tones from poorly recorded tracks without using outboard graphic equalizers."
Electronic Musician February 1994

Legendary producer/engineer Shep Pettibone with his 32•8 at NYC-based Masterwix Productions Ltd. Recent projects include tracking for Madonna. Partially at her request, he's since bought a matching MB•32 meterbridge.

A surprisingly high percentage of 8•Bus warranty cards rave about how quiet our consoles are: "...quiet enough for hard disk digital recording." "...transparently quiet and musical..." "I am very happy with the low noise levels." "Phenomenally quiet!!!" "Less noise than the expensive board I used to have."

You get the idea. One of the most important reasons for these comments is Very Low Impedance Circuitry (VLZ).

VLZ wouldn't be necessary if we did all our recording in outer space or on the surface of Neptune where it's extremely cold. At absolute zero (–273 degrees F), circuit components are noise-free because the atoms that comprise them are completely at rest.

However, when over three hundred degrees hotter (room temperature on Earth), all the atoms in circuit componente are agitated and crash into each other. That causes little random voltage spikes which we hear as thermal noise. It's generated by all circuitry — even wire and circuit traces. Far more objectionable (and noticeable) than hum, thermal noise is what most consoles have too much of.

Me design around thermal noise by making internal impedance as low as practical at as many places as possible within the console. VLZ is achieved by scaling down resistor values by a factor of three or four — resulting in a corresponding reduction in thermal noise.

A prime example is our consoles' mix buses. Here, mix resistors are ¼ the value of those typically used in other mixers. Thermal noise is also ½ as much. It's a big contributing factor to the 8•Bus' overall low noise level.

Another advantage of VLZ is that low impedance circuitry, by its very nature, is more immune to crosstalk problems. By designing with low impedance, crosstalk throughout the console is inaudible.

Our approach isn't anything mysterious or proprietary. It's just straight-ahead, Mackie-style, over-engineering. However, VLZ doesn't come without cost. All circuitry has to be thoroughly buffered. Plus, the current consumption of the console goes up, requiring a larger power supply (which, of course, we provide in our usual excessive, over-engineered fashion – see below left). But when you compare the overall noise of our consoles to any of their competitors or imitators, you'll understand why Very Low Impedance circuit design puts the 8•Bus in the big leagues.

You can never be too rich or have too many inputs. Since most of us don't qualify on either count, we've designed the 8•Bus Console Series so that you can add more inputs as your budget and job requirements grow.

Start with an initial outlay as small as $3995 (suggested retail for a 24•8). Add a meter bridge. When your spouse wants the card table back, add a matching epoxy-coated steel stand.

Now comes the nifty part. You can increase inputs in groups of 24 with our 24•E Expander. It has 24 complete channel strips with tape returns and connects to our 24•8 or 32•8 in minutes. Each 24•E comes with its own power supply, meter bridges and stands are also available. Because you can "daisy chain" up to seven 24•Es together (for a potential total of 200 channels and 400 inputs at mixdown), we think that our modular approach should hold the average gear head for at least a few years.

You want a fader to reduce sound level in a smooth, predictable manner. To fool our ear into perceiving this, expensive mega-consoles use faders with a **logarithmic** taper. By contrast, other under-$10,000 consoles use "off-the-shelf" **D-taper** faders with a single extra resistive element screened onto the existing carbon (Fig. A at right). Bottom line: the sound level can drop precipitously when the fade gets around –20dB, making a smooth fader frustrating if not impossible.

For the Mackie 8•Bus, we commissioned a completely new 100mm fader that uses a complex network of additive resistive elements (Fig B.). They combine at various points along the faders' travel to achieve an absolutely accurate logarithmic taper (blue line on graph below). You get an even, predictable fade rate all the way to the bottom (where you get absolute attenuation — just like on big, expensive consoles).

Fig. A

Fig. B

Six Aux Sends, each with master level control & Solo buttons. Aux Sends 3 & 4 / 5 & 6 can be fed as stereo pairs to Phones 1 or 2.

Stereo Aux Returns. Returns 1 & 2 have a stereo Solo switch, stereo Level control, Pan control & Assign options to L/R Mix buses & odd-even submaster bus pairs. Returns 3 & 4 have a stereo Solo switch, stereo Level control & Assign option to the L/R Mix buses and/or Phones 1 & Phones 2 buses. Returns 5 & 6 are permanently assigned to the L/R Mix.

MIX-B/Monitor section. Acts as master gain control when building a separate broadcast, recording or monitor mix. MIX-B To L/R Mix switch doubles inputs during mixdown.

Phones 1 & Phones 2. Independent controls let you build custom headphone mixes using any combination of Monitor, MIX-B, Aux 3 & 4, Aux 5 & 6, & External (a totally separate stereo input intended for click tracks, etc).

Monitor. Individual controls for Control Room & studio playback monitors. Select any combination of L/R Mix, MIX-B, 2-TK & External. Mono switch sums L/R channels for checking mono mixes, and phase coherency.

Solo, with stereo level pot, lets you adjust the level of all soloed signals being fed to the monitor section.

Talkback. Converse via built-in microphone to any combination of Aux 1, Aux 2, Tape/Submasters (L/R Mix & the eight submasters) & Phones/Studio.

Meter Section. 12-segment Submaster LED ladders with –40 to +10dB range. 13-segment Main L/R meter with –40 to +22dB range. Entire section is covered with matte Lexan™.

8•Bus Assign Section. Pressing L Mix (odd-numbered buses) & R Mix (even-numbered) assigns bus to left or right Mix bus. Along with the Mono L & R switch, it assigns submaster buses to L/R mix.

Proprietary expansion port (32•8 & 24•8 only). Connects to 24•E Expander console. Each Expander has its own internal mix amplifier so the main console only "sees" one extra channel per 24•E Expander.

Main balanced outputs, +28dBu max output.

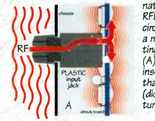
Submaster/Tape Outputs. ¼" TRS balanced (also wired for ¼" TS unbalanced) Tape Output Operating Level buttons switch the Submaster/Tape Output jacks to either +4dBu or –10dBV in groups of four "triple-bussed" outputs. Triple-bussing lets you feed a 24-track deck (or three 8-track digital decks) without having to constantly re-patch, by providing THREE outputs for each output bus.

Tape Returns. ¼" TRS balanced (also wired to accommodate ¼" TS unbalanced) Tape Return Operating Level buttons switch Tape Return jacks to +4dBu or –10dBV in groups of 8 channels.

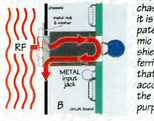
[1]Mention in this ad denotes ownership and useage only and does not imply official endorsement by the individuals, groups, or production companies listed.

AUTOMATION FOR THE 8•BUS SERIES is coming soon! First to be released will be the OTTO-34 outboard automation module and UltraMix™ ultra-screaming-fast, Mac™ software. OTTO-34 connects via 8•Bus' channel inserts (replaced with duplicate inserts on the OTTO-34's front panel). OTTO-34 provides smooth MIDI level & mute automation of channel inputs, AUX returns and main outputs for up to 32 channels.

ALL CONSOLE CONNECTORS ARE NOT EQUALLY QUIET.
Every input and output on a mixer is a chance for RFI (radio frequency interference) to sneak into the console via external cables. RFI is generated by everything from computers and cellular phones to video equipment and local AM, FM, TV, CB and paging transmitters. On most mixers, RFI protection consists of grounding the input to an internal circuit trace. Unfortunately, this lets RFI use the circuit trace as a mini transmitting antenna (A). Everything inside the mixers that rectifies (diodes, IC's, etc.) turns into little crystal radio receivers and converts the RFI into audible, annoying hash (or actual faint radio reception).



Our 8•Bus consoles have metal ¼" jacks that make electrical contact with the metal chassis via a solid metal lock washer (B). Although RFI can get in a short way via plugs, it is immediately diverted with a shunting capacitor across the inputs. RFI is routed back through the metal jack and into the outer chassis where it is dissipated. 8•Bus mic inputs are shielded with ferrite beads that accomplish the same purpose.

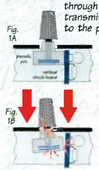


COMPARE CONSOLE POWER SUPPLIES
Only Mackie provides a 24-lb, ultra-low noise, triple-regulated, 220-watt power supply that can handle wide voltage variations & high ambient temperatures.

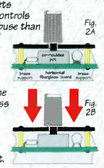
The MegaMondo 8•Bus Fantasy Combo
A 32•8 flanked by two 24•E Expanders and a Sidecar, for a total of 80 inputs during tracking and 160 inputs during mixdown. Suggested retail price for all you see here is (hold onto your Depend™s) $14,450. But look again. You couldn't touch this much console from any other manufacturer for under $30,000. And, you can start building this combo with a 32•8 for just $4995.

Frank Serafine, in the Foley Room at his Venice, California film and video sound complex. An innovative sound designer with film credits like Hunt for Red October, Poltergeist & Lawnmower Man, Frank has 8•Bus consoles in three of his production rooms. "It's the only under-20,000 console we'd consider using for feature films and network TV sound."

SUDDEN IMPACT
Many other 8-bus mixers make three mechanical design mistakes that can lead to expensive repair bills (Fig. 1A). First, they use un-sealed potentiometers containing brittle phenolic as a base for the pot's resistive element. Next, they mount the potentiometers on vertical circuit boards. Finally, many consoles have pots whose bushings extend through holes in the chassis. This is a deadly combination when somebody decides to drop something on the console (Fig. 1B). Look at what happens when downward force is exerted on a knob whose bushings go through holes in the chassis: It transmits all the shear forces to the potentiometer and circuit board solder connection. If the phenolic inside the pot doesn't crack, the whole thing can get yanked off the vertical circuit board. If a number of controls get bashed from above (such as when a monitor topples onto the board), the repair bill can be hefty.



Our 8•Bus consoles head off all three design errors (Fig. 2A). Our knobs "ride" just thousandths of an inch from the metal surface of the console. When downward force arrives, it is transferred from knob to steel — instead of from knob to potentiometer. Next, we employ a co-molded potentiometer that doesn't use brittle phenolic at critical mechanical points. If the console really gets whacked, our rotary controls withstand far more abuse than regular pots. Our final design feature is our braced, horizontal circuit board and shock-absorbing structure (Fig. 2B). The board is thick fiberglass and is connected at regular points to the chassis by metal stand-offs that further absorb impact.



The Mackie 8•Bus SideCar
("295 suggested retail")
is a matching, floorstanding equipment console.
It provides 11 rack spaces for power supplies, patch bays and outboard signal processors. The SideCar can be placed on either side of a stand-mounted 32•8, 24•8, 16•8 or 24•E.

Call 800/258-6883 for the name of your nearest Mackie 8•Bus dealer.

"When Steven Tyler (Aerosmith) and I sat down to design his home studio, we knew that our choice of a console was critical. We needed lots of inputs, routing flexibility, and most of all, great, clean sound. The Mackie 8•Bus with 24 inputs was the answer. It has 48 channels during mixdown, 24 mic pre's with phantom power and much more. When you're ready to shop for a mixing console (in any price range under $50,000), be sure to check out the Mackie 8•Bus."
MIDI March/April 1994

"With a retail price of $3995, the Mackie 24x8 offers a major price/performance breakthrough. I expect that the (24•8) will find a comfortable home in small home studios as well as broadcast and live applications."
Mix February 1994

Steve Milo, technician and engineer for Michael Bolton with Michael's road-cased 32•8. Other notable 8•Bus owners include Dave Abbruzzese, drummer for Pearl Jam; Michael Frondelli, Creative Director for Capitol Records; Mick Jones, producer for Van Halen & guitarist for Foreigner; Will Calhoun, drummer and engineer for Living Color; Danny Kortchmar, producer for James Taylor and Billy Joel; and Art Neville[1].

"Aside from the spectacular price/performance ratio, the board has some really excellent touches:
—...meticulous attention to level matching makes the board very easy to manage levels with, even for the brain dead among us...it's very forgiving and very clear.
— Careful consideration to the range of recorders the board is likely to be hooked up with has led to excellent decisions regarding input and output levels, so it will plug anywhere with no fuss or muss...
— Robust construction. The unit came out of the box after multiple shippings and handlings, plugged in in 20 minutes and has worked perfectly since."
Recording (formerly Home & Studio Recording) April 1994

World Radio History

"PROFESSIONAL RECORDING CONSOLE QUALITY AND FEATURES AT AN AFFORDABLE PRICE."

In just a little over one year, the Mackie 8•Bus Series has re-defined the affordable recording/PA console.

Right now, at least a dozen major albums are being tracked on 8•Buses. Our boards are being built into the personal recording studios of such notables as Whitney Houston, Steven Tyler, Natalie Cole, Michael Bolton, k.d. lang and Boz Scaggs†, just to name a few (which can only lead to more albums being created with our mixers).

8•Bus consoles are in use at all four TV networks and in top name video post and film production houses. For example, dialog editing for The Untouchables and sound design for Baywatch are done on 8•Buses†.

We've given up counting the number of network commercials that have been mixed and/or scored on 8•Bus consoles. They include work for Pepsi Cola®, McDonalds®, Coca Cola®, Pizza Hut®, Kenner Toys®, Six Flags®, Skittles™ and Fox TV†.

24•8s and 32•8s are handling front-of-house sound for hundreds of clubs, churches, auditoriums and are constantly on the road with regional sound companies (8•Buses are also currently being used for live recording on several major world tours.)

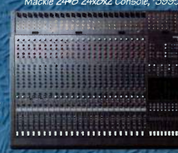
We've received extremely favorable reviews in Mix, Electronic Musician, Recording, Keyboard, EQ and MIDI magzines as well as in over a score of foreign audio journals.

If it seems like we're starting to border on outright bragging, we don't mean to. We're just trying to make an important point: Our 8•Bus consoles really work. When used in real-world applications by pros whose livelihoods depend on sonic quality and rock-solid reliability.

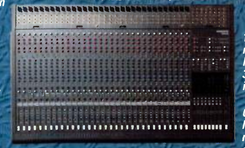
When Music & Sound Retailer Magazine polled America's top music retailers, they voted our 8•Bus console the most innovative product of 1994.

Mackie 16•8 16x8x2 Console, $3195*

Mackie 24•8 24x8x2 Console, $3995*



Mackie 32•8 32x8x2 Console, $4995*



24•E Expander adds 24 channel strips and tape outputs to the 24•8 & 32•8. $2995
Up to seven 24•Es can be daisy-chained.

Writer/producer Bill Moss' project studio in Los Angeles, CA

We've created this mini-brochure because we want you to know why our 8•Bus Series consoles are on the road to becoming the de facto industry standard for affordable consoles. The reason that we've gone into such excruciating detail is because it's the details that set our consoles apart from our competitors.

It's not just that we offer true parametric equalization...it's the extreme bandwidth, wide sweep range and expensive circuitry (that insures musical-sounding EQ).

It's not just that we use the finest, double-sided, through-hole fiberglass circuit boards...it's that we combine them with a special knob shock-absorbing design and brass standoffs to virtually eliminate impact damage (during the January '94 Los Angeles earthquake, dozens of 8•Bus consoles survived direct impact damage from falling monitors that sent other mixers into the shop for major repairs).

It's not just that we provide two separate headphone sections...it's the remarkable combination of sources you can use to build a custom mix (including Mix-B, Aux 3/4, Aux 5/6 and even an external click track input).

It's hidden things like the design of our ¼" jacks that routes Radio Frequency Interference away from internal circuit traces in ways plastic jacks can't. Semi-hidden things like our special custom

Channel strip jack section has:
- Phantom Power (applied to channel strips in groups of eight)
- Balanced Mic Inputs (the latest version of our highly-respected, discrete preamps)
- Mic/Line Switch
- Line In (bal./unbal. ¼" phone jack)
- Direct Out (unbal. TS ¼" phone jack, post-EQ/post-fader/post-mute switch)
- Channel Insert.
- In addition, the 16•8 and 24•E have one 12V BNC lamp socket. The 24•8 and 32•8 have two.

"With excellent sonic quality, frequency response, harmonic distortion and crosstalk specs, available number of inputs, plenty of headroom, good quality mic preamps and the upcoming automation package, the price of the 24•8 seems insignificant."
Mix February 1994

"The first thing we noticed about the Mackie (24•8 console) is how great it sounds (extremely quiet) and how well it's laid out logically. Controls are just where you expect them to be. The options are plentiful."
MIDI March/April 1994

The Mackie 24•8 Recording/PA Console. Shown with optional MB•24 meter bridge (*695*) and The Stand (*295*)

"THE 8•BUS SEEMS TO INVITE YOU TO BE CREATIVE & EXPERIMENTAL."
Keyboard June 1994

100mm faders with true logarithmic taper. And obvious things like how logically our 16•8, 24•8 and 32•8 consoles are laid out for day-in, day-out professional use.

If all comes down to this: From Greg Mackie on down, most of us have been playing, recording and running PA for more years than we care to think about. Our 8•Bus Console Series wasn't designed by a marketing department or in response to a competitor's mixer.

We simply set out to create the ultra-affordable, big-studio-quality console we've always wanted to own. After you've read this brochure, we hope you want to own one, too.

*Suggested retail price. Slightly higher in Canada. †Mention indicates confirmed useage or ownership only and does not intended to in any way imply specific endorsement by the individuals, corporations or production companies cited in this ad.

Aux Send Outputs (Aux 1 & 2 are balanced TRS outputs, designed so that ¼" unbalanced TS phone plugs can also be used without level loss. Aux 3-6 are unbalanced)

Submaster Inserts
Aux Returns (all unbal. stereo)
2-Tk Input
External Input
MIX-B Output (¼" TS unbalanced)
Main Mix (¼" TS unbalanced, +4dBu nominal level)
Control Room Output
Main Inserts
Phones

Mic/line Channel Trim
Flip reverses tape & mic/line input, works with Mix-B (Monitor), making both tracking & mixdown easier.
Aux 1 & 2 with common Pre/Post switch.
Aux 3, 4, 5, 6. Shift connects level controls to either sends 3 & 4 or to sends 5 & 6. Source switch breaks Aux Sends 3-6 away from main channel strip input to tap from MIX-B/Monitor signal. Common Pre/Post switch.
Hi Mid EQ. ½ to 3-octave variable bandwidth, 500-18kHz sweep.
Lo-Mid EQ. 45Hz-3kHz fixed-Q sweep.
12kHz shelving Hi EQ & 80Hz shelving Lo EQ. Switched into MIX-B circuit when Split button is depressed.
Lo Cut filter. 18dB/octave low-cut (high-pass) filter with a –3dB point of 75Hz reduces room & PA rumble.
MIX B/Monitor Section with Level, Pan, EQ & Source capabilities. In the UP position, MIX-B Source works with the Flip switch to determine the input running to the MIX-B controls. MIX-B receives the selected signal from the Flip switch. In the Channel position, MIX-B's input provides a 2nd, independent stereo mix from the main channel signal.
MIX-B Split inserts Hi & Lo EQ into the MIX-B signal path.
+20dB Overload LED with diode matrix that monitors three critical signal chain points, reading the highest at any one time, tripling chances of detecting overload.
–20dB Signal Present LED tells at a glance what's on the channel.
Pan Control pans channel signal between the two sides of the L/R Mix buses, & between odd/even pairs of Buses 1-8 (depending on positions of the five assignment switches).
Solo/Channel Metering. Press Solo & the console's Main L/R LED meters display the ch.'s operating levels so you can accurately set input trim. Also assigns the output of the ch. to the stereo Solo buses, & disconnects all other sources from the Control Room monitor speakers (but doesn't interrupt the eight Submixers, MIX-B, L/R Mix, or Aux sends). Solo assignments are stereo so you hear the channel in full stereo perspective – even with the source panned hard left & effects return hard right.
Special 100mm logarithmic taper faders (see story on inside spread)

8•BUS CONSOLES
• MACKIE •

TEAR-OUT PRODUCT GUIDE

World Radio History

READ THE BOOK: CALL 800/258-6883

Our really detailed 24-page 8•Bus tabloid brochure includes common console hook-ups for tracking, mix down and PA applications and lots more arcane info. Call toll-free today.

SEE THE MOVIE: SEND US $9.95

We've produced an in-depth 8•Bus "video owner's manual" that covers every facet of our consoles.

"Our friend, The 8•Bus" includes demonstrations of all functions, step-by-step hook-up instructions for both studio and PA applications and special tips from the Mackie Technical Support team. Although extremely complete (and even occasionally serious), it's anything but boring. You'll learn the details of why pros overwhelmingly prefer the Mackie 8•Bus.

As a bonus co-feature, we'll include a copy of our award-winning, 28-minute feature "The First Mackie Home Studio Video: Clam Boots in Paradise," a merry madcap romp through LaLa land home studios of the stars with two genuine Mackoid employees (no mixers were harmed during the filming of this video). To get both, send a money order for $9.95 (U.S. currency) to: Mackie Designs 8•Bus Video Offer, 20205 144th Ave NE, Woodinville, WA 98072. Allow two weeks for delivery (we pay shipping). Offer expires 6/1/95.

Sorry that we can't accept personal checks or bank cards or phone orders...but, being a manufacturer who sells our mixers only through retail dealers, we're just not set up for intensive mail order.

We apologize for the inconvenience but we think you'll find the videos worth your while.

16•8, 24•8, 32•8 Specifications

Noise. (Measured 20Hz to 20kHz bandwidth, Tape Returns selected, no EQ, Channel Pans alternating L/R, L/R "Faders up" refers to Unity gain, 0dBu position.)

Main L/R Output Noise. Master fader down, –101dBu; master fader up/no ch.'s assigned, –95dBu; master fader up/24 chs. assigned, –90dBu; master fader up/24 chs. assigned, ch. faders up, –86dBu; +4dB operating level S/N ratio, –90dBu

Submaster Output Noise. Master fader down, –99dBu; master fader up/no ch.'s assigned, –96dBu; master fader up/24 chs. assigned, –90dBu; master fader up/24 chs. assigned, ch. faders up, –86dBu; +4dB operating level S/N ratio, –90dBu

Total Harmonic Distortion. (1kHz @ +4dBu measured 20Hz–20kHz, mic input. Direct output, 0.0013% typical; L/R Mix output, 0.0014% typical; Submaster output, 0.0015% typical

Crosstalk. (1kHz measured relative to 0dBu, measured 20Hz to 20kHz.) Line In to Adjacent Channel, –91dBu; L/R mix output w/channel down, –95dBu; submaster output w/channel down, –86dBu; L/R mix output w/channel muted, –95dBu; submaster output w/channel muted, –96dBu; L/R mix output w/channel un-assigned, –91dBu; submaster output w/channel un-assigned, –96dBu; L/R mix output w/adjacent channel assigned, –92dBu; submaster output w/adjacent channel assigned, –94dBu; L/R mix output pan pot attenuation, –87dBu; submaster output pan pot attenuation, –87dBu

Frequency Response. +0dB/–1dB, any input to any output 20Hz to 50kHz, +0dB/–3dB, any input to any output, 10Hz to 120kHz.

E.I.N. Mic input (150Ω termination, 20Hz–20kHz) –125.5dBm

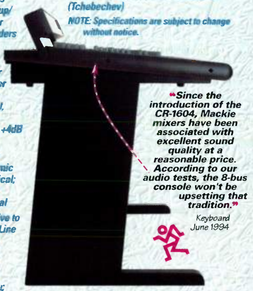
C.M.R.R. Mic input, max gain @1kHz, –83dBu; line input, minimum gain @1kHz, –45dBu; tape input, no gain @1kHz, –45dBu

Maximum Levels. Mic input, +14dBu; all other inputs, +22dBu; L/R Mix balanced output, +28dBu, all other outputs, +22dBu

Impedances. Microphone input, 1.5 kΩ; *channel insert return,* 2.5 kΩ; *all other inputs,* 10 kΩ or greater; *all outputs,* 120Ω.

Equalization. Hi Mid, full parametric, ±15dB freq. sweep from 500Hz–18kHz, bandwidth (Q) variable from 1/12 octave to 3 octaves; *Lo Mid, swept,* 45Hz–3kHz ±15dB; *Hi, shelving,* 12kHz ±15dB; *Lo, shelving* 80Hz ±15dB; *Lo Cut (HPF)* 75Hz, 18dB/octave (Tschebechev)

NOTE: Specifications are subject to change without notice.



"Since the introduction of the CR-1604, Mackie mixers have been associated with excellent sound quality at a reasonable price. According to our audio tests, the 8•bus console won't be upsetting that tradition."
Keyboard June 1994

8•BUS SERIES DIMENSIONS

Consoles (H" x W x D"*), inches [cm]*

32•8: 6.8 x 45.8 x 28.8 [13.8 x 116.3 x 73.1]
24•8: 6.8 x 37.0 x 28.8 [13.8 x 94.0 x 73.1]
16•8: 6.8 x 29.2 x 28.8 [13.8 x 74.1 x 73.1]
24•E: 6.8 x 29.2 x 28.8 [13.8 x 74.1 x 73.1]

Meter Bridges (H x W x D), inches [cm]

MB•32: 5.7 x 45.8 x 2.6 [14.4 x 116.3 x 6.6]
MB•24: 5.7 x 37.0 x 2.6 [14.4 x 94.0 x 6.6]
MB•16: 5.7 x 29.2 x 2.6 [14.4 x 74.1 x 6.6]
MB•E: 5.7 x 29.2 x 2.6 [14.4 x 74.1 x 6.6]

Stands (H x W x D), inches [cm]

ST32•8: 29.5 x 45.8 x 28.8 [74.9 x 116.3 x 73.1]
ST24•8: 29.5 x 37.0 x 28.8 [74.9 x 94.0 x 73.1]
ST16•8/4•E: 29.5 x 29.2 x 28.8 [74.9 x 74.1 x 73.1]
Sidecar (H x W x D), inches [cm]
SC•8: 5.3 x 23.4 x 28.8 [13.4 x 59.4 x 73.1]
Power Supply (H x W x D), inches [cm]
PS21•8: 3.5 x 19.0 x 10.1 [8.9 x 48.3 x 25.6]

*"Measured from highest point of main chassis
**Add 5.5" [14 cm] for power connector clearance.

MACKIE.
MACKIE • DESIGNS • INCORPORATED

20205 144th AVE NE • WOODINVILLE • WA • 98072 • USA • PHONE TOLL-FREE 800/258-6883 (OUTSIDE THE U.S. CALL 206/487-4333) • FAX 206/487-4337 • 24-HR BBS 206/488-4586 OR GO MACKIE ON COMPUSERVE • MACKIE IS REPRESENTED IN CANADA BY S.F. MARKETING • PHONE TOLL-FREE 800/363-8855 • FAX 514/856-1920
MACKIE IS REPRESENTED WORLDWIDE BY MMS MARKETING • PHONE 908/988-7800 • FAX 908/988-9357

TABLE 2: *LISTSERV*s Up-to-the-minute news and opinion on almost any topic you can imagine.

Topic	Description	Address	Subscription specifics (if any)
Alesis QuadraVerb	Forum about Alesis' DSP	qv-interest-request@swap.eng.sun.com	
Algorithmic composition	Using computers to assist in music composition.	majordom@heinous.isca.uiowa.edu	"Message: subscribe ALGO-COMP" in the body of your letter.
Alternate tunings	It's not just 12-tone equal temperment anymore.	listproc@varese.mills.edu	A blank line, followed by: "SUBSCRIBE TUNING <Your Name>" in the body of your letter.
Analog synthesizers	Forum about analog synthesizers.	analogue-request@magnus.acs.ohio-state.edu	
Auditory perception	Information about research in acoustic perception.	auditory%mcgill.bitnet@psuvm.psu.edu	"Subscribe auditory <your e-mail address>" in the body of your letter.
Commodore Amiga	Information on sound files and utilities.	mrcserv@janus.mtroyal.ab.ca	Send a HELP message first.
Creative Labs Sound Blaster	Forum about programming the Sound Blaster.	listserv@porter.geo.brown.edu	"Subscribe blaster <Your e-mail address>" in the body of your letter.
Didjeridoo	Information, discography, and performance techniques for this Australian Aboriginal instrument.	didjeridu@varese.mills.edu (Note: Forum moderated by Toyoji Tomita.)	A blank line followed by: "Subscribe didjeridu <Your e-mail address>" in the body of your letter.
DigiTech RP-1	Information on guitar effects pedals.	rp-1-l@ecn.nl (Note: Forum moderated by Marcel Bernards.)	
E-mu Emax	Forum about E-mu's samplers.	emax-request@foobar.hpl.hp.com	
EMAGIC *Notator*	Information about this notation software.	fokke.de.boer@rivm.nl (Note: Forum moderated by Fokke de Boer.)	
Internet Underground Music Archive (IUMA)	Alternative means of publishing recordings.	majordomo@www.echo.com (Note: For more information about IUMA, send e-mail request to info@iuma.com)	"Subscribe iuma-news" in the body of your letter.
Ensoniq VFX	Forum about Ensoniq keyboards.	vfx-request@digibd.com	
Korg 01/W	Forum about this Korg synthesizer.	korg-admin@apicc.dseg.ti.com (Note: Forum moderated by Bill Huston.)	
Korg Wavestation	Forum about this Korg synthesizer.	listserv@otax.tky.hut.fi	"Subscribe Wavestation <your e-mail address>" in the body of your letter.
Kurzweil K2000	Forum about this Kurzweil synthesizer.	listserv@jhuvm.hcf.jhu.edu	"Subscribe K2000 <Your e-mail address>" in the body of your letter.
Music theory	An online seminar on music theory.	listserv@husc.harvard.edu	"Subscribe mto-j" in the body of your letter.
Netjam	Live Internet MIDI jam software and other resources.	netjam-request@xcf.berkeley.edu	"Request for info" on the subject line of your letter.
Opcode *Max*	Information about this graphical music programming language.	owner-max@vm1.mcgill.ca	"Subscribe max" in the body of your letter.
Roland D-70	Forum about this Roland synthesizer.	cyamamot@kilroy.jpl.nasa.gov (Note: Forum moderated by Clifford Yamamoto.)	
Roland JV-80/880	Forum about these Roland synthesizers.	jv80-request@burner.com	"#SUBSCRIBE <Your e-mail address>" in the body of your letter.
Roland samplers	Forum about Roland samplers.	sgroup-request@lotus.uwaterloo.ca	
Steinberg *Cubase*	Information about this sequencer.	cubase-users-request@mcc.ac.uk	
Synthesis	A general discussion of synthesis technology.	listserv@auvm.american.edu	"Subs synth-l <your e-mail address>" in the body of your letter.
Twelve Tone Systems *Cakewalk*	Information about this *Windows* sequencer.	listserv@lists.colorado.edu	"Subscribe Cakewalk <Your e-mail address>" in the body of your letter.
Waldorf products	Forum about Waldorf products.	user-forum-request@waldorf-gmbh.de	"Subscribe" on the subject line of your letter.
Women's issues in music	Forum dealing with just that.	listserv@iubvm.ucs.indiana.edu	"Subscribe wiml-l <your e-mail address>" in the body of your letter.
Yamaha DX7	Information on the Yamaha DX7 synth.	xeno@iastate.edu (Note: Forum moderated by Gary L. Snethen.)	
Yamaha SY series	Forum about this line of Yamaha products.	sy-request@chorus.fr	
Yamaha TX16W	Forum about this Yamaha synth.	majordomo@lists.eunet.fi	"Subscribe tx16w <Your e-mail address>" in the body of your letter.

World Radio History

If you don't think you're quite ready for a sampler, think again.

Introducing the Roland S-760 Digital Sampler, a professional sampler for the kind of cash mere mortals actually have. A single rack space digital powerhouse that does virtually everything kazillion dollar units do and more. Including 48kHz stereo sampling, built-in digital EQ, multi-mode filters, extensive wave editing and everything else you would expect from a Roland sampler.

And right out of the box it's ready to use as a 32-part multitimbral musical instrument or a full-fledged studio production tool. With its diversity of sounds and infinite sonic possibilities, unsurpassed fidelity and sound manipulation capabilities, the S-760 will open up new worlds of sound, even if you already have a full rack of synths.

We should also mention that the S-760 can be expanded to 32 megabytes of memory, providing a total of more than three minutes of stereo sampling time at full bandwidth.

And the built-in SCSI interface lets you plug in virtually any storage device, including CD-ROM drives, hard disks and removable optical disk drives.

Edit your sounds with monitor and mouse.

Our large high-res LCD makes it easy on the eyes when you're editing without an external monitor. And with the optional OP-760-01 Board,

World Radio History

you can connect the S-760 to either a dedicated monitor or your ordinary color TV, and use a mouse for point, click and drag editing. View and access all editing operations such as loop, time stretch and cut/splice functions in an intuitive, easy-to-use graphic environment without having to use an external computer with dedicated software.

The Option Board expands the S-760 with lots of advanced functions like S-video, RGB and composite video output plus digital I/O, transforming the S-760 into the ultimate high-end sampler.

All the sound in the world at your fingertips.

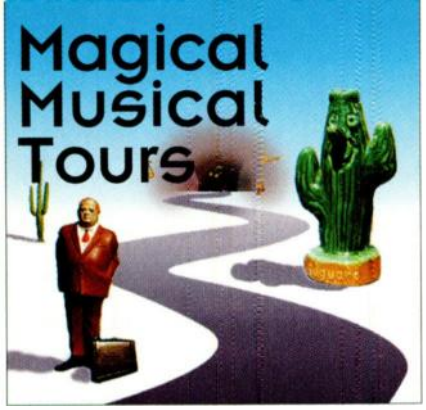
The S-760 gives you immediate access to the vast Roland 700 Series CD-ROM library, the fastest-growing sound library in the world. And it comes with a 600 Mbyte CD ROM Preview Disk that'll get you started right away. Its standard SCSI port accepts up to seven SCSI devices, letting you play thousands upon thousands of meticulously recorded CD-ROM samples from around the world. Like Roland's Sample Archives, Project Series, Composer Series and numerous third party sources. The S-760 can even load data from the S-550 as well as convert programs from Akai® S-1000/1100 data.

Five bucks says you're ready for a sampler. Put down this magazine, pick up your phone and call (800) 386-7575. Ask for our $5 *Sample Archives Demo Disk II* audio CD and our new CD-ROM catalog of Roland and 3rd party sounds. Better yet, put down this magazine and get to your nearest Roland dealer for a real-time demo of the S-760 Digital Sampler. Then you'll know what we've known all along. You're ready.

Roland

Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141
Roland Canada Music Ltd., 5480 Parkwood Way, Richmond, B.C. V6V 2M4 (604)270-6626. COMPUSERVE®: GO ROLAND; 72662,376
All trademarks are registered by their respective companies.

World Radio History



There are three important points to make about Usenet: Make sure your access provider receives a full news feed, that it provides a decent means of viewing the news, and that it allows you to "post" to the server. If you can't post your own contributions to Usenet, you'll be limited to being to an observer, not an active participant.

Some Internet access providers, such as PAN and Delphi, build a menu of the newsgroups they think their users would be most interested in. For example, PAN offers a set of menus containing all the newsgroups related to music and the music industry. You can pick the topic you're interested in and begin reading with a single keystroke. Newsgroups that are not on the menu remain accessible to the user. Other services rely on UNIX programs such as *tin, rn, nn,* or *emacs* that run on the provider's computer.

Here's how to use *tin* to tap into a Usenet newsgroup for people who are interested in alternative electronic music: Type **tin** at the UNIX prompt and hit the return key. A list of newsgroups will scroll up the screen. Type **/alt.emusic** at the *tin* prompt and hit the return key. A list of articles from that newsgroup will scroll up the screen. Use the arrow keys to select an article from this list and hit the return key to read it.

Can you believe it? The tour's already half over!

GIMME SOME OF THAT

Once you've become accustomed to navigating the Internet, you should be ready to download some files. Refer to **Tables 1** and **3** for listings of some of the resources musicians will find valuable. (The IP addresses listed in these tables are an alternate means of identifying Internet sites. If your host doesn't recognize the site name, try the IP address.)

When it comes to downloading files, a fast modem makes all the difference in the world. If you're using the Internet only to post and receive e-mail, you can get by with a 2,400-baud modem. Once you get into transferring files, you'll soon be lusting for a modem that does 9,600 baud, 14.4 kilobaud, or more.

The number of steps it takes to download a file from a site depends on whether your access provider provides a direct connection to the Internet (e.g., AlterNet or PSINet) or utilizes an Internet shell (e.g., PAN or Delphi). If you have a direct Internet connection, you need only download the file into your personal computer from the site at which it resides.

If your access provider uses an Internet shell, you first download the file from the site to your workspace on the access provider's machine, then download the file to your personal computer. Finally, delete the file from your workspace on your access provider's host, because if you store a lot of files in your workspace, you may be charged an online storage fee.

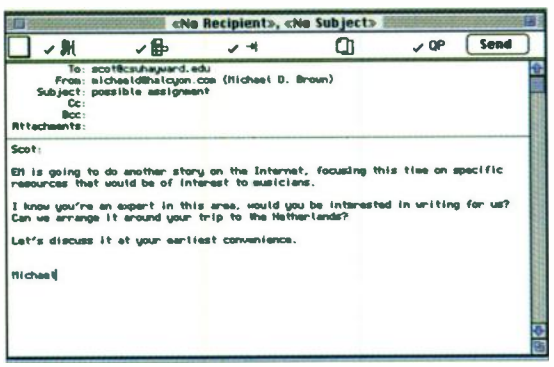


FIG. 2: Contracting with an Internet access provider that supports SLIP or PPP lets you use the new Internet-access programs that feature graphic user interfaces. *Eudora*, shown here, is an Internet electronic-mail program for the Mac.

In this example, we'll download a Kurzweil K2000 patch from the Internet site ftp.uwp.edu using the UNIX program *ftp* (*File Transfer Protocol*), which resides on the remote host machine. At the UNIX prompt, type ftp, followed by the site address:

ftp ftp.uwp.edu
Connected to ftp.uwp.edu

Next, *ftp* will ask you for a login name or user id, just as your access provider's system did when you logged onto it. Unless you're logging onto your own account at the ftp site, log on as anonymous. Internet sites that allow public access are often referred to as anonymous *ftp* sites.

Name (ftp.uwp.edu):
anonymous
331 Guest login ok, send ident as password

Password: **<your.user.id@your.address>**
230 Guest login ok, access restrictions apply.

For security reasons, *your* password doesn't appear on the screen. When logging in as anonymous, it is customary to use your Internet address as your password.

From **Table 1**, we know the files we want are in the directory called pub/kurzweil/sounds. We can go directly into that directory by typing this UNIX command:

cd/pub/kurzweil/sounds
250 CWD command successful

The table doesn't tell us what files are in this directory, however, so we have to issue this UNIX command:

dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/dl.

bassclar.kr1	562772
bassoon2.kr2	388316
basvoice.kr2	1446912
basvoice2.kr2	325200
beat.kr1	140200
bigbells.kr1	1096264
bigfmstk.kr2	1455112
bigfmstk.kr2	9680
bothfrhn.kr2	585608
trumpet.krz	857908

10 Transfer complete.

The host machine assumes that the files you're looking for are in ASCII format. If the files are in binary format, you must prepare the host machine to send the files using this command:
binary
200 Type set to I.

If you want only one of the files, issue the UNIX command **get** then the name of the file. With the command **mget**, followed by the file names **bassclar.kr1 bassoon2.kr1 beat.kr1 bigbells.kr1**, you

World Radio History

TAKE TEN!

$10 REBATES ON THE WORLD'S MOST POPULAR MICS: THE SM58 AND THE SM57.

FROM SEPTEMBER 1st THROUGH OCTOBER 31st:

Great job everyone! Take five. Or better yet... take ten. Dollars that is. Back from the purchase of every SM58 and SM57 microphone.

You've helped make the SM58 and SM57 the world's #1 selling mics once again and we're rewarding you by giving you a ten dollar "break" on every one you buy.

But hurry. "Breaktime" ends soon.

Shure's "TAKE TEN" Rebates:

*To receive your rebate send: **1.** A copy of your dated sales receipt (non-returnable) indicating model number(s) and name of store where mic(s) were purchased , **2.** The actual silver model number label (no substitutions) from the end of each outer carton, and **3.** This completed coupon to: Shure "**TAKE TEN**" Rebate Offer, 222 Hartrey Ave., Evanston, IL 60202-3696*

*Name*_____

*Address*_____

*City*_____ *State*_____ *Zip*_____

*Phone*_____/_____

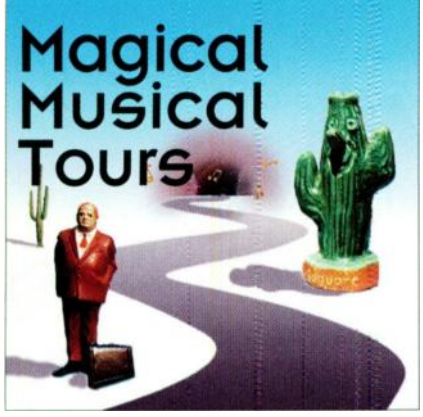
*Qty. purchased: SM58*_____ *SM57*_____

*Age*____ *Occupation*_____

$10 rebate applies to Models SM58-LC, SM58-CN, SM58S, SM57-LC and SM57-CN only. Rebates are limited to a total of six per customer, household, or organization. Offer valid only on consumer purchases made at retail between September 1, 1994 and October 31, 1994. Rebate claim forms must be postmarked no later than November 30, 1994. This is a consumer (end user) offer only. Shure microphone distributors, retailers or their employees are not eligible for rebates, nor may Shure microphone distributors, retailers or their employees claim rebates on behalf of consumers (end users). Rebate requests not including proper documentation (official coupon, silver model number label from end of carton, and dated sales receipt with retailer's name) will be returned as incomplete. Shure is not responsible for late, lost, or misdirected mail; insured or certified mail is recommended. Offer good only on purchases made in the U.S.A. and open to U.S. residents only. Void where taxed or prohibited by law. Allow 6 to 8 weeks for delivery of rebate check. Coupon face value 1/4¢. Rebate eligibility as determined by Shure is final.

SHURE®
The Sound of the Professionals®...Worldwide.

World Radio History



can grab all those files in one pass. Even cooler, use **mget** with a wildcard character (e.g., ***.krz**) to download only the files that share a given characteristic, such as a common file extension. Let's try that:

mget *.krz
200 Type set to I.
200 PORT command successful.
150 Opening BINARY mode data connection for trumpet.krz (857908 bytes).
226 Transfer complete.

In this case, the file trumpet.krz was the only file that matched the wildcard, so it was the only one downloaded. Depending on your access provider, the files are copied directly to your own computer or to your workspace on the provider's computer. In the latter scenario, you must then download the files to your computer using whatever file-transfer protocol your telecommunications software supports (for example, Kermit, Xmodem, etc.). Before you do that, however, you should sign off the Internet site by issuing the **Quit** command at the UNIX prompt.

There's a good chance that any files you download will be in a compressed form in order to save space; they must be uncompressed before you can use them. Compressed files can be identified by characteristic file extensions, such as .hqx, .stf, and .cpt for Macintosh files;

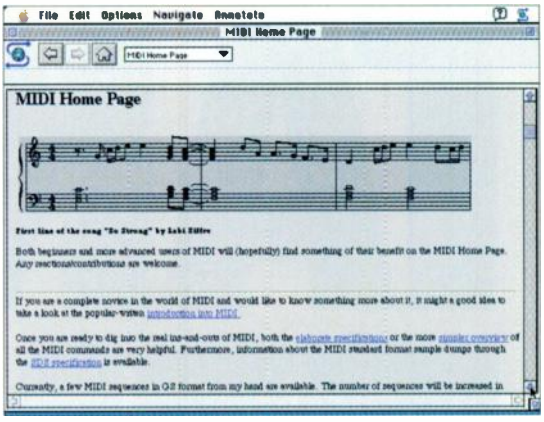


FIG. 3: The World Wide Web is a hypertext-based Internet service. *Mosaic* is a Web document reader that supports graphics within the Web document. Unlike *Lynx*, you can use the mouse to navigate hypertext links.

TABLE 3: Anonymous *ftp* Sites for Utilities, Programs, and Other Information

Description	Site Name	IP Address	Directory
Atari archive with misc. utilities for Atari ST series computers	atari.archive.umich.edu	141.211.120.11	/atari/Music
Cakewalk files	nic.funet.fi	128.214.6.100	/pub/msdos/sound/cakewalk
Eudora e-mail front-end for Macintosh	ftp.sunet.se	130.238.127.3	/pub/mac/mail
File format conversion programs	qiclab.scn.rain.com	199.2.908.97	/pub/music
Macintosh MIDI programs	castrovalva.gsfc.nasa.gov mac.archive.umich.edu	128.183.33.197 141.211.165.41	/mac/sound/midi /mac/sound/midi
MIDI files, patches, and a few programs	ucsd.edu media-lab.media.mit.edu	128.16.1 18.85.0.2	/midi /music/midi
MIDI Sample Dump Standard programs and samples	alf.uib.no sweaty.palm.cri.nz	129.177.30.3 161.66.1.11	/pub/sds /sds
Mosaic graphical World Wide Web hypertext document reader	ftp.ncsa.uiuc.edu	141.142.20.50	/mosaic
MS-DOS files	impaqt1.mem.drexel.edu wasp.eng.ufl.edu	129.25.10.1 128.227.116.1	/pub/files/ibm/midi /pub/msdos/demos/music
Netjam submissions in Standard MIDI File format	scam.berkeley.edu	128.32.138.1	/misc/netjam/submissions
OS/2 programs	ftp-os2.cdrom.com	192.153.46.2	/pub/os2/2_x/mmedia /pub/os2/2_1/mmedia *
Patches, samples, sequences, and software	louie.udel.edu	128.175.1.3	/pub/midi
PC Gopher III mouse-navigable *Gopher* front-end for MS-DOS	yuma.acns.colostate.edu	129.82.100.64	/software.ibmpc/gopher/PCGopherIII
Pegasus e-mail front-end for *Windows*	ftp.oulu.fi	130.231.240.1	/pub/msdos/mail
Sound Blaster Files	garbo.Uwasa.fi wuarchive.Wustl.Edu	128.217.87.1 128.252.135.4	/pc/sb and /pc/music /pub/msdos_uploads/sblaster
TurboGopher graphical *Gopher* front-end for the Macintosh	boombox.micro.umn.edu	134.84.132.2	/pub/gopher
Used synthesizer prices (USA)	sprite.berkeley.edu	128.32.150.27	/synth_prices
Windows MIDI programs	ftp.cica.indiana.edu.pub	129.79.26.27	/pc/win3/sounds

*For a full index of OS/2 files at this site, retrieve /pub/os2/00index.txt. Submissions may be placed in /pub/os2/incoming.

World Radio History

DIGIDESIGN'S MOST AFFORDABLE 8-TRACK SYSTEM.

Introducing the new 882 I/O™ for Session 8™–The break you've been waiting for.

If you've been wanting to get into a hard disk recording system but the price was a bit steep, we've got some great news for you. Because with the new 882 I/O, you can now get into Digidesign's revolutionary Session 8 system for about $1,000 less. (Yes, you read that correctly.)

Imagine: 8 tracks of crystal clear digital audio. Random access digital editing. Digital track bouncing and stacking. And unparalleled MIDI compatibility. All for a price that compares very favorably to tape.

How did we do it? By creating a new audio interface that pairs the original Session 8's excellent AD/DA converters with a streamlined layout (8 ins, 8 outs, stereo mixdown, single-rack space design). Hook up the 882 I/O to your mixer and you have a complete system with the same sparkling sound quality that's made Digidesign famous.

882I/O front panel

882I/O back panel

SOUNDS COOL, RIGHT? IT GETS EVEN BETTER.

Session 8 is now more compatible than ever. Here is just some of what's new. Call us for the latest!

- **Sequencer Support for Session 8** (EMAGIC™, MOTU™, Opcode™, and Steinberg™)
- **New Digidesign ADAT® Interface***
- **New Sound Designer™ II****
- **New DINR™ Noise Reduction System****
- **New MasterList CD™****

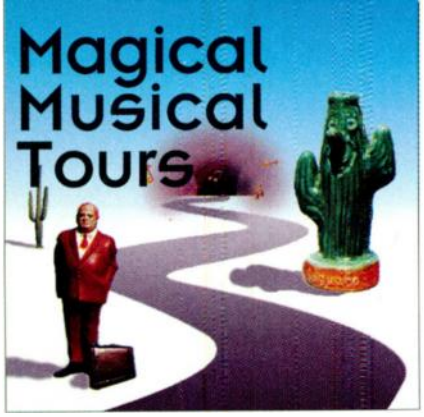
FOR INFORMATION ON YOUR NEAREST DIGIDESIGN DEALER, TO SCHEDULE A DEMO, OR TO RECEIVE PRODUCT LITERATURE. CALL 1.800.333.2137 EXT.109

digidesign®

• 1360 WILLOW ROAD • MENLO PARK • CA • USA • 94025 • 415.688.0600
EUROPE (LONDON) • 44.81.875.9977

All trademarks and registrations are the property of their respective holders. © 1994 Digidesign. All rights reserved. *PC only at present time. **Macintosh only. Alesis and ADAT are registered trademarks of Alesis Corporation used with permission. The Digidesign ADAT interface is a product of Digidesign, Inc., and is not a product of Alesis Corporation.

World Radio History



and .zip for DOS files. You can use the Mac program *StuffIt Expander* to decompress .hqx and .stf files and *Disk Doubler* to decompress .cpt files. On the DOS side, use *PKUNZIP* to expand .zip files.

NAVIGATING THE 'NET

Touring unfamiliar territory is no fun if you get lost. The depth and breadth of the Internet has inspired some users to develop powerful tools that simplify the task of locating and accessing the information it contains. Many of these tools are available as freeware and shareware and can be downloaded from various sources (see **Table 3**). In "Cruising the Internet," in the April 1994 **EM**, there is a thorough discussion of one of those tools, *Gopher* (one of those programs that reside on the remote host computer), so I won't duplicate that coverage in this article.

However, I would like to point out that the *Gopher* server at the WELL (Whole Earth 'Lectronic Link in the San Francisco Bay Area) is particularly rich with information of interest to electronic musicians. To get to the WELL's *Gopher* server, type **telnet gopher.well. sf.ca.us** at the UNIX prompt. (*Telnet* is a UNIX program that resides on the remote host computer. It takes you directly to another host computer as if you had dialed it up directly.) The *Gopher* menu, with a set of numbered selections, will appear. Select the "Art, Music, Film" menu item. Finally, select the "New Music" menu item.

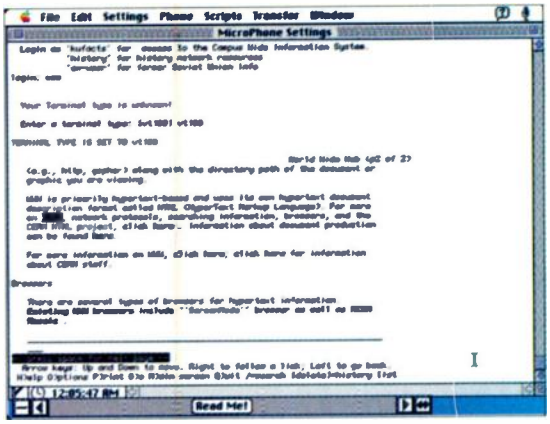


FIG. 4: *Lynx* is a text-based Web document reader. The bold-faced text indicates that the word or phrase is linked to another hypertext document at the same or another Internet site.

All the major commercial online services that provide Internet access to their members build a firewall to prevent nonmembers from gaining admittance, and the WELL is no exception. However, the WELL's *Gopher* server is open to anyone with an Internet account. The editors at the WELL describe it as "...an experiment in publishing in Cyberspace. We wanted to build something that would be something like a magazine—with editors, editorial control and comments, and

TABLE 4: How Much for a Ticket to Ride?

This list is not intended to be comprehensive, but it does provide an example of the different routes through which you can obtain access to the Internet. Note that you must have SLIP or PPP access to use programs such as *Mosaic* and *TurboGopher* that present graphical front-ends to the Internet.

Access Provider	Type of Access	Startup fee	Monthly & Hourly fee(s)	Telephone No.
AlterNet	PPP	$99 (Includes *Windows* graphical user interface.)	$20 for basic service + $10 for private e-mail box + $10 for newsgroup e-mail box + $3/hour for access on local hub OR $9/hour for 800 number access (Other plans also available.)	(800) 488-6384
PSINet	PPP	$200 (Includes graphical user interface for Mac, *Windows,* or UNIX and unlimited access during first three months.)	$29 for 29 hours of access $2/hour for ISDN access beyond 29 hours. $3/hour for V.32.bis access beyond 29 hours (Other plans also available.)	(800) 774-3031
NETCOM	PPP or SLIP	$50	$17.50 + $2/hour (Other plans also available.)	(408) 554-8649
Delphi	Internet shell	None (Includes access to all other Delphi services.)	$20 for 20 hours access + $3 for Internet access + $1.80/hour beyond 20 hours. (Other plans also available.)	(800) 695-4005
PAN	Internet shell	None (Includes access to all other PAN services.)	$35 for 5 hours access $3.60/hour thereafter (Other plans also available.)	(215) 584-0300
The WELL	Internet shell	None (Includes access to all other WELL services.)	$15 + $2/hour	(415) 332-4335

World Radio History

THE BEST MUSIC EQUIPMENT CATALOG IN THE BUSINESS

FREE

MUSICIAN'S FRIEND GIVES YOU...

GREAT VALUE, SERVICE AND SELECTION

- 45-day money-back guarantee
- Toll-free ordering
- Full technical support and customer service
- Extra fast delivery
- Customer satisfaction
- Immediate up-to-the-minute inventory and price information
- Major credit cards accepted

MONEY 100% BACK — 45 DAY SATISFACTION GUARANTEED

FULL COLOR CATALOG FEATURING...

- Detailed product descriptions
- In-depth reviews of new products
- Informative product articles
- A huge selection of quality brand name equipment including *guitars, basses, amps, keyboards & MIDI, software, effects processors, recording equipment, PA gear, books, videos and tons more...*

Zoom · ART · DigiTech · Ibanez · Marshall · Roland · BOSS · E-MU · DiMarzio · Seymour Duncan Pickups · FURMAN · lexicon · SAMSON · NADY · FSP · Jackson · Gibson USA · Charvel · DOD · WASHBURN · KORG · EV · Epiphone · FOSTEX · ADA · TASCAM

For all of your music equipment needs call 1-503-772-5173 and ask for your FREE Catalog

OUR PLEDGE
The best values, shipped to your door

❒ YES! Please rush me the next 3 editions of Musician's Friend totally FREE of charge!

Now's your chance to join hundreds of thousands of satisfied musicians in receiving the #1 catalog, absolutely free!
Call 503 772-5173, or mail in this coupon to Musician's Friend, P.O. Box 4520, Dept. 107, Medford, OR 97501.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

World Radio History

More From Your MIDI!

Drummer

Workstations and Drum Machines will come alive. Drummer is an interactive pattern writing tool that listens and responds to your performance, providing creative and authentic drum parts easily and instantly.

Strummer

Do you have great guitar sounds? Now you can play great guitar parts. Strummer will transform your keyboard playing into a stunning and convincing performance featuring realistic guitar articulation.

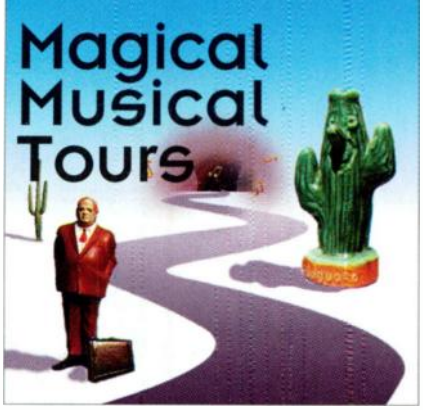
Cyclone

Cyclone elevates even the simplest keyboard part into anything from a delicate shower of notes to a multi-keyboard pyrotechnic extravaganza. Programmable, definable, and interactive, Cyclone is the definitive MIDI arpeggiator. Back by popular demand!

Oberheim

American Innovation Continues...

Oberheim • 2897 Chapman Street • Oakland, CA 94601
1-800-279-4346
a division of Gibson Guitar



a clear 'point of view.'" Hats off to the WELL for putting the interests of the online community ahead of the profit motive.

SPIDERMAN'S HAVEN

An increasing number of Internet sites are now adding World Wide Web (WWW) directories (see **Table 5**). The Web is a universe of Internet sites linked together through documents prepared with the Web's HTML (Hypertext Markup Language) scripting language. Web documents can include embedded graphics and sound, as well as text, so it may be the closest thing to real-time multimedia on the Internet. Selecting keywords or objects in the body of a Web article can trigger a sound or take you to other areas of the article, another directory at that Internet site, or even another Internet site (whether it's a Web site or not). You can also go directly to any document at any Web site by using its Universal Resource Link (URL) address. In *Lynx* (one of the text-based Web browsers that resides on the remote host computer), type **g**, hit the enter key, and type the URL address at the URL prompt.

Links can also have different characteristics. For example, an *http* (*Hypertext Transfer Protocol*) link can retrieve hypertext documents from other Web sites. An *ftp* link can reach out to another Internet site and retrieve a file using *ftp*. *Gopher* links can reach out and search *Gopher* servers. Using the Web, you might start out reading about a new development in synthesis technology at a Web site at U.C. Berkeley, encounter a technical term you're not familiar with, click on the term, find yourself reading a definition of the term from a *Gopher* server in Helsinki, Finland, and then download a digital-audio recording of the new synth from an *ftp* site in Switzerland. The Web makes all the computers on the Internet seem like one *very* deep reservoir of information.

Mosaic, a graphic front-end developed for browsing the World Wide Web (see **Fig. 3**), is one of the best justifications for paying for SLIP or PPP access to the 'net. Navigating the Web using *Lynx* (see **Fig. 4**) is clumsy and slow compared to *Mosaic*'s point-and-click ease. *Mosaic* takes much better advantage of the Macintosh and *Windows*

TABLE 5: The World Wide Web

The World Wide Web is evolving into the first true multimedia online service. Here are some Web sites and documents of particular interest to musicians.

Type of Information	Universal Resource Link (URL) Address
General info on the WWW.	http://info.cern.ch/hypertext/WWW/TheProject.html
A directory of music-oriented sites for general music information.	http://www.oulu.fi/music.html
A comprehensive catalog of all types of music-oriented information on the Internet, including links to *Gopher* and *ftp* sites.	http://www.music.indiana.edu/misc/music_resources.html
MIDI Home Page. A MIDI archive containing lots of tools and sequences in Standard MIDI File format.	http://www.eeb.ele.tue.nl/midi/index.html
Internet Underground Music Archive. Music, artwork, and bios of musicians and bands. The shareware concept extended to music publishing.	http://sunsite.unc.edu/pub/ianc/index.html
Terrain Project. An interactive music site that uses geographic elevation as a compositional element.	http://www.mcs.csuhayward.edu/~tebo/terrain.html
WNUR Jazz Information Server. Contains a wealth of information on this style of music.	http://www.acns.nwu.edu/jazz

World Radio History

EVERYTHING YOU EXPECTED. AND MORE.

THE LEXICON PCM-80: THE NEXT GENERATION OF DIGITAL EFFECTS PROCESSING

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

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

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

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

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

There's also a 'tempo' mode for every program which can drive almost any element of the PCM-80's effects. Delay lines, LFO's and Lexicon's unique Time Switches can all be quickly aligned to the tempo of your piece, with both rhythmic and absolute time values. You can source the tempo from MIDI, or generate MIDI clock from your own tap.

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

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

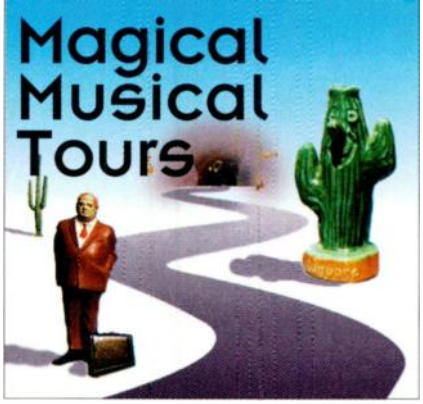
lexicon

HEARD IN ALL THE RIGHT PLACES

A Harman International Company

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

World Radio History



user interfaces (or *X Window*, if you happen to be running a UNIX workstation) because you can use your mouse to trigger hyperjumps.

Perhaps the best aspect of the Web is that it's fairly easy for individual users to create their own Web documents using HTML. Ask your access provider if they have allocated space for a Web site and, if they have, how you can publish on it. If you have *Mosaic*, or another Web browser, you can check out the CD catalog that Tim Perkis developed for our record label, Artifact. It's available through the Web site at California State University, Hayward. You might also want to check the Web site in Helsinki, Finland. It catalogs many of the Internet resources that are relevant to the subject of music and music-making. Of course, it also provides hyperlinks to these sites. Please refer to **Table 5** for the specific addresses of these and other Web sites.

NEXT STOP: THE FUTURE

As we come to the end of our tour, please keep your hands inside the bus until it comes to a full and complete stop. I hope I've sufficiently piqued your interest—and provided you with enough navigation tips—that you'll begin taking Internet trips on your own. Once you do, I'm sure you'll find yourself hooked.

The Internet is constantly changing; every day, it becomes capable of more. Consider the Internet MBONE (Multicast Backbone). Although this technology is still in the experimental stage, it may soon be possible for musicians and other artists around the world to join together in virtual jam sessions without having to leave their studios.

You can't begin to fathom how extensive the Internet's resources are until you get out there and start exploring. I think you'll find the Internet sites listed in these tables to be good resources, but they should be considered nothing more than starting points for your own adventures. Of course, the Internet is a two-way highway, so don't forget to make your own contributions to the knowledge that's out there.

Uh-oh. Do I hear AC/DC's "Highway to Hell" playing? I feel my alter ego coming on again. I think he wants to have the last word.

So, what did you think of the Internet? Heck of a ride, isn't it? Yeah, there are a few potholes, but still, it's a heavy trip. Hey, if you're out cruisin' cyberspace and find some cool stuff, drop me a line. My address is scot@csuhayward.edu. See ya on the 'net!

Scot Gresham-Lancaster *is a composer, performer, and instrument designer who lives in Oakland, California. He lectures on the subject of computer music at California State University, Hayward.*

TELECOMMUTING FROM AMSTERDAM

I accepted the assignment to write this story three days before I left for an artistic residency at STEIM, in Amsterdam, the Netherlands. Ironically, it was the Internet itself that made it possible for me to accept the assignment. Thanks to Internet tools such as *rlogin*, *telnet*, *Lynx* (all of which are UNIX programs that reside on the host computer), and e-mail, I had access to the same resources I would have had from home or work.

Once I arrived in Amsterdam, I opened an account on hacktick.nl, a commercial service not unlike NETCOM, the WELL, or any other online service in the U.S. (hacktick.nl happens to be the Netherlands' first commercial network access node).

Using my PowerBook to log onto my hacktick account from my hotel room, I used the program *rlogin* to log onto my Internet accounts in California. Once there, I had total access to all the files, research, and reference materials that are stored in my workspace at Cal State Hayward. *Lynx* led me to discover several new Web sites in Europe, and I used e-mail to communicate with my associates in the States.

The Music Industry's Only Connection to The Internet...
THE PAN NETWORK

CompuServe doesn't have it.
GEnie doesn't have it.
Prodigy doesn't have it.
America OnLine doesn't have it.

Only PAN gives you the advantages of *complete* and *unlimited* access to the Internet-the Global Electronic Superhighway.

Besides giving you access to thousands of MIDI song files, patches and samples, song lyrics, guitar tab files, MIDI software titles and free programs and utilities, PAN's Internet Advantage features over 2,600 Usenet newsgroups and direct connection to thousands of BBS's.

- MIDI Documentation
- Equipment Reviews
- Newsletters
- Radio Playlists & Charts
- Library of Congress
- Tour Support
- Artist Profiles
- New Record Releases
- Video and Film
- Pro Audio Network
- Music Research Digest
- Free Classifieds
- Employment Opportunities
- FTP, USENET, Gopher
- Virtual Reality
- How-to Articles & "FAQ's"
- Mailing Lists & "Listservs"
- Record Label Support

PAN IS EASY TO USE!

To connect to PAN from any location:

Direct Dial - 617-576-0862
1. Press RETURN twice after you connect.

Sprintnet - call 800-877-5045 for local #
1. After CONNECT, type @D
2. Press RETURN 3 times
3. At the "@" prompt type C PAN

Tymnet - call 800-336-0149 for local #
1. After CONNECT, type the letter "o"
2. At "Please login", type PAN

Internet - telnet pan.com

Overseas/PTT
1. Connect to "NUA" 311061703093

TO JOIN PAN

1. At the "Username" prompt, type PANJOIN
2. At "Authorization Code", type ADVANTAGE

Rates as low as $3.60/hour.
Free usage for database contributors

THE PAN NETWORK

The PAN Network
P.O. Box 162
Skippack, PA 19474
Tel: 215-584-0300
Fax: 215-584-1038
Internet: pan@pan.com

THE INTERNET ADVANTAGE

World Radio History

Worldwide Standards

Price, Performance, Reliability, Innovation, Selection. All combined with a Lifetime Guarantee. Since 1988, MIDIMAN has set the Worldwide Standard of Excellence in MIDI/Multimedia hardware products for everyone from the studio professional to the home hobbyist.

MIDI Interfaces for the PC and Macintosh - Internal and External MIDI/Multimedia interfaces for every application and budget. MIDIMAN offers the largest selection of MIDI interfaces available today.

MIDIMAN Sound Card Cable - Instantly (and inexpensively!) connects your SoundBlaster Pro, Pro Audio Spectrum or any SoundBlaster 15 pin compatible sound card to the world of external MIDI sound modules and MIDI devices.

MIDI Synchronizers / Video Solutions - From the Industry Standard SmartSync, Syncman, and Syncman Pro line of MIDI sync boxes to our State of the Art VITC reader / writer / universal time code translator, Video Syncman, MIDIMAN offers more MIDI / Multimedia sync solutions with more features than anyone in the business.

Audio Mixers for the MIDI / Multimedia Musician - Digital quality audio mixers and sub mixers especially designed with the MIDI/Multimedia musician in mind. From our configurable 8 channel MiniMixer to our new, 18 input, half rack MicroMixer we offer the most innovative, cost effective audio mixing solutions available.

MIDI "Must Have" Peripherals - The MIDI Thru and MIDI Merge box are essential components in any MIDI setup and we've got you covered with our all new Thru 1 x 4 and Merge 2 x 2.

Wireless MIDI - Since its' debut in 1989, TransMIDI has been in use by more keyboardists around the world than any other wireless MIDI system.

MIDIMAN "Worldwide Standards" are available at over 400 retail locations in the continental U.S. and in 30 countries worldwide. You can also find many of our products around the world under such prestigious names as **Roland**, **Steinberg** and **EMAGIC**. For product information or the name of a MIDIMAN dealer or distributor near you call us Toll Free at **(800) 969-6434**.

midiman
GUARANTEED FOR LIFE

236 W. Mountain St., Suite 108, Pasadena, CA 91103 · Tel:(818)449-8838 FAX:(818)449-9480 BBS:(818)449-2019 · CompuServe: MIDIBVEN Forum(Section 2)-ID#75300,3434 for E-Mail

World Radio History

World Radio History

Prepare your *Windows* system for hard-disk recording without breaking the bank.

Diving into DIGITAL

By Zack Price

Illustration: James William Gary

You might think that hard-disk recording is something only professional studios can afford. The idea of working with high-quality digital audio without spending a ton of money seems like a fantasy. As for *Windows* users, the closest many get to digital audio is the tinny fanfare they hear when *Windows* first opens.

But lurking inside that IBM-compatible is the foundation for an affordable and potentially high-performance digital-audio system. What's more, most of the elements needed to perform effective hard-disk recording on a *Windows* PC are often part of a standard system package. The only additional things you need are hard-disk recording software and perhaps a better-quality sound card, which can be purchased for less than you might think. There are two types of hard-disk recording software: stereo (or 2-track) and multitrack. Stereo software works with just about any hardware configuration. *Windows* even comes with a couple of stereo digital-audio programs: *Media Player* and *Sound Recorder*. Many commercial programs—including Sonic Foundry's *Sound Forge* (see **Fig. 1**), Turtle Beach's *Wave*

World Radio History

Diving into Digital

for Windows, and Digital Audio Labs' *FastEddie*—are in the $100 to $200 range. (See the review of five other low-cost, stereo, hard-disk recording programs for *Windows* in the June 1993 **EM**.)

Multitrack software—such as Turtle Beach's *Quad*, Innovative Quality Software's *Software Audio Workshop* (*SAW*; see **Fig. 2**), and Digital Audio Labs' *The EdDitor Plus*—is generally more sophisticated (and expensive), requiring more specific (and expensive) hardware configurations. Nevertheless, you can typically add budget-priced multitrack capabilities to your computer for less than $1,000.

BASIC HARDWARE

Budget hard-disk recording has three essential requirements. First, the computer system and software must be able to smoothly record and play back stereo sound files at a sampling rate of 44.1 kHz with 16-bit resolution. Second, file size should be limited only by available hard-drive space, not system RAM. Third, the digital-audio software must offer editing functions that can be applied to recorded sound files.

Capabilities beyond these basic requirements depend on the performance of the hardware (computer, hard drive, and sound card) and software. More accurately, it is the *interaction* of the hardware components that normally determines how well a given system works with a particular hard-disk recording program. In addition, the more sophisticated multitrack programs often have demanding system requirements to match their extensive capabilities.

It may seem like a futile exercise to assemble the necessary hardware and software configurations for inexpensive hard-disk recording. In the IBM-compatible world, it's all too easy to assemble a system that includes incompatible components, especially because of interrupt (IRQ) and bus-address conflicts. For example, if your mouse and sound card use the same IRQ, the digital-audio software won't work properly. (Microsoft's upcoming Plug-And-Play specification will make it much easier to configure systems by automatically setting the various components' IRQs and bus addresses to avoid conflicts.)

Nevertheless, there are some general guidelines for determining the ability of your system to perform hard-disk recording. Keep in mind that these are guidelines, not rules set in stone.

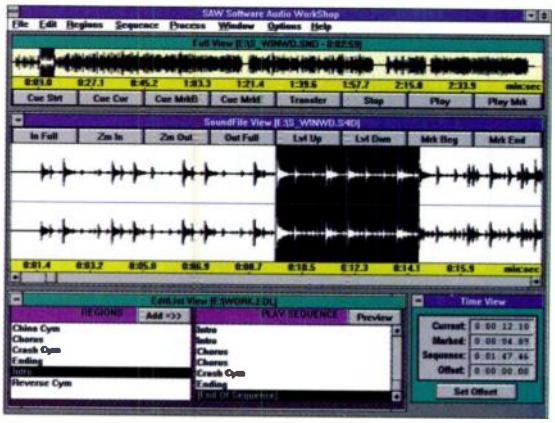


FIG. 2: Innovative Quality Software's *Software Audio Workshop* (*SAW*) lets you record up to eight audio tracks, configured as four stereo pairs. You assemble Regions in the EditList View (bottom left). Time View (bottom right) shows the cursors location in time.

THE MUSICAL COMPUTER

Basic hard-disk recording requires at least a 25 MHz, 80386SX-based machine with 4 MB of RAM. (This ensures compliance with the latest Multimedia PC specification, known as MPC Level 2.) However, more advanced software requires a faster processor to operate at full potential. In addition, 8 MB RAM is recommended (and in some cases, required) for multitrack programs designed to operate in multitasking environments with sequencing programs. In fact, overall program performance is directly affected by the processing chip, the chip's clock speed, and available RAM.

Although the performance-to-chip/clock/memory correlation is generally reliable, there are some exceptions. For example, a 33 MHz 80386DX with a SCSI-2 drive may be able to outperform a presumably faster 25 MHz '486SX with an IDE drive, because the throughput (amount of data transferred per second) is significantly higher with a SCSI-2 drive. This might not be important if you're recording a stereo sound file, but it could be critical if you're planning to use a multitrack program.

Another important exception to this general rule applies to computers with clock-doubled processors (designated by "2-" before the clock speed, e.g., 80486DX2-66.) Computers with clock-doubled processors might not run as fast as computers with seemingly lower processor speeds. For instance, a '486DX2-66 chip processes information internally at 66 MHz, but it can transfer data across its I/O bus at only 33 MHz. A '486DX-50, on the other hand, performs both operations at 50 MHz. Because hard-disk recording involves heavy I/O transfers, the '486DX-50 will probably perform better at this task than a '486DX2-66.

The video capability of the computer is also important to consider. Of course, VGA graphics are required by almost all programs to view and edit waveforms on the screen. However, each time you change something, the screen is normally redrawn. This can be maddeningly slow unless you have a fast video card or a *Windows* video accelerator.

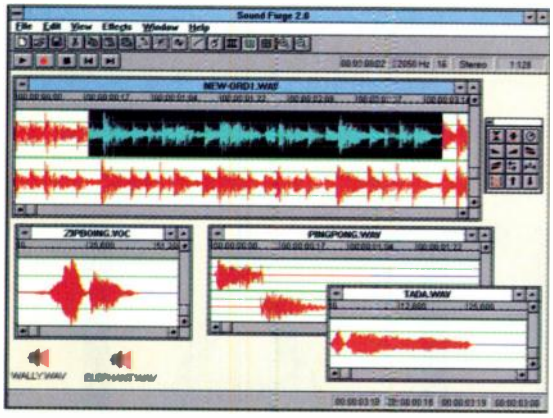


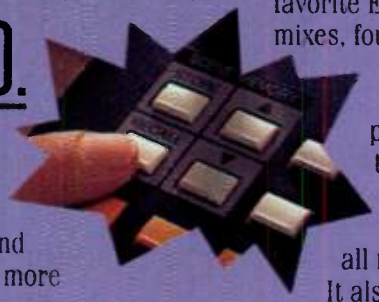
FIG. 1: In addition to its capable recording and processing features, Sonic Foundry's *Sound Forge* 2.0 can combine segments from different files and split stereo files to mono. It is unrivaled at handling multiple file formats, translating between Mac AIFF and SND, NeXT, Sun, Amiga SVX, Atari *Sound Designer*, and most PC formats.

HARD-WORKING DRIVES

Recording to hard disk requires a large-capacity hard drive. Fortunately, most

World Radio History

AFTER 25 SONGS AND 1300 MILES, PUSH A BUTTON AND YOU'RE RIGHT BACK WHERE YOU STARTED.



Ahh, the joys of being on the road. One night the mics are giving you feedback. The next night it's the lead singer. And your nightly sound checks need more time than you have to spare.

Fortunately Yamaha has something to make your life a little easier.

We call it ProMix 01.™ But before you can truly appreciate what it is, we have to tell you what it's not.

It's not a mixer in the traditional sense. To call the ProMix 01 merely a mixer, is like calling a computer just a typewriter.

And it's not expensive. In fact, ProMix 01 is the first digital mixer that's down right affordable.

Yet ProMix 01 gives you something no other mixer at this price can touch. Namely the ability to store and recall all the settings of your mix. And that saves you a lot of time.

What does this mean to you? You can now get a digital mixer with mix memory and motorized faders for about the same cost as a low-priced analog one.

ProMix 01 is also capable of dynamic automation. All your moves can be recorded in real time and played back in conjunction with any outboard MIDI sequencer.

And because ProMix 01 is rugged and extremely compact, you'll find it's the perfect mixer to take on the road.

It has enough ins and outs for everybody in the band. Including 16 balanced mic/line inputs (plus one dedicated stereo input), phantom power, 4 aux sends, 2 stereo effect returns, metering of all inputs, two sets of stereo outputs and a monitor output with cue features.

Plus you'll find ProMix 01 is the ideal mixer for your project studio. Push a button and you're right back where you left that tune you were working on a few months back.

You'll also find two onboard digital effect processors. Three assignable stereo compressors. And a three-band parametric EQ on every channel to help control feedback and add punch to your sounds.

There's even an EQ library to store your favorite EQ settings. And when it comes to tough mixes, four fader groupings let you control multiple channel levels with a single fader.

Sounds pretty good? Actually it sounds pretty great. ProMix 01 boasts more than 100dB of dynamic range. All made possible by the latest 20-bit AD/DA converters. Which virtually eliminate all noise, distortion and crosstalk.

It also features digital out for flawless audio transfers to R-DAT and other digital mediums.

Every once in a while, something comes along that raises the standard of what people can expect. This is one of those times.

The Yamaha ProMix 01. It can recall your best mixes in an instant and make you forget about using any other mixer just as fast.

YAMAHA
Programmable Mixing

For a hands-off demonstration, stop by your nearest Yamaha dealer today. Or call 1-800-937-7171, Ext. 360 for more information.

© 1994 Yamaha Corporation of America, Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622. (714) 522-9011.
Yamaha Canada Music LTD, 135 Milner Ave., Scarborough, Ontario M1S 3R1 (416) 298-1311

World Radio History

computers sold today come equipped with 245 MB hard drives, and 340 MB drives are rapidly becoming the norm in system packages. In addition, hard-drive prices are down, so it's easier to afford a second drive that can be dedicated to digital-audio files only. However, don't expect file-compression software, such as *Stacker* or *DoubleSpace,* to double the space on your hard disk for audio files. (I'll explain why later.)

Access time—the time it takes to find a particular piece of data on the disk—is just as important as storage capacity. It is expressed in milliseconds (ms). Access times of 12 to 15 milliseconds are adequate for most hard-disk recording in stereo. In most cases, the larger a hard disk's capacity, the faster the access time.

Another important factor is data throughput, which measures the amount of data that can be transferred to and from the hard disk per second. A stereo digital-audio file requires a minimum throughput of 176.4 KB/s, which is no problem for most modern drives. Depending on the processor and clock speed, IDE drives top out at about 1.1 to 1.4 MB/s, while SCSI-2 drives can reach 6.7 MB or more.

This would seem to indicate that you can run six to eight simultaneous stereo tracks from an IDE drive, but it's not that simple. The practical number of simultaneous tracks is reduced with processing overhead, CPU speed, etc. In one test by Innovative Quality Software, an 80486DX-33 machine with an IDE drive was able to sustain two stereo tracks indefinitely, three or four tracks intermittently, and four continuous tracks for no more than 30 seconds. Digital Audio Labs has found that a sustained throughput of 800 KB/s is a practical minimum for reliable 2-track recording and playback, while you need at least 1.6 MB/s for multitrack operation.

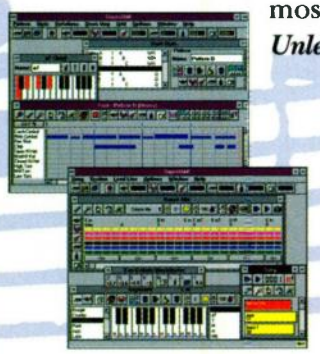
The final critical factor is the free space left on the hard disk after you've loaded all your programs and files. Stereo sound files recorded at 44.1 kHz with 16-bit resolution occupy roughly 9 to 10.5 MB per minute of sound, so a 4-minute song eats up about 42 MB of hard-drive space. And because you often mix information from two or three stereo sound files at once, you should have at least twice as much free space as your finished song will take. Overall, I recommend having at least 120 MB of free space.

The type of hard drive can also be a factor. Nearly all hard drives sold with IBM-compatible computers (usually IDE drives) work well for stereo recording. In some faster systems, IDE drives provide adequate levels of performance for multitrack programs.

However, if you plan to use a multitrack program, a SCSI-2 hard drive makes more sense. In multitrack hard-disk recording, each "track" is a pointer that accesses different digital-audio files scattered in different physical locations on the disk surface. The drive must be fast enough to quickly find, read, and transfer these multiple "lists" of information. Because SCSI-2 drives transfer data more quickly than IDE

OUR JAM IS WORTH GETTING INTO! SUPER JAM!

Don't get stuck with outdated software! If you're serious about music, you need SuperJAM!™ - the ultimate auto-accompaniment tool for Windows.
SuperJAM! composes lifelike arrangements and offers "on-the-fly" command of key, tempo, groove, chord, style and embellishments. Its extensive recording and editing features provide complete control over every musical element. Plus, SuperJAM! includes the industry's most sophisticated style creation tools ever.
Unleash the power of your creativity with SuperJAM!



UPGRADE IN-A-BOX!
$49.95 PLUS SHIPPING (Sugg. Retail: $129)
If you own the JAMMER™ or Band-in-a-Box™, get SuperJAM! for less than $50! If you don't, ask for the latest special! CALL 1-800-226-0212 NOW! (Outside the US, dial 404/315-0212.)

All trademarks are hereby acknowledged.

Top 25 products under $250... Electronic Musician

"An amazing music platform– doubly so when you consider the rock bottom price..." Keyboard

"Perfectly suited to the inexperienced user, die-hard MIDI addict, or skilled musician..." PCWorld

THE BLUE RIBBON SOUNDWORKS LTD
404/315-0212
800/226-0212
fax 404/315-0213
bbs 404/315-0211

World Radio History

SERIOUS TOOLS

The Aphex ST Series Offers You Serious Audio Tools at Amazingly Affordable Prices

Until now serious audio tools came with serious price tags. So you had to settle for affordable "toys" that might do the job, but just don't sound good. Now Aphex, the world's leading professional audio signal processing company, has the solution. Serious tools at affordable prices.

Introducing The ST (Serious Tools) Series℠

The Easyrider™ Four Channel Compressor, the Four Channel Logic Assisted Gate™ and the famous Aural Exciter® Type C² with Big Bottom® are designed with Aphex's commitment to ultra clean audio paths, simplicity of operation, and unrivaled performance. Only Aphex signal processing uses the VCA 1001 and has six separate patents issued or pending on the proven technology in these products.

NEW! Aphex Model 106 Easyrider Four Channel Compressor

This four channel compressor features an intelligent detector circuit which varies attack and release characteristics depending upon the texture of the input signal. This intelligence makes the Aphex Easyrider simple and fast to setup and use. And, unlike the "toy" compressors, it sounds great for any application.

NEW! Aphex Model 105 Four Channel Logic Assisted Gate

Four full-featured channels of high performance gating. The detector circuits are logic assisted so gate operation is absolutely positive and consistent. This is a serious tool for drum gating ... reducing feedback in PAs ... automatically muting unused channels ... quieting noisy modules and effects processors ... and creating special dynamic effects.

Aphex Model 104 Type C² Aural Exciter with Big Bottom

Over 100,000 Aural Exciters are in use in recording, broadcasting and sound reinforcement around the world. Licensed by leading audio manufacturers, it is the world standard for high frequency enhancement. The C² gives you two channels of true Aural Excitement plus explosive Big Bottom bass enhancement technology.

Get Serious Today

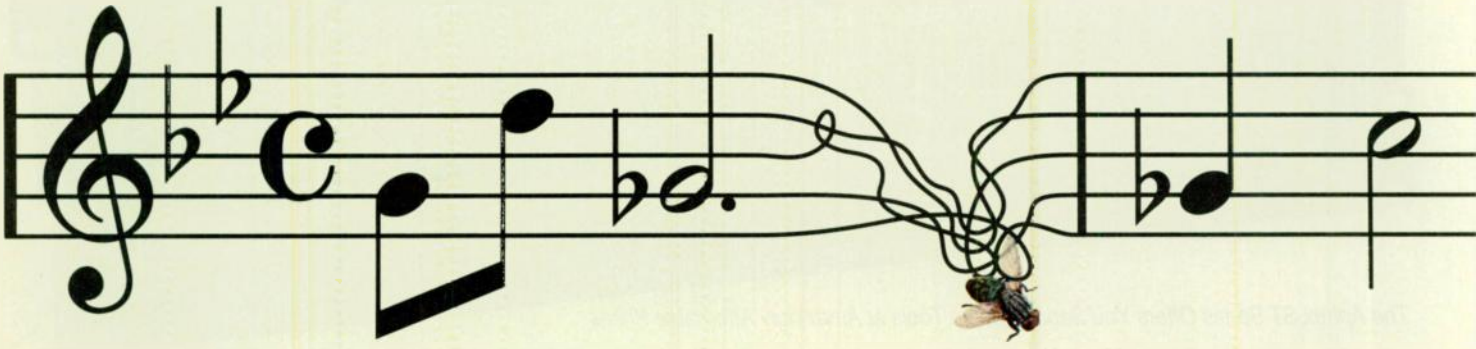
Check out the new Aphex ST Series at your nearest Aphex dealer today. Compare them to the "toys". You'll hear the difference, and marvel at the affordable prices. If you're serious about your sound, get Serious Tools from Aphex!

APHEX SYSTEMS *Improving the way the world sounds℠*

11068 Randall Street • Sun Valley, CA 91352 U.S.A • (818) 767-2929

Aural Exciter, Big Bottom, Logic Assisted Gate and Easyrider are trademarks of Aphex Systems Ltd. and are covered by patents issued and pending.
© Aphex Systems

World Radio History



If it's in the room, it's on the tape.

3M™ 966 and 3M 996 Audio Mastering Tapes are so accurate they capture every nuance in the studio—from the emotion in a blues note, down to the fly on the wall. 3M 966 tape lifts technological barriers by allowing you to record more signal with less print, so you get less print-through without higher noise. It's all you need to record every note, every beat, and every whisper in the music with crystal clarity. But if you do want more, there's 3M 996 tape. The industry standard in high-output audio mastering tapes. So for true sound reproduction, demand 3M 966 and 3M 996 tapes. And as a precaution, you might want to invest in a little bug spray. For more information, call 1-800-752-0732.

3M *Reliability*

©3M 1994

World Radio History

drives, most software performs better with a SCSI-2 drive. In addition, IDS drives are limited to 540 MB. Fortunately, the new Enhanced IDE standard will remove this limitation.

Keep in mind that SCSI-2 drives are usually more expensive than IDE drives, although prices are rapidly dropping to competitive levels. You will have to get a SCSI-2 controller card, as well. This adds to the expense, and it also takes up another card slot in your system. However, you can control up to seven SCSI devices with one controller card. (IDE controllers can accommodate only two drives; however, the Enhanced IDE standard will let you control four drives.) If you opt for a SCSI-2 drive, you should make sure the controller is a 16-bit card, which transfers information at a faster rate than 8-bit cards.

If your applications and other files take up too much of your primary hard disk, it's time to get a dedicated drive. (This is highly recommended in any event.) As of this writing, the street price for a 540 MB internal hard-drive kit (12 ms access, IDE type) is under $400. That translates into about 50 minutes of total recording time.

There are several reasons to install a hard drive that is dedicated to digital-audio files. For one thing, *Windows* is notorious for creating and deleting temporary files during every working session. This process causes serious fragmentation of the data on the disk, because files are broken into pieces and stored at different physical locations on the disk surface. As a result, the disk takes longer to store, find, and transfer files. To overcome this problem, you must periodically defragment the disk (discussed shortly). Because a dedicated drive only stores audio files, this chore must be performed less often. In addition, multitrack programs definitely work more efficiently when the operating system, application, utilities, and other supplementary files reside on a different drive from the audio files.

If you have a single, large-capacity drive, you can partition it into two virtual drives (C and D) instead of buying another drive. Use the D partition exclusively for digital-audio data. This is usually less expensive than the same amount of storage on two separate drives.

SUPERIOR SOUND CARDS

To comply with the MPC Level 2 specification, your sound card must be able to record and play digital audio at a sampling rate of 44.1 kHz, with 16-bit resolution, in stereo. Most, if not all, stereo programs work with any sound card that is compatible with *Windows* and compliant with the MPC Level 2 spec. Multitrack programs are more limited because they demand more from the card.

If you have the option of choosing a sound card, don't assume that just any card will do. Many cards bundled with "multimedia" computer packages can't record and play back digital audio at the required specs. Even if they do, the audio quality varies widely from one card to another. Not all cards work with MIDI, digital audio, and CD-ROM drives, either. Some cards, such as the Roland SCC-1, include a MIDI synthesizer but don't play digital-audio data. Other cards, such as the Digital Audio Labs CardD, record and play digital-audio data, but don't provide a synthesizer.

If you intend to use multitrack software, you need a sound card that can simultaneously record and play digital-audio information. Unfortunately, *Windows* was never intended to support tightly synched, simultaneous recording and playback, so software developers must be crafty to make it work correctly. All of this suggests you should shop for software that performs this task successfully, then buy a card that supports it. For example, the Digital Audio Labs CardD and Turtle Beach Monterey support synched recording and playback, while the Sound Blaster 16 with ASP does not. Other sound cards may or may not have this capability, so always check the specs.

Some sound cards do double duty as SCSI-2 controllers. They save a card slot, but many operate as 8-bit controllers. To be on the safe side, you should use a separate SCSI-2 controller card anyway. There's no point in making your sound card work harder than it has to.

World Radio History

BACKUP DEVICES

Once you have a lot of digital-audio data recorded, it's wise to back it up. (You back up all your other important data, don't you?) Any backup device will do the job, although digital-audio files are quite large. It is possible to use floppies with a standard backup program for digital-audio files, but this is not recommended.

High-capacity, removable media, such as 270 MB SyQuest or 230 MB magneto-optical (MO) drives, work well. You can also use a data DAT tape drive to back up as much as ten gigabytes for not much more than the removable drives. The tradeoff is that DAT tape is a far cheaper storage medium than removable cartridges, but restoring files from tape is less convenient than directly accessing them from a cartridge. (See "Computer Musician: Backing Up Digital Audio," in the December 1993 **EM**.)

SOFTWARE CONSIDERATIONS

Of course, hard-disk recording requires software to record, play, and edit digital-audio files. Budget programs offer various features and levels of performance, which translates into list price. However, don't overlook the software that comes with most computer systems, at least as a starting place to become familiar with the concepts of hard-disk recording. For example, *Windows* includes two such programs.

Recording Time. As mentioned earlier, recording time should be limited only by available hard-drive space. Some programs (such as *Windows' Sound Recorder*) limit file size to the available RAM in your computer. This type of program is typically found bundled with low-quality sound cards or on bulletin board services. Other than *Sound Recorder*, all programs mentioned in this article limit file size to free hard-disk space.

Number of Tracks. This refers to the number of separate sound files that can be played simultaneously. In most cases, each file is a stereo track. As you might surmise, stereo programs can record and play one stereo or mono file at a time. However, most of these programs (with the exception of *Sound Forge*) cannot split a stereo file into two mono files. Except for *Audio Toolworks* for the Roland RAP-10 system, most programs cannot play two mono tracks at once. Ironically, most multitrack programs are limited to stereo files; they can't work with mono files. Turtle Beach's *Quad* can record and play with mono files and split stereo files into separate mono files, however.

It's important to understand that stereo programs can manipulate more than one stereo track at a time (see **Fig. 3**). Most of these programs can layer, or mix, many stereo tracks from different sound files into one track before it is played. In some cases, you can even "unlayer" files to fix mistakes or try different edits. Of course, it's easier to work with multiple tracks in a multitrack program, but stereo programs can sometimes get the job done faster in applications such as radio production.

Methods of Working. Most digital-audio programs approach hard-disk recording in one of two ways. The first is the traditional tape-track metaphor, in which each sound file is equivalent to a tape track. Separate files can be recorded, played, and/or mixed down into a single file.

With the other approach, once one or more sound files are recorded, you highlight and name regions within the files and create a list of regions to play in a specific order (see **Fig. 4**). This "playlist" refers back to the original sound files and applies any editing instructions during playback without altering the files themselves. Regions can be played repeatedly to increase the total playback time without increasing the size of the file itself.

Destructive and Nondestructive Editing. Some programs edit files destructively; that is, they permanently change the source material during editing functions. Programs that perform nondestructive edits leave the source material untouched, storing the parameters for the changes in a separate file. Destructive edits take more time to accomplish, but playback takes no extra time. Nondestructive edits are applied to the file each time it is played, which can delay playback. In general, stereo programs are destructive, and multitrack programs are nondestructive.

Effects Processing. Most hard-disk recording programs offer a variety of signal-processing options. The most common effects are EQ, volume adjustment and normalization, time stretching, pitch shifting, crossfading, and reverse playback. Some programs also offer reverb, chorus, and a host of exotic effects, such as 3-D audio processing.

Synchronization. If you use a sequencer, drum machine, or multitrack tape deck in conjunction with a hard-disk recorder, it's a big plus if you can synchronize them to play together. This is normally accomplished by recording SMPTE time code on one track of the tape and converting it into MIDI Time Code (MTC) for the sequencer and hard-disk recorder to follow. Unfortunately, no stereo hard-disk recording programs include this feature. (Fortunately, SMPTE support will be included in the upcoming version 3.0 update of *Sound Forge*.)

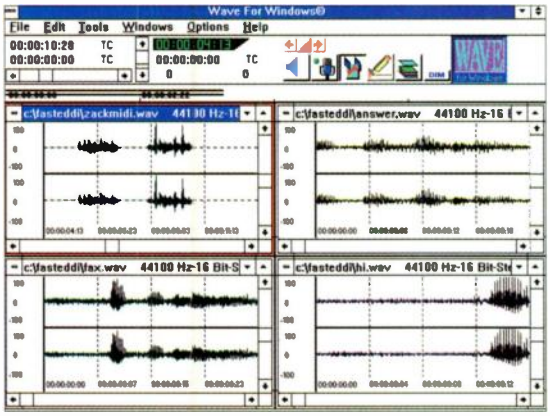
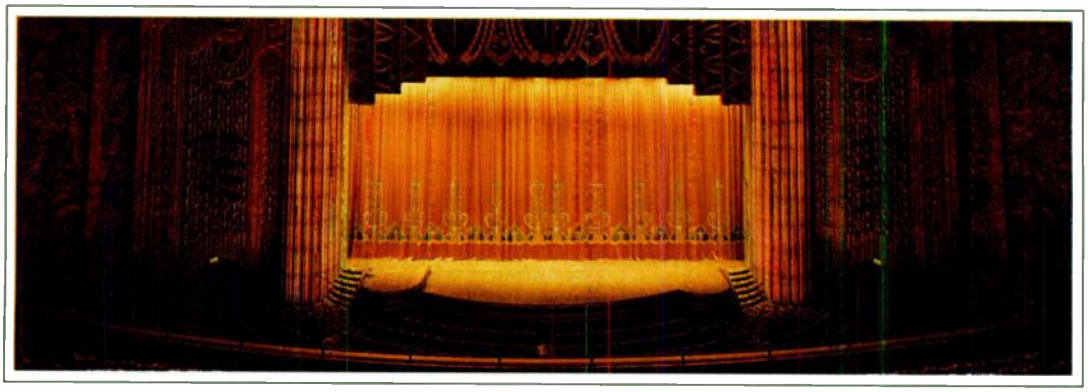


FIG. 3: In the main screen from *Wave for Windows*, up to four files can be open at once, but only one is active. Several stereo sound files can be combined and played as one file.

Multitrack programs typically include synchronization capabilities. For example, *SAW* and *The EdDitor Plus* require the Music Quest MQX-32M MIDI interface for synchronization at SMPTE frame rates of 24, 25, 30 drop-frame, and 30 nondrop. (The 29.97 fps frame rate is not supported, which is a big problem if you're working with NTSC video.)

MIDI Note Triggering. This feature lets you trigger sound files from a MIDI controller or sequencer program. You can also cue up sound files to play at

World Radio History



The AUDIENCE forked over $125 a seat to be *here.*

The LEAD is demanding $12,000 a *performance.*

The PRODUCER put up $4 mil of his own *money.*

The CRITIC is in one wicked *mood.*

So, what kind of WIRELESS MIC was that *again?*

The WMS 900
The only wireless with the sound and quality of an AKG

AKG. The most foolproof wireless systems in the world.

AKG

A Harman International Company

© 1994 AKG Acoustics, Inc. AKG is a registered trademarks of AKG Acoustics, Inc.
All other trademarks are property of their respective companies. 1525 Alvarado St., San Leandro, CA 94577 USA Phone 1•510•351•3500 Fax 1•510•351•0500 In Canada contact: 514•696•3966

World Radio History

the proper time. Currently, only *SAW* offers this capability directly, but it will be available in *Sound Forge* 3.0.

For other programs, you can trigger sound files to play from a sequencer with Media Control Interface (MCI) commands, which tell the computer to play the specified sound file using whatever software it needs at a certain time. The exact time at which the file is played can't be accurately predicted; it depends on how much work the processor is doing at the moment and other factors. However, it's better than nothing.

OPTIMIZING YOUR SYSTEM

Hard drives can pose two serious problems if you're not careful, particularly if you use the same drive for applications and other files in addition to digital audio.

Delete Useless Files. The first problem is having too little space to completely record or edit sound files. You probably have a surprising number of useless or redundant files on your hard disk right now. All these extra files deprive you of valuable recording time, so back them up and erase them from your drive. These files include program tutorials, "read me" files, automatic backups (which usually have .bak filename extensions), and unused files, such as fonts, clip art, and templates.

Defragmentation. As mentioned earlier, the second major problem is fragmentation. When your hard disk is new, the computer stores applications and files in contiguous sectors on the disk for fast retrieval. However, as you create, save, modify, and delete files, they eventually end up in pieces that are stored at several different locations on the physical surface of the disk.

As a result, the drive takes more time to find the files it needs. Fragmentation can also affect the time it takes to store a new file. Both of these factors can cause any digital audio to exhibit noticeable glitches during recording and playback. To solve this problem, invest in a utility program that will defragment your disk so that files are rearranged into contiguous clusters for faster storage and retrieval. If you have MS-DOS 6.0, you can run *DEFRAG* to take care of the problem. Defragment your hard drive on a regular basis to ensure that your hard drive is working to its full potential.

Avoid Data Compression. You might think about compressing the digital-audio data on the hard disk to conserve space, but I don't recommend it. File-compression programs and disk-doubling utilities don't work well with digital-audio files. First of all, real-time data compression doesn't work fast enough to keep up with digital-audio information. In addition, real-time data compression and decompression makes the computer work even harder. Hard-disk recording places a heavy demand on the system, and adding the extra burden of real-time data compression and decompression is a strain your computer can do without.

You might be thinking, "What if I compress digital-audio files after recording them? Won't that save space?" The truth is that the data reduction is minimal. File compression works best on (relatively) recurring information, and digital-audio information is largely nonrepetitive in nature. In fact, certain data-compression techniques can actually make digital-audio files larger than their uncompressed form. Some programs claim to significantly reduce digital-audio file size, but it isn't worth the effort when dealing with large files. Besides, you still have to decompress the file to work with it.

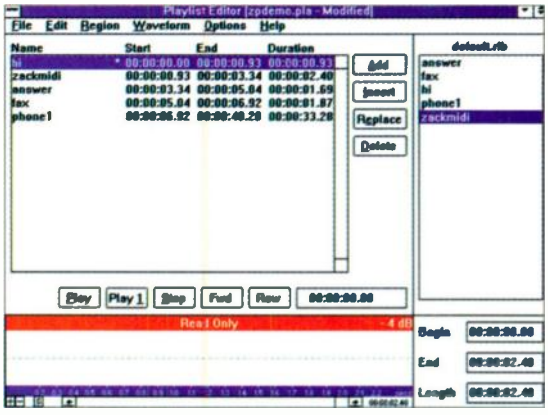


FIG. 4: Like many programs, *FastEddie* can assemble a playlist of several sound files to be played in sequence.

Optimize System Files. You can do several things to the system software to improve performance. For one thing, turn off any disk-cache programs, such as *SMARTDRV,* which generally don't help with hard-disk recording and add unnecessary overhead to the CPU. In the CONFIG.SYS file, set BUFFERS=20 or 30 for maximum drive performance and set FILES=100 or more if you are using a nondestructive program, such as *FastEddie.*

In addition, it is probably better to run *Windows* in Standard mode, which demands less CPU overhead and may run faster than Enhanced mode. Finally, Enhanced mode may be set up to use virtual memory, which can cause glitches or gaps in audio recording or playback.

GET TO WORK!

No matter how much you know about *Windows* computers and hard-disk recording software, you should thoroughly check out the programs you're interested in before making a purchase. Talk to others who use the programs and find out what systems they use, the extent to which they use the programs, any problems they've had, and so on.

An online service, such as CompuServe or America Online, is especially useful for getting feedback about programs. In addition, these products are covered regularly in **EM** reviews, features, and columns. You'll soon gather a consensus about the quality, operation, and true system requirements of various programs.

Budget-level hard-disk recording in *Windows* is finally a reality. There are some fine programs that can get you started in hard-disk recording for a modest amount of money right now. And as more *Windows* users learn how to work with hard-disk recording, they'll demand and get even more software capability for their money.

Furthermore, system upgrade costs are dropping, which means that you can get more computer power for less money. With the new Pentium processors becoming available, the performance level of these programs will rise, as well.

Zack Price *would like to acknowledge the invaluable assistance and expertise of the late Etienne Munson of Innovative Quality Software. His knowledge and patience were crucial in my rapid assimilation and understanding of this material.*

World Radio History

SERIOUS FUN.

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

FUN. Like you've never had before, because the KC20 comes with built-in pegs that allow you to strap it on and take off to some places you've never been: like center stage. With a KC20 you're no longer chained to a rack of keyboards: the elegant slim-body design and incredibly light weight (just 9.1 lbs) allows the KC20 to be played just like a remote keyboard — and unlike most remotes, it not only has a full 61-note keyboard, it also looks and functions like a true keyboard instrument, not a space probe.

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

KAWAI

Digital Magic.

© Kawai America Corporation, 2055 E. University Drive, Compton, CA 90220. (310) 631-1771. Kawai Canada Music Ltd., 6400 Shawson Drive Unit 1, Mississauga, Ontario, Canada L5T1L8

World Radio History

The Freshes

Performance you won't find anywhere else...

Compare Emagic's LOGIC Audio head to head with other sequencing, notation and digital audio software, and you'll see that there is no comparison. LOGIC Audio offers more features, better performance, and a lower price. And best of all, LOGIC Audio is available now. Check the specs for yourself.

The Vision of the future today!

Emagic products are developed with user evolution in mind. Our software is constantly being expanded to meet the demands of today's changing MIDI and digital audio technology. Future new features include TDM support, SD-II style plug-ins, compatibility with the Yamaha CBX-D5 and Akai DR8d and new additions to the Digital Factory, including the incredible Quantize Engine. And with native power PC/AV support just around the corner, the best is yet to come...

Take the cue based on what our users and the press are saying:

"I've been with you for 8 years! You're doing things right." FLYING WHALE RECORDING

"In direct comparison LOGIC AUDIO in its current version is surely the more powerful program (...)" GERMAN KEYBOARDS 7/94, RALF KLEINERMANNS IN THE CONCLUSION OF HIS CUBASE AUDIO 2.0 REVIEW

"LOGIC AUDIO rules! It's like having another instrument." A. GETZOFF

"Highly recommended! Written with real users in mind." M. ALLEN

"It should be apparent that I favor LOGIC AUDIO" ELECTRONIC MUSICIAN USA 4/94 P. FREEMAN IN THE CONCLUSION OF HIS COMPARISON REVIEW OF CUBASE AUDIO, STUDIOVISION, DIGITAL PERFORMER AND LOGIC AUDIO

"This is truly the best software I've seen for music on the Mac!" N. REICHMAN

"Killer program!" W. SZALVA

	EMAGIC LOGIC AUDIO 2.0	STUDIO VISION PRO 2.0	DIGITAL PERFORMER 1.4	CUBASE AUDIO 2.0	TIME BANDIT 1.0
PPQN TIMING RESOLUTION	960	480	480	384	N/A
USER DEFINABLE SCREENSETS	YES	NO	NO	NO	NO
DEFINABLE MIDI MIXERS & EDITORS	YES	NO	YES	YES	NO
OBJECT ORIENTED ENVIRONMENT	YES	NO	NO	NO	NO
FULL SCORE DISPLAY RECORDING	YES	NO	NO	NO	NO
VARIABLE ZOOM MODES 0-500%	YES	NO	NO	NO	NO
APPLE QICKTIME MOVIE SUPPORT	YES	NO	NO	YES	NO
STEREO SAMPLE EDITOR	YES	NO	NO	NO	NO
AUDIO TIME COMPRESSION	YES	NO	NO	NO	YES
AUDIO TIME EXPANSION	YES	NO	NO	NO	YES
AUDIO PITCH SHIFTING	YES	NO	NO	NO	YES
TIME COMP./EXP. + P-SHIFT IN 1 PASS	YES	NO	NO	NO	NO
GROOVE MACHINE	YES	NO	NO	NO	NO
SAMPLE RATE CONVERSION	YES	YES	NO	YES	NO
AUDIO TO MIDI GROOVE TEMPLATES	YES	NO	NO	NO	NO
AUDIO TO SCORE STREAMER	YES	NO	NO	NO	NO
DIGIDESIGN SESSION 8 SUPPORT	YES	NO	NO	YES	NO
LEXICON NUVERB SUPPORT	YES	NO	NO	NO	NO
RETAIL PRICE	699	995	995	799	399

ALL INFORMATION ACCURATE AS OF 8/94

Order your LOGIC Audio Video today!

See LOGIC AUDIO in action. For only 10$ we will send you a 30 minute Power Demo on Videotape. Just call 916-477-1051 and it will be shipped to you immediately.

24 hour Product Information: 916-477-1053 / EMAGIC Inc. Business Office: phone: 916-477-1051 / fax: 916-477-1052
Canada: MUSICWARE: phone: 416-785-3311 / fax: 416-785-6416

LOGIC AUDIO, Digital Factory, Quantize Engine, Time Machine and Audio to Score Streamer are registered trademarks of EMAGIC GmbH. All other trademarks are property of their respective holders.

World Radio History

st Code
on the Block!
LOGIC
AUDIO
EMAGIC
... we make computers groove.
World Radio History

NOISE Killers

Illustration by Richard Stutting

What comes out of any top studio's monitor speakers? *Nothing!* That is, when there's no music, there's no noise. This may seem obvious, but time and time again I go into project studios where the monitors spew buzzes, small audible pops, and loads of hiss and hum. You may think these sounds are normal, and you have to just live with them. Not so!

If you set up your system correctly, you should be able to turn your monitors up to a comfortable listening level and hear no hiss, no hum, just good, clean *nothing*. If you turn your system all the way up, you should only hear a nice, clean hiss far in the background.

Achieving a silent studio may seem like black magic, but it isn't that hard. Let's trace those buzzes, hums, and noises and eliminate them.

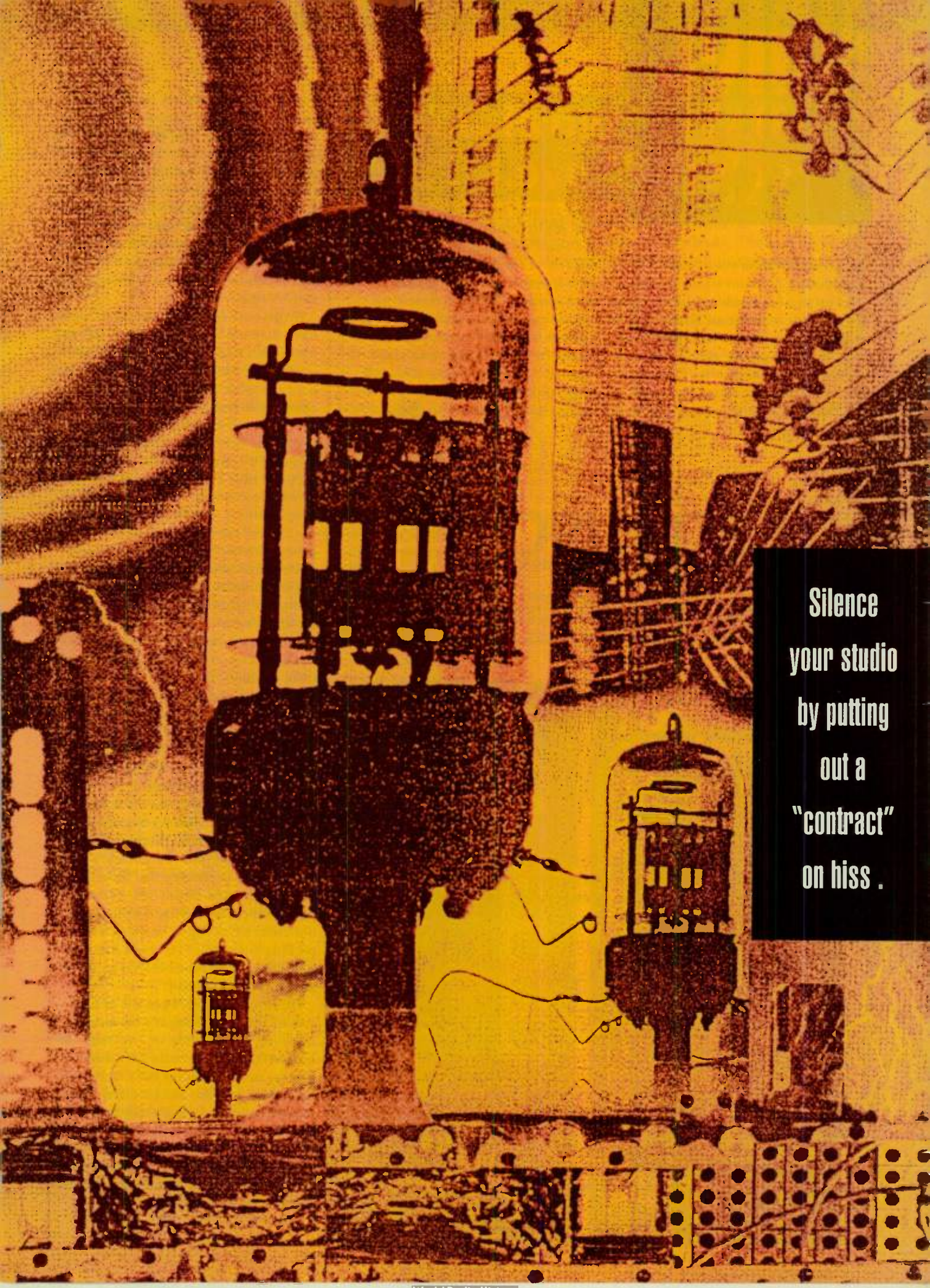
SILENT RUNNING

First, you need a quiet power amp. Fortunately, most pro amps are very quiet these days. To test your amp, turn it off, remove the input connections, turn the amp back on, and slowly turn up the volume. All you should hear is hiss, and you should only hear this when the amp is turned way up. If you hear buzzes, pops, or your local radio station, try turning off the amplifier and installing shorted input connectors (that is, the connector's hot and ground points are connected together), so there is no possible input signal. If you don't hear a clean hiss, you have a bad power amp. Get it fixed.

By Michael Gore

So now you have a clean power amp. Turn it off and hook

World Radio History

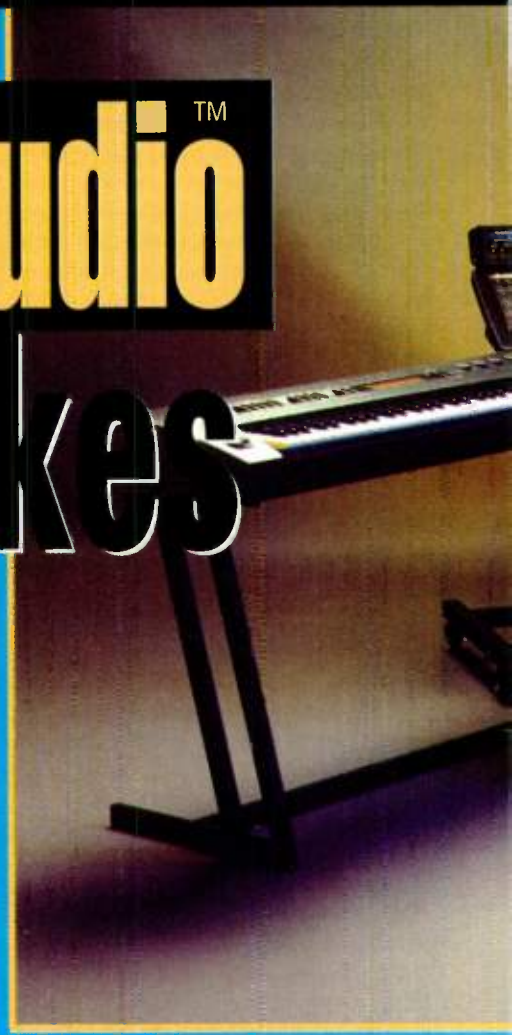


World Radio History

Mix® & Electronic Musician® PRESENT

the dream studio™ Sweepstakes

from Alesis Studio Electronics



Enter to win the complete Dream Studio™ from Alesis—a total value of $34,646—and start or renew your subscription to your favorite industry magazine!

The Dream Studio™ includes all the digital and analog Alesis equipment you need to record your music: three ADAT® digital multitrack recorders, mixer, power amp, studio monitors, all of the Alesis signal processors, synthesizers, and drum machines—and even the cables, racks and stands that put it all together!

You could win the Alesis Dream Studio™ or one of these other cool prizes:

- **Grand Prize:**
  The Alesis Dream Studio™: a collection of Alesis products combined to create the ultimate recording setup (one winner).
- **Second Prize:**
  One Alesis ADAT® 8 Track Professional Digital Audio Recorder (one winner).
- **Third Prize:**
  One Alesis QuadraVerb 2™ Dual Channel Octal Processing Master Effects with Digital I/O (one winner).
- **Fourth Prize:**
  One *Mix/Electronic Musician* Alesis Dream Studio™ Sweepstakes T-Shirt (100 winners).

No Purchase Required!
To Enter, Here's What You Do:

Official Rules—No Purchase Necessary. To enter the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes giveaway outlined below, you must respond by the date specified below and follow all directions published in this offer. Prizes will be awarded according to the terms detailed in this promotion.

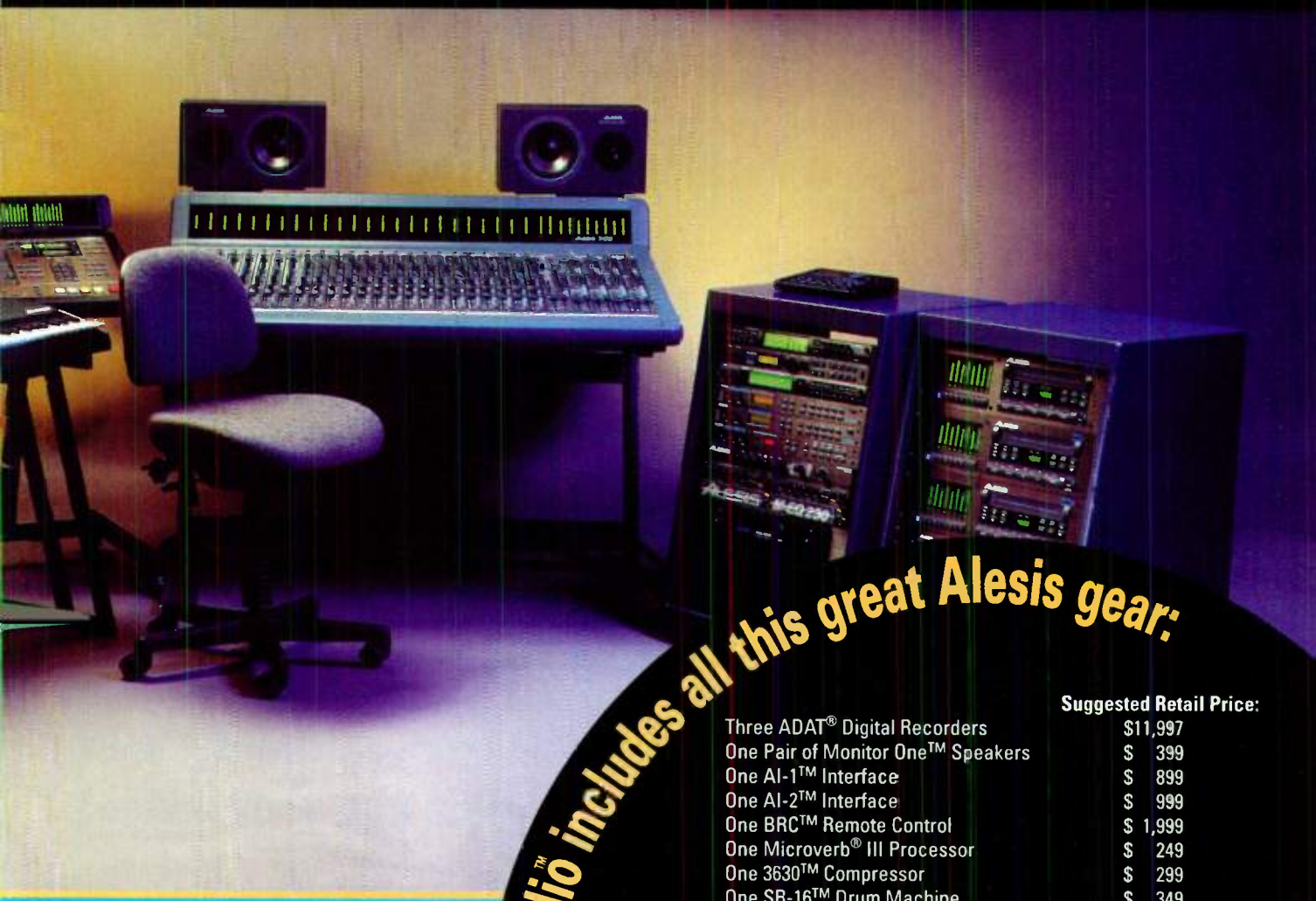
1. To enter the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes, print your name, address and phone number on the attached Subscription/Entry form or a facsimile thereof and mail it to the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes, P.O. Box 8845, Emeryville, CA 94662-0845. Enter as often as you wish, but all entries must be postmarked separately. **All entries must be received by October 15, 1994.**

2. The *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes is not open to employees of Alesis Studio Electronics Corp., Cardinal Business Media, Inc., all other companies owned or affiliated with Alesis Studio Electronics Corp. or Cardinal Business Media, Inc., such companies' advertising or promotion agencies, and members of those employees' immediate families. This offer is subject to all applicable federal, state, provincial and local laws and regulations and is void where prohibited or restricted by law.

3. The winner of each prize will be determined by a random drawing conducted by Cardinal Business Media, Inc., whose decisions are final. This random drawing will be conducted within 30 days of the October 15, 1994 deadline. Chances of winning are dependent upon the number of entries received. Sponsors are not responsible for lost, late, misdirected, damaged, incomplete, illegible or postage-due mail. Entries become the property of Cardinal Business Media, Inc., and will not be returned.

4. Sweepstakes open to residents of the United States and Canada (and residents 21 and older in those parts of Europe, Asia, Australia, Mexico, South America, Central America, Puerto Rico and other U.S. possessions and territories and APO/FPO address-

World Radio History



The Dream Studio™ includes all this great Alesis gear:

	Suggested Retail Price:
Three ADAT® Digital Recorders	$11,997
One Pair of Monitor One™ Speakers	$ 399
One AI-1™ Interface	$ 899
One AI-2™ Interface	$ 999
One BRC™ Remote Control	$ 1,999
One Microverb® III Processor	$ 249
One 3630™ Compressor	$ 299
One SR-16™ Drum Machine	$ 349
One D4™ Rack Mount Drum Module	$ 399
One QuadraVerb GT™ Processor	$ 599
One Midiverb® III Processor	$ 399
One RMB™ Remote Meter Bridge	$ 999
One RA-100™ Power Amp	$ 349
One M-EQ 230™ Equalizer	$ 249
One QuadraVerb™ Processor	$ 499
One QuadraVerb 2™ Processor	$ 799
One S4™ Rack Mount Synthesizer	$ 999
One QuadraSynth™ Master Keyboard	$ 1,499
One X2™ Console	$ 7,999
One X2™ Console Stand	$ 649
One BRC™ Rollaround Stand	$ 299
One QuadraSynth™ Stand	$ 299
Two 19" 15-Space Racks	$ 360
Three ELCO to ELCO Cables	$ 600
Four insert cables	$ 120
Two XLR to 1/4" Cables	$ 32
Two 1/4" To Banana Cables	$ 52
Thirty-Two 1/4" Audio Cables	$ 256
TOTAL VALUE	**$34,646**

To Enter, Fill Out and Return the Attached Card.

All Entries Must Be Received by October 15, 1994!

as where permitted by law. Prizes won by minors must be awarded in the name of parent or guardian. Prizes will be distributed by Alesis Studio Electronics Corporation, whose address is 3630 Holdredge Avenue, Los Angeles, CA 90016, and shipped at Alesis Corporation's cost within the U.S. only. All taxes and duties, shipping outside of the U.S. and any other expenses not specified herein are the responsibility of the sweepstakes winners. Random drawings to award all unclaimed prizes will be conducted from all eligible entries received. In order to win a prize, residents of Canada, and wherever else mandated, will be required to correctly answer a skill-testing question administered by mail. Any litigation respecting the conduct and awarding of a prize in this publicity contest by a resident of the Province of Quebec may be submitted to the Regie des loteries du Quebec.

5. This sweepstakes will be presented in conjunction with various promotions and solicitations sponsored by properties owned by or affiliated with Cardinal Business Media, Inc., including *Mix* and *Electronic Musician*, and by Alesis Corporation. No substitution of prizes is permitted, and prizes are not transferable. Each winner will be notified by mail within 14 days of the drawing, and each winner must sign and return an Affidavit of Eligibility and Release of Liability, with proof of identity, to Cardinal Business Media, Inc., within 21 days of notification, or an alternate winner will be selected in a random drawing. Any prize or prize notification returned as undeliverable will result in the awarding of that prize to an alternate winner. Entry and acceptance of prize constitutes permission (except where prohibited by law) to use the winner's name, town or city of residence, and likeness for purposes of advertising and promotion on behalf of the sweepstakes sponsors without further compensation. Prizes are guaranteed to be awarded and delivered to winners promptly after receipt of executed affidavit(s).

6. For a listing of sweepstakes winners, send a stamped, self-addressed envelope to: Cardinal Business Media, Inc., Alesis Sweepstakes Winners, P.O. Box 8845, Emeryville, CA 94662-0845. The foregoing rules and conditions of the *Mix/Electronic Musician* Alesis Dream Studio Sweepstakes may be changed without prior notice. Alesis Corporation and Cardinal Business Media, Inc. shall be deemed sole interpreters of such rules and conditions.

Alesis, ADAT, Microverb and Midiverb are registered trademarks of Alesis Corporation. The Dream Studio is a trademark of Alesis Corporation. *Mix* and *Electronic Musician* are trademarks of Cardinal Business Media, Inc. All other trademarks are the property of their respective holders.

World Radio History

DIGITAL MIND. ANALOG HEART. DAMN GOOD PRICE.

Classic Keys—Analog keyboard sounds that fit your style and your budget.

Got your eye on a Vintage Keys, but your hand over your wallet? Then the Classic Keys MIDI sound module is made for you. Classic Keys features all the great samples of our popular Vintage Keys—but at an unbelievably low price. Get all of the most popular analog synthesizer and keyboard instrument sounds from the 60's, 70's and 80's, including dozens of electric pianos, organs and analog synthesizers, at your fingertips.

No similarly priced module holds up to Classic Keys. There are 512 presets, 32-voice polyphony, 16-part multi-timbral capabilities, and the industry's most straightforward, easy-to-use interface, plus 2 built-in programmable effects. And like all E-mu® products, you can count on the CD-quality, 16-bit sound that professional musicians around the world depend on.

What's more—you can build your own sounds using the more than 250 sampled instruments as raw material! Classic Keys is so quick and easy to program you may scare yourself with the great new sounds you invent. Or lay your hands on collections of new, fully-cooked preset sounds for Classic Keys. They're just a downloadable floppy disk away.

So what are you waiting for? See your E-mu dealer for a Classic Keys demo today. Classic Keys—all the vintage analog keyboard sounds you need to expand your mind, without the price tag to deflate your wallet.

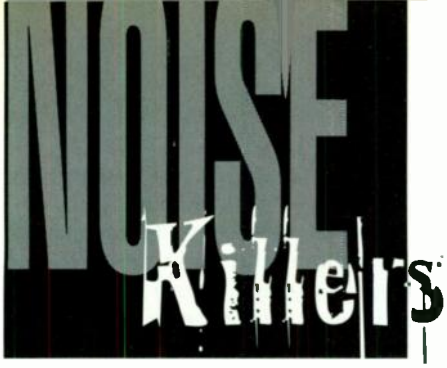
CLASSIC KEYS
Analog Keyboards

E-mu Systems, Inc.
P.O. Box 660015, Scotts Valley, California 95067-0015 • 408-438-1921
U.K. E-mu Systems, Ltd., Suite 6, Adam Ferguson House, Eskmills Industrial Park
Musselburgh, EH21 7PQ • 44-031-653-6566

© 1994 E-mu Systems, Inc. E-mu and E-mu Systems are registered trademarks, and the E-mu logo is a trademark of E-mu Systems, Inc. All other trade and product names are property of their respective owners.

E-MU

World Radio History



AC POWER PROBLEMS

AC power strips and cables are a primary cause of hum, because they emit large magnetic fields that are picked up easily. Move them far away from the console, power amp, and any audio wiring.

In a large, top-of-the-line studio, I'll go as far as isolating each piece of gear from the AC outlet ground (via 3-pin to 2-pin AC adapters). Instead of grounding the system via the AC outlet's third conductor, I run a separate chassis ground wire back to the main studio ground (we call this "technical earth"). Then I connect this "tech earth" back to the main AC ground and/or a large, copper rod driven eighteen feet into the ground (providing a *true earth ground*). Thus, every piece of gear still has AC fault protection, but no grounds are tied together. This kind of system is known as a *star ground*.

TRADE SECRETS

Here are a couple of trade secrets. Don't spread them around, or the ultrasecret Audio Technicians Guild will come after me for revealing this stuff!

Consoles operate best with their monitor volume controls at about the one or two o'clock position. That's where you get the best signal-to-noise levels, which means quieter monitoring. So play a compact disc or other music source through your mixer, set the faders so your meters read normal levels (for VU meters, this means peaks of about +2 VU), and turn the monitor pot to the one o'clock position. Turn down the power amp until the music is at a normal listening level. That's the level you want from your power amp: One o'clock is normal, four o'clock is quite loud.

If you have your amp turned way up, as most small studios do, you're just amplifying hiss from the console. Remember that everything has some noise. If you turn your power amp all the way up, even the best of consoles will sound noisy, even though the system is quiet. If your power amp doesn't have level controls, have your local tech build some for you.

A buzz that seems to grow slowly in volume, then slowly diminishes, indicates you are picking up the 60 Hz signal from a power line that is beating with demodulated vertical sync pulses from a local TV station, which are normally at 59.94 Hz. This causes a pulse that cycles every 16.7 seconds. Either of these forms of interference sounds like ordinary line buzz, but combined, they cause the fading effect. At this point, you may have to get a good technician. Even then, you may have simply located your studio in the wrong place. (For a discussion of more extreme solutions to radio-frequency interference, such as Faraday cages, see the October 1992 "Service Clinic" column.)

A buzz that seems to come for only short pulses, always at a constant level, could be caused by a pulse riding in on your AC lines. This is very difficult to fix. It might be caused by lamp dimmers somewhere in the house, a bad fluorescent lamp, or an old refrigerator turning on and off.

If the buzz appears and stays on, document what time of day it happens. I once traced such a buzz down to a large neon sign a block away that turned on each evening. I was able to "neon-proof" the system, but you can sometimes get the store owner to fix the problem. Besides, sometimes just knowing why things happen makes them less irritating.

Computer monitors are notorious for causing hum, as their deflection yokes emit powerful magnetic fields at 50 to 70 Hz. You can easily trace this just by turning the monitor on and off. CRT monitors also can create magnetic fields at 15 to 40 kHz. Although this might not be obvious, it can cause high-frequency distortion and eat up high-frequency headroom in your analog tapes. In general, keep monitors as far away from audio equipment and cables as possible.

When you stack various pieces of equipment on top of one another, one piece of gear could have its internal AC power transformer in a spot that causes a hum in the equipment just

SAFETY FIRST

The chassis of each piece of gear must be connected to a good AC ground. This way, if there is a fault in one piece of equipment, the user cannot become the ground path for AC current. That third prong on your AC cable connects the chassis directly to AC ground, and once you use an adapter, you must be sure that there is a ground wire between that gear's chassis and good AC ground. With almost any modern equipment, there is absolutely no reason to lift the third prong of the AC cable. In any event, never remove chassis ground protection.

In major studios, we use a system called a star ground. Then we make sure there are no other grounds in the audio wiring and AC cables. Everything is still connected to AC ground with individual ground wires. This eliminates almost all ground loops and still ensures a safe system. It also makes sure all zero-volt references stay exactly the same.

In a home or project studio, attention to system grounding is equally important. You must ensure that not only is your system quiet, but it's safe.

Finally, don't overtax your AC wiring. Your house wiring is meant to supply normal currents and isn't designed to provide maximum levels for long periods of time. Don't have a lot of AC outlet boxes connected together into one wall outlet. Make sure that no AC wire is getting warm when it's used. One project studio owner had five AC strips daisy-chained into one wall outlet. That first AC strip wire was carrying all the current of the entire chain and was getting hot to the touch, making his whole setup a fire hazard. Don't do this!

You're much better off centering your AC system around a professionally designed power-distribution system, available from companies such as Furman and Juice Goose. Calculate the amount of current your devices draw, and make sure the total does not exceed the capacity of the power-distribution system or the house AC circuit.

World Radio History

Study Computer
and Electronic Music
at
OBERLIN

*Music Technology curriculum, composition emphasis
*Four-year BM degree
*America's leading exclusively undergraduate conservatory
*Double degree programs in a liberal arts setting
*Distinguished graduates:

Marc Canter,
designer of MacroMind Director
Charles Harbutt,
tonemeister at Sony, NYC
Greg Hendershott,
author of Cakewalk

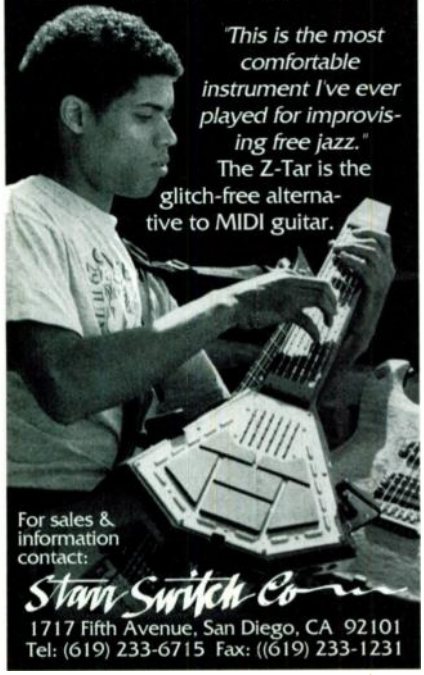
TIMARA
Technology in Music
and Related Arts

Admissions Office
Conservatory of Music
Oberlin, OH 44074
(216) 775-8413

Stanley Jordan:
Beyond
MIDI Guitar

Hear Stanley play the
Z-Tar on his new CD, *Bolero*.

"This is the most comfortable instrument I've ever played for improvising free jazz."
The Z-Tar is the glitch-free alternative to MIDI guitar.



For sales & information contact:
Starr Switch Co.
1717 Fifth Avenue, San Diego, CA 92101
Tel: (619) 233-6715 Fax: ((619) 233-1231

NOISE Killers

above or below. When you can't eliminate the hum with transformers, always try turning off pieces of equipment around any gear that seems to have a hum. Once you locate the offending unit, move it to another spot and try it again.

Get two good audio transformers and build yourself an isolation box. There are times when nothing but transformers will eliminate hum. If friends and clients bring in hum-causing equipment, you can save hours of frustrating troubleshooting by using transformers.

Be careful of level and impedance problems. Microphone inputs are a poor place to put line-level signals, but lots of people try. If you must use your mic inputs for non-mic signals, use a matching transformer. This not only isolates the equipment, but matches the levels. Alternatively, have your tech build a pad that reduces the line-level signal to mic level. I just converted eighteen mic inputs of a console for line-level use, making all the changes in each module. The client can have two line inputs for most of his console modules and still keep a few unconverted modules as normal mic inputs.

Remember that the impedance of a mic is about 200 ohms (very low), and the impedance of most mic preamplifiers is about 1,500 ohms, which minimizes signal loss caused by loading the microphone. Thus, low impedance outputs driving high-impedance inputs, while technically a mismatch, works well. But most of your synths and equipment are designed to feed their signals into 10,000 ohms (high impedance). You increase noise and distortion if you overload the outputs by driving low impedance (under 100Ω) inputs. By the way, don't forget that most mic inputs also have an output: 48 volts of phantom power to drive condenser mics. That's bad for almost anything except a mic.

Your system is normally in its quietest state when everything is powered up. It isn't a good idea to have some things turned on and others off, as impedances change when a unit is turned on. In general, turn everything on, even if you're not using it all.

Try to hit the input of effects units with a strong signal, and lower the effect's output level. Lots of reverb and delay units have background noise, and you'll reduce this problem by turning the output down. Also don't use lots of compression unless you need to; compression lowers the signal-to-noise ratio of the track. Unless you use a noise gate along with your compressor, you'll add noise.

Jensen's JT-11P-1 (left) is a top-notch, professional-quality transformer that can handle up to +19 dB before it hits 1% distortion at 20 Hz. However, you have to drill out a case for the connectors and wire them yourself.

World Radio History

HUM TERMINATORS

One of the easiest ways to eliminate ground hums is to isolate the offending equipment via input and output transformers. These devices work wonders in the audio world and are often contained in the best equipment found in pro studios. The idea of a transformer is to ensure that there is absolutely no electrical contact between two pieces of gear except the audio signal. If you need to quickly remove a ground loop caused by poor grounding, or to transform balanced to unbalanced signals, grab a transformer.

But transformers are not perfect. True, expensive transformers provide excellent fidelity, but you pay for the engineering and construction quality. Less-expensive transformers tend to suffer from design limitations and low-budget construction. But if you match your requirements to the correct transformer, you need not spend an arm and a leg to get what you need.

Ebtech (tel. [619] 679-6510; fax [619] 679-2802) has designed a transformer isolation box that in most cases is perfect for removing grounding problems found in the home studio. The Hum Eliminator ($69.95) offers two transformers, each with a ¼-inch, TRS input and a ¼-inch, TRS output. The device is packaged in a small (4.25 x 3.5 x 1.4-inch), nicely constructed metal case. It connects any mixture of balanced or unbalanced signals and works well at standard -10 dB (semi-pro) levels. Total harmonic distortion is listed at less than 0.005% (at 1 kHz) and crosstalk better than -97 dB.

The manufacturer claims a frequency response of 20 Hz to 70 kHz (±0.5 dB). However, I found that any signal above +4 dB begins to drive the transformers into severe saturation around 20 Hz, resulting in severe distortion at very low frequencies. (Ebtech claims this is inaudible.) Above 50 Hz, it's fine. I didn't have this problem at -10 dB levels, so for the average home recordist, the Hum Eliminator is a good buy. In addition, Ebtech offers an 8-channel, 1U rackmount version ($279.95).

Ebtech also is preparing to ship the Hum Eliminator Pro (price tba) a 4-channel version with better transformers and gold-plated, XLR input and output connectors. This should address professional studio needs.

In the meantime, for the pro studio operating at +4 dB levels, you'll have to go for the top quality transformers. I prefer Jensen Transformers (tel. [213] 876-0059; fax [818] 763-4574), though there are other excellent manufacturers around. You're going to pay much more for top-of-the-line transformers, though: Jensen JT-11P-1 transformers sell for $63.49 each, and you have to drill out a case for the connectors and wire them yourself. But you can put in up to +19 dB before you hit 1% distortion at 20 Hz, which is killer performance. I install these when I need top studio performance. By the way, Jensen also makes the ISO-MAX ($169.95), which contains a stereo pair of JT-11P-1 transformers in a compact, steel box, with gold-plated connectors. It's primarily marketed for high-end car stereos, but if you don't mind using adapters for the RCA connectors, it should do the job for home-studio applications.

Transformers can do other things besides isolate two pieces of equipment. You can use a transformer to step up (or down) signal levels. Say your console's outputs are at +4 dB, and you need to drive a -10 dB device. You could turn the input levels of the device way down, or run the console level way down, but it's better to run things at their optimum levels. Ideally, you would run the console at +4 dB and the next device at -10 dB while maintaining normal fader levels. A step-down transformer can do the trick for you, putting everything right where it should be.

Ebtech's Hum Eliminator provides two low-cost isolation transformers with balanced, ¼-inch I/O.

If you need to hook up both a balanced and unbalanced device to the same output, isolate the unbalanced gear via a transformer. Otherwise, once both devices are connected to the same point, you've unbalanced the signal to both.

Finally, transformers are essential for professional-quality remote recording. The only safe way to split mic lines and send the same mic signal to more than one mixer is to use a splitter transformer.

THE WELL-GROUNDED STUDIO

The time-consuming and complex troubleshooting scheme we've discussed is almost always foolproof. A ground loop or other noise problem can arise in many different ways, and occasionally some nasty noises will resist your best efforts. You'll still find some piece of gear that requires audio transformers to eliminate ground loops. But with today's equipment, you rarely have to go to extremes. With a few hours of patient troubleshooting, you'll be able to make your project studio much quieter.

It's not surprising that most musicians consider the process of denoising studio black magic. The truth is it's mostly a systematic process of eliminating the problems one by one. Armed with this knowledge, you're ready to attack your studio's sonic gremlins. The truth will make you noise-free!

(Special thanks to Bill Whitlock and Dave Hill of Jensen Transformers, Inc.)

Michael Gore *is owner and chief technician of Bay Area Studio Engineering (BASE) in San Francisco.*

World Radio History

Shift Happens

Pitch shifters help you sing like a bird and a bullfrog—at the same time.

By Scott Wilkinson

Pitch shifters are among the most useful and least understood signal processors in the electronic musician's arsenal. These devices take an input signal and shift its pitch up or down, in real time, by a user-specified amount. Accomplishing this with any degree of success requires heavy-duty digital signal processing.

Basically, there is only one parameter to master: the amount by which the pitch is shifted. This is usually specified in terms of a musical interval, such as a third, fifth, octave, etc. You can also shift the pitch of the input signal by very small amounts, which are specified in cents. (One hundred cents equal a semitone, or half-step.)

These days, most pitch shifters are found within multi-effects units. In the recording studio, they are connected to the mixer's aux send and return loop in the same manner as other effects, such as reverb and delay (see "Square One: In the Hall of the Reverb King" in the August 1994 **EM**). In this case, you would typically set the wet/dry mix to 100% wet and control the balance between the original and pitch-shifted signals with the aux send and return level controls on the mixer. Alternatively, you can dedicate the pitch shifter to one instrument by patching it to the mixer's channel insert point and controlling the wet/dry mix from the processor.

You can also connect the output of a guitar or synth directly to the input of a pitch shifter and connect its output to the input of another effects device, a P.A. mixer, or an amplifier. In this application, you control the wet/dry mix from the effects processor.

The Eventide DSP4000 is the latest incarnation of their powerful multi-effects processor, which includes some of the most sophisticated pitch shifting available.

DETUNING

Very small pitch shifts are collectively known as *detuning*. If you mix a piano sound at its normal pitch with the same sound detuned a few cents up or down, it resembles a honky-tonk piano. (The original honky-tonk pianos sounded that way because they weren't tuned

World Radio History

WARNING: these devices produce some very serious side effects.

Once you experience EV/Dynacord DRP 10 and DRP 15's lush reverbs, accurate room simulations, and beautifully layered multi-effects, you'll be hooked. The DRP 10 and DRP 15 high-quality reverb and multi-effects units with 24-bit digital processing are awe inspiring. The reverbs and room simulations are extremely natural. The effects are smooth, plentiful and simultaneously usable. Program and parameter changes are immediate and absolutely transparent. Editing is a snap, with full, real-time MIDI implementation. And for all those times you thought to yourself, "If only they'd make a 'rotary speaker cabinet' that could fit in my rack", say hello to EV/Dynacord's DLS 223 digital rotary cabinet simulator. It's studio-quality, rack-mountable, and the answer to your prayers. ARS-10 24-bit signal processing ensures perfect simulations with real room acoustics, in stereo. Every parameter is fully editable and programmable via MIDI. And like the DRP 10 and DRP 15, it's backed by a rock-solid, three-year warranty. What more could you ask for? How about a hands-on demonstration at your EV/Dynacord dealer! Call 800/234-6831 for detailed specs, a slick brochure and as much helpful information as you need.

High-quality reverbs and multi-effects grouped according to application • 240 factory presets and 259 user memories • 30 factory programs and 20 user memories per application group plus a separate user-definable bank with 99 memories • >90 dB signal-to-noise ratio and <0.03% THD • three-year warranty

High-quality reverbs, delays and other effects using room acoustics criteria with complete control of all parameters • 100 factory presets and 128 user memories • 17 basic effects–up to six simultaneously usable, including phase, flange, chorus and pitch-shifts • >90 dB signal-to-noise ratio and <0.03% THD • three-year warranty

A "rotary speaker cabinet" and room simulator that fits in one rack space • perfect simulations of various "rotating speaker" cabinets • all parameters, including rotating direction, acceleration and slow-down rates, distortion, rotor balance, crossover frequency, EQ and more, are fully editable and programmable via MIDI • >90 dB signal-to-noise ratio and <0.03% THD • three-year warranty

EV DYNACORD®
Precision German Engineering

Electro-Voice, Inc. a MARK IV company 600 Cecil Street Buchanan, Michigan 49107 616/695-6831 In Canada: 613/382-2141

World Radio History

very often; honky-tonk establishments had other priorities.) This technique is often used to "thicken" individual drum sounds, as well.

As I mentioned last issue ("Square One: Delayed Gratification" in the September 1994 **EM**), you can thicken an individual track by delaying it 30 to 50 milliseconds and mixing it with the unprocessed signal for a doubled effect. If you add a bit of detuning to the equation, the effect is even more pronounced. You can also simulate a stereo image by panning the unprocessed signal to one side of the stereo sound field and panning a slightly delayed signal to the other side. If you include a little pitch shifting, the results can be quite satisfying. Try one of these techniques on a bass part to fatten it up.

Bruce Springsteen, among others, often uses a modified version of this technique on his lead vocals. The vocal track is split. One signal remains unprocessed and is panned to the center. The other signal is sent through two pitch shifters. One is set to shift upward by a few cents, the other is set to shift down by the same amount. The output from one shifter is panned hard right, and the other is panned hard left. (There are a number of devices that incorporate several pitch shifters and stereo audio outputs in one unit. The output of each shifter is panned hard right or left within the unit.)

You might think that the same effect can be achieved by making copies of samples and delaying and detuning them. This is indeed a similar process, but the final result is noticeably different. All pitch shifters have an inherent, inconsistent processing delay because of the time it takes to identify the pitch of the input signal and shift it up or down. In general, low frequencies take longer to identify because they take longer to complete a full waveform cycle, resulting in a longer processing delay. This delay makes a qualitative difference in the final sound, which some people describe as "spread out."

DigiTech's The Vocalist is an intelligent pitch shifter designed specifically for vocals.

Some engineers perform a neat trick with detuning and reverb. They send the 100% wet sound from a reverb unit into a pitch shifter set to detune a few cents flat. The output of the shifter is then sent to the aux return on the mixer. This is said to give the sound a more "poignant" quality. You can also detune upward for a more "excited" quality.

PITCH CORRECTION

Another important application of detuning is *pitch correction*. If a singer or instrumentalist is consistently sharp or flat, it's relatively easy to run the signal through a pitch shifter to correct the problem. But what if only a few notes are out of tune? This is particularly irksome if the performance is otherwise great. First, bounce the offending track

MAKING MILLIONS, MAKING MUSIC with KASHIF
SEMINAR & EXHIBIT

With 55 million records sold, the 5 time Grammy nominated producer for Whitney Houston, Kenny G, George Benson, Dionne Warwick, and author of "Everything You'd Better Know About the Recording Industry", hosts a 3 day intensive seminar on

how to prosper creatively & financially in the recording industry

Pop • R&B • Hip Hop • Jazz • Dance • Alternative • Rock • Techno • Classical

- How to produce a hit record
- How to start your own record label
- Master the creative process used by successful producers & songwriters
- Creating realistic budgets and alternative financing
- State-of-the-art recording & production techniques
- Using traditional and/or modern instrumentation
- Hands-on-demonstrations of Kashif's favorite recording devices and software

Seminar includes on site recording studio with live musicians

"Kashif's production class is a hit of its own. His seminar provides tremendous motivation for the aspiring producer, songwriter, musician & singer".
- *Greg Phillinganes, Hit producer and keyboardist for Michael Jackson, Quincy Jones, Eric Clapton*

"Kashif's course for beginners and professionals in the music industry is really informative. His approach is easy to understand and extensive in a wide range of subjects".
- *Smitty Cook, Director of Marketing Admin. Motown Records*

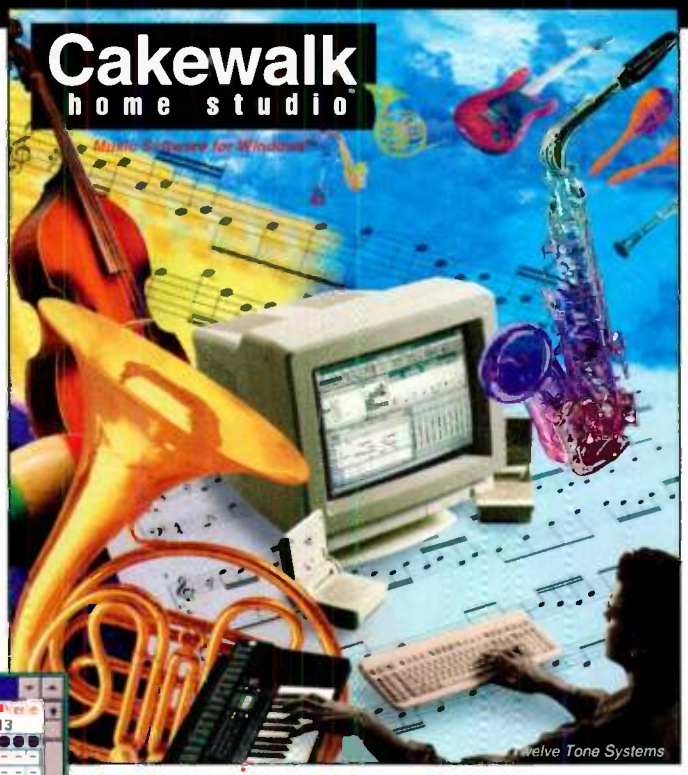
San Francisco	March 10-12	Nashville	May 5-7	Dates to be announced:
Seattle	March 17-19	New York	May 12-14	Chicago
Philadelphia	March 24-26	St. Louis	May 19-21	San Diego
Los Angeles	March 31-April 2	Washington, D.C.	June 2-4	Minneapolis
Houston	April 7-9	Boston	June 9-11	Dallas
Miami	April 21-23	Detroit	June 16-18	Denver
Atlanta	April 28-30	Cleveland	June 23-25	New Orleans

Due to limited availability, we advise early registration.
Advance registration fee: $350, pre-registraion: $375, $395 at the door

To register by phone & to find out when we'll be in your area, call
800-974-RIIS (7447)
Dates Subject to Change

World Radio History

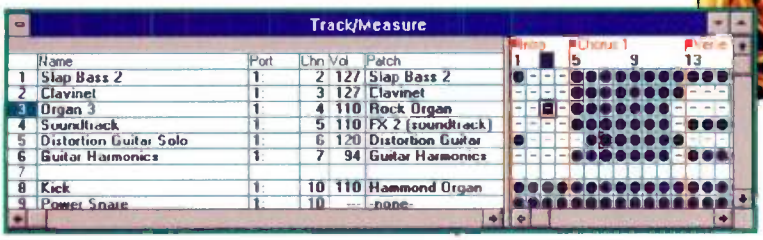
Turn On. Play In. Print Out.

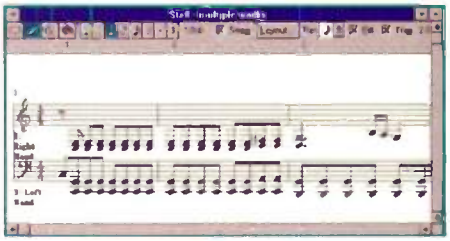


It's that simple. If you want a great MIDI sequencer for Windows, but you don't need all those pro-level features, then you should get into Cakewalk Home Studio™.

Cakewalk Home Studio is a great way to start exploring the world of music and computers.

Once you turn it on, you'll find many of the essential recording and editing tools that are part of the award-winning Cakewalk Professional™ software.





Get Started

Cakewalk Home Studio has everything you need to start creating music with your PC: 256 tracks; Staff, Piano Roll, and Event List views; a 16-track Faders view; and high-quality notation printing.

The Home Studio edition also plays back digital audio wave files on Windows-compatible sound cards. So you can add sound effects or voice directly into your MIDI sequence.

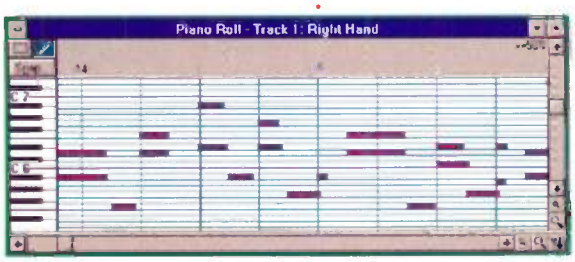
Take the Next Step

And when you think you're ready, expand your MIDI experience by upgrading to Cakewalk Professional. Although it's a more advanced sequencer, Cakewalk Professional includes all the views and commands found in Home Studio. So making the move to the Professional edition will feel natural.

Cakewalk Home Studio Highlights:

- 256 tracks
- Real-time and step recording
- Track/Measure, Piano Roll, Event List, Staff and Controller views
- Faders for volume, pan, and reverb
- Drag-and-drop editing
- Event Filters for criteria edits
- Graphical tempo map
- Meter/key map
- Markers for organizing song parts
- Plays wave files on Windows sound cards
- Displays General MIDI, other instrument patch names
- Prints up to 16 staves per page

Only $169!



PC Multimedia PC

Try It Today

So drop into your local music or computer store, and tell them you want to get started with Cakewalk Home Studio. For the name of an authorized Cakewalk dealer near you, call Twelve Tone Systems at

800-234-1171 or 617-926-2480.

Demo pack for just $5. Call today and get a free copy of the Twelve Tone Systems customer newsletter, *QuarterTone*, while supplies last.

Twelve Tone SYSTEMS

P.O. Box 760, Watertown, MA 02272

Cakewalk, Cakewalk Home Studio, Cakewalk Professional and Twelve Tone Systems are trademarks of Twelve Tone Systems Inc. Other products mentioned are trademarks of their respective manufacturers.

World Radio History

Ultimate Analog

OB·Mx

"...the OB•Mx is so great sounding and flexible that I'd have no complaints if someone took all my other gear away and left me with just this box; this is definitely the 'desert-island' synth."
— Peter Freeman, Electronic Musician

" How does it sound? Amazing. Big fat bass, rich swirling pads, cutting leads, and special effects to die for. The multitimbral layered patches will move mountains."
— Jim Aiken, KEYBOARD

Experience the OB•Mx and the entire family of Oberheim products, available now at these

Authorized Oberheim Dealers

Bananas at Large
San Rafael, CA

Wagstaff Music
Murray, UT

Professional Sound & Music
San Diego, CA

Dr. Sound
New York, NY

YRS MIDI Systems
Fern Park, FL

Manny's Music
New York, NY

Rhythm City
Atlanta, GA

Gand Music & Sound
Northfield, IL

Synthony
Phoenix, AZ

Goodman Music
Hollywood, CA

Brook Mays
Dallas, TX

Gelb Music Studio
Redwood City, CA

Sam's Music
Brentwood, TN

Arnoldt-Williams
Detroit /Westside, MI

Apple Music
Portland, OR

West L.A. Music
Los Angeles, CA

House of Guitars
Rochester, NY

Rainbow Guitars
Tucson, AZ

Music Box
Detroit/Eastside, MI

Alan's Discount Music
Birmingham, AL

Ted Vesely Music
Las Vegas, NV

Drum/Keyboard/Guitar Shop
Houston, TX

Uncle Bob's Music Center
Milwaukee, WI

Oberheim
American Innovation Continues...

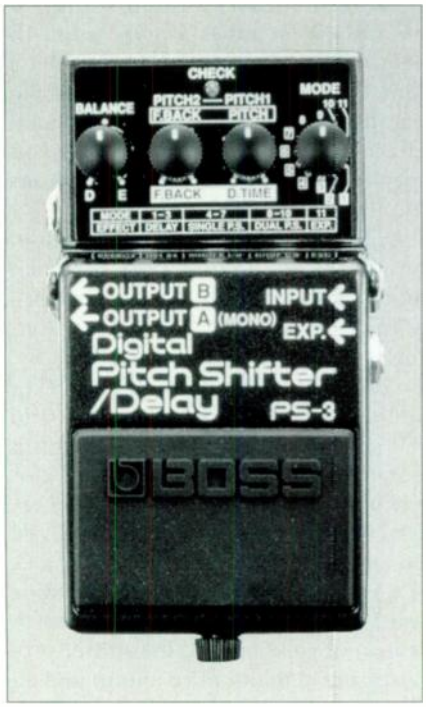
2897 Chapman Street • Oakland, CA • 94601
1-800-279-4346 a division of Gibson Guitar

World Radio History

to an empty tape track. Then send the original track through a pitch shifter set to correct the pitch of one bum note, and punch that one note into the bounced track. Repeat the process for each bad note, setting the pitch shifter accordingly each time. It's tricky and tedious, but it gets the job done. It helps a great deal if you can automate the punch in and punch out with MIDI Machine Control from a sequencer, which depends on the tape deck and sequencer you use.

If the pitch shifter responds to MIDI, it may be possible to correct the pitch of a performance by manipulating the pitch wheel on a synth or master keyboard. Make sure that MIDI Pitch Bend messages are assigned to control the amount of pitch shift. As you listen to the track, simply ride the wheel up or down to correct any notes that are out of tune. You can also automate this process by recording these movements into a sequencer that's synchronized to the tape deck. Once the Pitch Bend data is recorded in the sequencer, you can tweak it to achieve a perfect take.

If you have enough dough, you can buy an *intelligent* pitch shifter, which includes the Eventide Harmonizer brand effects processors (such as the H3000, H3500, and H4000) and DigiTech's



The BOSS PS-3 Digital Pitch Shifter/Delay stomp box produces some wild effects for guitarists and keyboardists.

Headphone Solutions For The Small Studio

The **HA-6 Headphone/Monitor Amp** is ideal for the studio without a separate control room. Plug up to six headphones into the front panel, and each musician has his or her own volume control. It does double duty as a 20 watt/channel power amp for playback over small monitor speakers. If necessary, expand it by adding...

Up to a dozen **HR-2 Headphone Remote Stations**, economical passive headphone boxes that clamp to any mic stand. HR-2's may be daisy-chained with standard mic cords from a HA-6 or a...

SP-20 Half Rack Stereo Power Amp. The best way to go in the studio with a separate control room. This compact unit contains the same amply-powered 20W/channel headphone amp as the HA-6, but with only one built-in headphone jack. Put it in the control room and attach a chain of HR-2's on the studio floor. It can also do double duty driving small monitor speakers.

Furman manufactures a broad line of moderately priced, high quality signal processors and power conditioners for pro audio applications. For a catalog, call or write:

FURMAN

Furman Sound, Inc.
30 Rich St.
Greenbrae, CA 94904 USA

Phone: (415) 927-1225
Fax: (415) 927-4548

All Furman products are made in the U.S.A.

World Radio History

RAP — NEW —
from Five Pin Press
Rap Drum Patterns
Only $39.95

Instant Rap Drum Patterns™ — Over 500 measures of **rap patterns** on disk in Standard MIDI File format. All patterns **notated** in a 75 page **printed music book**! Use for **all styles** of contemporary rock, pop and rap music. Edit with any software sequencer to easily create custom drum tracks.

Still available: **200 Instant Drum Patterns™** and **260 Instant Drum Patterns™**. The *original drum tracks*, 460 all different one bar patterns and fills in a wide variety of styles. Extensive book shows patterns in both music and grid notation. $29.95 each, special price both for $49.95.

101 Instant Standards™ for Band-in-a-Box; with **printed music book, $39.95**; call for a song list.

Call for a complete Five Pin Press catalog
All products available for IBM, Macintosh and Atari
Shipping $3.05 in the U.S., $5.75 Canada. We ship worldwide.

Five Pin Press™ 1-800-PC N' MIDI
1-800-726-6434

Support 214-328-2730 Free MIDI BBS 214-328-6909
P.O. Box 550363 Dallas, TX 75355-0363 Fax 214-328-1092
Dealers: Distributed in the U.S. by joel Sampson MIDI Source

KEYBOARD SPECIALISTS

FOR MUSICIANS/BANDS/STUDIOS
CHURCH/HOME/SCHOOLS

ALL MAJOR BRANDS

- SYNTHESIZERS
- DIGITAL PIANOS
- SAMPLERS
- DRUM MACHINES
- SOFTWARE
- MIXERS/AMPLIFIERS
- RECORDING EQUIPMENT

VOLUME DEALER
NEW & USED
ALL BRANDS
ALL MAJOR CREDIT CARDS
PROFESSIONAL ADVICE

Call for a catalog and pricing information

RHYTHM CITY

1485 NE Expressway, Atlanta, Georgia 30329

1 (404) 320-7253 • 1 (404) 320-SALE

The Vocalist and DHP lines of products. These devices can actually "quantize" the pitch of all incoming notes to the nearest pitches within a specified scale. This automatically corrects the pitch of all notes in a performance, which is a lot easier than the note-by-note process described previously.

Intelligent pitch-correction works well if there are only a few bad notes; set the shifter to correct only those notes, leaving other notes untouched. However, if most of the notes need correction, the end result can sound pretty artificial. This is more problematic for lead tracks than background parts.

TRANSPOSITION

Pitch shifting by intervals larger than a semitone is called *transposition*. Octave doubling is one of the most common forms of *parallel* transposition. However, most people double the part an octave below the original pitch, which sounds less artificial than shifting an octave higher. In fact, the ear is much more sensitive to artifacts in signals that are up-shifted, so it's a good idea to keep large upward shifts to a minimum (unless you like a helium-inspired chipmunk sound).

Most pitch shifters can also produce parallel lines at intervals other than the octave. For example, trumpeter Jon Hassell often uses a pitch shifter to double his melodies a perfect fourth below the original pitch. He also uses a unit with several shifters to produce parallel chords, which is a wonderful effect. Some multishifters also let you specify a different set of transpositions for all twelve chromatic notes.

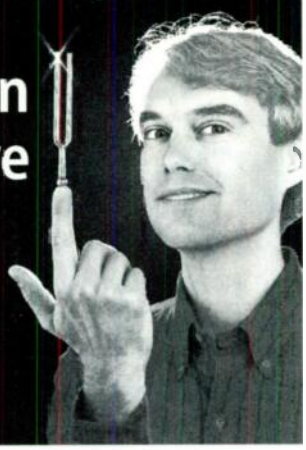
At the next level of sophistication, intelligent pitch shifters can do much more than automatically correct out-of-tune performances. In most cases, they can also transpose intelligently. To use such a device, you specify a key and the *type* of intervals you want, and the shifter will transpose each input note appropriately for that key. For example, suppose you specify the key of C major and the intervals of a third up and a fourth down. If you play a C, the shifter produces an E (a major third above) and a G (a perfect fourth below); if you play a B, the shifter produces a D (a minor third above) and an F (an augmented fourth below). Both chords are diatonic to the key of C major.

Intelligent pitch shifters let you do

World Radio History

PROVEN at TWO leading universities! Research info included with FREE Lesson!

"They LAUGHED when I said they could have Perfect Pitch ...until I showed them the secret!"



The TRUE STORY

by David L. Burge

IT ALL STARTED in ninth grade as a sort of teenage rivalry.

I would slave at the piano for five hours daily. Linda didn't practice anywhere near that amount. But somehow she always seemed to have an edge which made *her* the star performer of our school. It was frustrating.

What does she have that I don't? I would wonder.

Linda's best friend, Sheryl, sensed my growing competition. One day she bragged on and on about Linda, adding more fuel to my fire. "You could *never* be as good as *Linda*," she taunted me. "*Linda's* got *Perfect Pitch*."

"What's Perfect Pitch?" I asked.

Sheryl gloated over a few of Linda's uncanny musical abilities: how she could name any tone or chord—*just by ear*; how she could sing any pitch she wanted—*from mere memory*; and how she could even play songs after only *listening* to them on the radio!

My heart sank. *Her fantastic EAR is the key to her success* I thought. How could I ever hope to compete with her?

But later I doubted Sheryl's story. How could anyone *possibly* know F♯ or B♭ just by *listening?* An ear like that would give someone a mastery of the entire musical language!

It bothered me. Did Linda *really* have Perfect Pitch? I finally got up the nerve and point-blank asked Linda if the rumors were true.

"Yes," she nodded to me aloofly.

But Perfect Pitch was too good to believe. I rudely pressed, "*Can I test you sometime?*"

"OK," she replied cheerfully.

I couldn't wait to call her bluff...

My plan was ingeniously simple:

I picked a moment when Linda least suspected it. Then I boldly challenged her to name tones for me—*by ear*.

I made sure she had not been playing any music. I made her stand so she could not see the piano keyboard. I made certain other classmates could not help her. I set everything up so I could expose Linda's Perfect Pitch claims as a ridiculous joke.

Nervously I plotted my testing strategy. Linda appeared serene.

With silent apprehension I selected a tone to play. (She'll *never* guess F♯!)

I had barely touched the key.

"F♯," she said.

I was astonished.

I quickly played another tone. She didn't even stop to think. *Instantly* she announced the correct pitch.

Frantically, I played more and more tones, here and there on the keyboard, but each time she would somehow know the pitch—without effort. She was SO amazing—she could identify tones as easily as *colors!*

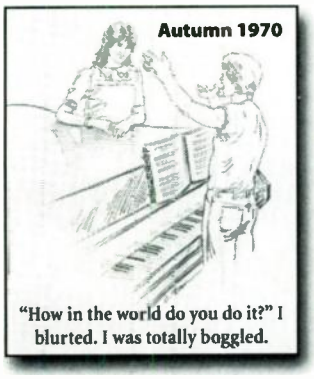
"Sing an E♭," I demanded, determined to mess her up.

With barely a pause she sang the proper pitch. I had her sing tone after tone. But as I checked her on the keyboard, I found that she sang each note perfectly on pitch.

I was totally boggled. "*How in the world do you do it?*" I blurted.

"I don't know," she sighed. And to my dismay, that was all I could get out of her!

The dazzle of Perfect Pitch hit me hard. My head was dizzy with disbelief, yet from that moment on I knew *Perfect Pitch is real.*



"How in the world do you do it?" I blurted. I was totally boggled.

I couldn't figure it out...

"*How does she DO it?*" I kept asking myself. On the other hand, why doesn't *everyone* know musical tones by ear?

Then it dawned on me that *most musicians* can't tell C from C♯, or A major from F major—like artists who brush painting after painting without ever knowing green from turquoise. It all seemed so odd and contradictory. I found myself even more mystified than before.

Humiliated and puzzled, I went home to work on this problem. At age 14, this was a hard nut to crack.

You can be sure I tried it myself. I would sweet-talk my three brothers and two sisters into playing tones for me, then guess each pitch by ear. My many attempts were dismal failures.

So I tried playing the tones *over* and *over* in order to memorize them. I tried to feel the "highness" or "lowness" of each pitch. I tried day after day to learn and absorb those elusive tones. But nothing worked. I simply could *not* recognize the pitches by ear.

After weeks in vain, I finally gave up. Linda's gift was indeed extraordinary. But for me, it was out of reach.

Then it happened...

It was like a miracle. A twist of fate. Like finding the lost Holy Grail.

Once I had stopped *straining* my ear, I started to listen NATURALLY. Then the incredible secret to Perfect Pitch jumped right into my lap.

I began to notice faint "colors" within the tones. Not *visual* colors, but colors of *pitch*, colors of *sound*. They had always been there. But this was the first time I had ever "let go"—and *listened*—to discover these subtle differences within the musical tones.

Soon I too could recognize the tones by ear! It was simple. I could hear how F♯ sounds one way, while B♭ has a different pitch color sound—sort of like "listening" to red and blue!

The realization hit me: THIS IS PERFECT PITCH! This is how Bach, Beethoven and Mozart could mentally envision their masterpieces—and name tones, chords and keys all by ear—*by tuning in to these subtle "pitch colors" within the tones.*

It was almost childish—I felt sure that *anyone* could unlock their own Perfect Pitch by learning this simple secret of "color hearing."

Excitedly I told my best friend Ann (a flutist) that *she* could have Perfect Pitch too. She *laughed* at me.

"You have to be *born* with Perfect Pitch," she asserted.

"You just don't understand how *easy* Perfect Pitch is," I explained.

I showed her how to listen. Timidly, she confessed that she too could hear the pitch colors. From this discovery, it wasn't long before Ann had *also* acquired Perfect Pitch! We became instant school celebrities. Classmates loved to test our abilities, leaving everyone awed and amazed by the power of our virtuoso ears.

Way back then I did not know the impact I would have when years later I explained my discovery to college music professors. I was surprised that many of them *laughed* at me at first. You may have guessed it—they told me, "One must be *born* with Perfect Pitch." Yet once I revealed the simple *secret* to Perfect Pitch—*and they heard for themselves*—you'd be surprised at how fast they would change their tune!

As I continued my own music studies, my Perfect Pitch ear allowed me to progress far faster than I ever thought possible. I even *skipped over* two required college courses. Perfect Pitch made *everything* much easier—performing, composing, arranging, sight-reading, transposing, improvising—and it enhanced my *enjoyment* of music as well! I learned that music is definitely a HEARING art.

And as for Linda?

Oh yes—time eventually found me at the end of my senior year of high school, with my *final chance* to outdo Linda. Our local university sponsored a music festival each spring. I went all out for it. Guess what? I scored an A+ in the most advanced performance category. Linda only got an A.

Sweet victory was music to my ears—mine at last!

THESE DAYS, thousands of musicians and two university studies have already proven my Perfect Pitch method. *Now I'd like to show YOU how to experience your own Perfect Pitch!*

I hope *you* won't laugh as you picture *yourself* with various Perfect Pitch skills—like naming tones and chords by ear with laser-like accuracy! I think you will be surprised at just how simple Perfect Pitch really is—*and how very valuable.*

I'll show you! Just call or write TODAY for your **FREE Perfect Pitch Lesson #1!**

For fastest delivery, call 24 hours:

(515) 472-3100

FAX: (515) 472-2700

FREE PERFECT PITCH LESSON #1!

☑ **YES!** Please rush me my **FREE Perfect Pitch Lesson #1** (written) with no obligation. Show me how I can gain Perfect Pitch for *myself*—to uncover deeper levels of *my own* talent.

NAME

ADDRESS

CITY

STATE ZIP

Mail to:
American Educational Music Publications, Inc.
Music Resources Building, Dept. MC-47
1106 E. Burlington, Fairfield, IA 52556

Send coupon at right or circle Reader Service Card #501

World Radio History

KeyDisk

TERMINATOR™

is a Macintosh software package that will give licensed software users the capability to run any original copy-protected master key disk application **without using the key disk anymore!**

$99

Plus $6 Second Day Air—CA Add Sales Tax
COD/MC/VISA Orders Processed Same Day Received

Unlimited application copies and launches • Take favorite key disk applications on the road without worry • No more down time due to lost installs or authorizations • No more deinstalling or deauthorizing before optimizing hard drives • Applications run smoother • No more system install conflicts or crashes due to installs or authorizations • Replaces all installs or authorizations back onto original copy-protected master key disks for safe keeping • KDT does not alter any proprietary codes on original copy-protected master key disks. Regain your rights to make backup copies of your own licensed software!

SYDNEY URSHAN MUSIC

TEL (800) 88-DWEEB

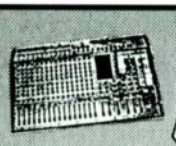
FAX (818) 901-WEEB • AppleLink URSHAN

KDT will not work with applications that require 'dongles' or 'keys' that are attached to the Macintosh ADB port. Must have at least one install left to use.

SPEIR MUSIC COMPANY

SPEIR MUSIC

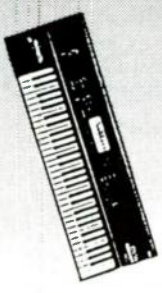
Dallas, Texas



• **GIANT** Inventory – New and Used

• **Over 30 Years** in Business! Buy with Confidence!

• **CALL NOW** for the Best Deal Anywhere!



800 • 219 • 3281

1207 S. Buckner / Dallas, TX / 75217 / 9-6 M-F

some remarkable things. For example, you can create an entire vocal harmony part in real time with a single singer. A horn player can become a horn section with appropriate chord voicings on each note. (No horn section has absolutely perfect timing, however. If your pitch shifter has multiple outputs or internal delay lines, you can make the horn-section effect more realistic by adding slightly different, very short delays to each note.) Even if the musician hits a note slightly sharp of flat, the harmonies remain in tune, thanks to pitch quantization.

Some intelligent shifters also let you specify the intervals on the fly from a MIDI keyboard. As each note in the audio track enters the shifter, you can play a chord on the keyboard, which tells the shifter what intervals to produce. The actual notes you play on the keyboard are not used; only the intervals between them. This lets you create any chords you want in real time, even different chords for the same input note at different times.

Combining transposing pitch shifters and delays can be lots of fun. Most multi-effects processors include both types of signal processing, as do some stomp boxes, such as the BOSS PS-3. Sending a delayed signal into a pitch shifter can create some great arpeggiation or "stairstep" effects if there is a feedback path from the output of the pitch shifter to the input of the delay.

For example, if you specify a delay time of a few hundred milliseconds and a shift interval of a minor third upward with some feedback, you get an upwardly arpeggiating diminished chord that fades out over time. You could also try this with a shift interval of a perfect fourth or fifth upward for soothing quartal or quintal arpeggios. In multi-shifter units, you can specify simultaneous upward and downward shifts for an even wilder effect.

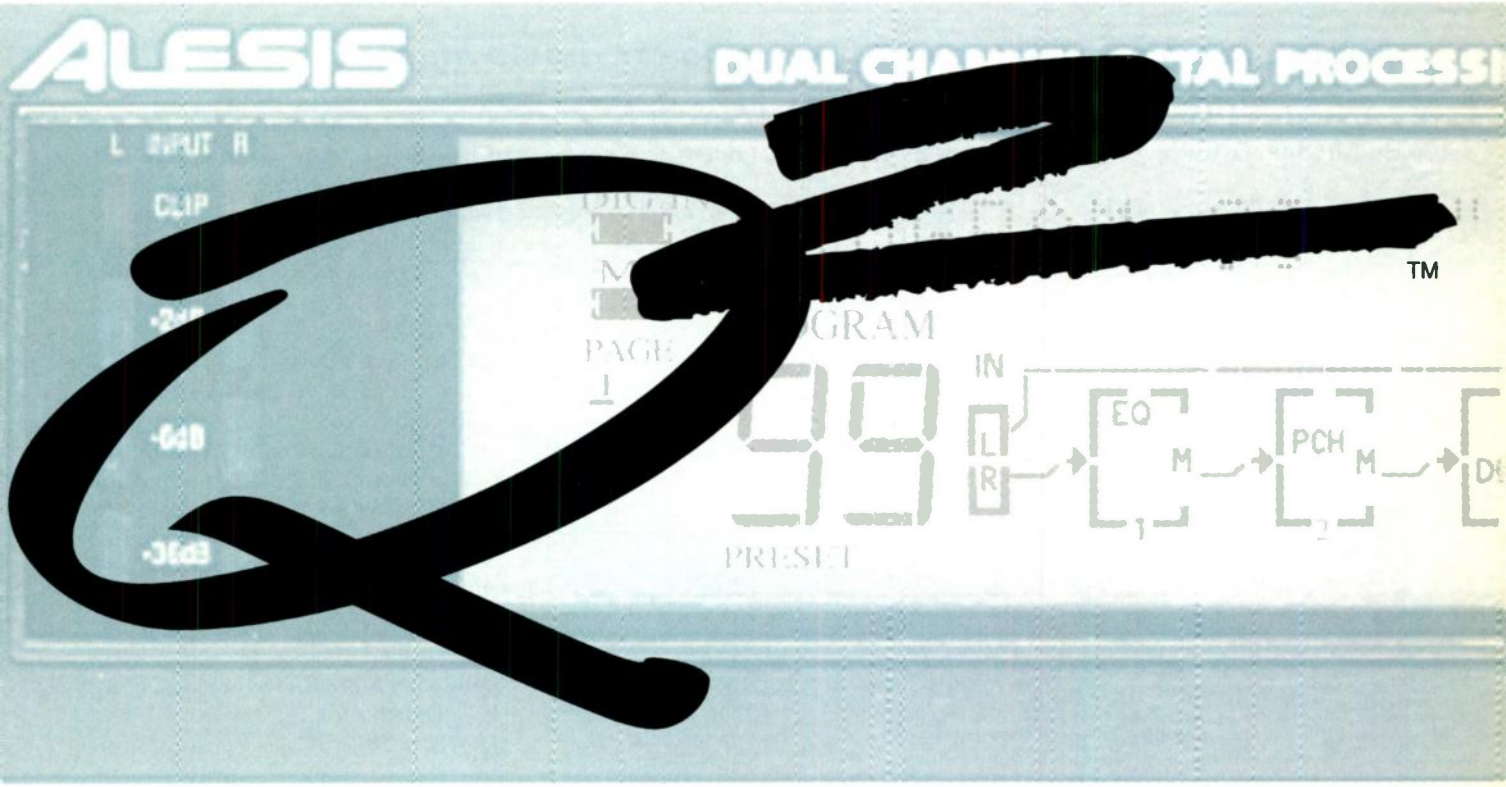
Clearly, pitch shifters are powerful creative tools for studio recording or live performance. However, they require some experimentation to get the most out of them. So find the pitch shifter in your multi-effects box and get to know its capabilities. A wonderful world of sonic manipulation awaits.

EM *Technical Editor* **Scott Wilkinson** *down shifts his voice to scare little kids on Halloween.*

World Radio History

IN 1947,
CHUCK YEAGER BROKE THE SOUND BARRIER.

IN 1994,
ALESIS ANNIHILATES IT.



KEEP YOUR EARS OPEN

Q2 is a trademark of Alesis Corporation.

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016
Phone: 1-800-5-ALESIS
(In North America only)
e-mail: ALECORP@Alesis1.usa.com

ALESIS
STUDIO ELECTRONICS

World Radio History

MULTIMEDIA MUSICIAN

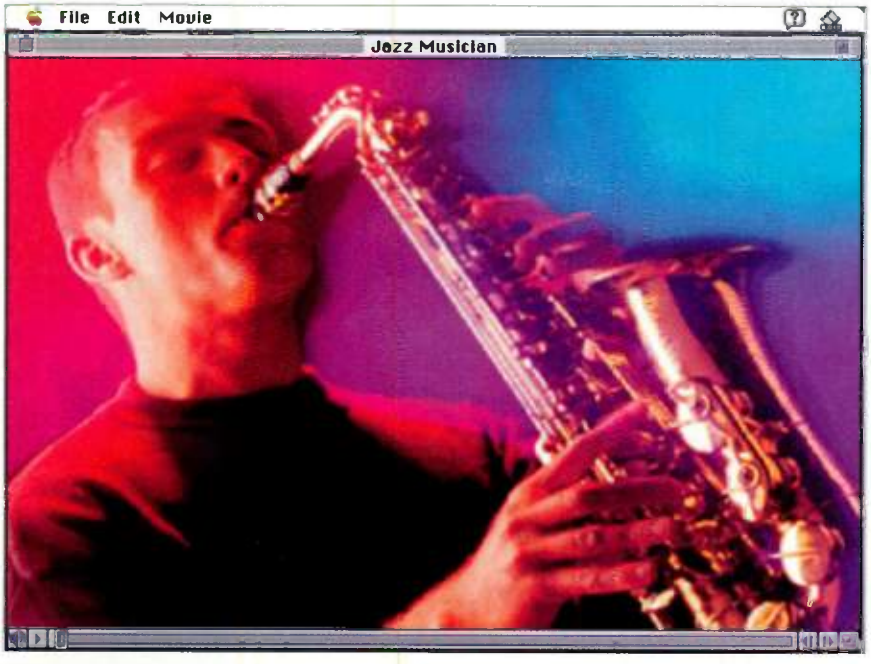
QuickTime 2.0

Apple unites sequencers and celluloid for movie magic.

By Michael Brown

Okay, so digital videos aren't made on celluloid; allow me some poetic latitude. The point is, Apple Computer has fundamentally changed the way its *QuickTime* multimedia software handles music. Oh, by the way, *QuickTime* 2.0 also features bigger, faster, and smoother digital-video playback. But that's to be expected, right?

What you might not expect to find in this type of software package is a new, software-based music synthesizer; a subset of General MIDI (GM) instrument sounds, licensed from the Roland Corporation; a new music track; support for SMPTE time code; and more. *QuickTime* 2.0 has much to offer musicians who are interested in exploring the worlds of video and multimedia production.



Digital-video movies can be bigger and faster than ever, but the new software synthesizer and the addition of MIDI support are the most exciting aspects of *QuickTime* 2.0.

With the latest version of its multimedia software, Apple once again leaps ahead of Microsoft in the desktop video production market. In fact, many would argue that Apple has merely lengthened its lead over Microsoft and its *Video for Windows*, which has yet to move beyond version 1.1. The observations presented here are based on *QuickTime* 2.0 for the Macintosh, but *QuickTime* 2.0 *for Windows* possesses the same set of features, according to an Apple spokesperson, and should be shipping by the time you read this.

SOUNDTRACK AVAILABLE ON...

The new music track is in addition to, not a replacement for, the digital-audio track that exists in earlier versions of *QuickTime*. Although the *QuickTime* architecture supports multiple digital-audio tracks, most people have digitized all their audio material (dialog, sound effects, ambient sound, and music) into a single audio track because of bandwidth constraints during playback. In addition to consuming prodigious

World Radio History

It Doesn't Get Any Better Than This!

No other sampler can match the ASR-10 in features, fidelity, and fun.

Samplers offer the creative musician so many possibilities — from playing realistic instrument sounds to creating loops and sounds recorded from any source imaginable. And no other sampler offers the range of possibilities found in the ENSONIQ ASR-10:

- up to 31-note polyphony
- up to 16 MB memory
- 16-bit stereo sampling
- onboard effects processing *(62 algorithms)*
- 2-track digital audio recording *(to RAM or hard disk)*
- 16-track sequencer
- advanced resampling
- expressive voice architecture
- exclusive performance features
- optional S/PDIF digital I/O
- available as a keyboard or rack

The ASR-10's excellent fidelity and features haven't gone unnoticed. It was awarded EQ's "Blue Ribbon Award" *('93 AES)*, nominated as the *Music & Sound Awards* "Most Innovative Keyboard" and "Product of the Year" *('94 Winter NAMM)*, and tested #1 in frequency response and distortion in the August 1994 issue of *Keyboard*.

The ASR-10 has a *huge* library of sounds on diskette and CD-ROM *(including our acclaimed Signature Series artist collections)*. And this fall we're premiering CD-ROMs created for ENSONIQ by *Hollywood Edge, Sounds Good, InVision, Sonic Arts,* and *Q Up Arts;* as well as new volumes available from *Eye and I, Greytsounds, Pro-Rec,* and *East-West.*

Isn't it a great time to be alive and making music? ASR-10 owners certainly think so. So can you.

Call 1-800-553-5151 to find out more.

ENSONIQ

LEADING THE WORLD IN SOUND INNOVATION

○ ***I want the best!*** Please send me the ASR-10 Version 2 promotional video — *enclosed is $4.00 to cover S/H.*

○ Please send me free info on: ○ ASR-10 ○ TS Series ○ SQ Series ○ KS-32 ○ DP/4

Name _____

Address _____

City _____ *State* _____ *Zip* _____

Phone ( ) _____

Mail to: ENSONIQ, Dept. E-46, 155 Great Valley Pkwy, PO Box 3035, Malvern, PA 19355-0735

All names are trademarks of their respective holders. © 1994 ENSONIQ Corp

World Radio History

We've Unleashed A New Force.

Real Four Track Digital Audio For Your PC!

The truth is, to really have home studio recording potential you need four tracks of digital audio. So we developed Quad Studio™... an incredible digital audio recording system for your PC!

Now you can record, overdub, mix and bounce tracks in real time with no loss in sound quality.

Lay down your vocal or lead guitar tracks while simultaneously listening to the rest of the mix.

TURTLE BEACH QUAD STUDIO FOUR TRACK DIGITAL AUDIO

Or record your business presentation's narration while listening to your background music.

Quad Studio provides full synchronization between your digital audio tracks and your MIDI sequencer, plus there's Turtle Recall™ ... real time automation of your level, pan and mute settings.

See your favorite dealer or call **1-800-645-5640** for more information on the biggest breakthrough in PC audio!

TURTLE BEACH SYSTEMS

52 Grumbacher Road • York, Pennsylvania 17402 • 717-767-0200
1-800-645-5640 • FAX: 717-767-6033
A Division of Integrated Circuit Systems

All trademarks are registered by their respective companies. Specifications may change without notice.

World Radio History

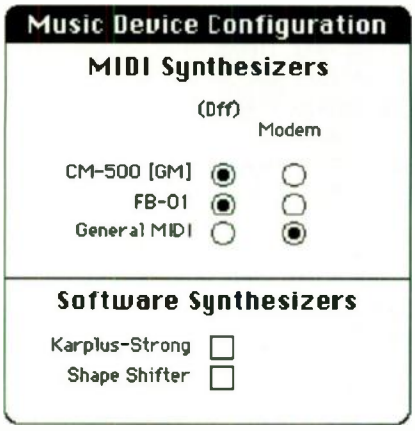


FIG. 1: The Music Device Configuration dialog box in *QuickTime* 2.0 lets you choose which type of synthesizer—hardware or software—will be used to play back the music soundtrack.

amounts of storage, this practical limitation made it exceedingly difficult to produce a musical score that offered any degree of continuity from scene to scene.

With *QuickTime* 2.0, music is not only recorded onto a separate track, it is based on MIDI sequences and synthesizers, rather than digitized audio. Thanks to that change, the music in a *QuickTime* video production now demands far less in the way of resources, but it delivers far more. For example, a typical MIDI-based music soundtrack requires relatively little memory, so the entire score can be loaded into RAM before the movie begins. This technique boosts the video frame-rate, because subsequent disk (or CD-ROM) access can be reserved for the retrieval of video material.

QuickTime 2.0 even comes with its own multitimbral, polyphonic, software-based synthesizer. This synth includes a subset of the GM sound library, consisting of 43 instrument sounds that Apple has licensed from Roland (see the table on p. 102).

Perhaps even more importantly, you can use *QuickTime* 2.0's *MoviePlayer* 2.0 utility to convert any Standard MIDI File (SMF) into a *QuickTime* 2.0 music soundtrack. That means you can use your regular sequencer to create a score, map your sound choices to the General MIDI instruments in *QuickTime* 2.0, paste the converted SMF into the movie file, and *voilá!* You have a movie soundtrack. Third-party *QuickTime* movie editors, such as Adobe's *Premiere,* will provide more sophisticated soundtrack-editing tools.

If the SMF contains multiple instruments, the music soundtrack will have multiple instruments, too. In order for the music to play back properly without an external synth module, of course, there must be equivalent instruments available on the Mac's internal synth. However, *QuickTime* will match instruments as well as it can according to their category.

For example, if you import an SMF that uses a GM Honky Tonk piano, an instrument that *QuickTime* does not currently support, the software will assign that track to its Acoustic Grand piano. If you don't like the choices the software makes, you can easily reorchestrate the score using the *QuickTime* 2.0 Instrument Picker.

THREE-PART HARMONY

Apple's new Macintosh Music Architecture consists of three parts: the Note Allocator, the Tune Player, and various music components (either the Mac's software synth or external MIDI synths). The Note Allocator maintains a database of the musical components that are connected to the Mac via Apple's *MIDI Manager.* The database is maintained by the user through the Music Device Configuration dialog box (see **Fig. 1**). From here, you can decide whether *QuickTime* uses the Mac's software synth or one or more external MIDI synths. The Instrument Picker dialog box (see **Fig. 2**) provides a standard user interface for choosing a particular instrument and sound. You can click on the keys on the dialog box's piano keyboard to hear what each instrument sounds like.

The Tune Player is a minisequencer that plays a time-ordered list of events with the Mac's software synth or one or more connected MIDI synths. It receives instructions from the Note Allocator as to which instruments should be played. The Tune Player can play multiple sequences at the same time, provided there are enough voices available. It can also cue up one sequence while another is playing, so there is no gap between two sections of a score.

The third element of the Macintosh Music Architecture consists of the music components: the new software synthesizer and outboard MIDI synths. The software synth acts just like a conventional MIDI synth, except that it's not limited to sixteen channels. Theoretically, there are no limits on its multitimbral capability or polyphony. In the real world, of course, the synth is limited by the amount of memory and the number of clock cycles the Mac can afford to dedicate to it.

For example, on an average LC 475, you can expect the software synth to have 8-voice polyphony. On a mid-range Quadra, you can expect 12-voice polyphony, and on a Power Mac, as much as 32-voice polyphony. Each instrument requires between 50K and 60K of memory, so the synth's multitimbral capabilities are determined by the amount of available of RAM more than anything else.

SCALABLE TECHNOLOGY

Like *QuickTime* itself, the new music architecture is fully scalable. That is, a *QuickTime* 2.0 music soundtrack automatically plays back on the highest-quality sound generator at its disposal. If there is a MIDI keyboard or sound module connected to the Mac's printer or modem port, for example, *QuickTime* 2.0 will automatically switch its MIDI output to that device via *MIDI Manager.* Alternatively, you can force it to use only the software synth.

If *QuickTime* 2.0 finds itself running on one of the Quadra AV machines, the software synth automatically takes advantage of the 16-bit sound capabilities offered by those machines. Apple has also produced a system extension (the *QuickTime PowerPlug*) with native PowerPC code that enables *QuickTime* 2.0 to take advantage of the enhanced audio capabilities of the Power Mac.

According to Duncan Kennedy, Apple Computer's *QuickTime* product line manager, *QuickTime* 2.0 converts

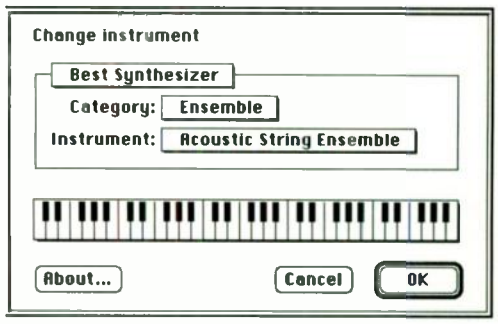


FIG. 2: The Instrument Picker dialog box in *QuickTime* 2.0 is used to select the instruments that will perform the movie's music soundtrack.

World Radio History

RECORDING MUSICIAN

DAT Mastering at Home

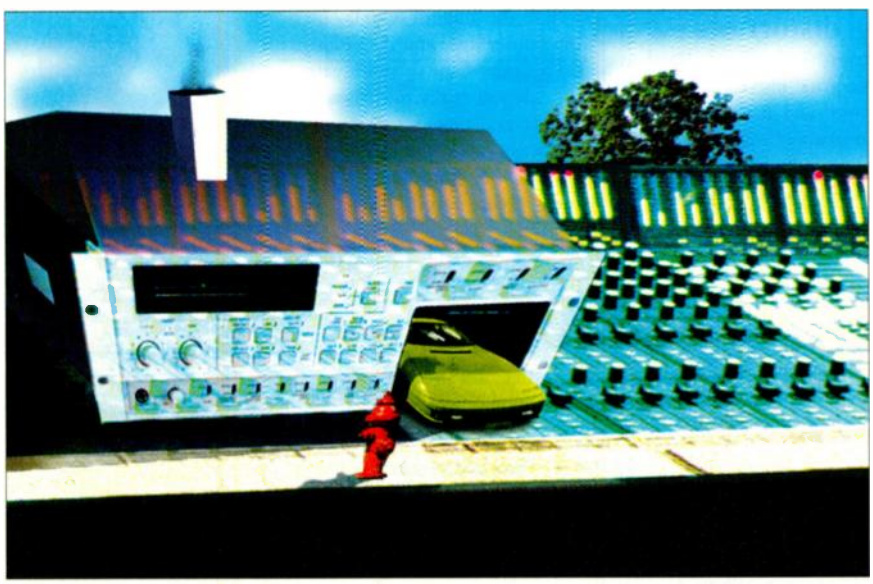
Control your musical destiny with a personal mastering suite.

By Buddy Saleman

Mastering is the last step in the record-making process before duplication to CD, cassette, or vinyl. Many producers and engineers consider mastering the most critical stage of audio production, because it's the last chance to fix problems and add the sparkle that turns mixes into masterpieces. A basic mastering session involves sequencing songs in the desired order, adding EQ to spice up the sound or adjust for tonal deficiencies, and using signal processing (compression, spectral enhancing, and so on) to increase sonic impact.

Unfortunately, professional mastering rooms aren't cheap. A trip to these hallowed houses of sound often means parting with $125 or more, *per hour*. That tariff is certainly too stiff for most home studio owners. You can bypass the commercial rooms if you own a digital audio workstation, but even these tools remain too expensive for most home recordists.

But if you can borrow two DAT machines, you can use your existing mixer and signal processors to turn your home studio into a private mastering suite. DAT-to-DAT mastering is a simple and inexpensive way for home recordists to take even more control of music production. Finally, *you* can decide how your final product sounds; you only need your ears, a few pieces of easily accessible gear, and a little patience.

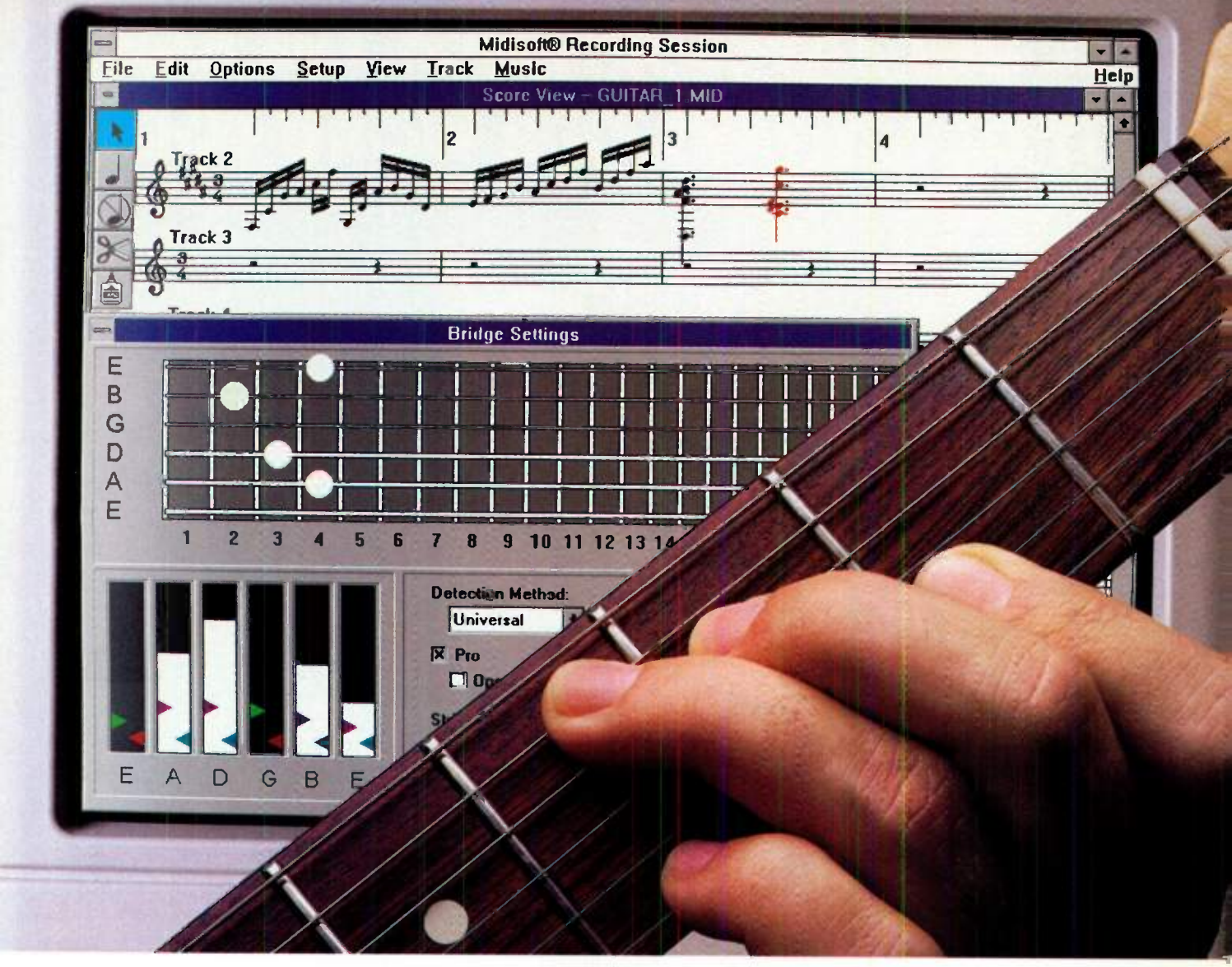


DMITRY PANICH

GEARING UP

Although commercial mastering suites are filled with high-tech audio equipment, the basic home mastering system is very simple (see **Fig. 1**). One DAT machine is used as a playback deck for your already-mixed musical works. A mixer is used to process the signal from the playback deck, facilitating EQ tweaks, additional signal processing, and level adjustments. A second DAT machine is used as the master recorder, allowing you to sequence your songs in any order you desire. The master DAT recorder produces the final

World Radio History



Write to MIDI, no keyboards.

Finally. No more running back and forth between fretboard and keyboard every time you compose with MIDI.

Because with G-VOX Bridge™ software, you can go direct from your guitar, via the G-VOX Pickup and Belt Pack, to top Windows-based sequencing and notation software.* Meaning you can write, record, edit and save to MIDI with a package designed expressly for guitarists.

Bridge is fast, accurate and easily conforms to your playing style. What's more, Bridge comes with Midisoft's Recording Session™ and Howling Dog's Power Chords™ for G-VOX. Absolutely free.

So get started. See your local dealer or just call (215)922-0880 for more information. Then go write to MIDI.

With your guitar.

G-VOX®

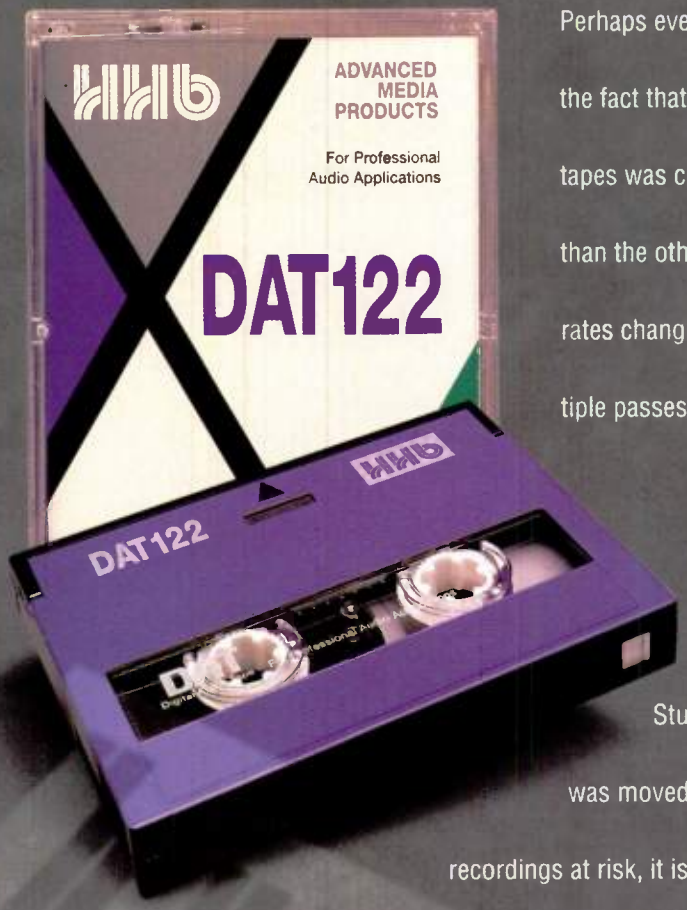
Play with it.

*Please call the manufacturer of your sequencing and/or notation software to find out if it is fully G-VOX Bridge™ compatible. (Or call 215-922-0880.) To link your guitar to MIDI software, Bridge requires the G-VOX Pickup and Belt Pack, sold separately, and requires Windows v3.1 or later. Pictured on the monitor above: Midisoft's Recording Session™ and G-VOX Bridge. Windows is a trademark of Microsoft Corp. G-VOX, G-VOX BRIDGE and PLAY WITH IT are trademarks of Lyrrus, Inc. Patents pending.

World Radio History

ALL DAT TAPES ARE NOT THE SAME BUT DON'T TAKE OUR WORD FOR IT

Ask Studio Sound, one of the world's most highly respected professional audio publications. They recently subjected eight leading DAT tape brands to an exhaustive series of tests and the results should be of interest to everyone serious about audio.



In the critical area of block errors, the tapes fell into two distinct categories of performance. Three exhibited similarly low error rates with the others presenting error levels considerably higher. HHB DAT Tape was one of the leading three.

Perhaps even more significant was the fact that one of these leading tapes was clearly more consistent than the others, with its low error rates changing very little over multiple passes. That tape was HHB.

And when it came to archiving stability, Studio Sound's reviewer was moved to write: "If it were my recordings at risk, it is clear which choice I would make". His choice? You guessed it – HHB.

HHB DAT Tape. Would you trust your recordings to anything less?

Call Independent Audio today for your free copy of Studio Sound's "DAT On Trial".

HHB

Independent Audio · 295 Forest Avenue, Suite 121, Portland, Maine 04101-2000
Tel 207 773 2424 · Fax 207 773 2422

Studer Revox Canada Ltd · 1947 Leslie Street, Toronto, Ontario M3B 2M3
Tel 416 510 1347 · Fax 416 510 1294

HHB Communications Ltd · 73-75 Scrubs Lane, London NW10 6QU, UK
Tel 081 960 2144 · Fax 081 960 1160 · Telex 923393

World Radio History

duplication master that you send off to make CDs, cassettes, or vinyl records.

It's best if both DAT machines are professional units, but one consumer deck and one pro-level deck can do the job. One of the machines should record analog signals at 44.1 kHz (the standard CD sample rate), or you may have to pay extra for a sample-rate conversion at the duplication plant. Of course, few home recordists can afford two DAT machines, so calling in favors and friends is usually the key to getting what you need. Two recordists can combine their gear at one studio and schedule a double mastering session that benefits both parties. In the event that a "freebie" machine is nowhere to be found, pro audio-rental companies can provide decks at reasonable rates.

The mixing console is the command center of a conventional home studio, so you should already have a clean, sweet-sounding model. Because DAT-to-DAT mastering involves routing the stereo signal from the source DAT through the mixer's EQ, the importance of a good mixer to the home mastering process cannot be overemphasized.

If you have reservations about your mixer's sonic health, borrow or rent a highly regarded compact mixer, such as Mackie's CR-1604 or Allen & Heath's GL2. Don't scrimp on sound quality; a substandard mixer can sabotage the mastering process by introducing audible hiss and other sonic anomalies to the duplication master.

A home mastering system doesn't require that you rustle up two pro-quality DAT recorders. I've produced great sounding masters using a consumer model Sony DTC-700 as a playback deck and Tascam's professional studio machine, the DA-30 (shown above), as the master deck.

A good-quality stereo compressor completes the basic home mastering system. Compression smoothes out signal levels and dynamics to put more punch in your master. (For a full explanation of compression, see "Recording Musician: Maximum Compression" in the December 1993 **EM**.) If you really want to make your masters shine, add a spectral enhancer or a hiss-reduction device to the equipment list.

I know that many recordists may question the wisdom of going through an analog signal chain (the mixer) to produce a DAT duplication master. In practice, I've mastered countless projects using this method, and no one has complained about compromised sonic quality. And I'm not just talking about demo projects. Several of these masters have been released commercially by major and independent record companies.

In my opinion, some engineers put too much importance on keeping everything in the digital domain. Good-quality analog equipment will not seriously degrade a digital audio signal and, in fact, may add a nice bit of analog warmth. Don't fall victim to digital snobbery. Trust your ears. After reading this article, I'm sure you'll be excited about producing duplication masters in your home studio, not worried about slipping out of the digital domain.

HOOKING UP

Setting up your mastering system is easy. Take the left/right stereo outputs from the source (playback) DAT machine and connect them to an adjacent pair of input modules on the mixer. Make sure all other input channels, aux sends, etc., are muted or in their null (off) positions. Connect the master (recording) DAT machine to the stereo output bus of the mixer. (It makes sense to use the better of the two DAT machines as the master deck.)

Each channel of the stereo compressor is inserted into the appropriate input channel through the input send/return jack on each module. (If your mixer doesn't have channel inserts, connect the compressor to the stereo bus inserts.) Now, pan the two input channels left and right, confirming that the left/right outputs from the source DAT machine correspond to the left/right panning on the board. If this instruction seems too remedial,

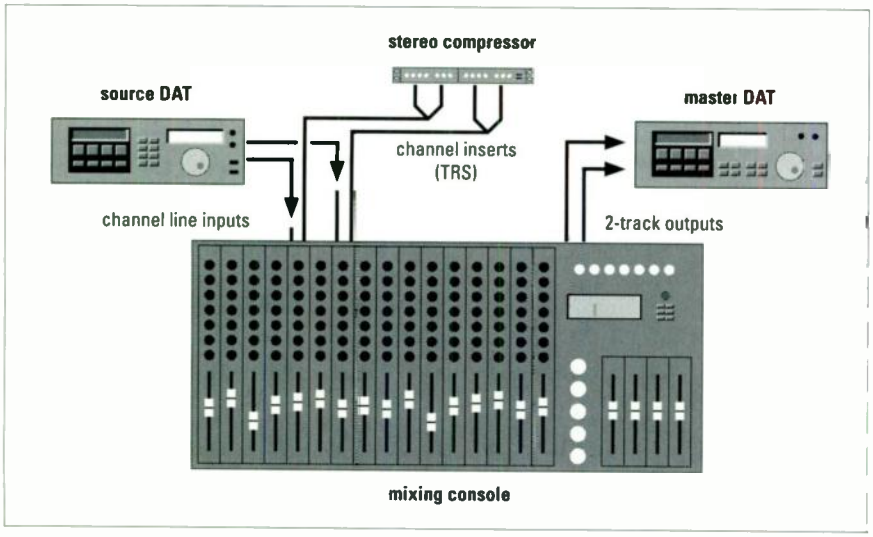


FIG. 1: A typical signal-routing scheme for a basic DAT-to-DAT mastering system. The source DAT plays the original mixes, which are compressed and reequalized through the mixer to produce optimum sonic quality. Compiling the duplication master is as easy as recording the processed mixes in a user-selected order.

World Radio History

the levels up before the song starts and down as the song fades out. Because the source signal is running through mixer input channels, fading audio in and out is an easy way to make sure that transitions between songs are silent.

Regarding transitions, the typical space between musical selections is three to five seconds. However, a dramatic pause of ten seconds between one song and another may be appropriate, while one song might sound best kicking in one second after the previous track ends. Base your final decision on how the transitions "feel."

Luckily, the mechanics of DAT-to-DAT sequencing are child's play. If you don't like a transition, you can easily do it again and again until you're satisfied. You just shuttle the source DAT to the appropriate cut, cue the master DAT to where the next selection should begin (including the silence between cuts), and simultaneously press Play on the source machine and Record on the master deck.

However, don't expect precise "razor" edits from this system. The DAT machine's rotary heads don't engage immediately, so you often end up with a second or more between cuts than you wanted. A little experimentation is usually required to find the best spot

AMPEX

Production Master

Studio Sound & Vision

Client Dave Crimmen

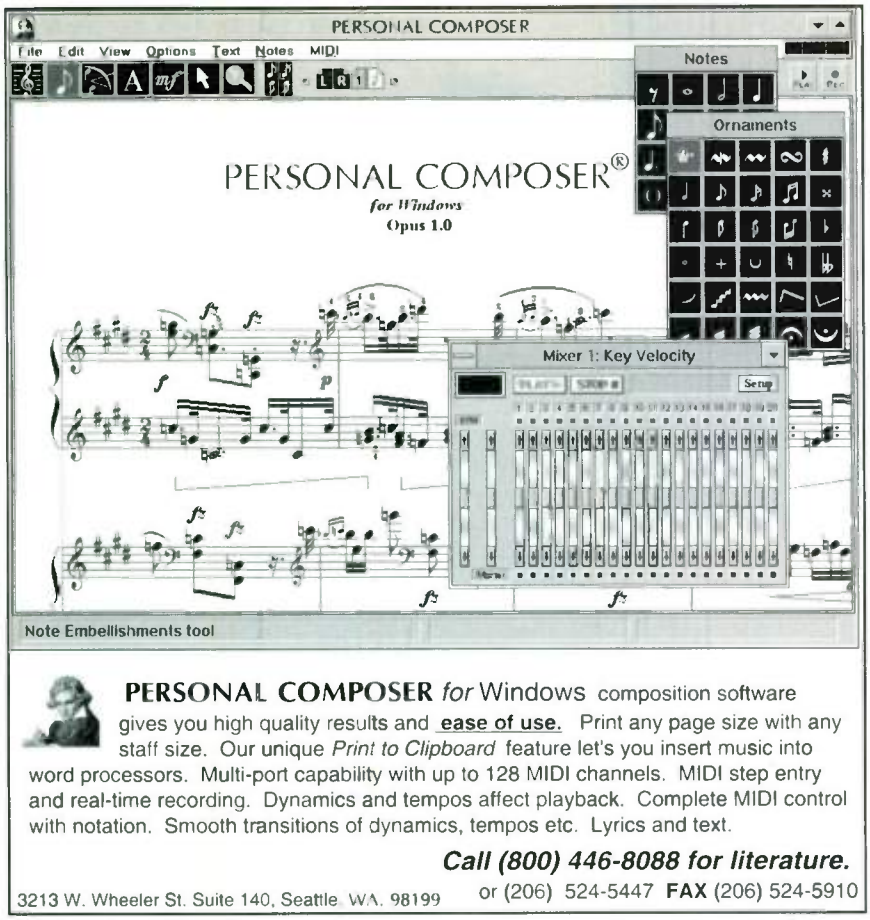
Program "It's Only Rock 'n' Roll" CD project

Date/Time 9 August 1994
Engineer Buddy Saleman
Assistant Dian Langlois
Producer Michael Molenda
Source Tascam DA-30 44.1 kHz

Comments 1 kHz Tone @ 0 VU 0:00-0:45
Silence 0:46-1:59

1.	Desperate to Dance	2:00-4:17
2.	Stay with me Tonight	4:21-7:01
3.	Still On My Mind	7:04-10:44
4.	Time Will Tell	10:48-13:22
5.	Where The Sun...	13:25-17:59
6.	Been Here Before	18:04-22:12
7.	If It Were Me	22:15-25:41
8.	I'd Do Anything	25:44-30:30
9.	Here With You	30:34-34:07
10.	Gotta Get Out	34:11-40:15

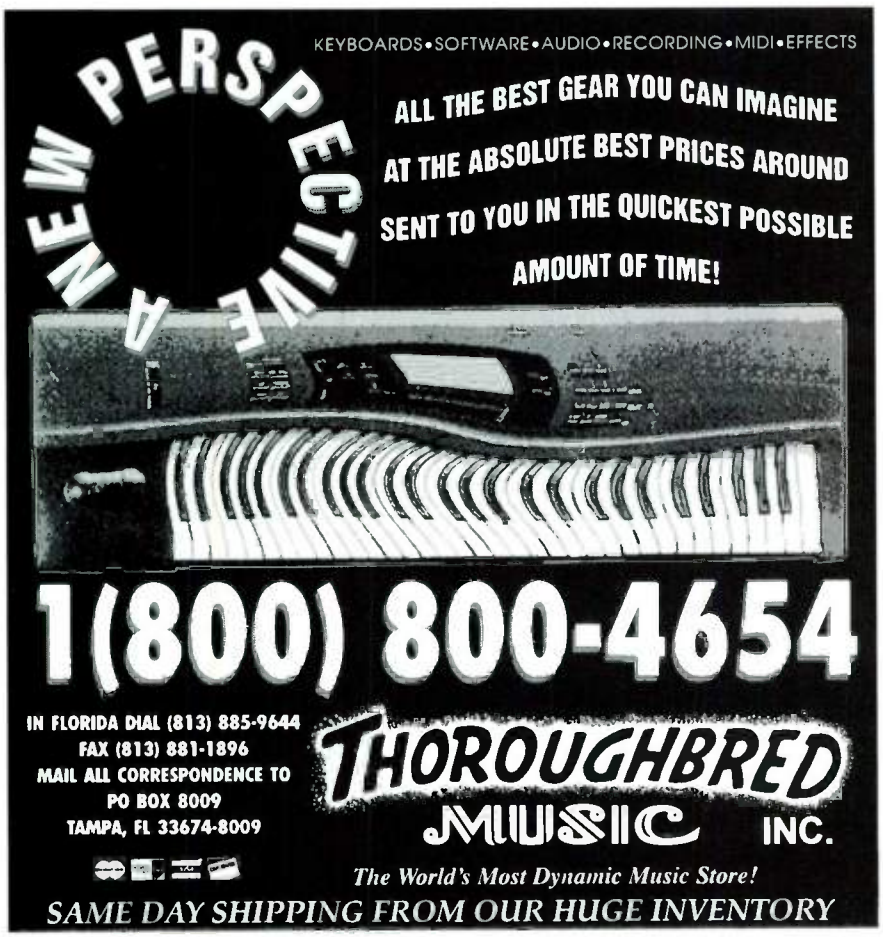
FIG. 2: A properly labeled DAT duplication master lists every program event in absolute time.



PERSONAL COMPOSER *for* Windows composition software gives you high quality results and **ease of use.** Print any page size with any staff size. Our unique *Print to Clipboard* feature let's you insert music into word processors. Multi-port capability with up to 128 MIDI channels. MIDI step entry and real-time recording. Dynamics and tempos affect playback. Complete MIDI control with notation. Smooth transitions of dynamics, tempos etc. Lyrics and text.

Call (800) 446-8088 for literature.

3213 W. Wheeler St. Suite 140, Seattle, WA. 98199 or (206) 524-5447 **FAX** (206) 524-5910



World Radio History

to pause both machines to produce, say, a 3-second silence between selections. It is important that you do not press Stop on the decks at any time during sequencing. If you press Stop on both decks between edits, the machines will have to wrap the tape around the heads before going into Play or Record—a process that can add those frustrating extra seconds to your song sequences. Pause mode does not fully disengage the heads from the tape, which makes quicker, more precise edits possible.

When the mastering is finished, *always* make a safety copy of your duplication master. Never send your only DAT master to be duplicated. When you tempt fate, it usually bites. In other words, your sole DAT master will disappear as soon as it leave your hands.

IT'S NEVER ENOUGH

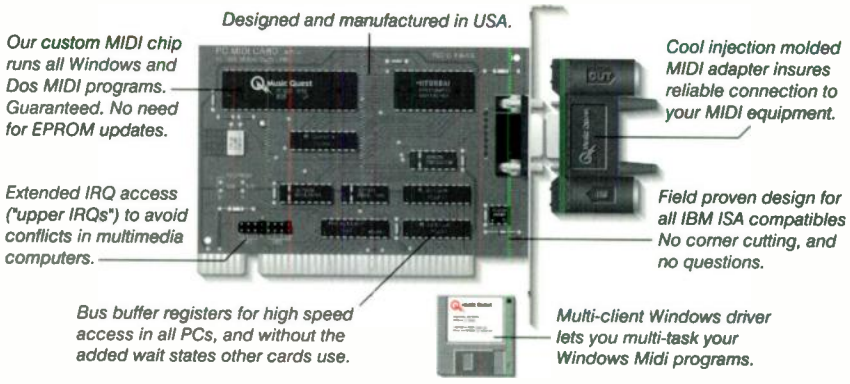
Unfortunately, your worries aren't over after you've shipped your brilliantly mastered DAT to the duplication plant. Although duplicators often do a fine job, there is a always the possibility that your product will come back sounding less than wonderful. To avoid being stuck with a disappointing record, always demand that the manufacturer send a test pressing before you approve the complete run. Even if you are charged extra for the test pressings, do it. They're worth many times their price.

Compare the tests to your safety master to make sure the majority of the sounds you produced are present. Allow for the playback characteristics of the medium—cassettes, for example, will not sound as wonderful as the DAT master—but if something doesn't thrill you, ask the duplicator to recut their master and run another test. Tell your account person why the test pressing did not compare favorably to the master (it sounds too thin, lacks bass, the high-end seems distorted, and so on).

The beauty of do-yourself mastering is that you *know* how the record should sound. So accept no substitutes; stand firm until the pressing plant gets it right.

Buddy Saleman *is head engineer at Sound & Vision studios in San Francisco. He also produced several tracks on the recently-released compilation CD,* The Infinite Summer of Love *(Taxim Records, Germany).*

The One IBM Midi Card You Can Count On



The PC MIDI Card.™ Ask for it.

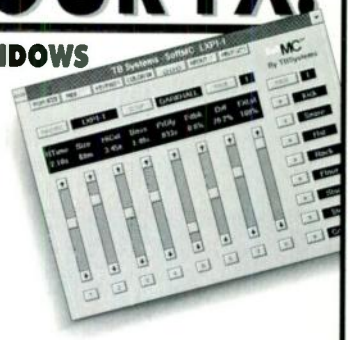
Don't Miss a Beat! Call 1-800-876-1376
toll-free, U.S./Canada

Music Quest *makers of intelligent MIDI interfaces since 1987*
1700 Alma Drive Suite 330 Plano, TX 75075 Phone: 214 881-7408 Fax: 214 422-7094

Music Quest and PC MIDI Card are trademarks of Music Quest, Inc. Other product/brand names are trademarks of their respective owners.

CONTROL YOUR FX!

ANNOUNCING SoftMC™ V2.0 FOR WINDOWS



SoftMC™ is an easy to use programmable MIDI controller for Windows. SoftMC™ will allow you to control multiple MIDI devices, at discrete levels, in a complex MIDI system environment. SoftMC™ controls virtually any MIDI device available along with built in support for Lexicon's LXP-1, LXP-5, LXP-15, and PCM70 multi effects processors.

- **Supports Lexicon's LXP-1, LXP-5, LXP-15, & PCM70**
- **Fully Programmable**
  Controls virtually any MIDI device. Create mixers, lighting controllers etc. Great for studio & live applications.
- **Full System Exclusive Programmability**
- **Cost effective alternative to a dedicated hardware MIDI controller**

NEW VERSION!
30 Day Money Back Guarantee

Just $99.95
For more info or to order call us at
1-800-476-3862
Visa & MasterCard accepted
TB Systems™ 2205 Boston Rd Bld O-144
Wilbraham, MA 01095 FAX (413)596-9846

World Radio History

WORKING MUSICIAN

Singles Going Steady

The 45 rpm single is alive and well in the alternative music scene.

By Diane Lowery

Ah, yes, I remember the days when I scrounged through Mom's purse to find enough change to buy a couple of new 45s. I couldn't resist the mesmerizing, colorful sleeves that lined the walls and filled the bins of my local record store. I would make my selection, then run home to hear the 3-minute blast of music that was worth the risk of Mom discovering her pocketbook mysteriously empty.

I wasn't the only one seduced by these small, 7-inch discs chock full of sound. Vinyl 45s ushered in the rock 'n' roll era, maintaining an important presence in the music industry through the early 1980s. Then, the market changed. "You don't hear about a single selling a million copies anymore," says Max Hechter, a clerk at Rhino Records in Los Angeles. "Top 40 radio is different today; it isn't singles driven like it was in the 1960s."

But even though the CD has effectively buried the vinyl LP and major market radio has abandoned the single, the vinyl 45 refuses to die. In fact, the 7-inch record is surprisingly healthy. The latest Recording Industry Association of America (RIAA) statistics show that vinyl singles still move more than 15 million units a year. By comparison, the much-promoted CD single format sells just 7.8 million units a year. So, if your music fits into the "singles scene," an open market is waiting for you.

Pavement's recent single "Cut Your Hair" (Matador Records) was a marketing tool to promote their upcoming CD release. The B-side contains two songs not included on the CD.

SINGLES MARKET

Fitting into the scene is easier if your music is nonmainstream and youth-oriented. The reason for this can be traced to the roots of punk rock in 1975, when the 45 rpm single became the perfect vehicle for punk's do-it-yourself ethic. Singles were cheap to produce and could be marketed and distributed regionally, without the interference (or support) of major record labels. These benefits are not lost on today's generation of punk and alternative artists.

"The 7-inch single represents the

World Radio History

Once you hear how SUPERIOR our new powered mixers are, you won't mind PAYING LESS for them.

Need to run a large PA with eight speaker systems? Need to run a PA and a monitor system? ...No Problem! The six new MetroMix powered mixers from SoundTech are designed to eliminate all the excuses you get from other power mixers. No compromises with MetroMix's massive power and total flexibility. You can handle any sound reinforcement job from simple to sophisticated.

new MetroMix

That's right! Dual power models have two independent graphic EQ's and power amp sections.

This means a dual powered version will power up to eigh: PA speakers or four PA and four stage monitor speakers.

Single graphic EQ/power amp and dual graphic EQ/power amp versions are available.

Ready to rack mount for professional applications or you can get an optional "top box" to carry it around.

Three band EQ provides you with absolute tonal flexibility.

Phantom power for condenser microphones on every Mic input.

Three aux busses (1 pre, 2 post) plus built-in reverb give you the most versatility in tackling monitor or effects needs.

Built in compressor eliminates amplifier distortion, even at very loud levels.

Balanced mic and unbalanced line inputs on every channel.

Six models have up to 650 Watts RMS total power.
All units can handle 2 Ohm loads.

Tape to Monitor control lets you route the recorded music directly to the stage monitors. Great for sing along Karaoke gigs where shy, aspiring singers need to hear the music loud in the monitors.

Connector panel can be moved to the back of the unit. No more "rat's nest" of cable to trip over on stage. Great for rack users or permanent installations.

For the location of a stocking Sound Tech dealer near you... Call 1-800-US-SOUND, ext. 131 / 132

All these features and power are backed up by the Sound Tech 3 year warranty.
Check out all six versions of the new Metro Mix powered mixers at your local SoundTech dealer today.

SoundTech™
PROFESSIONAL AUDIO
255 Corporate Woods Parkway
Vernon Hills, IL 60061-3109 USA (708) 913-5511

World Radio History

punk scene because it captures the moment," explains Dr. Frank, lead guitarist and vocalist for the Mr. T Experience. "It's a mini sound bite of what your band was doing at a particular time. Fans can buy your single and become a part of that moment."

Audience support is critical to the success of a 45. Unlike CDs and CD singles, which are mass-marketed corporate products, 45s are often love letters from a band to its fans. The acts can personalize artwork without fear of censorship or catering to mass commercialism. And the inexpensive nature of the medium works two ways. "Singles are a great way for fans to hear new bands without spending a lot of money," remarks Lee Joseph, owner of Hell Yeah! and Dionysus Records in Burbank, California.

Distribution of vinyl singles is largely handled by small independent record stores that cater to alternative bands and their fans. "You get all sorts of people buying singles: college students, aging punk rockers, music junkies who gravitate toward independent music, and record collectors who love 45s," says Hechter.

The musicians most likely to put out a cool single are people who buy and collect 45s themselves. If that's you, great. You're probably well aware of the marketplace and the types of bands that are successful with the medium. However, if this article is your introduction to the scene, do some homework before you leap in. It's essential that you know your audience. Don't put out a 45 if it's not appropriate to your style or market.

"People who like Pearl Jam or Garth Brooks don't buy 7-inch singles," says Deborah Orr, publicist for New York-based Matador Records. "Singles consumers are people who like more intimate, offbeat, and nonmainstream music. If you don't fit the profile for a singles band, don't release a 45 just because you think there's no other way of getting your stuff out. It won't sell. You'd be better served by going out and playing live to develop an audience."

SPINNING DISCS

The vinyl 45 is an affordable medium for tightly budgeted alternative bands to put out product (see sidebar, "The Kids are Alright"). Depending on the manufacturer, pressing costs hover around $1.10 per disc. Many companies offer package deals that include disc mastering, a limited number of test pressings (to reference the sound quality of the run), labels and label typesetting, white paper sleeves, and a press run of between 500 and 1,000 singles. Of course, if the act decides to print a flashy cover and press the singles on colored vinyl, the costs escalate rapidly.

"When we were starting out, our singles were produced very inexpensively," says Lawrence Livermore, president of Lookout Records in Berkeley, California. "We'd photocopy the artwork and stuff the records into the sleeves ourselves. We saved a lot of money. But now, many of our acts are doing very well. When you're pressing tens of thousands of singles, you can't do everything by hand. We have to give the jobs to commercial printers, which brings up the costs considerably. It has been difficult for us to get a release costing under a dollar per unit."

For the independent artist who produces his or her own record, keeping a budget under control is critical. If you can't afford the production costs, your project will self-destruct. Cutting recording costs is the first step to producing an affordable

THE KIDS ARE ALRIGHT

Last year, I did something really fun and really dumb. I released a 7-inch single. Back in 1976, I slunk around San Francisco's punk community, playing music too loud, looking too silly, and recording and collecting 45s faster than executives trade business cards.

I thought those days were gone, but the recent resurgence of the 45 in local alternative music circles pushed all my nostalgia buttons. I longed to join the kids and get into the (vinyl) groove again.

So I recruited some of **EM**'s extended musical family—ex-art director Andrew Faulkner (guitar), ex-circulation consultant Ira Epstein (bass), and long-time contributor Larry the O (drums). We wrote two silly new wave songs, thought up a ridiculous band name, and dragged everyone into the studio.

There was no rehearsal. In true punk fashion, we learned, recorded, and mixed the songs in one 6-hour session. The tracks, recorded on a single Alesis ADAT, were mixed to DAT and shipped off to Rainbo Records in Santa Monica, California, for pressing.

In less than a month, we had 500 electric blue vinyl 45s. The cover sleeve, designed by Faulkner, was cooler than the music, but I didn't care. I was a singles artist again! Here's what it cost to relive my past:

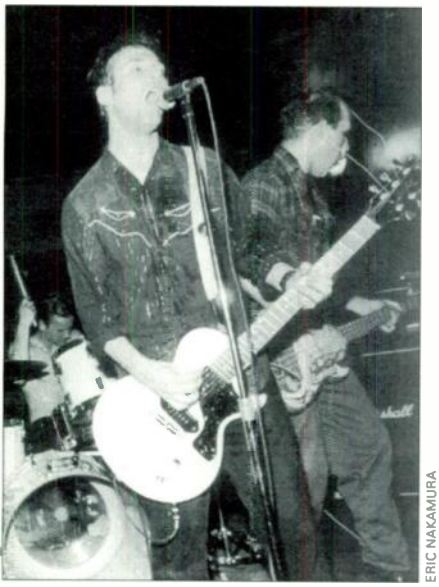
Tape Costs: $40
Recording Time: 6 hours (free)
Shipping Costs: $40
Cover Art Printing: $400
Pressing: $669
Plastic Sleeve Covers: $50
Total Production Cost: $1,199

The real gas was that Ascot Jacket's whimsical release received airplay on 52 college radio stations, which led to real gigs, actual rehearsals, and commitments from the musicians to become a real band. Now I'm stuck with these guys. (Actually, Faulkner bailed out and was replaced by local guitar goddess Randi Joy.) Ascot Jacket is currently recording a full-blown CD, and I still can't believe all this ruckus was caused by a tiny 7-inch single.

—Michael Molenda

Ex-EM art director Andrew Faulkner's spiffy cover design for Ascot Jacket's premiere single.

World Radio History



ERIC NAKAMURA

The "Gun Crazy" single by the Mr. T Experience (Lookout Records) had a limited run of 2,000 copies and immediately went out of print. Although the three songs on the single also appeared on the band's follow-up CD release, fans and collectors prize the 45 version.

release. Unfortunately, it's difficult for most alternative acts to record tracks (for free) in a member's home studio, because the music is typified by loud guitars and drums.

If you must shoulder the cost of commercial recording rates, be sure to rehearse until every beat and note is etched into your brain cells. The studio clock doesn't stop ticking while you forget arrangements and make mistakes. It's great to leave a little room for on-the-spot creative inspiration, but scripting out your session like a military maneuver definitely reduces studio stress.

At the mixdown session, it's a good idea to mix your tape a little brighter than you would for a CD release. This overall tonal tweak compensates for any slight mid- and high-frequency losses that may occur when your production is stamped into vinyl. Professional opinions vary on whether bright mixes are necessary to optimize the sound of vinyl records, but it seldom hurts to punch up your stereo master. After all, you're making a blistering rock 'n' roll record, right?

Mastering for vinyl duplication is easy. If you're preparing an analog master tape, record approximately 30 seconds each of 100 Hz, 1 kHz, and 10 kHz tones at 0 VU. Edit a liberal amount of paper leader tape between

Ace Music CENTER

Serving Musicians Since 1952

■ Miami ■ Ft. Lauderdale
■ Orlando ■ Drum City ■ West Palm

1-800-446-4ACE

Toll Free Sales and Support

No Grief

30 Day Money Back Guarantee

Free UPS Delivery

No Sales Tax
Except in FL

- Keyboards
- Recording
- Software
- PA
- Lighting
- Guitars
- Amps
- Basses
- Band Instruments

VISA, MasterCard, Amer. Exp., Diners Club, Carte Blanche, Discover.

FASTER THAN A SPEEDING BULLET

That's right, we're the quickest in the business. We will have your cassette order done in 3 weeks, no hassles, no excuses.

QCA

At QCA all orders are rush orders. We don't charge extra and we don't require you order some stripped down overpriced "Express" package. When you need your product quick and you want it right the first time, call QCA.

1-800-859-8401

QCA Inc. • 2832 Spring Grove Ave. Cincinnati Ohio 45225 • (513) 681-8400 Fax (513) 681-3777
Manufacturers of Quality CD's, Cassettes & Records for over 40 Years

World Radio History

ANNOUNCING THE NEW

Mix Reference Disc™

The editors of *Mix*, the world's leading pro audio magazine, proudly present the **Mix Reference Disc**. This collection of test tones on compact disc is invaluable for a wide variety of applications in recording, studio maintenance and audio post-production. It features alignment tones, 1/3-octave bands, frequency sweeps, a digital black noise check, frequency response tests, dry instrumental performances, SMPTE time code, a phase test, and tuning notes. The **Mix Reference Disc** replaces expensive analog alignment tapes and unwieldy tone generators—at a far lower price than competing test-tone CDs.

Use this CD for:

- Tape Deck Alignment
- Audio Equipment Calibration
- Testing Sound System Performance
- Troubleshooting & Diagnostics

SPECIAL HALF-PRICE OFFER!

Regularly $29.95, now only $14.95

plus $4.00 shipping & handling; specify item "MRD."
CA, CT, NY, PA and TX residents please add state sales tax; Canadian residents include 7% GST.

ORDER NOW!

Call toll-free (U.S. and Canada): (800) 233-9604

International (510) 653-3307; 24-hour fax (510) 653-5142 (credit card orders only)

or write: Mix Bookshelf; 6400 Hollis Street, Suite 10; Emeryville, CA 94608

We accept Visa, MasterCard, American Express, Discover Card, personal check or money order. Sorry, no CODs.

Hyperprism™ 1.5

REAL TIME SOUND EFFECTS PROCESSING SOFTWARE

For Macintosh® with Audiomedia™ I or II, Sound Tools™ I or II, or Pro Tools™

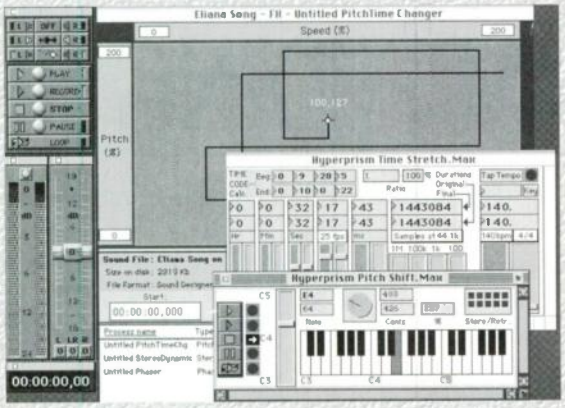
"Hyperprism immediately proved itself to be musically useful..." (Peter Freeman, Electronic Musician)

"Hyperprism is the doorway to a world of musical effects..." (Paul White, Sound On Sound)

"A very unique and clever program." (Nick Batzdorf, Home & Studio Recording)

"Hyperprism is the perfect partner for the creative sound designer, composer or musician." (Mike Collins, Audiomedia)

Hyperprism users include: Thomas Dolby, Electronic Arts, Weddington Productions (The Flintstones, Speed), KISS 108 FM Boston, Berklee College of Music...



- PROFESSIONAL QUALITY PROCESSES INCLUDE ON-THE-FLY TIME STRETCHING & PITCH SHIFTING, FILTERS, FLANGING, CHORUS, DELAYS, RING MODULATION, FREQUENCY SHIFTING, PITCH AND ENVELOPE FOLLOWERS, DOPPLER, VIBRATO, TREMOLO, SPATIALIZERS AND MORE...
- PROCESSES AND COMMANDS NOW CONTROLLABLE WITH MIDI DEVICES, SEQUENCERS, AND STAND-ALONE MAX™ INTERFACES
- MULTIPASS, NON-DESTRUCTIVE PROCESSING • FILE AND LIVE MODE

Arboretum SYSTEMS
P.O. Box 470580
San Francisco, CA 94147
Fax (415) 931-7725

CALL YOUR LOCAL DEALER FOR A DEMO OR (415) 931-7720 FOR MORE INFO

Hyperprism is a trademark of Arboretum Systems. All other trademarks are the property of their respective owners.

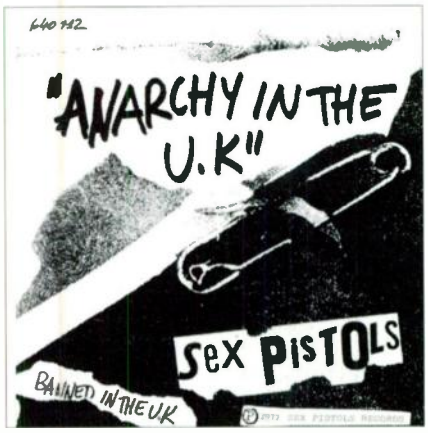
the tones and side one and side two, and store the master reel tails out. DAT masters only require a 1 kHz tone recorded at 0 VU. Record at least one minute of silence between the tone and side one and side two. Be sure to log the program data in absolute time on the DAT sleeve (1 kHz tone 0:00-0:45; silence 0:46-1:59; side one, "song A" 2:00-4:07; and so on). Finally, never let a valuable master tape out of your hands until you have made a safety copy. If you ship your only master to a pressing plant, it will get lost. Believe it!

MOVING UP THE CHARTS

Once you've pressed your single, there are several ways to get your 45 to the fans. First and foremost is the old standby of getting out and performing live. In the alternative scene, club gigs, warehouse concerts, impromptu rehearsal space shows, and performances at parties are critical to developing an audience.

"On a local or grass-roots level, nothing beats playing live and selling your 45 at the show," maintains Joseph. "If people see your band and they like you, they can buy a record right then and there."

Selling your single at gigs is also a way to get creative feedback. "At shows we find out if our singles or albums are doing well by word-of-mouth," says Dr. Frank. "We ask people what their opinions are. If you are active in the local scene, eventually you'll hear what people think about your stuff."



The Sex Pistols kicked punk rock into the mainstream in the mid-1970s. Their outrageous behavior and facile publicity machine gained them oceans of ink in daily newpapers (and even *Time* and *Newsweek*). Here's the single that started the carnival of publicity and myth-making.

World Radio History

The Boss Martians signed an album contract with Dionysus Records after owner/producer Lee Joseph came across their self-produced single in a San Francisco record store.

Another way to get heard is to send your single to college radio stations. However, it's seldom productive to ship records out unless you're aware of the station's format and audience.

"I don't see the worth of making sure every little 10-watt station has your record," says Orr. "Massive mailings don't ensure that large numbers of people will be hearing your single. To get significant radio airplay, you have to make sure your 45 is received by stations that understand and support your type of music."

In addition, the small and exclusive record collector's market can provide acts with a substantial promotional boost. Limited runs, special editions, and colored vinyl are often extremely desirable for people worshipping the *scarcity factor*.

"If you only put out 500 copies of a single, it usually sells out fast, " says Dr. Frank. "If there's a buzz, more people will want to get their hands on it, because it's already a rare thing. The interest generated by a limited edition can help push you forward to more sales on your next release."

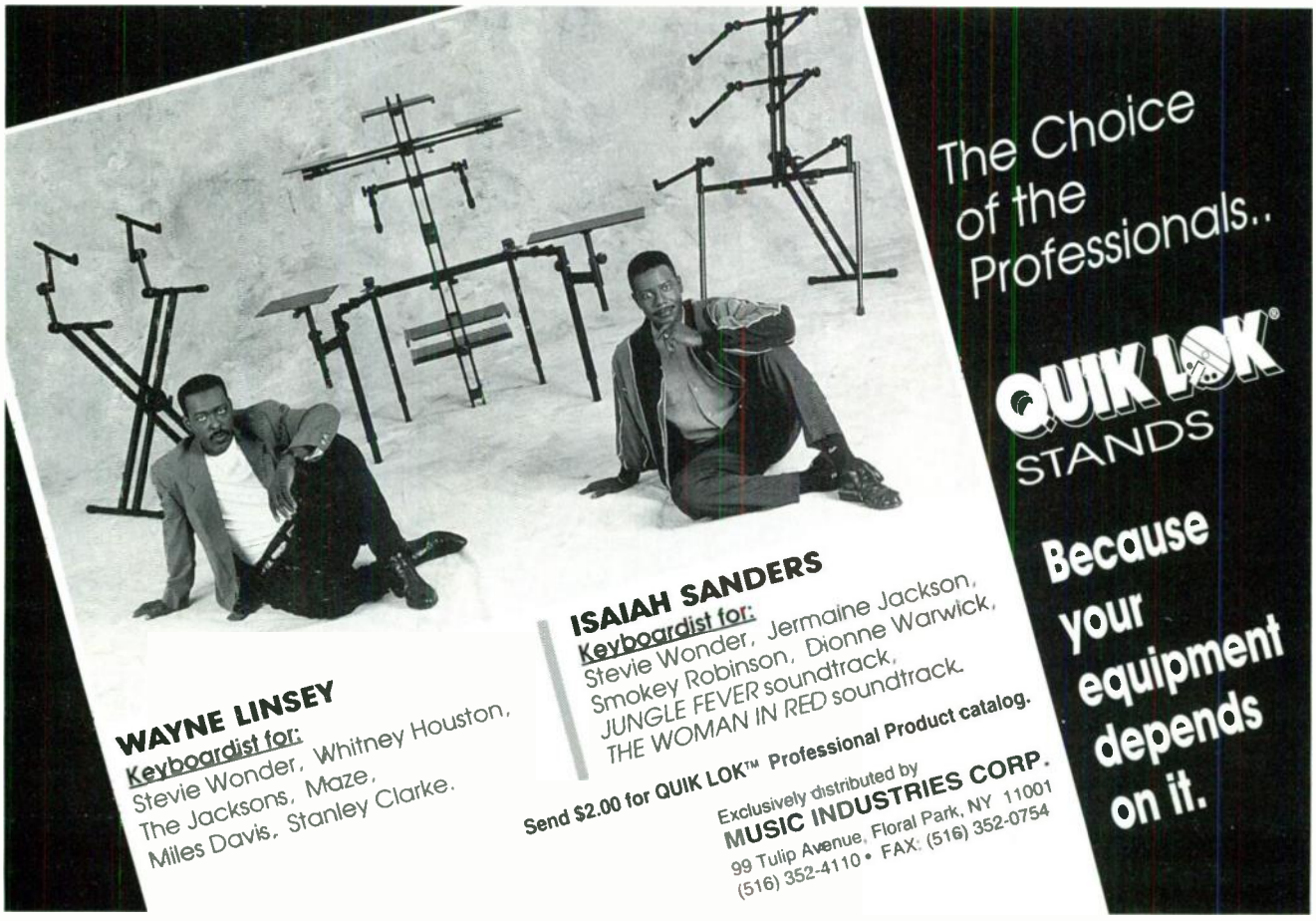
IT'S A HIT!

The 45 still attracts notice from the music industry. "Everyone from *Rolling Stone* record reviewers to major-label scouts come to Rhino looking to discover the next big thing," says Hechter. "They scour the 45 bins and try to find talented acts before anyone else."

Whether a single is broadcast on college radio stations, reviewed in underground fanzines, or played during teenager slumber parties, it remains a great way for a band to promote its latest sound. If your goal is world domination, a 45 may not be the best vehicle, but it *is* the coolest, most cost-effective, and identifiable music marketing tool around.

But promotional opportunities aside, many bands put out 45s just because they collect records and love music. "Doing a single is good because it doesn't really matter how many you sell," says Dr. Frank. "The main thing is to give something fun to people who like you."

Diane Lowery *is editorial assistant of* Electronic Musician *magazine.*



World Radio History

SERVICE CLINIC

Questions and Answers

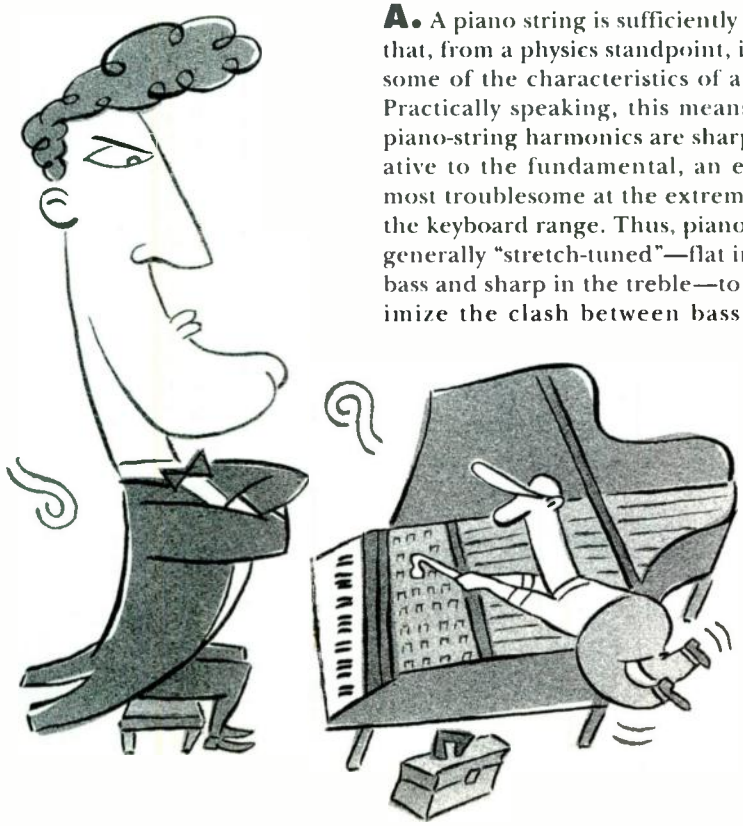
The Professor lectures on piano tuning and technical education.

By Alan Gary Campbell

Q. A friend of mine who plays acoustic and electro-acoustic keyboards a lot says that you can tune them—even pianos—with a strobe tuner. I've tried this, and either I didn't know the trick, or it just doesn't work. Is there a way to tune a difficult, older instrument, such as a Yamaha CP-70, with a strobe?

A. A piano string is sufficiently rigid that, from a physics standpoint, it has some of the characteristics of a rod. Practically speaking, this means the piano-string harmonics are sharp relative to the fundamental, an effect most troublesome at the extremes of the keyboard range. Thus, pianos are generally "stretch-tuned"—flat in the bass and sharp in the treble—to minimize the clash between bass harmonics and midrange fundamentals and midrange harmonics and treble fundamentals. This is a gross oversimplification, but it illustrates the complexity of the problem.

A strobe tuner can be useful in piano tuning if you allow for the "stretch" offsets. Moreover, newer, digitally controlled tuning devices such as the Sanderson Accu-Tuner (Inventronics, Inc., 9 Acton Rd., Chelmsford, MA 01824; tel. [800] FAST-440) allow stretch tunings to be programmed with great accuracy (see **Fig. 1**). Such devices are as far removed from the strobe tuner as a keyboard workstation is from a Minimoog.



JACK DESROCHER

Q. I'm pursuing a two-year associate's degree in a community college electronics-technology program. I want to get a job as a service technician and eventually work for an established artist or manufacturer. Will an associate's degree be enough? The local tech claims you don't even need a degree, and the store has already given me a lot of bench work.

A. Over the years, I have been privileged to befriend many of the best techs in the industry, and I have discovered that their backgrounds are as disparate as are their genotypes. Some have almost no formal education, while some have Ph.D's, often in fields seemingly unrelated to music or electronics (psychology, for example).

World Radio History

PG Music announces... **PowerTracks Pro™** **...at the incredible price of $29**

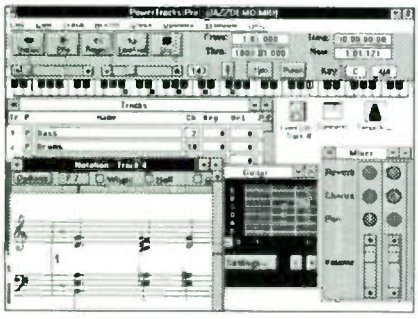
SEQUENCER/NOTATION/PRINTING FOR WINDOWS (IBM)

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

NEW! Music Printout

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

NEW PowerTracks Pro 2.2 for Windows



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 2.2 FOR ONLY $10

For starters... PowerTracks has all the Pro features found in sequencers costing hundreds of $$ more.

Pro Recording, Playback, Synch, Edit & Sys-Ex Options: *48 tracks, real/step/punch record, sound on sound, MIDI File support, sync (SMPTE, Midi Time Code, MIDI) edit (quantize/ cut/ copy/ paste/ undo/ data filters/transpose), multi port support, 480 ppq timebase, sys ex editor 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 lead sheets! You can also print the piano roll window for even more detailed analysis of a track!*

Deluxe Windows Interface: *Multiple Windows – Staff Roll, Event List, Tracks, Bars, Meter, Tempo, Piano keyboard, Guitar fretboard.*

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

✔ *Enter/ print out Chord symbols in Notation* ✔ *Automatic Drum tracks (100 drum styles included)* ✔ *Reads in Chord Symbols from Band-in-a-Box 6.0 MIDI files* ✔ *Patch caching for Gravis UltraSound* ✔ *Comprehensive support for Guitar (on-screen guitar, tab printout)* ✔ *Built-in Roland Sound Canvas Editor* ✔ *On-screen piano and guitar show notes as they're played* ✔ *Pro MIDI files included.*

Our customers love PowerTracks!! Here are some actual comments from customers...
"Killer software" "Unbelievable" "Intuitive and powerful" "Best MIDI program on the market" "I love the notation" "Incredible features & easy to use" "Other packages just don't compare" "Totally unbelievable – I love it!"

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

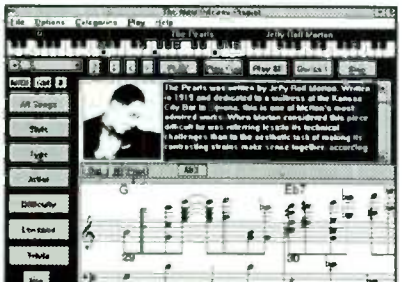
For your PC Soundcard or MIDI system
All for the amazing price of... **$29**
+ $5 S/H Shipping & Handling per order ($10 outside USA/Canada)
30 DAY Unconditional MBG

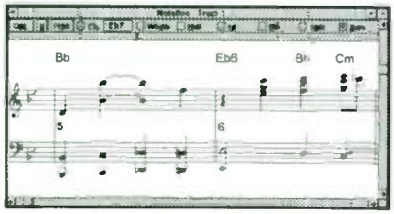
From PG Music... *The makers of The Jazz Guitarist, Band-in-a-Box, The Pianist, The Jazz Pianist*
☎ *Phone orders:* ***1-800-268-6272*** *or* ***(905) 528-2368*** *VISA/MC/AMEX/cheque/mo/po# Fax (905) 628-2541*
e-mail address – Internet: 75300.2750@Compuserve.Com
PG Music Inc. *266 Elmwood Avenue Suite 111 Buffalo NY 14222*

PG Music announces... An Exciting New Music program for Windows, Macintosh & Atari!

The New Orleans Pianist™

This software makes it "too easy" to be a great New Orleans pianist!





UNCONDITIONAL 30 DAY MONEY BACK GUARANTEE

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

INCLUDES: music trivia questions, "Guess the Song" game, program notes, pianist biographies (all on disk) & much more!

LEARN HOW TO PLAY THE MUSIC: *An on-screen piano keyboard shows you exactly what the pianist is playing. Slow down the piece, or step through it chord by chord. Learn the music "note-for-note" by watching the notes on screen. Load the MIDI files into your favorite programs for future study!*

PROFESSIONAL PERFORMANCES & CD-QUALITY: *All pieces are complete performances professionally performed, recorded & saved as Standard MIDI files. All the pieces have been recorded in "real time" by top pianists on an 88 note weighted keyboard. They are never quantized or step recorded. You'll hear the music playing with CD quality through your sound card or MIDI system, just as if the pianist was in your home.*

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

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

BACKGROUND PLAYBACK: *Listen to the music while you work in other programs. The built-in Juke Box plays the music one song after another. Use the program for great background music, music for presentations, telephone on-hold, etc.*

SPECIAL SUPPORT FOR SOUNDCARDS & MIDI SYSTEMS: *Includes a built-in mixer to change instruments, channels, transposition, volumes, panning, tuning or other MIDI information.*

TRIVIA & GUESS THE SONG GAMES: *Have some fun while you learn about New Orleans piano music. Test your knowledge with the Music Trivia Game (over 200 questions about the music, famous New Orleans performers & composers). In the "Guess The Song" game, the program plays songs at random for you to guess. Read memos about the pieces, or composer biographies as you listen.*

For your PC Soundcard or MIDI system

All for the amazing price of... **$49** *+ $5 S/H $10 outside USA/Canada*

From PG Music
☎ *Phone orders:* ***1-800-268-6272*** *or* ***(905) 528-2368***
VISA/MC/AMEX/cheque/mo/po# Fax (905) 628-2541
e-mail address – Internet: 75300.2750@Compuserve.Com
PG Music Inc. *266 Elmwood Avenue Suite 111 Buffalo NY 14222*

REQUIREMENTS: ***MACINTOSH*** *2mb memory, system 6 or 7, MIDI interface + synthesizer/ module with guitar, bass, drums sound, 2mb hard drive space required.* ***WINDOWS (IBM)*** *2mb RAM memory, Windows 3.1, SoundCard (Roland, SoundBlaster, etc.) or MIDI system with guitar, bass, drums sound, 3.5" or 5.25" high density floppy disk, 2mb hard drive space required.* ***ATARI*** *104GST/TT/Falcon with floppy disk drive, mono or color.*

World Radio History

Get Your Music To The Right People.

The fact is, you won't get a deal if you can't get your tape solicited by a major label or publisher. We work with over fifty of them. Film & TV music supervisors too. You're curious but suspicious. So were hundreds of other songwriters, artists, and bands who have become members. Now their tapes get to Atlantic, CBS/Sony, Elektra, Epic, Geffen, Island, MCA, Mercury, Motown, RCA, SBK and many more. Sounds too good to be true... until you find out how we do it. Then you'll wonder why nobody's ever done it before.

TAXI

The Independent A&R Vehicle

Call now, before you get distracted.

1-800-458-2111

Sponsored by

MUSICIAN

Nonetheless, the tech who doesn't have a basic understanding of such niceties as differential and integral calculus, applied physics, basic inorganic and organic chemistry, engineering materials, computer programming, musical acoustics, and music theory and performance—not to mention electronics theory and troubleshooting techniques—is at a considerable disadvantage.

An associate's degree in electronic technology can provide good preparation for a career as a service tech. A typical program with emphasis on microprocessor technology might leave some ground uncovered—there may be gaps regarding analog circuitry, for example, that would make a first encounter with an active-filter network mystifying—but this terrain can be traversed.

A B.S. in electronics technology can open many more doors and is particularly desirable for those who aspire to move up to higher-level technical positions in manufacturing. (An MBA doesn't hurt, either.) The electronics technology degree is more applications-oriented than a traditional electronics engineering degree.

As important as a degree is, bench experience really stands out on a résumé. Keep a log of repairs performed, with brief notes regarding the type of equipment and nature of the service, as well as the troubleshooting techniques brought to bear. Log any clever fixes or "tough dogs." Gear you've built from kits or from scratch should also be bragged about, especially if it works!

Naturally, even the best course can't cover more than a portion of what you'll need to know in an interdisciplinary field such as music technology. Continuous self-education is a must.

FIG. 1: Sanderson's digitally controlled Accu-Tuner allows extremely accurate custom tuning.

Q. My Peavey DPM 3 sometimes "locks up" and has to be reset from the front panel. This only happens on the gig, not at home. I have operating system version 1.1, and the local tech says I need version 2, at least. Will an upgrade solve the problem?

A. Although it is possible your instrument has an intermittent hardware fault, the fact that the problem occurs only on the gig strongly suggests that AC line transients at the site are the cause of the memory scrambling. A simple surge suppressor (the cube-tap type) might prevent this, but stubborn transients sometimes require an AC line filter or line regulator to clean things up.

I know of no specific version 1.1 problems of the type you relate. However, Peavey recommends upgrading older operating systems as a matter of course. Version 1.3 (the final revision of the version 1 series) is available through authorized service centers for $49.99 (plus installation). But for the same price, you could just as easily get version 3.2, which would upgrade your synth to a DPM 3SE Plus, without the added memory.

You could even upgrade the memory board to provide full DPM 3SE Plus, or even DPM 4, capability. Complete kits that include the new memory board, updated operating-system ROMs, and new system disks are available for $299.99 and $349.99, respectively. These upgrades must be installed by an authorized service center.

Users with questions regarding DPM service problems or authorized service-center locations can call Peavey's Customer Service department for keyboard products; tel. (601) 483-5365.

Q. Recently, I plugged an audio cable into one of the Mix outs on my Kurzweil K2000R when the module was already on, and I heard a distinct *bwaap!* Soon after, the output became noisy. The technician said I had damaged the FET that mutes the output during power-up, by exposing it to static electricity or to an excessive ground potential. He replaced the FET and advised me to install a daughterboard with diodes to protect the output-muting FETs. If these diodes protect the FETs, they must be in parallel with

World Radio History

the outputs and will surely affect the sound. Is this modification advisable?

A. The FET Protection Board adds, at each output, a pair of reverse-parallel 1N4001 diodes, which are tied to the positive and negative supplies. A similar board is available for the K2000 keyboard synth. This is a well-designed fix. Any distortion produced by the diodes would be virtually undetectable, even with the most sensitive test gear, and will be swamped by the output signal. According to Kurzweil, field surveys have revealed no problems, even in critical applications.

Certainly a zener diode does not provide a perfect open circuit (infinite resistance and zero capacitance) when it is idling. A tiny amount of added distortion may be assumed to be present with the modification in place. Nonetheless, the signal levels at the outputs are high enough that any minute distortion products will be "swamped" and rendered inaudible.

▼

Any distortion produced by Kurzweil's FET Protection Board is virtually undetectable.

The modification is highly recommended, but somewhat involved. Though no drilling or trace-cutting is required, numerous wires from the FET Protection Board must be carefully tack-soldered to the output jacks. This is an authorized-service-center-only job. The update is available at no charge for in-warranty instruments; boards are available for a nominal charge (under $20) for installation in out-of-warranty units, with the installation charge to be determined by the service center. Current K2000 models include the board.

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

WEST L.A. MUSIC
GUARANTEED LOWEST PRICES!

Every Major Brand
Digital Multi-track Recording • Analog Recording
Hard Disc Recording • Mixing Consoles
Power Amps • Microphones • Speakers • Computers
Software • Keyboards • Guitars • Amps • Drums
"Where The Pros Shop"

Frank Zappa
with Don Griffin - West L.A. Music

George Harrison
with Derek Synder - Guitar Dept.

Mel Torme
with Mark Spiwak - Pro Audio Mgr.

We Will Beat Any Deal! Call Now!
All Credit Cards Accepted. Financing and Leasing Available. We Ship *Everywhere.*

WEST L.A. MUSIC
11345 Santa Monica Blvd.
Los Angeles, California 90025
(310) 477-1945 Fax: (310) 477-2476

WOW! WAY OVER
1000
SUPER COOL
DRUM
PATTERNS
For the awesome low price of
$49.95

VERSIONS FOR: IBM PC, Macintosh, Atari ST

WORKS WITH: Cakewalk, Cadenza, Performer, Vision, Drummer, Master Tracks, Cubase, Power Chords Pro, Musicator, Trax, Notator, EZ Vision, Musicshop, and all other programs that read MIDI files.

DOZENS OF STYLES: Includes patterns from the simple to the sublime.

HIGHEST QUALITY CONSTRUCTION: Composed by a drummer with a Ph.D. in composition. Honest! No, really!

DEVELOPED BY: COOL SHOES SOFTWARE
The leader in computer drumming software.

P.O. Box 2359
Kernersville, NC 27285
Phone: 910-722-0830
Fax: 910-724-4412

COOL SHOES SOFTWARE

World Radio History

Reviews

124 • Alaska Software DigiTrax (Mac)
130 • Novation Bass Station
133 • Turtle Beach MultiSound Monterey
138 • ADA MP-2 MIDI Tube Guitar Preamp
140 • Kawai KC20 Synthesizer
144 • Aphex 105 Gate/106 Compressor
147 • Tech 21 SansAmp PSA-1
149 • Altech GMS (Mac)

Alaska Software DigiTrax 1.0 (Mac)

By Jeff Burger

Six-track hard-disk recording for the Mac AV.

Alaska Software's *DigiTrax* is one of the new breed of multitrack digital-audio recording programs that relies on the digital signal processing power in the Macintosh Quadra 660AV and 840AV. The software also runs on any NuBus-equipped Mac with a DSP card that is compatible with the Apple Real Time Architecture (ARTA) technology, such as Spectral Innovations' NuMedia (see sidebar). Unfortunately, *DigiTrax* does not support Digidesign audio cards, such as Audiomedia.

FIG. 1: Alaska Software's *DigiTrax* includes a Mixer window that emulates a traditional analog mixing board, with input channels, a meter bridge, and master input and output faders. The program provides simple hard-disk recording for the Mac AV and other ARTA-compatible Macs, with few frills.

DigiTrax provides six simultaneous tracks of 16-bit digital audio at sampling rates up to 48 kHz. This architecture works in conjunction with the AV Mac's 2-channel I/O; thus, recording is limited to one or two tracks at a time, and the output is a stereo mix. All editing, mixing, bouncing, and EQ is done in the digital domain. Although it's not quite the same as third-party hardware/software packages that cost $1,000 and up, this software-only solution brings impressive 6-track digital recording to Mac owners for a song.

A few system caveats: You'll want a large, fast hard disk that has minimal thermal recalibration time. All drives periodically pause for thermal recalibration, and you want one that pauses the least. Unfortunately, this is not a widely published spec, except by manufacturers who have something to be proud of. Alaska Software claims the drives that ship in all AV Macs are kosher.

The company also warns you to disable file-sharing, dismount servers, defragment your hard drive, and turn off virtual memory, speech recognition, Express Modem software, and any unnecessary system extensions. These are reasonable and common requests, considering what the system is being asked to do.

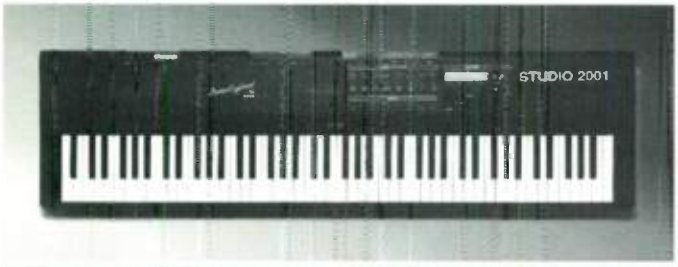
THE BASICS

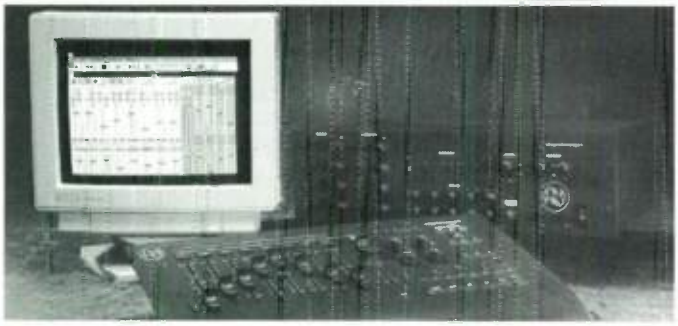
Any musician who has worked with mixers and recorders will immediately feel at home with *DigiTrax*' user interface. The Mixer window (see **Fig. 1**) consists of six tracks configured as typical mixer channels, a 6-track meter bridge, master left/right input faders and meters for the AV's audio inputs, and left/right faders and meters for the AV's audio outs. The other windows include traditional transport controls, waveform displays along a timeline, and EQ settings.

Recording basic tracks is a snap: Record enable the desired tracks to receive from the AV's left or right input, adjust the master input faders (which span a 22 dB range) according to the meter level and clip indicator in the Mixer window, then engage Record. I had no problem successfully recording six tracks, and I was able to pan and adjust mix levels without referring to the documentation. Each channel includes a switch to select between recording from the left, right, or both input channels; Play; and Mute, complete with multicolor status light. (A solo button would be appreciated, though.) Stereo pan and level faders are supplemented by displays for dB and left/right ratio, respectively. Adjacent faders can also be ganged for common manipulation.

World Radio History

AMERICA'S FASTEST GROWING MUSIC RETAILER*





*Source: Music Trades (8/93), Inc. Magazine (10/93), Music Inc. (5/94)

There's a simple reason for Sweetwater Sound's success. Not only do we have the equipment you want in stock at affordable prices, but we also offer outstanding value: one-on-one customer service and quality after-the-sale support other dealers can only dream about.

Our sales engineers all have real-world MIDI and recording studio experience, so they can direct you to the perfect product for your particular needs.

But don't just take our word for it. Give us one try and we're willing to bet Sweetwater Sound will be your first choice for audio, MIDI and recording equipment for a lifetime!

OVER 80 OF THE BEST NAMES IN THE BUSINESS

Korg • Roland • Opcode • Mark of the Unicorn • Alesis • Sony
Digidesign • AKG • Kurzweil • Marantz • Mackie • Ramsa • DBX
Tascam • KRK • Panasonic • Neumann • Fostex • E-mu Systems
Digitech • Summit • Sennheiser • Lexicon • JBL • Fatar • Furman
Tannoy • Crown • BBE • KAT • Carver • Passport • Rane • Shure
Coda • TOA • JLCooper • Dynatek • TAC/Amek • Soundcraft
3M, Ampex & Denon Tape • Macintosh & IBM Software & MIDI Interfaces

OTHER MAJOR BRANDS TOO! HUGE IN-STORE INVENTORY!

OUR EXCLUSIVE GUARANTEE:
"If you don't like it, we'll take it back — with no hassles!"

Sweetwater SOUND INC.®

VISA MasterCard Cards DISCOVER TECHNOLOGY CARD

5335 BASS RD. • FT. WAYNE, IN 46808 **(219) 432-8176** FAX (219) 432-1758

World Radio History

SPECTRAL INNOVATIONS NUMEDIA CARD

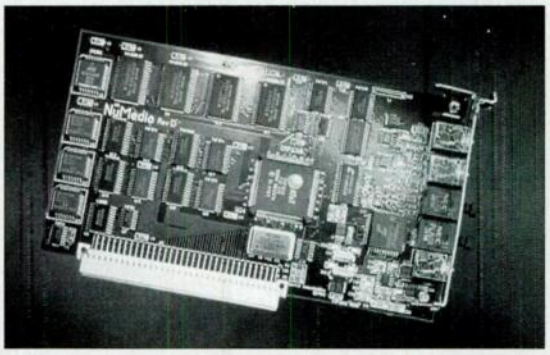
The DSP capabilities of the Quadra 660AV and 840AV are specifically designed to handle digital signal-processing functions that can become processor bottlenecks even on accelerated 68040 machines. Fortunately, you can add this AV-series DSP capability to any Mac II series or Quadra by installing the NuMedia NuBus card from Spectral Innovations ($695).

The NuMedia card utilizes the same 16-bit, AT&T 3210 DSP chip as the Mac AVs. The sonic quality of the analog audio I/O is comparable, with an 80 dB signal-to-noise ratio. A stereo microphone input is provided, primarily for multimedia voice-overs.

Spectral Innovations uses ⅛-inch, stereo minijack connectors and breakout cables for RCA connectors, which some people consider relatively low on the food chain. However, the NuMedia card ups the ante by including digital I/O, although Spectral's choice of fiber-optic connections over more standard formats is questionable.

The card uses Apple's *Sound Manager* 3.0 and is compatible with *QuickTime* 1.6.1, making it easy to integrate with any application. NuMedia's support of ARTA (Apple Real Time Architecture) means the circuitry enhances all DSP operations, including speech recognition. More important for multimedia producers or musicians with a graphics bent, the card also supports the Adobe Charged series of *Photoshop* filters, which significantly accelerate operations such as Rotate, Resize, Gaussian Blur, Sharpen Edges, Unsharp Mask, and more. Other graphics and multimedia products such as *Fractal Painter X2* and *VideoFusion* 1.5 are also beginning to take advantage of DSP to accelerate other intensive functions.

The analog I/O quality of the NuMedia card (and the AV machines) is pretty decent and comparable to other sound cards in its price range. You'll find poorer signal-to-noise ratio, more distortion, and less channel separation than in Digidesign's higher-end systems, along with the restriction of only two simultaneous ins and outs. Many people won't be able to distinguish the difference unless they are auditioned side by side, though. Using the card's digital I/O obviates most differences in audio quality. (Spectral Innovations also offers the NuMedia^2 card without digital I/O for $495.) When you buy either card, you also get Opcode *Audioshop* 2.0 and a Killer Track CD with over 50 minutes of royalty-free music.



The Spectral Innovations NuMedia card provides ARTA-compatible digital audio thanks to an AT&T 3210 DSP chip.

NuMedia installation and operation proved trouble-free in conjunction with *DigiTrax*. Considering the price of trading in an existing Mac for an AV machine—not to mention digital I/O—Spectral Innovations' solutions is both practical and attractive.

Overall rating: 4.5. Spectral Innovations; 1885 Lundy Ave., Suite 208, San Jose, CA 95131; tel. (408) 955-0366; fax (408) 955-0370.

Each recording pass produces namable Phrases that reside in the affected tracks and take the form of individual AIFF files on the hard disk. (*DigiTrax* does not support the *Sound Designer II* file format.) Phrases are also displayed as waveforms in the Timeline window. Tracks can be constructed from a series of Phrases, and Phrases can be selectively assigned to specific times in Tracks, which is handy for spotting sound effects, for example. Screen redraw can be tedious, so I found myself keeping the Timeline window closed when trying repeatedly to get a perfect take.

The Transport window (see **Fig. 2**) supplements the SMPTE counter display and transport controls with a palette of twenty auto-locate buttons. Auto-locate points can be given names, which is a handy feature. You can also locate the transport by dragging a marker along the waveform display in the Timeline. Unfortunately, the converse is not true: The waveform display does not scroll to reflect the auto-locate points. Buttons for looping and punching passages are provided.

Key equivalents are provided for Record, Play, and Reset (to zero), but not Fast Forward or Rewind. User-definable equivalents would be great, however, because the preset ones differ from those I am used to in *Digital Performer*. It's also frustrating not to be able to type a location point directly into the counter.

Alaska needs to build more elegance into the process of recording or punching takes. Tracks pop out of Record mode after each take, and there's no provision for automatic return-to-zero or to a auto-location point. Redoing a blown take means invoking Undo, relocating the transport, rearming the desired track(s), engaging Record, and triggering Play. Tracks also pop out of punch-in mode after each take, so add that to the list during surgical retakes. Although the looping feature is handy for practice, trying to get the perfect take quickly becomes tedious given the aforementioned series of events.

The Transport window can also be expanded to reveal controls for an internal or external CD-ROM drive, which is a nice touch for acquiring audio from CDs. (You can import Red Book audio from CD-ROM, but you can't access data files.) The controls are functionally equivalent to those in Apple's *CD Remote* control panel.

EDITING

Editing is performed on the waveforms in the Timeline window (see **Fig. 3**), using one of three tools/modes. Phrase mode performs operations such as cut,

World Radio History

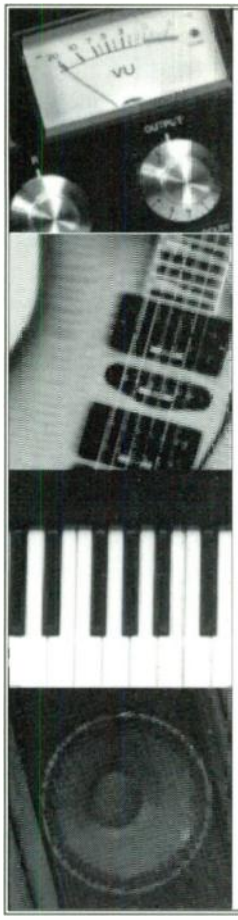
copy, paste, and clear on entire Phrases. You can also drag or "slip" Phrases along the timeline, even during playback. For example, this is handy when adjusting sound effects and other hits to video. Phrases automatically stop when they butt up against another Phrase if dragged within the same track. By dragging to a different track and then back to the original, *DigiTrax* allows Phrases to be overlaid in the same track. The keyboard arrow keys, in conjunction with modifier keys, can be used to nudge Phrases left or right in the timeline, at various resolutions. Window handles can also be used to "crop" Phrases, nondestructively removing unwanted portions of audio at the beginning and/or end of files.

Other Phrase-editing options include reversing for backward playback, inverting for smoothing edit points or reducing phase problems, and normalizing to maximize amplitude so that peaks are at 100% without clipping. The effective volume set by the Track's Mix fader level can also be applied to the AIFF file, as can the EQ settings. (More on EQ shortly.)

Selection mode lets you select and edit specific portions of one or more Phrases across one or more tracks. Although there are numeric readouts for start time, stop time, and length, you can't enter numbers directly into those fields. In addition, there is no way to directly translate the selection endpoints into begin and end times for loop and punch operations. At the very least, I'd like to see the ability to audition a selection for aural verification of the endpoints.

Selection editing is used for other cut/copy/paste operations, although selections can simply be dragged to new locations or option-dragged to create and position duplicates (good for effects such as stutters). No level, EQ, or other modifications can be made on selections, only on Phrases. Although you can copy selections to new Phrases, the ability to modify selections would be a welcome addition.

Level/fade mode provides simple, linear envelopes for creating fade-ins and fade-outs, as well as adjusting overall levels. You can select the points in time at which the fades start and end (i.e., the zero and maximum levels), but you can't draw custom curves, produce crossfades in a single track, or create fades by percentage. This stuff is



THE RIGHT EQUIPMENT.
THE RIGHT PRICE.
RIGHT AWAY.

1-800-966-9686

Call Century Music Systems today and talk with knowledgeable sales people about the musical equipment you need.

- Free Same-Day Shipping
- Leasing Available
- Major Brands
- Open Monday - Saturday, 10AM - 6PM CST
- Specializing in Keyboards, Digital Recorders, Multitrack, Software, and Signal Processing.

CENTURY MUSIC SYSTEMS

3515 Sunbelt Drive North, San Antonio, Texas 78218
FAX: 210/822-7453.
MC, VISA, AMEX & DISCOVER ACCEPTED

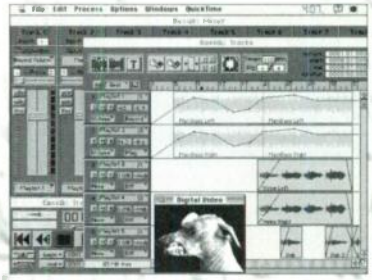
CONSUME THE MINIMUM • PRODUCE THE MAXIMUM

WITH LOW-PRICED, HIGH-POWERED SOFTWARE FROM OSC

TEC TECHNICAL EXCELLENCE & CREATIVITY 1994 NOMINEE

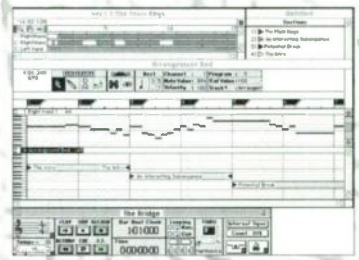
DECK II™ $399

DIGITAL AUDIO WORKSTATION SOFTWARE FOR MACINTOSH
DECK II OFFERS CD-QUALITY MULTITRACK HARD DISK RECORDING WITH TIMELINE-STYLE WAVEFORM EDITING, CONTINUOUS SYNC TO ALL SMPTE FORMATS, UNLIMITED VIRTUAL TRACKS AND DIGITAL MIXING, REAL-TIME MOVING FADER AUTOMATION, SYNCHRONOUS QUICKTIME MOVIE PLAYBACK DIRECT FROM DISK AND TANDEM OPERATION WITH METRO FOR INTEGRATED MIDI + DIGITAL AUDIO. FOUR TRACKS ON DIGIDESIGN SOUND TOOLS II/AUDIOMEDIA™, SIX TRACKS ON SPECTRAL INNOVATIONS NUMEDIA™ CARDS AND 660AV, EIGHT TRACKS ON PRO TOOLS™ & MACINTOSH 840 AV. 660/840AV - NO AUDIO CARD REQUIRED!



METRO™ $225

METRO IS OSC'S PROFESSIONAL MIDI SEQUENCER, WITH THE FEATURES YOU EXPECT FROM A HIGH-END SEQUENCING PACKAGE PLUS A SIMPLIFIED INTERFACE AND FULL BACKGROUND & FOREGROUND SYNCHRONIZATION WITH DECK II. METRO INCLUDES SUPPORT FOR GALAXY™, UNISYN™, OMS, MIDI MANAGER AND MIDI TIME PIECE™.



CALL OSC AT 1-800-343-DECK TO LEARN MORE.

World Radio History

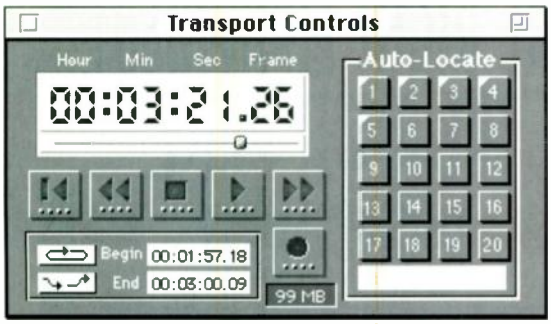


FIG. 2: The *DigiTrax* Transport window features twenty auto-locate points.

really straightforward. I'd welcome the ability to add additional envelope handles and specify Velocity curves, rather than living with only the traditional linear ramps.

Several features in the Timeline window facilitate the editing process. The Track status controls are duplicated, which is handy, because a large Timeline window can easily obscure the other windows on a small monitor. Buttons zoom the display magnification in and out; however, maximum resolution is still pretty coarse at approximately 1.5 screen-inches per second.

Holding down a modifier key while clicking in the timeline begins playback from that point at half speed, which facilitates scrubbing. This helps locate in and out points, but it's a far cry from the kind of scrubbing you get in something like Sound Tools II, where speed and direction are completely under mouse control.

PROCESSING

One of the benefits of DSP technology is real-time audio signal processing. Each track has its own equalizer, which can be manipulated as the audio is playing back. A common frequency-response display and control set are used in conjunction with track-selection switches. A low shelf, high shelf, or single-band parametric EQ can be selected for each track. The frequency-response curve and numeric readouts help visualize what's really happening, but again, there's no provision for direct numeric entry.

There is one EQ window (see **Fig. 4**); six buttons let you select which track's EQ is available for editing. You can't see more than one EQ curve at a time, so you can't do side-by-side visual comparisons of, for example, two similar tracks with different EQ, or the same EQ curve applied to stereo tracks. This limitation is exacerbated by the lack of an EQ copy or compare function. A copy function would be especially handy for applying identical EQ to similar tracks, such as multiple passes from the same vocalist. EQ continues to be applied in real time unless you apply it permanently to the AIFF files, which you need to do before bouncing tracks.

DigiTrax' ability to apply EQ within the computer is a powerful feature considering you can only get a stereo mix out of it. You'll probably want to apply other signal processing while recording tracks, so Alaska Software is promising chorus, flanging, and reverb this summer, followed by dynamics processing and other effects. So far, no third parties have written *DigiTrax* plug-ins, but the architecture is open, so this is a distinct possibility for the future.

One of the beauties of hard-disk recording is that you can bounce all six tracks to one or two new tracks. (For recordists used to analog tape, the absence of track planning and guard tracks in hard-disk recording is always a real kick!) Bounces are made with the current fader and pan levels (assuming a stereo bounce) for each original track, and track assignments are made via checkboxes in a dialog box.

For the final mix, simply attach your favorite 2-track recorder to the AV's audio outs. Alternatively, you can create an 8- or 16-bit master AIFF file, in either mono or stereo, from selected source tracks. This provides a hard-disk master and a handy tool for multimedia production.

A little caution is in order here, because the master faders are not active during AIFF mastering. Instead, you should preview by putting the faders at 0 dB and monitoring the levels to avert clipping; this reflects what will really go into the file. As with bouncing, EQ settings should also be applied before AIFF mastering.

SYNCHRONIZATION

DigiTrax is designed to work alone and in conjunction with other products

Talent • Desire • Knowledge • Equipment

We can't help you with the first two, but when it comes to knowledge and equipment, MacBEAT is the nation's leader. Throughout the electronic music industry, no other dealer matches our level of knowledge, customer satisfaction and product support for what we sell. Why not get it right the first time? Whether it's the latest mixer, mic, or computer software or hardware, call MacBEAT to deal with the best and to get the best deal.

MacBEAT™

Call us now for a Free Catalog!

1-800-MAC-BEAT

Sales, service, support: Digidesign, Apple, Tascam, AKG, Mackie, Ramsa, Panasonic, Opcode, Passport, Mark of the Unicorn, Kurzweil, JL Cooper, Korg,

Kawai, Roland, ART, Anatek, Prosonus, Coda, Rapco, E-mu, Lexicon, Steinberg Jones, beyerdynamics, Pacific Coast Technology & much much more...

Call the experts!

MacBEAT, Inc. 1314 Rufina Cr., Ste. #A4 Santa Fe NM 87501

1-800-622-2328 or 505-473-4929 505-473-4647 (FAX)

World Radio History

with its ability to send and receive MIDI Time Code (MTC). Most sequencer users will probably build MIDI tracks in their favorite application, then switch to *DigiTrax* and slave the sequencer. I used Apple's *MIDI Manager* to slave MOTU's *Digital Performer* to *DigiTrax* on the same machine. (*DigiTrax* needs at least 5 MB of application RAM, so you'll probably need more than 8 MB of RAM to run it concurrently with a professional sequencer.) Using a MOTU MIDI Time Piece, I was also successful in slaving *Performer* on one Mac to *DigiTrax* running on another Mac.

DigiTrax can slave to SMPTE with a SMPTE-to-MIDI converter. The program supports 24, 25, 29.97 drop-frame and 30 fps frame rates with SMPTE offset. It also offers preroll times to accommodate different hard-drive speeds. (The software's "transport" can start instantaneously in response to incoming time code. But a slow disk drive takes longer than a fast drive to find the desired start point in the audio file. To compensate for this, *DigiTrax* lets you set an amount of time, called *preroll time*, between the moment the first time code is received and the moment the program responds.)

Video from a video deck or similar source can be displayed in a quarter-,

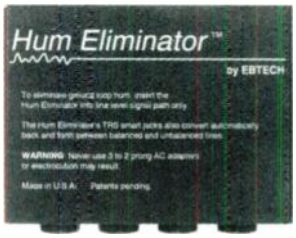
Product Summary

PRODUCT:
DigiTrax 1.0
PRICE:
$349
SYSTEM REQUIREMENTS:
Quadra 660AV or 840AV, or Mac II series with ARTA-compatible NuBus audio card; 8 MB RAM; System 7.1 or later; *QuickTime* 1.6.1 or later (for video features); large, fast hard drive; color monitor
MANUFACTURER:
Alaska Software
1197 Pomelo Ct.
Sunnyvale, CA 94087
tel. (408) 738-3320
fax (408) 524-9699

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

The Sound of Silence

Stereo pair version shown. Also available in 8 channel rack unit.



We've all heard it. That buzz, that noise, that AC hum pouring through audio equipment. It can really drive you crazy. Until now.

The Hum Eliminator™ from Ebtech breaks the groundloops that cause AC hum, quick and easy. Just plug it into the signal lines between offending pieces of equipment and you're done.

No hum. No signal degradation. No filtering. No noise gates. No dangerous ground lifts. No signal ground lifts. And for $69.95, no sticker shock.

So get the Hum Eliminator™ today, and silence AC hum forever.

EBTECH
the experts in great sound

For a dealer near you, call 619-679-6510, FAX: 619-679-2802.

RELEASE YOUR OWN CDs!

500 CDs plus 500 Cassettes $2,790

with two-color inserts and chrome tape

Ready in 3 Weeks!

Release your own major label quality CDs and cassettes affordably without sacrificing your artistic integrity or audio and graphic quality.

Our packages are complete and include insert design, film, and printing. No hidden costs! All you need to do is supply us with the master tape and photograph, and we'll do the rest.

"We just wanted to let you know how happy we are with the CD and cassette package! They definitely have a major label look and sound!"
– Michael Wagner,
INVISIBLE LISA,
Houghton Lake, MI

- ***Major Label Quality***
- ***Money Back Guarantee***

Call today for our FREE 1994 full color catalog:
1-800-468-9353

DISC MAKERS

1328 North Fourth Street • Philadelphia, PA 19122 • Outside USA (215) 232-4140 • FAX (215) 236-7763

World Radio History

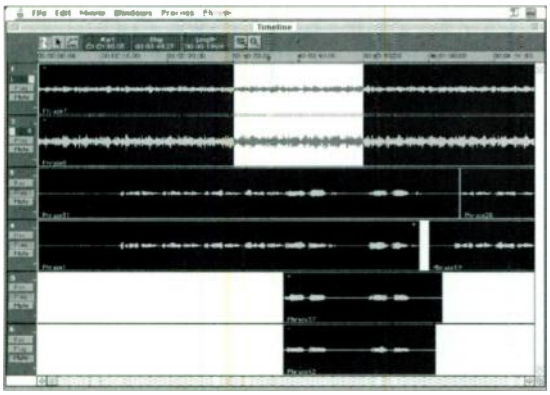


FIG. 3: In the Timeline window, waveforms are edited in tracks along a timeline. Here, a segment of Tracks 1 and 2 are selected for editing. You can cut, copy, paste, and clear entire Phrases, or work on parts of one or more Phrases across one or more tracks. Level/fade editing lets you apply extremely limited, linear envelopes.

half-, or full-screen window, which is useful when spotting or scoring to picture. This feature requires no additional hardware on an AV Macintosh, but other Macs need a third-party video-digitizing card.

DigiTrax can also be used to create soundtracks for *QuickTime* movies. Movies are displayed in a window and playback is synchronized to and controlled by *DigiTrax,* including scrubbing. You can either start from scratch, or import the movie's audio into one or two tracks in *DigiTrax.* Final mono or stereo tracks can be mixed into the movie at 8-bit or 16-bit resolution, with a choice of sampling rates. Clearly, *DigiTrax* offers powerful tools for serious multimedia producers.

CONCLUSIONS

For the most part, *DigiTrax* does what it promises. The documentation is acceptable, but not incredible. Many of the issues I've brought up, such as automation and copying EQ settings, are planned for the imminent 1.1 revision. Many of the program's user-interface limitations are more of a pain than anything else.

Is *DigiTrax* for you? If you're using a serious system, such as Audiomedia II, Sound Tools II, or Pro Tools, you already have better sonic quality, better editing, and advanced features such as playlists. If you're using an integrated sequencer/hard-disk recording package, the advantages offered by *DigiTrax* include two more tracks than the common 4-track environment, built-in EQ, and a metaphor that more closely emulates multitrack tape. The disadvantage is that you don't get tight sequencer integration.

One obvious comparison is with OSC's *Deck II.* OSC supports both Digidesign and ARTA-compatible hardware, is co-developing an open plug-in architecture, supports virtual tracks for multiple takes, provides eight tracks on a Mac AV, offers integration between *Deck II* and the company's *Metro* sequencer, and has a lot of other things going for it, notably automation. I have not worked much with *Deck II,* so I'll let **EM**'s March 1994 review speak to its strengths and weaknesses.

DigiTrax is a great addition for AV-based multimedia producers and home recordists who use basic sequencers. (Remember, though, you'll probably need more than 8 MB to run the two programs simultaneously.) Any musician who owns or can justify purchasing a large hard drive and an AV Mac, or an AT&T 3210-based DSP card for a non-AV Mac, will quickly appreciate the product's advantages over multitrack tape decks. One thing's for sure: Analog tape will soon be dead for anyone embracing computers.

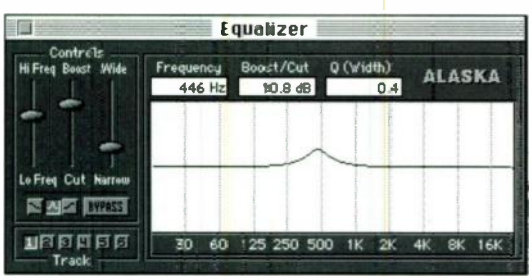


FIG. 4: The EQ window offers a choice of low shelf, high shelf, or single-band parametric EQ for each track. You can only see one EQ curve at a time; the buttons on the lower left select which track's EQ is available for editing.

Jeff Burger *is the author of* The Desktop Multimedia Bible *and* Multimedia for Decision Makers *and swears he won't ever write another book. Really.*

Circle #437 on Reader Service Card

Novation BassStation Analog Bass Synth

By Charles R. Fischer

The strap-on lets you stand up and take it like a dinosaur.

Perhaps the most interesting trend in this decade of digital delights is the marked interest in so-called "obsolete" technologies. A leading example is the second coming of analog synthesis, with several companies introducing new versions of vintage instruments.

The Novation BassStation analog bass synth offers an interesting blend of old and new. The BassStation combines a honest-to-analog, monophonic synthesizer with a 25-note, polyphonic MIDI keyboard. The 5.5-pound keyboard is battery-powered (six AA cells), and it even has pegs for service as a strap-on controller. Think of it as *Synthosaurus erectus.*

YESTERDAY AND TODAY

The BassStation embodies an odd mix of past and present. The synth can produce excellent re-creations of classic analog sounds. But control voltage, gate, and trigger inputs are nowhere to be found. They've been replaced by MIDI connectors.

The front panel is reminiscent of an ARP Odyssey or Sequential Circuits Pro-One, with its array of knobs and slide switches. It has no display. A pair of multifunction buttons let you octave-transpose Oscillator 1 over a total range of eight octaves, compare edits against saved programs, and write new programs into memory. Slide switches set programming modes, select waveforms, route modulators, and transpose Oscillator 2's pitch.

The 25-note, full-size keyboard is Velocity-sensitive, but does not offer Pressure or Release Velocity. It serves double duty as the user interface for setting the MIDI channel, programming the Controller wheel, and loading and saving programs via SysEx.

One of the two controller wheels is dedicated to Pitch Bend, with a ±12-semitone range. The other wheel can be used to send Modulation, Channel

World Radio History

Pressure, or MIDI Volume messages. This wheel's motion can also be routed to LFO depth and/or the filter cutoff frequency in the onboard synth. This greatly increases the synth's expressive capabilities.

The back panel includes the power switch; a connector for the wall-wart power supply; a ¼-inch, line-level audio output; and MIDI In and Out ports. There are no footswitch or pedal jacks. Finally, there's an ⅛-inch minijack for an optional Controller Grip with duplicate Pitch and Controller wheels, but Novation has recently decided not to offer this option.

VOICE FROM THE PAST

The voice architecture bears a close resemblance to many classic synths. There are two digitally controlled, analog oscillators; a voltage-controlled, lowpass filter (VCF); and a voltage-controlled amplifier (VCA). Modulators include the keyboard, a low-frequency oscillator (LFO), and two ADSR envelope generators (EGs), one of which is dedicated to the VCA.

Each audio oscillator generates sawtooth and pulse waveforms. Pulse width can be modulated from the LFO, EG 2, or a front-panel knob. As mentioned earlier, Oscillator 1 is transposed by octaves with the increment and decrement keys, while Oscillator 2 can be octave-transposed upward by as much as four octaves with a slide switch. Oscillator 2 can also be tuned upward by as much as one octave with a continuous knob, and both oscillators can be detuned by as much as ±50 cents. In addition to keyboard control, pitch can be modulated simultaneously from the LFO and EG 2, with variable depth. The audio oscillators cannot produce triangle waves, nor can they be hard synched, both of which would have helped re-create many classic sounds.

One of the best features is the resonant, lowpass filter, with a choice of 2-pole (12 dB/octave slope) or 4-pole (24 dB/octave slope) responses. The 4-pole filter has a fat, Moog-like sound, while the 2-pole filter has a restricted range (i.e., it can't open all the way) in order to emulate the more mellow Roland TB-303 Bass Line synth.

Neither filter type sounds identical to the classics it is supposed to emulate, but they're more than good enough. The CA 3080 ICs used in the VCFs and VCAs go back to about 1971,

Rock N Roll
MUSIC, INC.
YOU
MAKE THE CALL
WE'LL
MAKE THE DEAL
1-800-264-7625 (ROCK)
Call us for your Best Deal on Studio & Stage Equipment!

Music Software!
No question too dumb!
Here's an easy way to figure out which software will help you get the most out of your MIDI setup: call the MIDI software experts at Soundware 800/ 333-4554.

MACINTOSH
Performer
Trax, Master Tracks Pro
Notator Logic
Music Shop
Vision
Cubase
Deck 2, Metro
Finale
Finale Allegro
Encore
Music Time
Mosaic
Nightingale
Galaxy Plus Editors
Unisyn
1000 Super Cool Drum Patterns
MIDI Interfaces
MIDI Translator II
Translator Pro
Studio 3,4,5
MIDI Express
MIDI Time Piece II

IBM PC
Cakewalk
Cakewalk Professional Windows
Max Pak
Cubase
Trax, Master Tracks Pro
Sequencer Plus
Drummer, Sound Globs
1000 Super Cool Drum Patterns
Power Chords
Band in a Box
The Jammer
Music Time
Encore
Finale, Music Prose
Music Printer Plus
Musicator GS Windows
The Copyist DTP
Score
Quick Score Deluxe

MIDI Interfaces
PC MIDI Card
MQX-32M
Midi Engine 2Port/SE
SCC-1
MIDI Express PC
V-22, V-24s, VP-11

MIDI STARTER PACKAGES
IBM PC
Power Tracks Pro + PC MIDI Card
Cubase Music Starter Pack
Cakewalk Windows + MQX-32M
Macintosh
Cubase Music Starter Pack
Opcode EZ Music Starter Kit

Best Sellers
Cakewalk Windows/IBM
Vision-MAC
The Jammer-IBM
Finale-IBM/MAC
Encore-IBM/MAC
Performer-MAC
PC MIDI Card-IBM
MQX-32M-IBM
MIDI Express IBM/MAC
SEC-1-IBM
MIDI Quest-All
Bend in a Box-All

OUR POLICY
We accept VISA, Mastercard, and American Express with no added service charge. Your credit card will not be charged until we ship yous order. Personal and company checks accepted. Please allow one week to clear. California residents please add local sales tax to your order.

SOUNDWARE
Your MIDI Source

SHIPPING
For foreign orders and Next-Day-Air, please call. For all others, add $5 per item to cover UPS 2nd-Day-Air.
Call Soundware to order:
(800) 333-4554
Good anywhere in the U.S. and Canada
Monday thru Friday 9-5,
Saturday 10-4 PST

FREE CATALOG AVAILABLE
JUST WRITE OR CALL (800) 333-4554

©1994 Soundware Corporation, 200 Menlo Oaks Drive, Menlo Park, CA 94025 (415) 328-5773 FAX (415) 328-0611

World Radio History

Novation's BassStation combines a monophonic, analog synth with a small, battery-powered MIDI keyboard that can be strapped on. The sound is genuine, ear-rippin' analog, but the MIDI features are mediocre.

so the filter looks, sounds, and behaves 100% analog. While not extremely precise, it has a funkiness that disappeared from most synths some time back. For bass lines, this is very good stuff.

The filter cutoff frequency can be set from the front panel and modulated with the LFO or EG 2. However, there is no way for the filter to track the keyboard, which is an important technique for balancing the overall timbre between the higher and lower ranges.

The LFO can generate random, triangle, or sawtooth waveforms. Its frequency can be set to a moderate speed in the subaudio range, but it cannot be transposed into the audible spectrum, as you can with some vintage synths (e.g., the ARP 2600). Right, this *is* a bass synth.

The voice architecture is enhanced by several features, including a 3-way switch that selects single, multiple, or Autoglide triggering for the envelope generators. The Autoglide mode enables legato control over the portamento, i.e., if you hold down one note and trigger another, the pitch glides to the new note without retriggering the envelopes.

SNARL!

The BassStation's strongest feature is its nasty analog sound. Thanks in no small part to the onboard filter, the eight presets manage to suggest, if not quite duplicate, the timbres of several classic synths, including the Minimoog and ARP 2600. I was genuinely surprised at how well the BassStation managed to imitate the snarl of these older instruments. It sounds like it was built twenty years ago and has been preserved in a garage or pawn shop.

Unfortunately, the program memory holds only eight sounds (seven saved programs and the edit buffer). It's too much to ask for a memory-card slot, but 128 presets in RAM would make a big difference, and static RAM is cheap these days. Fortunately, the BassStation sends and receives SysEx data without problem, so it is possible to put together a large library of sounds.

MIDI CONTROL

The only disappointing aspect of the BassStation is its relatively weak MIDI implementation. Still, Novation provides MIDI control for many of the important onboard synth parameters. As previously mentioned, the unit sends and receives Note, Velocity, Pitch Bend, and Modulation messages. In addition, a number of front-panel parameters are assigned to specific MIDI controller numbers. The filter knobs send filter frequency, resonance, and mod depth (undefined Control Change numbers 105, 106, and 107), while the envelope knobs send envelope 1 and 2 attack and decay (undefined CC numbers 108, 109, 114, and 115). Naturally, the synth also responds to these messages.

On the down side, the synthesizer ignores many common MIDI messages, including Sustain, Volume, and Pressure—in fact, all but the aforementioned controllers. Although the synth responds to All Notes Off messages, the unit can't send them. There's no Local On/Off parameter, either. Fortunately, you can disconnect the onboard synth from the keyboard by setting different MIDI transmit and receive channels, as you would when sequencing.

Novation intentionally didn't include Sustain on the grounds that bass sounds don't require it. I disagree, but in the larger scheme of things, it's not a big deal. The lack of MIDI Volume is a definite drag, though; you can't properly control the synth remotely in a live performance or automate a virtual mix with your sequencer. This is especially odd because the programmable wheel can send Pressure or Volume to outside devices. Fortunately, the manufacturer plans to add Volume support in a future update.

Because the BassStation holds seven programs, it recognizes only Program Change numbers 0 to 6. However, I was dismayed to discover that it can't *send* these Program Changes.

CONSTRUCTION QUALITY

I ran into a few minor mechanical problems, but no major cause for concern. The review unit developed an intermittent glitch that caused the timbre of each note to vary unpredictably. The problem was caused by a loose internal multipin cable, which I easily fixed.

Less forgivable was the rough feeling of the pitch and controller wheels, caused by excess plastic left over from the wheel-molding process. I had to open the unit and file off the excess plastic.

CONCLUSIONS

The BassStation sounds wonderful. You get the equivalent of a classic analog synth, but with programmability and MIDI control. The keyboard makes it a handy, mobile bass instrument. Sound is more important to a synth than any other factor, so many people will forgive the BassStation's shortcomings.

The main shortcomings are the limited memory and weak MIDI implementation. At the very least, I'd like to see more RAM and support for MIDI Volume and Sustain. Add to that Local

Product Summary

PRODUCT:
Novation BassStation
Analog Bass Synth
PRICE:
$649
DISTRIBUTOR:
Music Industries Corp.
99 Tulip Ave.
Floral Park, NY 11001
tel. (800) 431-6699
or (516) 352-4110
fax (516) 352-0754

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

World Radio History

On/Off and outgoing Program Changes. That's not too much to ask from a unit that lists for $649. Further down the wish list, I'd like *all* knobs to send MIDI messages, so you could automate any front-panel changes.

MIDI features aside, I enjoyed this instrument for its sound. Maybe Novation will introduce an upgraded, stand-alone, rack-mount version with a display. They already have a good product, and with a few tweaks, it could be a big winner.

(Special thanks to Bill Heagy and Rob Johnson.)

Charles R. Fischer *is an electronics tech, MIDI musician, and inventor. His best-known musical creation is the EM FingerDrum percussion controller.*

Circle #438 on Reader Service Card

Turtle Beach MultiSound Monterey

By Dennis Miller

A highly rated sound card breaks new ground.

Once you have the highest-rated multimedia PC sound card on the market, what do you do for an encore? If you're Turtle Beach Systems, you release the MultiSound Monterey, a sound card for PCs that adds important new features to the highly successful MultiSound card (reviewed in the August 1992 **EM**). An elaborate new synth-patch editor, plus sampling capabilities, move the Monterey well beyond any PC sound card I've tried.

Multimedia is becoming increasingly important as a source of income for electronic musicians. Monterey is an excellent system to get you into this world. It's part wavetable synth, part hard-disk recorder, and small part sampler. In essence, the system combines two of Turtle Beach's other boards: the Tahiti sound card and the Rio synthesizer (see sidebar "Greetings from Turtle Beach"). Its specs are excellent for a card in its price range. Naturally, the

KEYBOARDS
BEFORE YOU JUMP...
CALL US LAST!

We'll Save You Time & Money!
• SYNTHESIZERS
• DIGITAL PIANOS
• RECORDING GEAR
• DRUM MACHINES
• SAMPLERS
• AMPLIFIERS
• MIXERS / EFFECTS
• SOFTWARE
ALL MAJOR BRANDS!
RICH
CALL OUR SALES STAFF OF MIDI EXPERTS
1-800-795-8493
RICH MUSIC • 1007 AVENUE C • DENTON, TX 76201 • FAX (817) 898-8659
Store Hours: Monday- Frday 10- 6:30, Saturday 11- 5
WE ACCEPT VISA • MASTERCARD • DISCOVER • AMERICAN EXPRESS

Voice Crystal™

Polo Jones & Son
Eric Clapton, Zucchero, Nils Lofgren, Whitney Houston, Clarence Clemmons-
"Using a Bass controller, the sounds are even more critical than Keyboards. Voice Crystal sounds are both artsy and intelligent".
Professional Sounds Programmed and used by Professional Musicians
"Even a child knows that Voice Crystals have great musical taste".
Polo Jones & Son
Voice Crystal sounds are available for these synthesizers.
ROLAND
JV-80/880, JD-800, JD-990, JV-1000, D-70, D-50/550, D-20, D-10/110, D-5, GR-50 and 256K BlankRAM Cards.
YAMAHA
SY-85, SY-77 and 64K Blank RAM Cards.
KORG
X-3 and i-Series, O1/W/FD/Pro/ProX, O3R/W, T-Series, M-1, M1-R, M-3R, 256K and 512K Blank RAM Cards.
WALDORF
Microwave and 256K Blank RAM Cards.
ENSONIQ
ASR-10, EPS16, TS-10, TS-12, KS-32, all SQ-Series, VFX/VFX-SD, SD-1, SQ-80, 32K Blank RAM Cards and EEProm Cartridges.
KURZWEIL
K-2000, K-2000R, K-2000S.
EVE PRODUCTIONS, INC.
MUSIC PRODUCTS DIVISION
930 Jungfrau Court • Milpitas, CA 95035
BUS: (408) 945-0139 FAX: (408) 945-5712
Watch for new products and endorsees!

World Radio History

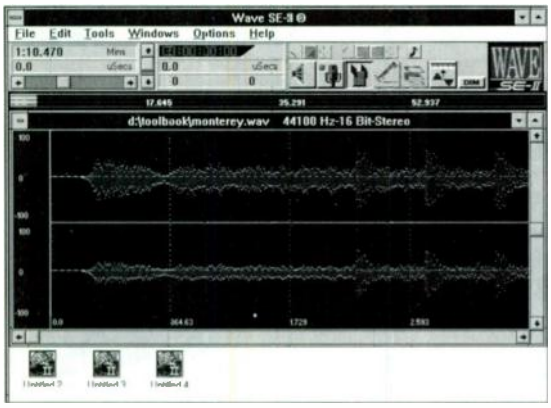


FIG. 1: *Wave SE-II* provides audio recording, playback, and editing and features a clear, uncluttered interface.

Monterey card also is bundled with many of the applications you'll need to work with high-quality desktop audio.

A straightforward installation, with software-selectable interrupts and base memory address, should have you up and running in no time. Like CD-ROMs, sound cards are notoriously difficult to set up, but I had no trouble getting both audio and MIDI moving to and from this card.

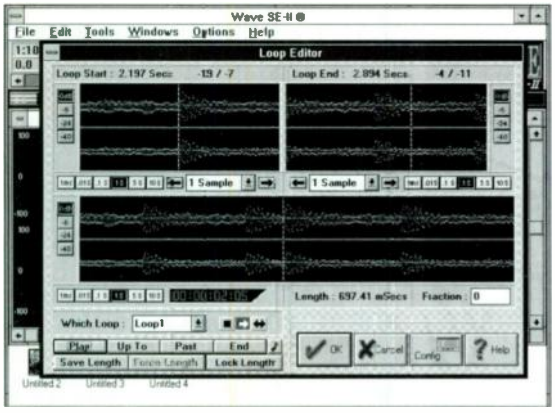


FIG. 2: The Loop Editor offers numerous options for finding smooth loop points.

WHAT YOU NEED

To use Monterey, you'll need a suitable *Windows* machine, preferably a fast 80386 or '486 with 4 MB of RAM. Unlike many sound cards, though, the Monterey doesn't rely heavily on your computer's CPU to perform its basic functions. If you expect to do a lot of hard-disk audio recording, plan on at least a 250 MB hard drive with an access time of 18 ms or better. Add to that a good Super VGA monitor and a mouse.

To send MIDI to or from the card externally, you'll need to purchase the optional 2-Out, 1-In MIDI adapter. (As do most other sound card manufacturers, Turtle Beach still fails to include this inexpensive adapter with the basic system, presumably because many of their desktop-production customers are not using external MIDI devices.) You can also buy a cable to connect most internal CD-ROM drives directly to the card for analog audio input. However, there's no support for the direct digital-audio connection offered by some CD-ROM players.

GO CONFIGURE

With no more than a few mouse clicks, the card can be repatched for numerous different MIDI setups. For example, the card can be used with or without an external MIDI keyboard. A bundled utility called *Mouse Player* lets you trigger notes from your computer keyboard or mouse.

If your sequencer supports multiport interfaces, you can send sixteen channels to the card and another sixteen to the external MIDI Out Port. Without multiport capabilities, you can still drive both the internal synth on the card and an external sound module from your sequencer by using either the *Windows MIDI Mapper* or Monterey's own *MIDI PatchBay* utility.

There's also an *External Thru* application, which lets an external controller send output to Monterey and through to the Monterey's output port. An Always Active option keeps MIDI data moving through the card even if you are running a nonmusic application.

HAPPENING HARDWARE

MultiSound Monterey is a full-length, single-slot, ISA card that contains several distinct hardware components. The dual-port MIDI interface is fully *Windows* multimedia-compliant and supports DOS applications through an MPU-401 emulation mode. (MPU-401 emulation requires some reconfiguring of your .INI files.) Note that the Monterey is not Sound Blaster-compatible.

Next is the WaveFront, a new General MIDI wavetable-synth chip that replaces the E-mu Proteus chip found on the first generation of MultiSound cards. This synthesizer, which is similar to the one on Turtle Beach's Maui card, contains four megabytes of uncompressed, 16-bit samples. It can be configured to operate at different sample rates, providing a scaleable number of polyphonic voices, from 32 voices at 33.075 kHz down to 24 voices at 44.1 kHz.

Each of the synth's 128 GM programs can contain up to four layers, each of which consumes one voice. A drum kit with 128 sounds can be mapped over a 5-octave range. The synth also offers a number of software-configurable reverb effects that can be altered in real time, but can't be mapped to MIDI controllers. Best of all, you can add 256 KB, 1 MB, or 4 MB of RAM to the card and load your own samples.

The third component of the sound card is the Motorola 56001 DSP chip, which provides 20 MIPS of horsepower. The DSP helps implement Turtle Beach's high data-transfer rate, Hurricane architecture. The 56001 is also used for the synthesizer's real-time reverb, among other tasks. The DSP Chip is programmable, allowing for future software upgrades. (Turtle Beach sells a Software Developer's Kit for the sound card.)

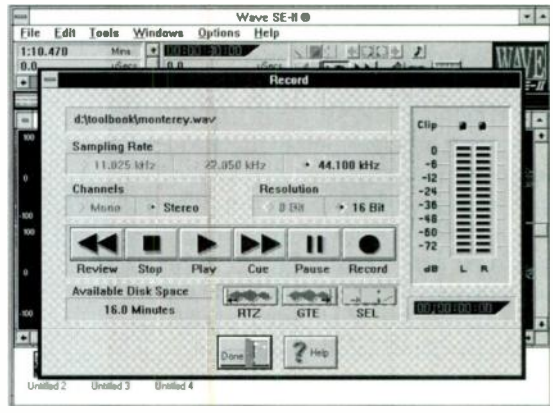


FIG. 3: To record a file in *Wave SE*, open the Record window and set the file specifications to your liking.

World Radio History

Finally, the card offers 8- or 16-bit (configurable), 64× oversampled, A-to-D conversion at sampling rates of 11.025, 22.05, and 44.1 kHz, for both mono and stereo signals. The DACs are 18-bit, 64× oversampled, with an 8× interpolating filter.

There are three ⅛-inch, stereo, line-level audio ports on the card, configured as two inputs and one output. Because I didn't have an internal CD-ROM connector, I patched my CD-ROM audio to the auxiliary input and used the second input for my mixer's output. (Monterey has no microphone preamps, so I routed my mic through a mixer.) For test purposes, I used an A/B switch to alternate between small desktop speakers and my studio monitors. One stereo ⅛-inch-to-RCA cable comes with the system, so be prepared to use adapters.

THE SOFT SIDE

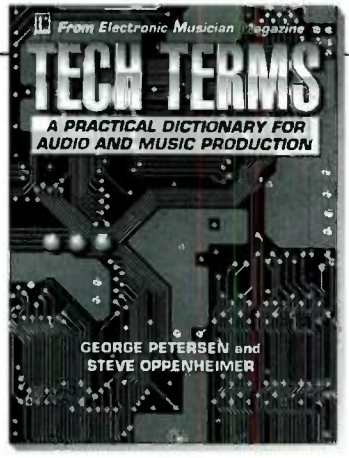
Monterey is bundled with two major programs, *Wave SE-I* and *Wave Patch*, in addition to several smaller utilities. *Wave SE-I* is directly descended from Turtle Beach's highly regarded *Wave for Windows* (reviewed in the February 1994 **EM**). It is somewhat scaled back from its predecessor, but a $39 upgrade gets you *Wave SE-II*, a more powerful editor. (Registered users of *Wave for Windows* can get *SE-II* for $5 shipping.) I highly recommend purchasing the upgrade, as you'll have numerous additional tools available to process your files. The program has an uncluttered interface, is very intuitive, and integrates nicely with Monterey (see Fig. 1).

One of *Wave SE*'s key features is its ability to export WAV files directly into the synthesizer's sample RAM, where they can be played back under MIDI control. The Autoload option can send a file immediately after any edit is made, and Loop points are always updated when changed. Depending on how much RAM you've installed, you can create numerous customized sounds with all the performance parameters of the synthesizer's ROM samples. This capability, which Turtle Beach calls SampleStore, breaks new ground for the sound-card market and moves the system ever closer toward an integrated, desktop-audio environment.

There is one catch: The time it takes to load even small samples just might

GOODMAN MUSIC

Keyboards • Computers • Pro Audio
Digital Recording, MIDI Software
Synthesizers, Workstations, Samplers
Pro DAT's, Recordable CD, Multitrack
CALL 1-800-842-4777
Goodman Music
Universal City
3501 Cahuenga Blvd. W.
Hollywood, Ca. 90068
(213) 845-1145
MC, VISA, AMEX, OPTIMA, DISCOVER, DINERS, CARTE BLANCHE, APPLE & ROLAND CREDIT



Look It Up!

Stay on top of technology. Covers the latest terms you need to understand digital audio, workstations, computer music and MIDI.

TECH TERMS: A Practical Dictionary for Audio and Music Production, ©1993, 56 pp. (P)

Only $9.95 (plus shipping)

ORDER NOW! Call toll-free (800) 233-9604, (510) 653-3307; fax (510) 653-3609, or write to Mix Bookshelf, 6400 Hollis St., #12-Q, Emeryville, CA 94608. Include $3 for shipping. CA and NY residents add state sales tax.

LimeLight™
VGA Sequencer

The sequencer for PC laptops and desktops.

You don't need the overhead of Windows to have a graphical, easy-to-use sequencer. LimeLight has graphical editing of all data, including notes on a printable grand staff. We support all popular external and internal MIDI interfaces. It's perfect for both laptop and desktop computers with VGA, DOS and a mouse. It's fast even on a '286. And only $99.95!

BeBop Systems
1-800-775-5557
214-320-2723 Fax 214-328-1092
PO Box 550363 Dallas, TX 75355
Download a free demo 214-328-6909
(OMNI-NET 1200 - 14.4k bps, 8N1)

World Radio History

GREETINGS FROM TURTLE BEACH

Turtle Beach has been active in the IBM music world since 1988, when it released the first successful PC sample-editor, *SampleVision*. The company moved heavily into producing audio hardware and now offers a number of products, most of which are internal cards for the PC. Because the different cards often use the same components, a bit of explanation seems in order.

At the top of the line is the 56K System, a 2-channel, disk-based, digital audio workstation. First released in 1990, the 56K includes a PC interface card, software, and an external box for digital audio I/O. No A/D or D/A converters are supplied.

Next is the original MultiSound card, also released in 1991. It combines an E-mu Proteus synthesizer chip with converters and a MIDI interface. The MultiSound has been replaced by the MultiSound Monterey.

The Maui card, which first shipped in 1994, is an upgrade card that contains a WaveFront wavetable synthesizer chip. It would most likely be used as an add-on to a system with an existing FM sound card. Maui incorporates the same SampleStore technology found in the Monterey, but it can manage up to 8 MB of sample RAM and moves samples many times faster than the Monterey. On the other hand, it holds only 2 MB of its own ROM samples and does not provide reverb.

The Tahiti, released this year, offers hard-disk recording capabilities through its ADCs and DACs, which are the same converters found on the Monterey. Tahiti can support an optional MIDI synthesizer, such as Creative Labs' WaveBlaster or Turtle Beach's own Rio. Rio, an add-on daughterboard used on the Monterey, adds wavetable synthesis and reverb to compatible sound cards.

Several other products have been announced for future release, including the Audio Advantage, a 12-bit PCMCIA sound card designed for business applications, and the Daytona, a 16-bit PCMCIA card.

stop you in your tracks. On a fast 80486 computer, it took nearly two minutes to load a 1-second, 44.1 kHz, 16-bit sample. A 2.7-second sample of the same type took over 4.5 minutes. That's because the system uses a proprietary sample dump protocol to move the data via MIDI, a method that will never win speed prizes. What's more, the samples are stored in RAM, so you have to load them every time you start up.

You can ease the pain a bit by creating Sample Sets, which are entire banks of program setups that can be automatically loaded whenever *Windows* is started. But there's no way around the lag time. (Turtle Beach's Maui card has similar capabilities, but loads samples much faster; see sidebar "Greetings from Turtle Beach.")

Wave SE-I has various tools for altering files and adds other features not found previously in *Wave for Windows*, including savable markers and loop points. One major new addition is the Loop Editor, which provides numerous methods for determining smooth loop points, including automatic zero-crossing detection and automatic amplitude-level matching between loop start and end points (see **Fig. 2**). If you've loaded a file into the synthesizer, you can preview the loop points by sending a MIDI note trigger directly from the Loop Editor screen, a useful option.

Though *Wave SE* doesn't have an extensive processing menu, it does provide many important tools, such as 4-band EQ, mix, and crossfade. Mercifully, *Wave SE-I* (but not *Wave SE-II*) also improves on one of *Wave for Windows*' major flaws: You can now choose not to save changes made during an edit session, even if Undo is disabled.

Wave SE-I is also the application you'll use to make hard-disk recordings. To do so, just open a new file, click on the microphone icon, pick a sample rate (11.025, 22.05, or 44.1 kHz) and a bit resolution (8-bit or 16-bit), then start recording (see **Fig. 3**). Two utilities—*Record Prep* and *Mixer*—can be used to alter the levels coming into the system. You'll also find clear and responsive peak meters to monitor your source.

I made some very long stereo recordings and had no trouble with the process. Remember to keep your drive defragmented, though, and if possible, maintain a separate drive (logical or physical) for digital-audio files.

PATCH OUT

Equally important for musicians is the *WavePatch* patch editor, which provides thorough visual editing of every parameter in the WaveFront synthesizer (see **Fig. 4**). With *WavePatch*, you get an excellent view of the synth's architecture. At the top level is the Bank, only one of which can be loaded at a time. A Bank contains 128 Programs, each having up to four Layers. Each Layer contains a Patch, which specifies a set of performance attributes for a sample or multisample.

One Bank of 128 General MIDI Programs comes with the system. There are over 200 ROM Patches available for building Programs and another 50 locations for user-defined setups. With over 250 samples stored in ROM and the ability to address up to 512 total, you have tremendous resources available for designing sounds.

WavePatch allows you to view one or more levels simultaneously. You can even access *Wave SE* directly from within the patch editor to edit your own samples. Overall, the interface is clean and consistent, though it can get a bit cluttered, and the buttons and sliders are very responsive.

When you first run the program, a

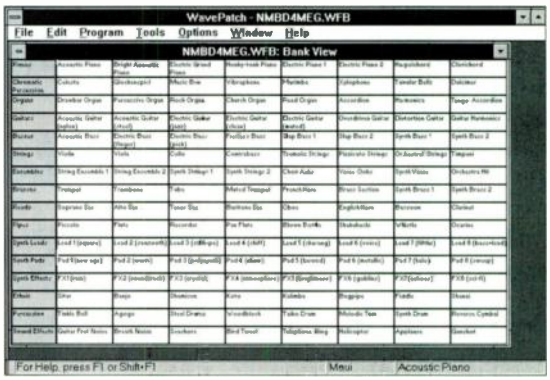


FIG. 4: *WavePatch* allows the user to work with the synthesizer on many different levels. The Bank View displays all the Programs that are currently loaded. To edit a specific Program, double-click on its name, and move to the Program View window.

World Radio History

Bank View appears, showing you all the Programs that are currently loaded. If you simply need to assign the Programs to different MIDI channels, pull down the Master Control screen from the main menu line. You'll also find global parameters here, such as tuning and master volume control.

To edit a specific Program, return to the Bank View, double-click on its name, and move to the Program View window (see **Fig. 5**). (An even nicer scheme would have allowed you to move right to the Program View window from the Master Control. I'm all for the ability to get to any level from any other.)

The Program View screen provides access to many of the editable Program attributes, such as the Patch in each Layer, its volume and pan settings, and key ranges. Because Patches can be used by more than one Layer, anytime you attempt to edit one, a message appears asking if you want to create a copy of the original. That way, other Layers that use that patch won't be affected by the change. That's a handy option that I've always wanted on my other MIDI hardware.

WavePatch offers fairly extensive external control of the LFOs and envelopes associated with each layer. These parameters can be altered with many common MIDI controllers, such as Channel Pressure and Velocity. However, you can't make arbitrary mappings in which, for example, Control

Product Summary

PRODUCT:
MultiSound Monterey Multimedia Sound Card

PRICE:
$399

SYSTEM REQUIREMENTS:
80386/25 or faster PC; *Windows* 3.1

MANUFACTURER:
Turtle Beach Systems
52 Grumbacher Rd.
York, PA 17402
tel. (717) 767-0200
fax (717) 767-6033
BBS (717) 767-5934

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

Thank You ...

Your patronage has made Sam Ash Music the largest retailer of musical equipment and accessories out of all the advertisers in this magazine.

For 70 years we have followed the most basic of ideas - ***the customer is everything.***

It is our commitment to continue to provide the selection, service and satisfaction which has made Sam Ash known around the world.

Here's to the next 70 years!

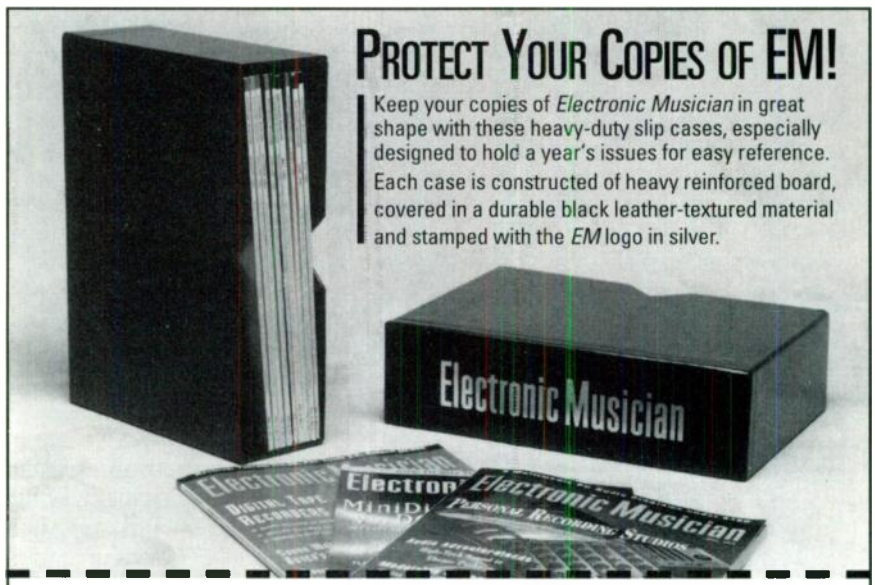
The Ash Family

1994 The 8th Annual MUSIC & SOUND Awards
"Dealer Of The Year"
AS VOTED BY MEMBERS OF THE MUSIC INDUSTRY

70 YEARS OF MUSIC! 1924 Sam Ash MUSIC STORES 1994 THE WORLD-CLASS MUSICAL INSTRUMENT DEALER

Call Toll-Free
1-800-4-SAM ASH
(1-800-472-6274)
In Pennsylvania: (609) 667-6696
In New Jersey: (201) 843-0119
(908) 572-5595 or (609) 667-6696
In New York State:
(516) 333-8700 or (718) 347-7757

Can't get through? Write for specific prices.
SAM ASH MUSIC STORES • DEPT. EM • PO BOX 9047 • HICKSVILLE, NEW YORK • 11802-9047



PROTECT YOUR COPIES OF EM!

Keep your copies of *Electronic Musician* in great shape with these heavy-duty slip cases, especially designed to hold a year's issues for easy reference. Each case is constructed of heavy reinforced board, covered in a durable black leather-textured material and stamped with the *EM* logo in silver.

Electronic Musician
Jesse Jones Industries, Dept. EM
499 East Erie Avenue
Philadelphia, PA 19134

Please send _____ *EM* slip cases at $7.95 each, plus $1.00 postage/handling per case.
Additional slip cases: $21.95 for 3 cases, $39.95 for 6 cases. Add $1.00 per case postage/handling; outside U.S. add $2.50 per case. Payment must be in U.S. funds only. PA residents add 7% sales tax.

☐ Enclosed payment: $_____
☐ Charge my: ($15.00 minimum) ☐ American Express ☐ Visa ☐ MasterCard ☐ Diner's Club
Card # _____ Exp. Date _____
Signature _____
CHARGE ORDERS: CALL TOLL-FREE 7 DAYS, 24 HOURS (800) 825-6690
Print Name _____
Street Address (no P.O. boxes, please) _____
City/State/Zip _____

SATISFACTION GUARANTEED

World Radio History

Change 10 is used for LFO depth.

The 7-stage envelopes give you exacting control over the time-varying qualities of a sound, though I'd like the option to draw the envelopes in addition to using knobs. It would also be helpful if you could simply type in the envelope values. Rather than offering just a few zoom levels, *WavePatch*'s Envelope View has a far more useful Time Display scroll bar that allows you to see from a fraction of a second to over thirteen minutes on a single screen.

Simple 1-click controls, such as the LFO Repeat button in the Oscillator window or the Envelope Restart button in the Envelope View, make designing sounds easy. Still, some type of Help balloons that show an icon's function as the mouse passes over it would make the icons easier to identify. Because you use different windows for editing each of the major program parameters, it's easy for the "audition" piano that appears at the bottom of the Program View to get buried.

The piano is essential if you don't have an external keyboard, so it would be better if you had the option to always keep it on top. Fortunately, you can use the program's onscreen keyboard in *Mouse Player*, which can remain on top, instead of the *WavePatch* keyboard.

File maintenance is a bit awkward. You must save an entire Bank, even if you've made only a minor change to a single Layer. Fortunately, in *WavePatch* version 1.2, which should be available by the time you read this, individual programs and drum kits can be saved and loaded.

Turtle Beach has not yet released a manual for *Wave Patch*, but there is thorough online help. If you prefer hard copy to reading onscreen, you can print out the entire help file with a single command. That will give you virtually all of the manual except the table of contents and index.

SWEET SOUND

The sound quality of the Monterey card is not quite top pro level, but it is as good as it gets from a PC card in this price range. The wave audio in particular is outstanding; Monterey uses the same good-quality converters as the MultiSound.

The WaveFront synth output is excellent, especially when running at 44.1 kHz. Like many wavetable synths, certain instrumental sounds are better than others. The brass and winds are particularly natural-sounding. The exception is the saxes, which don't have much of a bite. The percussion group has lots of punch, and even the sound effects are of high quality.

On the other hand, the solo strings, especially the violin, sound a bit "metallic," and the string ensemble has an unrealistic vibrato. I noticed an occasional spot where the crossover points in a multisample were too obvious (for example, when you cross from B♭2 to B2 in the oboe), but this is the exception, not the rule.

The WaveFront's reverbs have smooth decays, and the room simulations are convincing. I'd have no problem stacking them against the reverbs found in many keyboard synths.

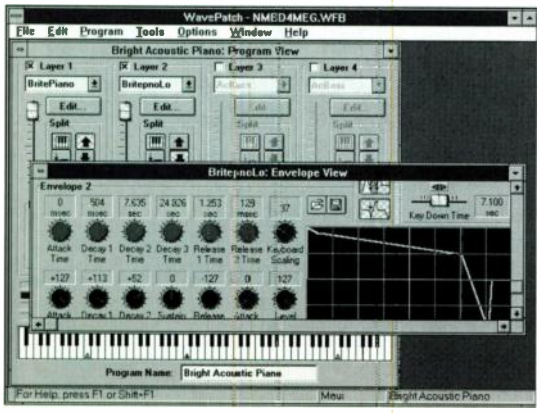


FIG. 5: The Program View window (background) contains many of the basic parameters of the WaveFront synthesizer. From there, you can access additional windows, such as the Envelope View (foreground), where you can edit the synth's 7-stage envelopes. The Time Display scroll bar lets you view from a fraction of a second to over thirteen minutes on a single screen.

SOUND OFF

In many respects, Monterey retains the high quality of its predecessor and remains true to its roots. At the same time, it incorporates significant new technology, such as the new synthesizer chip and SampleStore feature. Of course, there also is completely new software, especially the patch editor.

Given the fact that so many capabilities have only just recently been integrated, it's no wonder that the system still has some rough edges. There's no question that all the pieces are in place though, and after a little smoothing, Turtle Beach will have a truly outstanding desktop audio product on their hands. What will they do for an encore then?

Dennis Miller *is currently on leave from his teaching job at Northeastern University in Boston and has rediscovered the joys of life outside his office.*

Circle #439 on Reader Service Card

ADA MP-2 MIDI Tube Guitar Preamp

By Peter McConnell

How to successfully follow a tough act.

Sometimes the toughest act to follow is your own. If you do something well, something that sets a standard, people expect your next effort to be even better. In 1987, the ADA MP-1 paved the way for a proliferation of MIDI-controllable, tube preamps for guitar. It had its limitations, but it was destined to be a classic.

So the folks at ADA must have felt plenty of pressure while designing the MP-1's successor, the MP-2. Could they improve over the MP-1's limited tonal flexibility? The new unit should be easier to program, too. What about more complete MIDI control? And, of course, the new preamp had to sound great.

SETTING THE STAGE

At first glance, the MP-2 appears similar to the MP-1. The familiar-looking row of membrane buttons is designed for easy parameter access. But the old LED display of the MP-1 has been replaced by an LCD, which gives a more detailed view of the MP-2's parameters.

The unit features ten tube sounds, ranging from "Crystal Clean" to "Fat High Gain." There are separate drive and overdrive levels on the high-gain sounds, a compressor, four tone controls, and nine bands of graphic EQ (±12 dB). Add to all of this a programmable stereo effects loop, built-in

World Radio History

stereo chorus, noise reduction, and advanced MIDI features. Top it off with a wah filter and tremolo, and you have a feature-packed box.

GET CONNECTED

The MP-2's rear panel has an extra input, useful if you're going into the unit from another processor or a mixer bus. The rear input is overridden by the front-panel instrument input.

There are three sets of stereo outputs: stage outs for a guitar amp; unbalanced, ¼-inch outs; and balanced, XLR recording outputs. The recording outputs offer two circuits, selectable with a switch, that simulate a 2 × 12-inch or 4 × 12-inch speaker cabinet. These proved great when going direct to a mixing board. A similar switch lifts the ground on the XLR outs to alleviate hum problems.

The stereo effects loop is unusual. You get two mono sends and two mono returns that are hard-wired to the MP-2's left and right channels, respectively.

Finally, there are MIDI In, Out, and Thru jacks. The In port uses a 7-pin DIN connector for remote-powering a MIDI footswitch. Its phantom-power input works with ADA's MCX foot controller, Digital Music Corp's Ground Control, and similar controllers.

CRANK IT UP!

Once you're hooked up, getting around on the MP-2 is easy, although it doesn't quite pass the "I never read manuals" test. Factory Presets or user programs are selected using bank and arrow or number buttons. The Program Edit button gets you into Edit mode, where the arrow and number buttons change the values.

The number buttons do double duty depending on the mode, which can be confusing, especially for MP-1 users. The Program Edit button is right next to the number buttons and has the same green LED that lights up when pressed, so you don't always realize that you are in Program Edit mode. A red LED on the Program Edit button would have helped me avoid those times I meant to tweak a parameter quickly but loaded a new program instead.

When you finally open the manual, you'll find it clear and well written. It is especially good for getting MIDI novices through some of the advanced control features.

MIDI FOR MIDIPHOBES

The MP-2's MIDI control features are remarkable not only for how advanced they are, but how accessible. There are two modes for mapping MIDI controllers to parameters, a process ADA calls Real Time MIDI (RTM). RTM maps are stored at the Program level.

Suppose you have plugged a MIDI foot controller into the MP-2. Quick mode leads you by the hand as you move your footpedal, select a parameter, and test the result. You don't even need to know which MIDI message your pedal is sending; it's detected for you automatically. If you are sending messages over the wrong MIDI channel, you get a warning message.

Quick mode also lets you control Macro parameters (preset groups of parameters) with a single controller. For example, a macro called "V-CURVE" lets you change your whole EQ curve from a midrange sound to its inverse: a V-shaped curve with very little midrange. Sweeping through EQ parameters via MIDI causes some artifacts. But for the most part, MIDI control of parameters is fairly smooth.

Expert Mode gives a more detailed, hands-on level of control. Controllers are selected by MIDI controller number. You can create up to sixteen parameter maps per program, each of which relates one control source to one destination parameter. You can't set up your own Macros, but you can refine the maps by limiting the range through which a targeted parameter sweeps. You can even make the parameter change in the opposite direction of the controller.

A MIDI controller can adjust master volume for all programs or mute all outputs for use with a tuner. If you don't like fussing with arrow keys, you

ADA's MP-2 is a worthy successor to the venerable MP-1, combining clean, kicking sound and extensive MIDI control.

They Told Us It Couldn't Be Done. But We Did It Anyway!

. . . Crafting an audio cassette copy that's so close to a CD in sound quality that you may not be able to hear the difference . . . .

Hard to believe????

Call 1.800.869.0715 and hear the Phoenix cassette.

Music Annex Duplication

Cassette • CD • Media Services

MIDI WARE SYSTEMS

Write for our ***FREE*** Catalog Offering Software & Hardware for Composing • Notating • Sequencing • Scoring • Interfaces • Converters • Processors • Educational Materials • Computer Systems and all Accessories by Leading Names in the Industry. Plus Much More. . . . . .

Request Our Free Catalog!

MIDIWARE Systems
P.O. Box 15201
St. Petersburg, FL 33733

"THE MUSIC PEOPLE SERVING THE ENTIRE GLOBE"

World Radio History

can use MIDI controllers to adjust parameters selected from the panel. A MIDI SysEx dump feature lets you save your programs. Add to this the ability to map incoming MIDI Program Changes to any user program, and you have a package of MIDI features unrivaled in this type of guitar preamp.

DOES IT KICK?

Control features don't matter without great sound. Fortunately, the MP-2 comes through here. Those who liked the sound of the MP-1, but felt it was tonally limited, will appreciate the new preamp's multiple tube voices and EQ.

Perhaps the biggest improvement in the MP-2 over the MP-1 and many other tube preamps is reduced noise. I have long had trouble finding a preamp fat enough for my guitar and clean enough for my electric violin. The MP-2 is both. According to ADA, the MP-2 runs at a higher base voltage, ±18V instead of ±12V in the MP-1. The result is a better signal-to-noise ratio.

An MP-2 setup hint: The stage outs are tweaked for the sound of a classic guitar amp with a sharply rolled-off high end. If you play on a full-range component system, the recording outputs sound best.

COMPLAINTS

Great-sounding as it is, the MP-2 is not without drawbacks. The first unit I looked at was from an early production run. It kept blowing fuses because of a problem with a rectifier that pumped out too much current. The problem has since been corrected.

Aside from that, most of my criticisms are aesthetic. With a few exceptions, I found the presets to be of the ear-ripping, speaker-shredding, play-the-guitar-with-your-teeth-and-set-it-on-fire variety. The MP-2 can do much more than the presets imply; play with its parameters before judging it.

Despite the great trouble taken to make MIDI programming easy, I would have changed a couple of things. First, the unit displays warning messages if it gets *any* MIDI messages on the wrong MIDI channel. This is helpful if you have a simple, single-channel footpedal. But if your pedal sends Program Changes on several MIDI channels for controlling multiple devices, you'll get an error message even if you are sending what you want on the MP-2's channel. Fortunately, the warnings can be globally disabled.

In addition, the MP-2 allows you to call up user programs via MIDI, but not ROM presets. ADA's idea is that you should only be able to remotely access programs that can be modified, and you can't modify factory presets. The ROM presets are duplicated in user RAM, and you can access them there. But if you have filled the user memory with custom stuff and want to use a regular factory preset, you have to call it up from the front panel. That's an unnecessary inconvenience.

Finally, the MP-2 sends out only the Program Changes it receives, without remapping them. This is a drag if you want your preamp to configure other units by sending different Program Changes on multiple MIDI channels.

BOTTOM LINE

The MP-2 is a great-sounding, carefully thought-out device. For features and MIDI control, this is pretty much the leader in guitar tube preamps. When it comes to sound, personal taste figures heavily, but I rate the MP-2 near the top for its price range.

Without question, ADA has successfully followed the MP-1. The company has taken cues from its competitors, added its own innovations, and set a new standard.

Peter McConnell *lives in Berkeley, California. When he isn't composing and designing music software for LucasArts Games, he writes songs, sings, and plays electric violin and guitar in the San Francisco Bay Area band Hot Blue Sky.*

Circle #440 on Reader Service Card

Product Summary

PRODUCT:
MP-2 MIDI Guitar Preamp
PRICE:
$999
MANUFACTURER:
ADA Signal Processors
420 Lesser St.
Oakland, CA 94601
tel. (510) 532-1152
fax (510) 532-1641

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

Kawai KC20 Synthesizer

By Jim Pierson-Perry

A bargain-basement General MIDI keyboard.

Despite the general rush to market General MIDI tone modules, few companies have followed up with an entry-level GM keyboard. Products such as the Roland JV-35, Kawai K11, and Korg X3 offer GM-compatible sounds, but they cost anywhere from about $1,250 to $2,000.

To fill this gap, Kawai has combined its MDK61 keyboard controller and GMega LX sample-playback tone module into the new KC20 General MIDI synthesizer. Designed for both studio and stage, the KC20 combines a 61-note keyboard; 28-voice polyphonic, 16-part multitimbral, GM Level 1 sound source; and computer interface. The idea is to offer a lot of bang for the bucks. As we'll see, this was accomplished by keeping both bang and bucks within strict limits.

FIRST IMPRESSION

The KC20 sports a compact design with all controls readily at hand. This, along with its light weight (9 lbs.), makes it great to take onstage. It even has pegs under the body to attach a strap (not included).

The front panel holds the main volume slider; pitch bend and mod wheels; and a 16-character × 2-line, backlit LCD. During play, the LCD acts as a MIDI monitor and shows the channel numbers of incoming MIDI messages. Sixteen small, multifunction buttons to the right of the display access editing, patch selection, data entry, and other functions.

The rear panel includes MIDI In and Out ports (no Thru); a power switch and AC adapter jack; and ¼-inch jacks for headphones, a sustain pedal, and the L/R audio outs. There is no footcontroller input. However, the instrument recognizes MIDI Volume, so you can use a MIDI continuous pedal, slider, or wheel on another device for real-time volume changes. All system and sound settings are retained in battery-

World Radio History

backed memory when the KC20 is powered off, and you can offload them via SysEx.

Like the GMega and K11, the KC20 features a built-in serial interface (using an 8-pin DIN jack) for a *Windows*-based PC, Macintosh, or NEC PC-98 computer. A slide switch determines whether the unit responds to its MIDI ports or the computer interface. Mac users can connect directly; all Mac software I tested worked fine using a 1 MHz data rate. PC users need a *Windows* driver, available from Kawai. When you use the computer interface, data received at the KC20's MIDI In port pass to the computer, and data from the computer appear at the MIDI Out port.

The 61-note, unweighted keyboard senses Velocity, and you can select from ten preset Velocity curves. The review unit's action was a bit stiffer than most synth actions. This was especially true for the black notes, which made it difficult to control Velocity effectively. Although the keyboard does not send Pressure, the KC20 responds to incoming Channel Pressure by mapping it to vibrato. However, you cannot alter this assignment.

The review unit's sound source had a jerky response to the KC20 pitch-bend wheel, causing pitch jumps instead of a smooth shift. This did not happen with Pitch Bend messages from an external MIDI source, nor was it a problem when controlling external synths from the KC20's pitch wheel.

USER INTERFACE

The user interface is simple, with no frills. You press the Edit button, scroll forward or backward with single button presses, change parameter values with the ±1 and ±10 increment/decrement buttons, and hit the Exit button to return to Play mode. Pressing the System button while powering up displays the internal ROM version. (I had version 1.07.)

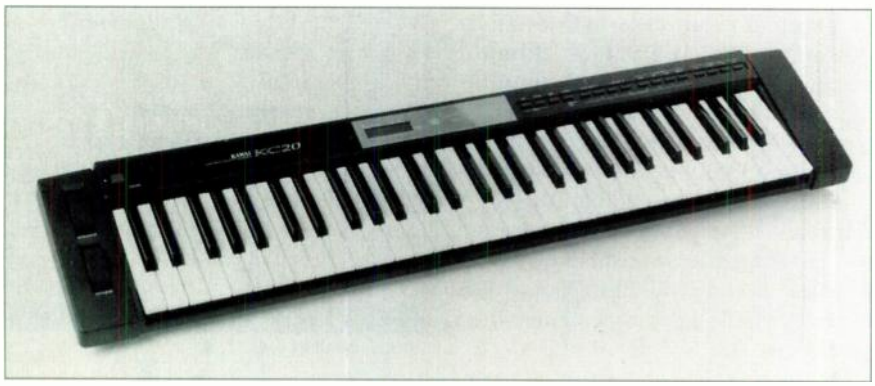
Although the user interface is workable, there's lots of room for improvement. For example, I'd like to use the keyboard to set split points and use the mod wheel for data entry (because there's no data-entry wheel or slider). I'll discuss other aspects of the user interface as we delve into the unit's parameters.

Given a target market of entry-level users, it is particularly unfortunate that the manual suffers from the poorest editing job I've seen. The text is understandable and well illustrated, but it's often inaccurate and internally inconsistent. Conflicting information is sometimes given about the same operation on different pages. This problem extends to Kawai's recent press releases touting the KC20's ability to assign different Control Change messages to the pitch-bend and mod wheels independently for each Patch. It can't.

VOICE ARCHITECTURE

The KC20's internal sound source is the GMega LX sample-playback tone generator, a stripped-down version of Kawai's GMega (reviewed in the June 1993 **EM**). It provides 160 preset Tones and seven drum kits. In all, the synth holds approximately 4 MB of sample ROM, compared to 6 MB in the K11 and GMega. The Tone parameters cannot be edited, curtailing any option to expand or improve the sound palette.

Although the synth has 28-voice polyphony, eight voices are dedicated to drums and percussion. Thus, even if you don't use the drums, you get 20-voice polyphony for melody and harmony parts. This complies with the GM



By sacrificing sound-editing features and eschewing bells and whistles, Kawai brought its KC20 General MIDI keyboard synth to market at a very low price.

The Case Specialists

Medium to Heavy Duty Cases Available for Keyboards, Mixers, Guitars, Rack Mount Equipment and More!

Call for pricing on standard or custom designed cases!

DISCOUNT DISTRIBUTORS

800-346-4638 (In NY) 516-563-8326

MIDI-QUIZZER

Finally.... An Authoring System made JUST for MUSIC TEACHERS

- Create your own lessons
- Runs with MS WINDOWS!
- Accuracy & Timing Testing
- Ear training & theory skills
- Computer based testing
- Complete record keeping
- Plays and Records MIDI files
- Imports PCX/BMP graphics
- Sound effects and WAV files
- Use ANY MIDI device !

Only $299, Amex, MC, Visa

Data Assist, Inc.

659 Lakeview Plaza, Suite H
Columbus, OH 43085
800-326-8088 614-888-8088

World Radio History

Level 1 specification, which requires a minimum of 24 voices, and it allows these to be configured as sixteen dynamically allocated voices for melody and eight for percussion.

The only onboard effect is minimalist reverb. Six preset reverb algorithms are provided. You make your choice as a system setting, along with a value for predelay time. All parts are processed by the same algorithm; your only other control is the depth (low or high) for each Section (Kawai's term for a multitimbral part, discussed shortly). Having only two fixed depths for all parts is severely limiting, especially because there is no control over the wet/dry mix.

The six reverb algorithms are not documented, and they sound almost the same. Amazingly, Kawai's representative could offer no details about them. The reverb processor's sound quality is adequate, and it adds presence to the sounds, so it accomplishes its basic purpose. Still, this function is disappointing.

COMPOSE YOURSELF

The KC20 has two operational modes: Compose and Performance. In Compose mode, the synth supports multitimbral recording and playing songs with an external sequencer. Performance mode is designed for live play, allowing two Tones to be layered and/or split within a single Patch. A button toggles between the modes.

Compose mode provides sixteen Sections, each of which is equivalent to one instrument, with the selected Tone and a set of control parameters. Each Section responds on its factory-set MIDI channel, which is a questionable constraint. Most other General MIDI modules let you assign parts to any MIDI channel; in many cases, you can even assign multiple parts to one channel to create composite "virtual" instruments.

Sound selection is limited to one of the preset Tones or drum sets. Beyond that, the KC20 offers eight controls at the Section level. These include level, pan, reverb depth (high or low), transpose (±2 octaves), tuning (±50 cents), and pitch-bend range (up to ±12 semitones). The Modulation Depth Sensitivity parameter controls how a Section responds to the mod wheel and governs how vibrato responds to Pressure. The eighth Section parameter determines whether each Section is on, off, or soloed.

The KC20 synthesizer also offers a Setting function, which lets you set the eight control parameters identically for up to sixteen Sections. The KC20 stores sixteen Settings, which can be used to instantly set up the synthesizer for a given song.

An alternative way to expedite setup is with the Snapshot function. This system-level feature sends a string of MIDI messages, including Bank Select, Program Change, Volume, and Pan for each Section. Recording this information at the beginning of a MIDI sequence lets you automatically set up each Section before starting into the song, which is very handy.

Each Section always receives on its respective MIDI channel. However, the keyboard's MIDI output can be routed to external devices on the channel of the currently active Section or the KC20's basic channel. The output routing and basic-channel assignment are system-level parameters.

SPECIAL FUNCTIONS

Two special real-time functions are available only in Compose mode: Octave Jump and Quick MIDI. Octave Jump can globally transpose the sounds of all sixteen Sections up or down by one to three octaves. Only internal sounds are affected; the keyboard still sends the MIDI notes as played, and data coming from the computer interface or MIDI In port play without change. It seems odd that octave transposition is provided in Compose and not Performance mode. I would be more likely to use it on stage, especially because it can't be captured in a sequence.

Quick MIDI provides a facile means of sending Program Change, Volume, Pan, or an assignable MIDI Control Change (0 to 119, specified as a system parameter) to an external device. It doesn't send Bank Select, though, which is a drag. Use the edit buttons to select a MIDI channel and message type, then press the ±1 and ±10 buttons to send that message with the desired value. Because each button press sends a separate value, you may have to send a series of intermediate values to reach the one you want. This aspect of Quick MIDI seems more clumsy than quick.

On the up side, using the mod wheel instead of the buttons allows smooth, continuous changes, which is useful for dynamic panning and volume fades. Although Quick MIDI only communicates with external devices, connecting the KC20 to a sequencer with its MIDI Echo (or equivalent command) enabled loops the messages back into the synth, where they can affect the internal sounds.

PEAK PERFORMANCE

In Performance mode, the KC20 acts as a 2-oscillator synth. All MIDI output in Performance mode is directed to a single basic channel, which is specified as a system parameter. Similarly, all messages except those on the MIDI basic channel are ignored. The KC20 supports Local On/Off to divorce the keyboard from the tone generator, which lets you play an external MIDI synth from the keyboard while a computer plays a sequence with the KC20's internal voices.

Only two Sections are available in Performance mode. However, you can set the low and high keyboard range and enable/disable Sustain (Control Change 64) separately for each Section. The Velocity switch parameter specifies how a Section responds to Note-On Velocity relative to a system-level threshold value. Notes can play at all times, or only when the Velocity is above or below the threshold. By combining keyboard zones and Velocity switching, you can create different types of splits and layers. The manual includes a number of examples to get you started.

A Mode control lets you turn each Section on and off and apply four different MIDI effects. In the latter category, you can double each note an

Product Summary

PRODUCT:
KC20 GM Synthesizer
PRICE:
$699
MANUFACTURER:
Kawai America Corp.
2055 E. University Dr.
Compton, CA 90220
tel. (310) 631-1771
fax (310) 604-6913

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

World Radio History

octave higher or add an interval of plus *and* minus six cents, twelve cents, or two octaves. (Doubling six or twelve cents above and below provides MIDI chorusing.) The MIDI processing only works with internal sounds; extra notes are not transmitted to the MIDI Out. Handle this feature with care: Because it adds two extra notes (one above and one below), you can eat up polyphonic voices in a hurry.

The combination of Tones and settings for the two Sections constitutes a Patch. The KC20 holds 64 Performance-mode Patches, stored as eight Banks of eight Patches each. Thus, the Patches are numbered 11 to 18 (Bank 1, Patches 1 to 8), 22 to 28, and so on, up to 88. This ancient program-numbering method is counterintuitive; it's too bad Kawai didn't include 0 and 9 buttons.

Patch selection can be clumsy at times. The ±10 buttons scroll through the Banks, and you select Patches within the Bank with eight Edit buttons that are preassigned to Patches 1 through 8. Unfortunately, you must punch the ±10 buttons repeatedly to increment or decrement the Bank number (for example, to get from Bank 1 to Bank 4, you hit the +10 button three times. This sometimes forces you to step through Banks to reach the desired Patch, instead of making a direct selection. Given the existing hardware, I'd rather use the eight Patch buttons in a fast 2-press sequence: The first press could select the Bank and the second could select the Patch within that Bank.

SOUNDS

As mentioned earlier, the KC20 provides 160 preset Tones and seven drum kits. The first 128 Tones fill the General MIDI timbre palette, and the additional 32 are pretty much more of the same. Many of the Tones are a bit thin and overly bright as solo instruments. They improve significantly in ensemble play, but still lack bottom. There are also fewer timbral dynamics than in the Roland Sound Canvas series of GM modules. Once triggered, the Tones often remain quite static in character. Fortunately, the synth is very quiet, although a few Tones have some grunge in the sample.

The pop sounds come off the best. The pianos, basses, guitars, synth leads, and solo brass and saxes are good for background lines, although most aren't strong lead voices. The organs are okay for backing tracks, but lack sufficient punch for a strong rock lead. The basic string sounds are good. This provides an adequate set of core sounds for most Top 40 music needs.

Things start to come apart with ensembles, string effects, and orchestral percussion. The tremolo strings has one of worst loops I've ever heard and should be ditched. The pizzicato strings has slapback instead of a clean hit. The harp's release envelope goes on so long that notes smear together in glissando runs. The timpani has a pronounced ringing at the end, a problem that also plagues most of the cymbal sounds in the drum kits. Fortunately, these Tones are less likely to be used than the pop Tones.

The drum kits follow a similar pattern. The standard fare come off much better than the specialty sounds. The snares are good, with bass and toms just a little behind. At the other end are lame ducks such as the bell tree and a drum roll that sounds like industrial noise.

BOTTOM LINE

Overall, Kawai has delivered on their promise of bang for the bucks by keeping the price low. While each individual component reflects tradeoffs of capability for cost, the overall package delivers an integrated keyboard, General MIDI tone generator, and computer interface that will meet the beginning needs of many novice or hobbyist users. In addition, the KC20 is the only strap-on MIDI controller with an onboard wavetable synth. All you need is an audio feed.

On the other hand, the sound quality is not up to most General MIDI modules, and there is no way to expand or edit the tone palette. The effects are minimal, and the user interface is awkward at times.

If you can afford to spend more—say, in the $1,300 and up range—you can do better. But if you're a newcomer to electronic music and want to dip your toe in the water, the KC20 will get you started at a price that won't make you wince.

Jim Pierson-Perry *is a clinical chemist and musician. He's still waiting with coffee and jelly doughnuts for the final episode of* Twin Peaks.

Circle #441 on Reader Service Card

BEECH'S
Midi Mail Order Software
144 W. Eagle Rd.
Havertown. Pa. 19083
(USA) 800-321-6434 (CAN)
(215-896-2424)

SAW
Software Audio Workshop

** If You Own a 16 bit digital recording card with a Windows driver **
With Saw you can easily:
Overlay vocals over music.
Add in sound effects.
Assemble complete albums.
Recommended cards :
Card D+
Turtle Beach Monterey
Sound Blaster 16
Call for Pricing !

Music Quest
Twelve Tone

Midi Interfaces:
Music quest 2 port SE
Music Quest PC Midi Card
Note 1 +/Note 1 - Laptops & desktops
We have Mac & Atari Products too !!
We Sell Cakewalk !

We ship worldwide !!
FAX 215-896-4414

professional
Audio Supplies
immediate shipment
QAR1/6b
AMPEX BASF maxell TDK 3M
labels
cassette boxes
albums
CD packaging
reels and boxes
ask for our free PolyQuick catalog
Chicago
(708) 390-7744 Fax: 390-9886
Los Angeles
(818) 969-8555 Fax: 969-2267
PolyQuick
1243 Rand Road, Des Plaines IL. 60016
16018-C Adelante Str. Irwindale CA 91702

World Radio History

Aphex 105 Gate and 106 Compressor

By Buddy Saleman

These moderately priced sanity-savers help clean up your act.

Even under the best conditions, electrical noise and out-of-control signals can be a problem. Nasty amp noise and lip-smacking vocalists with no dynamic control can be an engineer's nightmare. Punch, wipe, punch, wipe, argghhh! Gates and compressors help tame these sonic stinkers and let you focus on the actual recording of the material.

Over the years, Aphex has created a long line of products that help you avoid becoming a glorified audio janitor. Among their latest efforts are the Model 105 4-channel gate and Model 106 Easyrider 4-channel compressor. Both are cost effective and easy to use, though the 106 proved easier to use in some common applications than others.

The Aphex Model 105 4-channel noise gate is versatile, sounds good, and is easy to use. It's a winner all around.

The two models are built to last. A single PC board is solidly mounted inside a metal casing, ensuring roadworthiness. Even the sturdy, black knobs could probably survive a whipping. Unfortunately, the 1U rack-mount units use the dreaded external power supplies, and they lack power switches. The front-panel layout of both units is very simple, which translates into ease of use.

MODEL 105 GATE

Gates are a must for any serious recordist. They help eliminate horrible extraneous noises, such as lip-smacking, amp hiss, headphone bleed, and the like. Gates give your mix the tight, clean sound radio stations and record companies dearly love.

The Model 105 offers four independent gates, each with a control for Threshold (-50 to +20 dB), Attack (200 µs to 120 ms), Hold (1 ms to 1s), and Release (100 ms to 4s). There is an LED for gate status (open/closed) and one that indicates the presence of an external key signal. (The key input lets an external signal trigger the gate.)

There is also a 6/90 dB button, which sets the amount of attenuation when the gate is closed. The 90 dB setting is great when you want to completely shut down the audio, such as when gating a snare drum or sound effect. A more organic attenuation is produced by the 6 dB setting, because vocals and instruments are allowed to decay somewhat naturally. When you use the 6 dB setting, some unwanted sounds will trickle through, but it's a wonderful option when the hard "on/off" sound of a gate shutting and opening is more annoying than a touch of hiss or background noise.

The back panel holds ¼-inch, balanced inputs and outputs for each channel. The gate also can be run with unbalanced lines if necessary. A +4/-10 dB operating-level switch and a ⅛-inch key input are also included.

The 105 proved easy to work with, and I was very pleased by its sound. This is a pristine machine that does not degrade audio signals or add unwanted coloration. On tracking sessions, it handled vocals and guitars beautifully, taking out the garbage and leaving a smooth, clean track.

For mixdown, I placed it on the kick, snare, and bass. For the bass, it did a fine job, getting rid of the head and tails noise. For the snare track, I was able to tune out the tom and hi-hat bleed and center in on the snare impact. I had a harder time isolating the kick drum, so I used the 105's key function. This feature allows you to run a "Y" cable from the mixer channel and simultaneously route the input signal to an outboard graphic (or parametric) EQ *and* the 105's audio input. The user simply tweaks the kick frequencies in the equalizer, attenuates the tom frequencies to diminish their impact, and connects the output of the EQ to the 105's external key input. The equalized signal triggers the gate differently, allowing the kick to punch through while shutting down the toms. It seems almost nothing can stop the 105 from doing its job.

My favorite feature, however, is one I can't even tweak. The 105's Logic Assist circuitry stops annoying gate "chatter" caused by false triggering, because the logic chip forces the gate to open regardless of the user-set attack time. In tandem with the 105's adjustable controls, the circuit's ability to open on whippet-quick transients can produce some cool sound effects. For example, by slowing the 105's attack rate, opening up the Hold control, tweaking the console EQ, and adding a short plate reverb, I was able to transmogrify a kick drum into a very trippy record-scratch sound.

MODEL 106 COMPRESSOR

Compressors provide powerful control over a signal's dynamic range, which is great for helping vocalists with poor mic technique, drummers who hit inconsistently, and so on. Some home recordists aren't clear on the compression concept, so attack and threshold knobs can be a bit intimidating. You still have to negotiate these parameters on the 106, but it has a straightforward, user-friendly design

Product Summary

PRODUCT:
Model 105 4-Channel Logic Assisted Gate

PRICE:
$449

MANUFACTURER:
Aphex Systems
11068 Randall St.
Sun Valley, CA 91352
tel. (818) 767-2929
fax (818) 767-2641

EM METERS	RATING PRODUCTS FROM 1 TO 5
FEATURES	● ● ● ●
EASE OF USE	● ● ● ● ●
DOCUMENTATION	● ● ● ●
VALUE	● ● ● ●

World Radio History

The Aphex Model 106 Easyrider 4-channel compressor is designed for semiautomated operation. It's extremely easy to use for some applications, but the tradeoff is a lack of precise control and versatility.

that should calm even the most naive musician.

The 106 has four mono channels of compression, which can be linked as two stereo pairs. Each channel contains Drive and Output knobs, an On/Off (bypass) switch, and a 10-segment LED that displays gain reduction in 2 dB steps. An unusual, 2-position Process switch controls the compressor's attack and release. In Fast position, you get a tighter, punchier sound, while the Slow position is more transparent. This switch makes timbral adjustments a snap.

Two Link buttons combines compressors 1 and 2 and compressors 3 and 4, giving you two stereo compressors. The unit takes the loudest signal from either side and squashes both sides by the amount set for the louder channel. However, all the other controls, such as the Drive and Output, work independently, so it's not a true stereo link.

On the back panel, the setup is similar to the 105. You get a ¼-inch input and output for each channel and a +4/-10 dB operating-level switch.

The 106 acts sort of like a compression autopilot, which is probably why it's called the "Easyrider." For example, the Drive control not only sets the amount of compression, it also acts as an input gain control. Easy! It seemed that I was able to dial in effective settings within seconds.

I used the 106 compressor for a live *a cappella* show and was pleased to find that it "minded the store" very well. It kept a good handle on all the levels and let nothing get out of hand. For mixing and tracking in the studio, it proved useful for instruments that didn't require comprehensive tweaking, such as bass, synths, and drum machines.

The 106 produces a punchy sound, without much coloration. In fact, the 106 is so transparent, that massive compression doesn't *sound* like massive compression. The lack of breathing and pumping is great, but I have to admit I sometimes missed the sound of a brutally compressed signal.

CONCLUSION

The Aphex 105 is an excellent unit. It sounds great, it's versatile, and it does its job without putting you through a lot of changes. I would use it in any setting, on any instrument, and have no misgivings.

The 106's nearly automatic operation is a boon to inexperienced (but learning) recordists, as well as professionals who need a quick, dependable "signal minder." The tradeoff, of course, is a lack of versatility. If you're a compression zealot, the Aphex 106 may not be your primary machine. But every hip home studio should have more than one compressor, and whether the 106 becomes your primary or secondary unit, it certainly deserves a place in your rack. ●

Circle #442 on Reader Service Card

Product Summary

PRODUCT:
Model 106 Easyrider 4-Channel Compressor
PRICE:
$449
MANUFACTURER:
Aphex Systems
11068 Randall St.
Sun Valley, CA 91352
tel. (818) 767-2929
fax (818) 767-2641

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

MIDI SEQUENCES
MORE HOT LICKS IN EVERY BYTE!
TRAN TRACKS MIDI SEQUENCES
If you want faithful reproduction and unparalleled accuracy in MIDI programming, then you want the live-music sound of TRAN TRACKS MIDI Sequences.
With TRAN TRACKS you get quality service, great prices and a large selection of popular songs. We support all computer formats and most dedicated sequencers.
Experience the MIDIgroove™— it's "music-friendly!"
Call today and play tomorrow. 5 songs or more only $10.00 each.
ORDER LINE
1-800-473-0797
Fax (201) 383-0797
Technical Support
(201) 383-6691
Empire State Building
350 Fifth Ave. #3304, Dept. EM092
New York, NY 10118
TRAN TRACKS
MIDI SEQUENCES
AUSTRALIA: • Rhythmic Bytes • 383 Sydney Rd. Ste 6, Top Fl. Balgowlah, NSW 2093 • Tel. 02-948-4025 • Fax 02-948 4059
UK • Hands On • 3 Bull road, Cosham, Portsmouth, Hamshire, UK PO6 3NX • Tel. (0705) 221162 • Fax (0705) 382865

THE PROJECT STUDIO EXPERTS
CALL TODAY FOR A FREE CONSULTATION
203.442.9600
CARUSO MUSIC
all major brands • sales & service
20 Bank Street
New London, CT 06320
203.442.9600
203.442.0463 (FAX)

World Radio History

ADVERTISER INDEX

Advertiser	Reader Service #	Page
Ace Music Center	-	117
AKG (WMS 900)	-	73
AKG (Vintage TL)	-	17
Alesis Dream Studio Sweepstakes	502	82-83
Alesis (Q2)	503	97
Alesis (S4)	504	13
American Educational Music Publications	501	95
Aphex Systems	505	69
Arboretum Systems	506	118
Ashly	507	16
BASF	508	21
BeBop Systems	509	135
Blue Ribbon SoundWorks, Ltd.	510	68
Caruso Music	511	145
Century Music Systems	512	127
Computers & Music	513	104
Cool Shoes (Drum Patterns)	514	123
Crown	515	29
Data Assist	516	141
dbx Professional Products	-	24
DGS Pro-Audio	517	149
Digidesign	-	57
Disc Makers	518	129
Discount Distributors	519	141
DrumTrax	520	81
Ebtech	521	129
Effective Video Solutions	522	151
Electro-Voice (EV)	523	89
EMAGIC	524	76-77
E-mu Systems	525	84
Ensoniq (ASR-10)	526	99
Ensoniq (KT-76)	527	38-39
Ensoniq (TS-10/TS-12)	528	11
Europadisk	529	44
Eye & I Productions	530	133
Fatar/Music Industries	-	40
Five Pin Press	531	94
Fostex	532	31
Full Sail Center for the Recording Arts	533	36
Furman Sound	534	93
Golden Ears	-	105
Goodman Music	535	135
HHB Communications Ltd.	536	108
Howling Dog Systems	537	103
Ilio Entertainments	538	34
Imaja	539	149
Kawai	540	75
Korg	541	14-15
Kurzweil Music Systems	542	163
Leigh's Computers	543	143
Lexicon	544	61
Lil' Johnny Enterprises	545	151
Lyrrus (G-VOX)	546	107
MacBEAT	547	128
Mackie Designs	548	2-3
Mark of the Unicorn	549	164
MIDIMAN	550	63
MIDIWARE Systems	551	139
Mix Bookshelf	552	118, 135
Mix Bookshelf	553	137, 153
Mix Bookshelf	554	161
Music Annex Duplication	555	139
Musician's Friend	556	59
Music Quest (NOTEable)	557	71
Music Quest (MIDI Strip/FrameLock)	558	81
Music Quest (PC MIDI Card)	559	113
NRI/McGraw Hill	-	19
Oberheim	560	60
Oberheim #2	561	92
Oberlin College Cons. of Music	562	86
Opcode	563	7
OSC	564	127
The Pan Network	565	62
Passport	566	22-23
Peavey Electronics	567	45
Personal Composer	568	112
PG Music (Power Tracks Pro)	569	121
PG Music (Band-In-A-Box)	570	42-43
PolyQuick	571	143
QCA	572	117
Quik Lok/Music Industries	-	12
Quik Lok/Music Industries #2	-	119
Rane Corp.	573	111
Recording Ind. Information Services (RIIS)	574	90
Rhythm City	575	94
Rich Music	576	133
Rock & Roll Music	577	131
Roland (JV-90)	578	8-9
Roland (S-760)	579	52-53
Sam Ash Professional	-	137
Shure	580	55
SongWright Software	581	153
Sound Quest	582	41
SoundTech	583	115
Soundtrek	584	35
Soundware	585	131
Speir Music	586	96
Starr Switch	587	86
Steinberg/Jones	588	48
Sweetwater Sound	589	125
Sydney Urshan Music	590	96
Taxi	591	122
TB Systems	592	113
Thoroughbred Music	593	112
3M Corporation	594	70
Tran Tracks	595	145
Turtle Beach Systems	596	100
Twelve Tone	597	37
Twelve Tone #2	598	91
West L.A. Music	599	123
Yamaha	600	67

RATE THE ARTICLES IN THIS ISSUE!

OCTOBER 1994

We want to know what you think of the articles in *Electronic Musician!* Now you can use your reader service card to give us feedback about **EM**'s editorial coverage. We have assigned a rating number to each of the main articles in this issue. Please select a rating for each article and circle the appropriate number on your reader service card:

Please select ONE rating number per article	Very Helpful	Somewhat Helpful	Not Helpful	Didn't Read
a. "Cover Story: Magical Musical Tours," p. 46	701	702	703	704
b. "Diving into Digital," p. 64	705	706	707	708
c. "Noise Killers," p. 78	709	710	711	712
d. "Square One: Shift Happens, ", p. 88	713	714	715	716
e. "Multimedia Musician: Quick Time 2.0," p. 98	717	718	719	720
f. "Recording Musician: DAT Mastering at Home," p. 106	721	722	723	724

World Radio History

FREE Information!

FOR READERS OF Electronic Musician

FOR FREE INFORMATION ABOUT PRODUCTS ADVERTISED IN THIS ISSUE, USE THESE READER SERVICE CARDS.

1 Circle the reader service numbers on the card that correspond to each advertisement or article listed in the index on the opposite page.

2 Print your name and address on the card and answer ALL questions below.

3 Affix a stamp and mail!

IMPORTANT NOTICE TO READERS: Reader service inquiries are mailed directly to the advertiser, who is solely responsible for sending product information. *Electronic Musician* cannot guarantee response from all advertisers.

Electronic Musician 6400 HOLLIS ST. #12, EMERYVILLE, CA 94608
ISSUE: OCTOBER 1994 CARD EXPIRES: JANUARY 1, 1995.

NAME

ADDRESS

CITY/STATE/ZIP PHONE #

1 ARE YOU CURRENTLY A SUBSCRIBER TO ELECTRONIC MUSICIAN?
01. ☐ Yes 02. ☐ No

2 PLEASE CHECK THE ONE BEST DESCRIPTION OF YOUR MUSIC INVOLVEMENT:
03. ☐ Full- or part-time pro musician
04. ☐ Aspiring professional musician
05. ☐ Recreational or amateur musician
06. ☐ Other

3 PLEASE CHECK THE ONE BEST DESCRIPTION OF YOUR RECORDING INVOLVEMENT:
07. ☐ Record in a professional studio only
08. ☐ Record in both pro and home/project studios
09. ☐ Record in a home/project studio only
10. ☐ Have not recorded yet

4 WHICH ONE OF THE FOLLOWING IS YOUR MAIN COMPUTER USED FOR MUSIC?
11. ☐ Apple Macintosh Plus, Classic, SE, SE/30, or LC
12. ☐ Apple Macintosh II series or Quadra
13. ☐ Atari ST or TT
14. ☐ Commodore Amiga
15. ☐ IBM PC or compatible
16. ☐ Other brand _____
17. ☐ Don't use a computer for music

5 WHAT IS YOUR CURRENT INTEREST OR INVOLVEMENT IN MULTIMEDIA?
18. ☐ Creating multimedia projects
19. ☐ Using commercial titles (interactive, reference materials, presentations, etc.)
20. ☐ No current interest/involvement

RATE THE ARTICLES!

EDITORIAL INFORMATION							
401	407	413	419	425	431	437	443
402	408	414	420	426	432	438	444
403	409	415	421	427	433	439	445
404	410	416	422	428	434	440	446
405	411	417	423	429	435	441	447
406	412	418	424	430	436	442	448
ADVERTISER INFORMATION							
501	520	539	558	577	596	616	635
502	521	540	559	578	597	617	636
503	522	541	560	579	598	618	637
504	523	542	561	580	599	619	638
505	524	543	562	581	600	620	639
506	525	544	563	582	601	621	640
507	526	545	564	583	602	622	641
508	527	546	565	584	603	623	642
509	528	547	566	585	604	624	643
510	529	548	567	586	605	625	644
511	530	549	568	587	607	626	645
512	531	550	569	588	608	627	646
513	532	551	570	589	609	628	647
514	533	552	571	590	610	629	648
515	534	553	572	591	611	630	649
516	535	554	573	592	612	631	650
517	536	555	574	593	613	632	651
518	537	556	575	594	614	633	652
519	538	557	576	595	615	634	653
RATE THE ARTICLES IN THIS ISSUE! SEE FACING PAGE FOR DETAILS.							
701	704	707	710	713	716	719	722
702	705	708	711	714	717	720	723
703	706	709	712	715	718	721	724

Electronic Musician 6400 HOLLIS ST. #12, EMERYVILLE, CA 94608
ISSUE: OCTOBER 1994 CARD EXPIRES: JANUARY 1, 1995.

NAME

ADDRESS

CITY/STATE/ZIP PHONE #

1 ARE YOU CURRENTLY A SUBSCRIBER TO ELECTRONIC MUSICIAN?
01. ☐ Yes 02. ☐ No

2 PLEASE CHECK THE ONE BEST DESCRIPTION OF YOUR MUSIC INVOLVEMENT:
03. ☐ Full- or part-time pro musician
04. ☐ Aspiring professional musician
05. ☐ Recreational or amateur musician
06. ☐ Other

3 PLEASE CHECK THE ONE BEST DESCRIPTION OF YOUR RECORDING INVOLVEMENT:
07. ☐ Record in a professional studio only
08. ☐ Record in both pro and home/project studios
09. ☐ Record in a home/project studio only
10. ☐ Have not recorded yet

4 WHICH ONE OF THE FOLLOWING IS YOUR MAIN COMPUTER USED FOR MUSIC?
11. ☐ Apple Macintosh Plus, Classic, SE, SE/30, or LC
12. ☐ Apple Macintosh II series or Quadra
13. ☐ Atari ST or TT
14. ☐ Commodore Amiga
15. ☐ IBM PC or compatible
16. ☐ Other brand _____
17. ☐ Don't use a computer for music

5 WHAT IS YOUR CURRENT INTEREST OR INVOLVEMENT IN MULTIMEDIA?
18. ☐ Creating multimedia projects
19. ☐ Using commercial titles (interactive, reference materials, presentations, etc.)
20. ☐ No current interest/involvement

RATE THE ARTICLES!

EDITORIAL INFORMATION							
401	407	413	419	425	431	437	443
402	408	414	420	426	432	438	444
403	409	415	421	427	433	439	445
404	410	416	422	428	434	440	446
405	411	417	423	429	435	441	447
406	412	418	424	430	436	442	448
ADVERTISER INFORMATION							
501	520	539	558	577	596	616	635
502	521	540	559	578	597	617	636
503	522	541	560	579	598	618	637
504	523	542	561	580	599	619	638
505	524	543	562	581	600	620	639
506	525	544	563	582	601	621	640
507	526	545	564	583	602	622	641
508	527	546	565	584	603	623	642
509	528	547	566	585	604	624	643
510	529	548	567	586	605	625	644
511	530	549	568	587	607	626	645
512	531	550	569	588	608	627	646
513	532	551	570	589	609	628	647
514	533	552	571	590	610	629	648
515	534	553	572	591	611	630	649
516	535	554	573	592	612	631	650
517	536	555	574	593	613	632	651
518	537	556	575	594	614	633	652
519	538	557	576	595	615	634	653
RATE THE ARTICLES IN THIS ISSUE! SEE FACING PAGE FOR DETAILS.							
701	704	707	710	713	716	719	722
702	705	708	711	714	717	720	723
703	706	709	712	715	718	721	724

World Radio History

FREE Information!

FOR READERS OF Electronic Musician

PLACE STAMP HERE

Electronic Musician
Reader Service Management Department
PO Box 5323
Pittsfield, MA 01203-5323

PLACE STAMP HERE

Electronic Musician
Reader Service Management Department
PO Box 5323
Pittsfield, MA 01203-5323

Fill out and send the attached card for FREE information on products advertised in ***Electronic Musician***! See other side for details.

World Radio History

Tech 21 SansAmp PSA-1

By Michael Molenda

Is it live, or is it an amp emulator?

Tech 21 knows guitar players. Sure, sound is important. Guitarists sweat bullets trying to achieve their vision of the ultimate guitar tone. But looks count, too, and the company's PSA-1 is one of the sexiest boxes to slither into an equipment rack. The 1U rack-mount frame boasts a gleaming silver front panel and the coolest knobs I've ever seen on a signal processor. The design is a near-perfect cross-pollination of Frank Lloyd Wright, Studebaker, and the Jetsons. In short, it's a beauty.

But the SansAmp PSA-1 is more than just a pretty faceplate. The active, FET-based tube-amp emulator allows you to plug directly into a mixing console, P.A. system, or power amp and explode with the sounds of raging guitar and bass amps.

FAMILY TREE

The original floor-pedal model (reviewed in the August 1991 **EM**) is now called the SansAmp Classic and retails for $345. A stripped-down model, the GT2, costs $195. But the SansAmp really entered the power-user ranks with SansAmp Rackmount ($595), which offered comprehensive tonal control. The PSA-1 shares the timbral parameters of the Rackmount and adds presets, programmability, and MIDI control for $795. You can choose from 49 factory programs designed to emulate classic guitar and bass amps, or store your own creations into 49 memory locations. There are also two bypass programs (00 and 50).

The PSA-1's front panel is a temple of form and function. No nested parameter screens or multifunction keys slow down this baby. You get a ¼-inch input jack, eight knobs, a huge LED screen, a recessed Save button, and program increment and decrement buttons. That's it.

Functions are identified with stark, black lettering that harkens back to the funky controls of the rocket ships in 1950s "B" movies. The tone and output knobs are labeled with guitar lingo, rather than engineer-speak: Pre-Amp (preamp tube distortion); Buzz (low-end overdrive); Punch (midrange overdrive); Crunch (upper-partial harmonic content); Drive (power-amp distortion); Low (±12 dB of fixed, low-end EQ); High (±12 dB of fixed, high-end EQ); and Level (master output control). Diamond marks on selected controls indicate unity gain (no boost or cut), which is a nice touch.

The rear panel is as well laid-out as the front, with all connections clearly labeled in neat graphic boxes. Next to the IEC connector for the internal (hurray!) power supply is the MIDI box that offers Thru/Out and In jacks. A ¼-inch jack accepts an optional momentary footswitch. (Tech 21's Model FSP is $24.95.) The PSA-1 has a stereo pair of XLR outputs and a stereo pair of ¼-inch outputs. Both output pairs are switchable between 0 dB (line level) and -10 dB (instrument level). This is another thoughtful feature: You can run direct into the P.A. system *and* into a stereo power amp to drive two on-stage speaker cabinets.

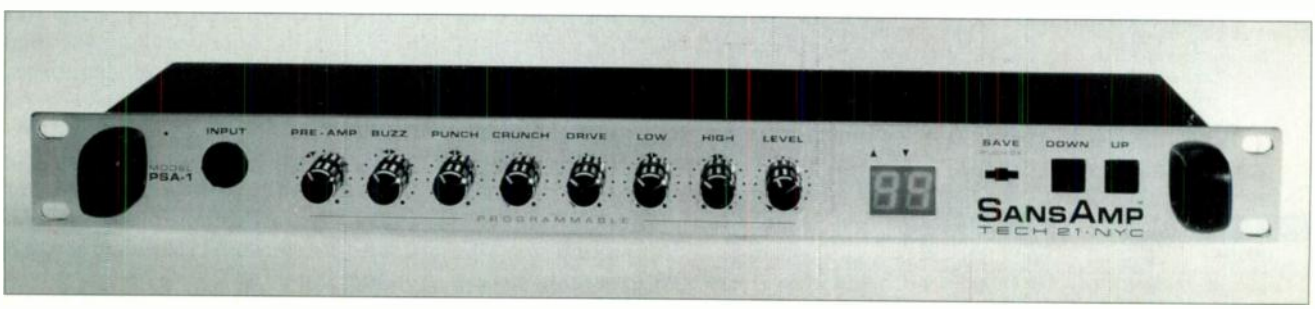
An effects loop with a ¼-inch mono send and ¼-inch left/right returns lets you insert your favorite effects into the signal chain. (The right return jack is used for mono.) A 50/50 switch routes the PSA-1 signal to both the effects loop and the main ¼-inch and XLR outputs. This means you can run your effects processor 100% wet and create your wet/dry mix within the PSA-1. When the switch is disengaged, the PSA-1 signal is only sent to the effects loop. (The effects loop send is muted when a bypass program is selected.)

Finally, a supplemental input allows you to leave the PSA-1 plugged into a mixer or patch bay for quick and easy studio use. This input is bypassed whenever you plug into the front-panel input.

PROGRAMMING

The first time I used the PSA-1, I operated *SansManual* and was able to tweak and save patches without making any fatal mistakes. Programming is intuitive, and you even get failsafes! If you feel you're making a mess and want to get back to a parameter's preset point, an ingenious blinking display above the LED brings you back home. The Up arrow blinks when you need to increase the setting, and the Down arrow blinks if you must decrease the setting. When you've zeroed in on the original preset point, the arrows stop flashing and go out. In addition, it's almost impossible to accidentally erase a patch, because the recessed Save button (which is only accessible with a pencil tip, fingernail, guitar pick, or similar instrument) must be pushed twice.

Getting into the PSA-1's MIDI functions requires perusing the manual and negotiating a few button punches, but operation remains simple. The MIDI data dump allows you to transfer your custom presets via SysEx to a sequencer, computer, or another PSA-1. You can set up a different preset file for every album or performance, which is a very cool way to manage your cache of custom sounds. The unit supports



The PSA-1 is the first programmable, MIDI-capable SansAmp, offering 49 presets and 49 user-memory locations in a spiffy, single-rackspace frame.

World Radio History

MIDI Program Change, and you can remap incoming Program Changes to any PSA-1 program. Right now, you cannot use continuous controllers to change parameters in real time, but Tech 21 has promised an upgrade that will add this feature.

A footswitch loop function simplifies live performance setups by allowing you to step through a user-determined series of patches. For example, you could program a four-loop pattern composed of a lead sound, a clean rhythm sound, an overdrive sound, and a fuzz sound. The loop automatically recycles, so you always know where you are, based on how many times you stomp on the footswitch. Shazam! Your most-used sounds are a few foot-taps away, and you don't even have to check out the LED to see where you are. There's also a handy Swap feature that reverses the numerical positions of the factory and custom presets (00 to 49 and 50 to 99). You also can memory-protect user patches.

COWABUNGA CHAOS

The PSA-1 manual includes a list of the unit's presets, describing each sound as a particular amplifier or effect "style." A few of the selections include Marshall JMP-1, Hendrix, Fender Twin, Mesa/Boogie Triaxis, Santana, Ampeg SVT, Pignose, (Vox) AC30 Queen, and Fuzz Face. These designations are, of course, extremely subjective, and I'd take issue with a few of Tech 21's sonic labels. I ended up tossing the preset list, opting to manually step through the numbers until I discovered an interesting sound.

Product Summary

PRODUCT:
SansAmp PSA-1 Amp Emulator
PRICE:
$795
MANUFACTURER:
Tech 21
1600 Broadway
New York, NY 10019
tel. (212) 315-1116
fax (212) 315-0825

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

Switching between programs produces a slight click, but I didn't find this a problem. I never step through different programs while recording, and the cacophony of the stage should mask the clicks when playing live. In the studio, some of the PSA-1's ballsier programs exhibited enough audible hiss to warrant hiss-reduction. However, I also employ single-ended noise reduction when I crank up real amps, because hiss is a fact of life with heavy guitar sounds.

▼

My loyalty to Marshall amps and Les Paul guitars borders on audio bigotry.

Now, as far as amp sounds go, my loyalty to Marshall amps and Les Paul guitars borders on audio bigotry. So I wasn't surprised when my initial run through the presets was somewhat disappointing. However, once I considered the presets as mere *foundations*, I was sold. A few knob twists never failed to tune in something amazing. If I needed a little more this, or a little less that, it was easy to adjust the timbre to my whims.

I used the PSA-1 on several sessions, switching between a Les Paul; an ESP custom Telecaster clone; a Fender Stratocaster; and even a Kramer Ferrington-model, thin-line acoustic/electric. No matter which guitar I used, I was constantly pleased with the aggressive tones the PSA-1 delivered. In addition, responsiveness was comparable to a conventional tube amp. The harder I hit the guitar strings, the grittier the sound became.

In fact, I was so happy with the sounds that I decided to use the PSA-1 on my band's CD project. The box saved the day when I couldn't get the right amp/guitar tone for a punk reggae track. After endless variations of guitars, mics, and mic positions, I decided to give the PSA-1 a shot. You can imagine my surprise when I plugged my Les Paul in, tweaked a few knobs, and found the perfect sound within ten minutes. The PSA-1 didn't work for every track—I'm still partial to the roar of a "real" amp—but it added a vast selection of tonal colors to the project.

Those colors aren't limited to guitar sounds, either. Producer Scott Mathews used the PSA-1 on everything *but* guitar during the recording of Dick Dale's new album, *Unknown Territory* (Hightone Records). Few of the album's drum and bass tracks made it to tape without first being routed through the SansAmp's tonal processing. Taking Scott's lead, I recorded some vocals through the unit. On subtle settings, the PSA-1 added a nice bit of warmth and grit, which really helped vocal tracks beat the clinical resolution of digital tape. The versatility of the PSA-1 is truly awesome.

RIFFING OFF

The PSA-1 is a monster. It's easy to program, looks cool, and sounds amazing. In the home or apartment studio, this box gives you all the shredding, ripping, Godzilla-destroying-Japan timbres you'd never be brave enough to record with a conventional amp/mic combination. (Can you spell e-v-i-c-t-i-o-n?) And that's assuming you owned all the different amps and stomp boxes the PSA-1 emulates. I'd be less inclined to use the PSA-1 live, but this isn't a knock against the unit's sound; I simply prefer the comfort of my trusty Marshall combo.

If you don't need the programmability and MIDI capability of the PSA-1, you can save $200 by purchasing the Rackmount. However, I think the ability to quickly and easily save your customized patches is well worth two bills.

Now for a confession. Being an admitted tube amp-aholic, I once bet one of the SansAmp crew a milk shake (it was a *friendly* wager) that I could always tell the difference between a real amp and their emulation. This was back when the floor-pedal units tended to have a tell-tale electronic edginess. Well, after using the PSA-1 on several tracks of my band's upcoming CD release, I must admit that no one can pick out the authentic amplifier sounds from the emulated sounds. Looks like your next chocolate shake is on me, Dale! ●

Circle #443 on Reader Service Card

World Radio History

Altech General MIDI Sequencer 1.1.1 (Mac)

By Jim Pierson-Perry

A new player storms the entry-level sequencer market.

Unlike the PC platform, with its myriad low-end products, the Macintosh entry-level sequencer market is pretty much dominated by two companies: Opcode Systems and Passport Designs. Challenging this stasis is Altech's new *General MIDI Sequencer* (*GMS*), which provides a wealth of features and an intuitive user interface at a very reasonable price. Don't be mislead by the title; even though some of the features are specific to the General MIDI standard, there are plenty of non-GM features, too.

GMS seems primarily suited for linear, real-time recording, but it offers surprisingly extensive pattern-based sequencing, MIDI data transformations, real-time manipulation of MIDI controllers, and event-list editing.

GETTING STARTED

According to Altech Systems, the program requires a Mac Plus or better, with at least 2 MB of RAM, running System 6.0.7 or later. (I used a IIci with 8 MB of RAM and System 7.1.) A hard drive is necessary, as the program consumes 1.7 MB of disk space. Any Mac MIDI interface can be used, but *GMS* only recognizes sixteen MIDI channels and a single port.

GMS can run under Apple's *MIDI Manager* (included) or default to Altech's proprietary MIDI driver. I had no problems with either configuration, but I typically used the Altech driver, which delivered faultless performance and required minimal CPU overhead. *OMS* is tolerated, but not actively supported. I found no conflicts with any system add-ons, except for the loss of some text characters when using DublClik's *Click Change* user-interface modification utility.

The program's stability is excellent. In keeping with its user-friendly nature, the program comes without copy protection, which is a boon to musicians fed up with dongles, hard-drive authorization, and the like.

Altech provides users with two sources of help are provided: the manual and a separate help program. The manual is well-written and contains many useful application suggestions. A tutorial on editing functions would be appreciated, though. The help program is an online version of the manual that can be printed. There is no context-sensitive help.

You can customize *GMS* to improve your efficiency. A dedicated window (see **Fig. 1**) displays a list of instrument names and their respective program numbers for each MIDI channel.

Although initial assignments are for General MIDI on all channels, data files are provided with program names for 41 popular instruments. If one of your synthesizers is not included, you can easily create a program-name file within *GMS* and save it for future use. Instrument and program assignments are stored as part of the program configuration and can be changed as your system evolves.

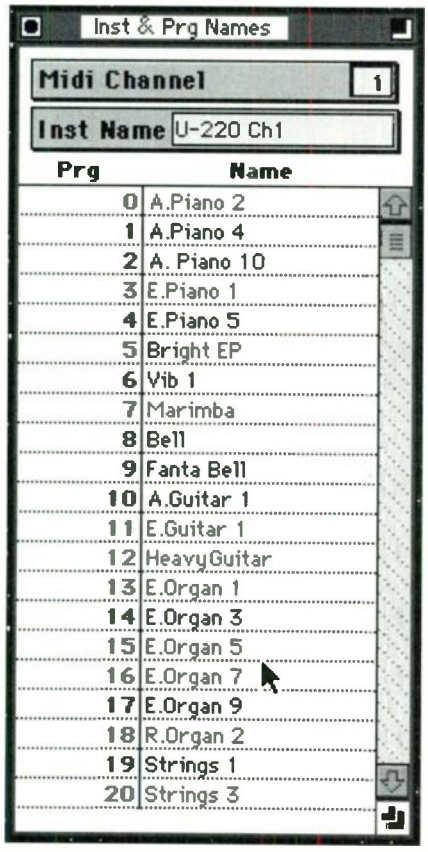
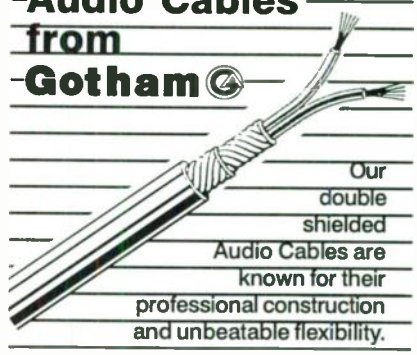


FIG. 1: Customizing *GMS* for your MIDI setup. The Instrument & Program Names window displays the name of each instrument and its respective table of program names assigned to the sixteen MIDI channels.

Superior Audio Cables from Gotham



Our double shielded Audio Cables are known for their professional construction and unbeatable flexibility.

Contact us or our distributors for free samples, application notes and price lists.

DGS PRO-AUDIO

Dealer inquiries invited.

DGS Pro-Audio is Deltron Connectors & Gotham Cable
P.O. Box 170426,
Arlington Texas 76003
1-800-292-2834

Fantastic computer video light shows

Bliss Paint™ for Macintosh®

Interactive with MIDI, sound, and keyboard input, Bliss Paint is an innovative sequencer/performance tool for painting. Create lightshows for music, video and multimedia production. Compose and improvise cutting-edge animated graphics with a huge library of shapes, patterns, and Imaja's powerful color synthesizer. Output live video or QuickTime movies. Call for more info. $79.

imaja

(800) 294-6252

PO Box 6386
Albany, CA 94706 USA

World Radio History

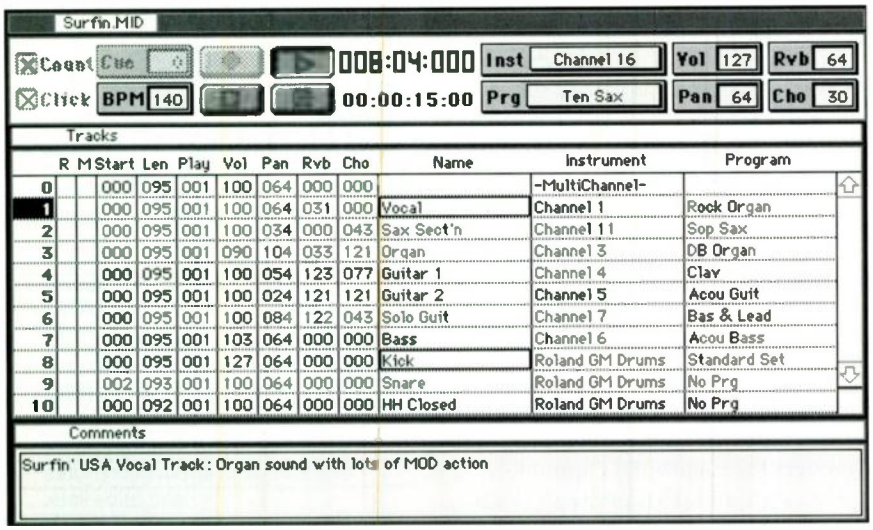


FIG. 2: The Track, Transport, and Comments windows. The array of track controller values can be manipulated in real time with the mouse for playback effects or recorded into the sequence. The Track Name field is highlighted with a box when there is MIDI data in the track.

WINDOWS ON YOUR MUSIC

The user interface is well-designed, with a clean layout and good use of color. Macintosh keyboard commands are provided for a few basic transport operations, but they cannot be triggered through MIDI. *GMS* provides immediate access to primary functions for real-time recording and mixing, while most editing functions require a trip to the menu bar.

The program offers Track, Piano Roll, and List Edit windows. These displays are tightly integrated; changes in one are immediately reflected in the others.

The Track window is based on a familiar track-sheet layout (see **Fig. 2**) and supports up to 128 tracks of 32,000 notes each (memory permitting). Each track can be named and given initial settings for Volume, Pan, Instrument, Program, Reverb Depth, and Chorus Depth. (The latter two are for instruments that support the Roland GS superset of General MIDI.) These settings constantly update during playback. Pan values are specified numerically as 0 to 127, rather than the more intuitive L7 to R7 syntax used in some sequencers.

Tracks can be assigned to play on the MIDI channel specified in the instrument-name field. Alternatively, a track designated as Multitrack plays back on the MIDI channels that were originally recorded. Unlike many sequencers, *GMS* supports multiple MIDI channels on a single track, which lets you merge a full sequence into a single track, or record several players at once, each on different channels. This feature is especially important because only one track can be recorded at a time.

Additional display fields let you solo or mute individual tracks and specify the active track for recording. During playback, tracks with MIDI activity are highlighted with a colored box around the name. Tracks can play through from beginning to end or loop any number of times. Each track can loop separately, with its own starting point and number of repeats.

The Piano Roll window displays one track of note data only (see **Fig. 3**). As usual, pitch is represented on the Y (vertical) axis, and time is represented on the X (horizontal) axis. The display scrolls during playback. Unfortunately, the active track number or name is not shown in the display. (The manufacturer is adding this feature, though.)

In the Piano Roll and List Edit windows, pressing Command-T allows you to change the display to any desired track. A bug prevents using the mouse with this command, but you can type in the track number. (According to the manufacturer, a new dialog box fixes this problem.) Clicking on notes in the Piano Roll window triggers the corresponding MIDI note, providing aural feedback while editing and serving as a poor man's scrub.

Combinations of the Option, Shift, and Command keys turn the cursor into icons for inserting, deleting, and selecting notes, in addition to adjusting note number, start time, duration, or Velocity. Unlike many Macintosh applications, dragging the mouse to select data does not automatically scroll the window. This aspect of the program needlessly limits the potential selection range.

Indicators at the top of the window's grid allow you to set the MIDI channel, Velocity, and duration of inserted notes. Selecting a note displays only its pitch and song position; you cannot see its Velocity, duration, or MIDI channel without going to the List Edit window. This is another annoying limitation.

The List Edit window (see **Fig. 4**) displays a list of MIDI events in a selected track. A pop-up menu of event types lets you insert new entries in the event list. A helpful but limited View Filter lets you restrict which MIDI events are shown: notes, Control Changes, Pressure, Program Changes, Pitch Bend, Tempo, Time Signature, and Track End. The View Filter cannot single out individual Control Changes, though. It's all or none. I'd prefer to see the specified Control Changes and ignore all others.

Unfortunately, *GMS* does not support System Exclusive. This means you can't store synth patches within a sequence, or record SysEx-only parameter changes. However, a companion SysEx bulk librarian is included on the program disk. It can run in tandem with *GMS* and handles patch files of up to 128 KB. The files may be saved to disk and recalled as needed.

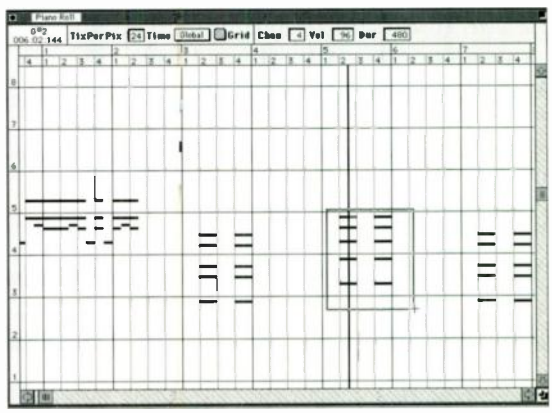


FIG. 3: Note data from a single track are displayed in the Piano Roll window. Mouse-based editing tools let you select and modify the notes. The display scrolls during playback.

World Radio History

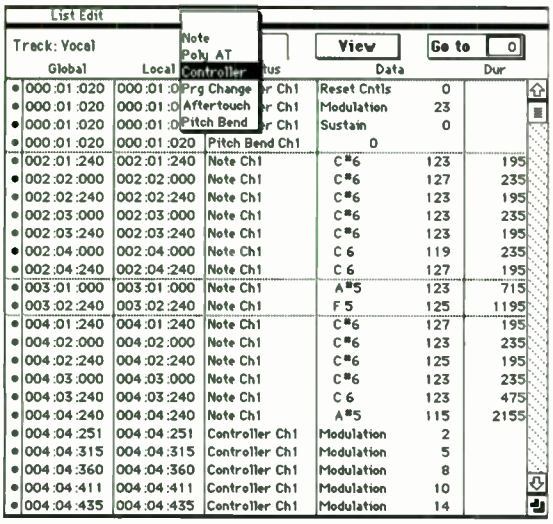


FIG. 4: The List Edit window offers a traditional MIDI event list, one track at a time. A View filter can selectively restrict the display to show only certain types of events.

and remap data on the fly. These transform capabilities are impressive. Notes can be bumped up or down an octave, or remapped entirely through a pitch map. Controller types can be remapped as desired; even the input device's pitch-bend wheel can be remapped to any specified controller. For example, you could do simultaneous real-time mapping of input notes to fall within a given scale, while boosting low Velocities, converting Breath Controller messages to Expression and sending Pan messages with the pitch wheel.

RECORDING

GMS runs at a pro-level resolution of 480 ppqn and offers several options for real-time recording. You can overwrite or merge existing data with new input while running in Linear or Looped mode. The only major omission is punch-in/out. However, there is a workaround: Loop all tracks through the punch interval, record takes of the punch in a fresh track until you're satisfied, then cut-and-paste your clean punch over the original track data. *GMS* also does not chase controllers. The currently displayed settings for controllers and programs are used regardless of the cue point.

Track 0 is reserved as the Conductor track to record tempo and time-signature events. Other tracks can also contain tempo events, but only from imported sequences, because *GMS* does not let you insert tempo events in any track but the Conductor track. Tempo maps must be created using step entry, as there is no provision for recording tempo changes in real time. This is promised for a future version, but for now, it is awkward to create smooth tempo maps, let alone edit events to adjust the rate of change.

A powerful Receive MIDI filter lets you configure *GMS* to ignore certain types of MIDI messages

Recording operations are controlled in the Transport window, with onscreen buttons for Start, Stop, Pause, and Record. Additional controls govern count-off, MIDI click, and tempo (32 to 250 bpm). You also can specify a cue point to start Play/Record. The Transport window displays elapsed time as measure: :beat:tick and SMPTE time (30 fps only). The final group of settings let you direct MIDI Thru data to a specified instrument and program with specified Volume, Pan, Reverb Depth, and Chorus Depth.

One of *GMS*'s strengths is real-time control of the Volume, Pan, Reverb, Chorus, Instrument, and Program settings for each track. Moving the mouse up and down alters the selected parameter's value in real time, much like moving a fader. You can experiment

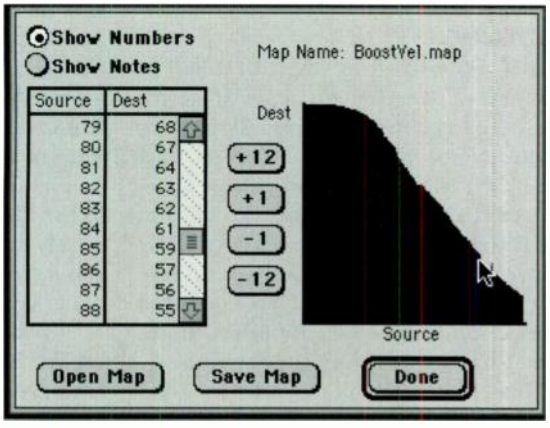
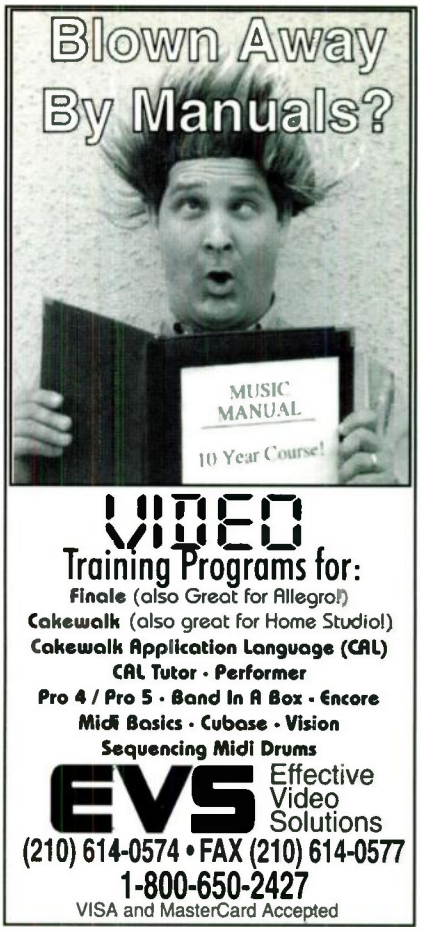
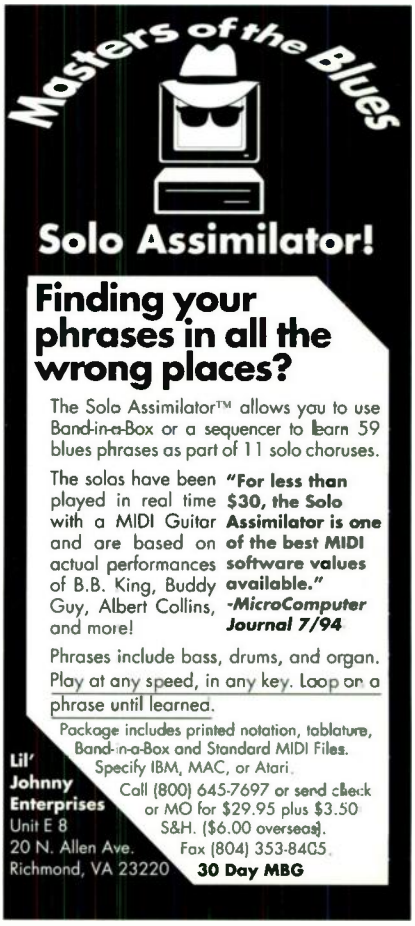


FIG. 5: A map for creating an inverse Velocity curve. You can directly edit the text entries, or use the mouse for graphic editing. Text values can be displayed as note pitches or absolute numbers, depending on your need.





World Radio History

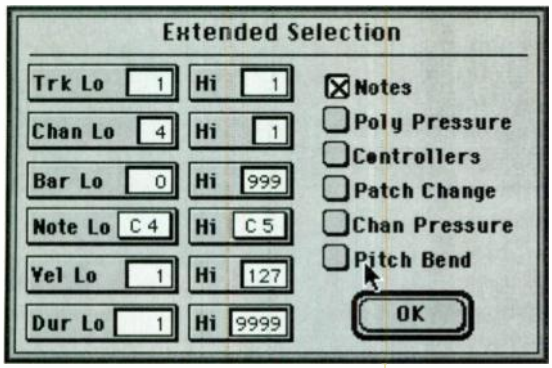


FIG. 6: The Extended Selection dialog box lets you apply a number of logical criteria simultaneously to select track data for editing. Setting the Low value greater than the High value will select all data outside of the criteria range.

with playback changes and actually record your mouse moves.

Holding the mouse button on the Program field opens a pop-up box with all programs for the assigned Instrument. Moving the mouse changes the program while the sequence plays; releasing the mouse completes the selection. Unfortunately, the Bank Select command used by many General MIDI synths is not supported from the Track window. It can be sent only by manually inserting the MIDI message in the List Edit window.

You can easily record parameter changes in an empty track assigned to the target Instrument. Don't like the take? Do it again until you're happy, then merge the controller track with the music track. This works well and is great for final mixdowns, adding dynamic panning and volume changes. Note that these operations only work on tracks set to a single MIDI channel. Support for real-time parameter changes in multichannel tracks is planned for a future upgrade.

Step-time recording by mouse entry is offered to a limited extent through the Piano Roll and List Edit windows. Step entry via MIDI is not supported. Controller data can only be entered one event at a time in the List Edit window, which is a painful drudge and will prove to be a significant limitation for some users. I hope to see graphic controller drawing and editing in a future version of the program. (Altech reports they have now added a graphic Controller Editor.)

GMS lets you save and load individual tracks, or entire sequences, as well as import and export Type 0 and 1 Standard MIDI Files. Type 1 MIDI files are automatically split into individual tracks for each MIDI channel when imported.

MAPS

In addition to the MIDI Receive filter, several other editing functions can utilize maps to transform data. These maps can be used to change data values, as in remapping drum notes or compressing Velocity values, or to change controller types, such as Mod Wheel to Reverb Depth.

Maps are conversion tables between source and destination data; each has a range of 128 possible values. *GMS* displays maps in both text and graphic format. Both forms are easy to create and edit. It's easier to enter drum-note conversions as text values, while you can create an inverse Velocity map with a single swipe of the mouse (see **Fig. 5**). Maps can be saved and recalled for later use, letting you build a library of applications.

An intriguing map forces note numbers into a specified chord or scale. A built-in editing function automatically creates pitch maps by scanning notes in a selected data. This map can be used to edit existing data, or as part of the MIDI Receive filter to alter incoming data prior to recording. Currently, controller types can only be remapped in real time through the Receive filter. I hope to see this extended to a track-edit operation in the future for remapping previously entered controllers

EDITING

GMS supports three levels of detail in selecting data for editing. An entire track, or a subset of discontiguous track data, can be chosen. Alternatively, data can be culled by a combination of selection criteria based on the type of MIDI message; track number; MIDI channel; bar number; and note pitch, Velocity, and duration. This Extended Selection feature (see **Fig. 6**) facilitates many creative editing applications.

Basic cut, copy, paste, and clear commands are available in all three display windows, following the usual Macintosh conventions. Simple edits can be made in the Piano Roll or List Edit windows. Beyond that, *GMS* provides a number of more musically useful transformations and editing tricks.

Quantize works on note start time, duration, or both. A Half Quantize mode moves notes halfway between their current start time and the nearest quantization position. This helps to tighten loose playing without going into mechanistic lock-step. The Channel command lets you set all selected events to a fixed MIDI channel, or hocket a set of notes across a continuous range of MIDI channels (i.e., note 1 is assigned to channel 1, note 2 is assigned to channel 2, and so on). This feature is especially effective when each channel has a distinctive timbre and pan position.

You can apply chromatic transposition, optionally moving the affected notes into a desired scale or chord with a pitch map before or after transposition. Velocity-editing options let you change values by adding a fixed offset, multiplying by a percentage, or going through a map. Similarly, you can set notes to a fixed duration, or multiply their current values by a given percentage, to get legato and staccato effects.

A Randomize function lets you modify the feel of your music by randomly varying note start-time, duration, Velocity, and even pitch. You can apply a pitch map after processing to bring the notes into some semblance of musicality. The Shift function lets you adjust the feel by sliding events ahead or back in time. This works well for drum grooves if you record individual sounds on their own tracks, then shift each track separately.

Another group of operations lets you add or delete bars across tracks, expand loops into linear form, merge tracks, and split tracks. The only program crash I experienced was when I tried to delete more bars than there were in the track. It was a dumb move and a heavy price to pay. A minor bug in the Merge function can erroneously set all tracks to Multitrack status. You can restore their original settings manually, but it's a pain.

Tracks can be split into separate tracks by MIDI channel, Program Change, musical line (polyphonic tracks split into monophonic parts), or on the basis of the multiple Extended Selection criteria. All of this is pretty darn impressive for an entry-level sequencer!

World Radio History

SPECIAL FEATURES

GMS's multichannel track capability lets you emulate pattern-based sequencers and use the Track window as a song editor. First, record a sequence normally, then merge all the tracks into a composite track. Repeat this process to build up a set of multichannel tracks. These tracks can be entire songs or song phrases (e.g., verse, chorus, bridge, etc.).

You can quickly create and experiment with different arrangements by changing the start times and loop setting of the different multichannel tracks. Just keep your polyphony limits in mind, and don't let tempo events run into each other.

Not all users have or work exclusively with General MIDI instruments, so *GMS* includes a GenMap function that translates the GM program numbers in a sequence to match the sounds available in your particular gear. This requires some initial setup in which you create a template that matches General MIDI program names and drum sounds to compatible sounds on your instruments. You can assign sounds across multiple instruments to maximize polyphony and get the best timbral selection.

How well this works depends on your particular gear and how well you set up the conversion template. To bootstrap the process, *GMS* can read .DK setup files from PG Music's *Band-In-A-Box* as GenMap templates. Otherwise, you must create your own templates. Once you've done that, however, you can automatically convert General MIDI sequences to play properly on your system. You should note that the conversion process writes a new sequence file after making conversions; GenMap is not a real-time program-mapping function.

A Panic button cures stuck notes by sending a complete series of Note Off messages and nominal values for Modulation, Volume, Pitch Bend, and Sustain. These messages can be sent on all channels, or just the current MIDI Thru channel. Although the version I had for review did not send All Notes Off or Reset All Controllers from the Panic button, Altech Systems has since corrected this.

Looking at this further, the program can send MIDI Mode messages on the Thru channel or all channels with a single menu selection. This is handy for quickly setting up instruments with Local On/Off, Omni/Poly mode, etc.

CLOSE AND QUIT

Overall, *GMS* looks like a winner for Altech Systems. Not only do you get a reliable and capable sequencer with a wealth of special features, but the program comes bundled with a SysEx bulk librarian.

GMS seems to be superior to Passport's *Trax* on most counts. Opcode's *EZ Vision* is a tougher competitor, though. It costs slightly more—$99, compared to $79 for *GMS*—but *EZ Vision* gets points for graphic, non-note event editing; controller chasing; superior Piano Roll design; MIDI step-entry; and SysEx support.

On the other hand, Altech's *GMS* weighs in with limited SMPTE support, multichannel tracks, a List Edit window, extensive MIDI filtering and remapping, and a wider assortment of editing operations. (Opcode also offers *Musicshop*, which is essentially *EZ Vision* with standard music notation for $149.95.)

In my book, it comes down to *EZ Vision* versus *GMS* in the entry-level Macintosh sequencer fray. Their feature sets are distinct enough that you should have little problem choosing the one for you.

Circle #444 on Reader Service Card

Product Summary

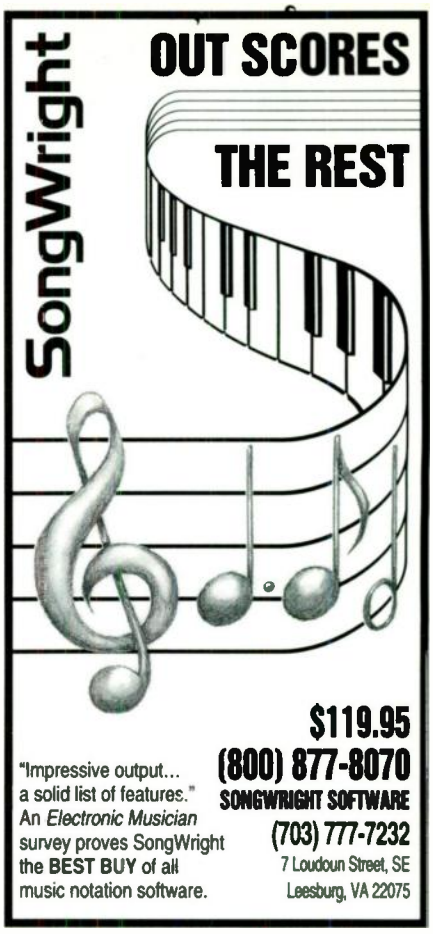
PRODUCT:
General MIDI Sequencer (*GMS*) 1.1.1

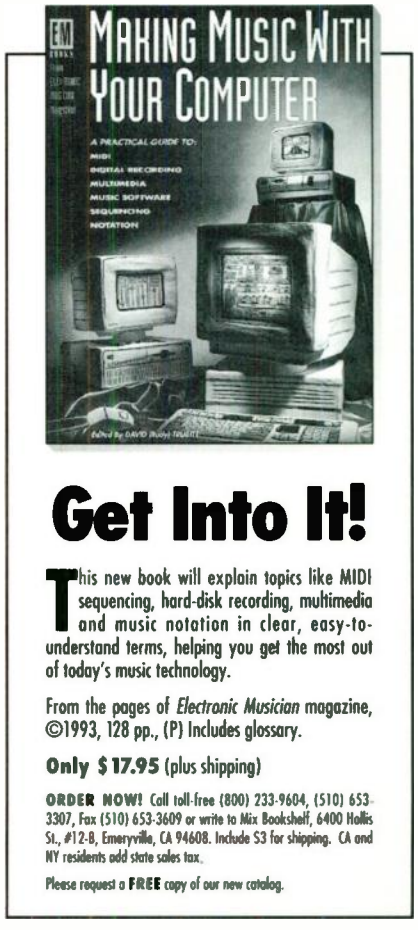
PRICE:
$79

SYSTEM REQUIREMENTS:
Mac Plus or better; 2 MB of RAM; System 6.0.7 or later; hard drive; MIDI interface

MANUFACTURER:
Altech Systems
122 Faires Industrial Park Dr.
Shreveport, LA 71106
tel. (318) 868-8036
fax (318) 868-7402

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





World Radio History

CLASSIFIEDS

ELECTRONIC MUSICIAN CLASSIFIED ADS are the easiest and most economical means to reach a buyer for your product or service. The Classified pages of **EM** supply our readers with a valuable shopping marketplace. We suggest you buy wisely; mail-order consumers have rights, and sellers must comply with the Federal Trade Commission, as well as various state laws. **EM** shall not be liable for the contents of advertisements. For complete information on prices and deadlines, call **(800) 544-5530**.

EMPLOYMENT OFFERED

▲▼▲▼▲▼▲▼▲▼▲▼▲

SOUND ENGINEERS/INSTRUCTORS
World Class audio school seeks Sound Engineers/Instructors. Requires the ability & desire to communicate knowledge to others & excellent attitude. Fax or mail resumes to: Attn: Kathy Burr, Full Sail Center for the Recording Arts, 3300 University Blvd., Suite 160, Winter Park, FL 32792. Fax: (407) 678-0070.

AUDIO MIXER
Established SF recording/audio-post facility seeks a hot audio engineer with a solid reputation mixing television spots. Workstation experience necessary. Features and scoring to picture a plus. If you would like to work for nice people in a beautiful city, DROP US A LINE! Please send letter/resume, client list, and salary requirements to: 2040 Polk St., #335, San Francisco, CA 94109.

LET THE GOVERNMENT FINANCE your new or existing small business. Grants/loans to $500,000. Free recorded message: (707) 448-0270. (NS9).

EXCELLENT CAREER OPPORTUNITY
for an energetic MIDI/Production Specialist. Must be a player and a people-person. Work for one of the nation's strongest and most respected retailers.
Call (914) 949-8448
Sam Ash Music,
White Plains, NY
Ask for Management.

Post-Production
Maintenance Technician
Wanted
Burbank post-facility has immediate opening for full-time tech with knowledge of Otari, Lynx, Macintosh, etc. Salary commensurate with experience.
Call Denny at (818) 972-4996

EQUIPMENT FOR SALE

▲▼▲▼▲▼▲▼▲▼▲▼▲

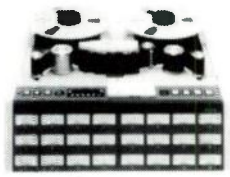
GREAT DEALS!
Used Audio/Video/Musical Equipment. In Stock!
Top Brands like:
Yamaha, Soundcraft, Akai, E-mu, Sony, Panasonic, Tascam, dbx, Neumann, AKG, and Many, Many More!
CALL or FAX for our Catalog/Listing and **SAVE**!
AVR
Audio Video Research
(Boston)
(617) 924-0660
fax: (617) 924-0497
(Connecticut)
(203) 289-9475
fax: (203) 291-9760

Need Audio, MIDI, or Recording equipment?
Buy from the best!
- Fastest growing music store in the country according to Music Trades Magazine, Aug. 1993.
- The only music store in the country on Inc. Magazine's Fastest-Growing company list in Oct. 1993.
- The most knowledgeable sales consultants in the industry will make recommendations, so you'll get the best equipment for your music.
- The largest technical support department.
- All of the greatest equipment names in stock.
- Professionals that really care!

Experience the *Difference*
that thousands of customers have enjoyed.
Experience the *Sweetwater Difference*.
Try us today!
Sweetwater SOUND INC.
5335 Bass Rd
FT Wayne, IN 46808
(219) 432-8176
Fax (219) 432-1758

Don't Get Beat
When you need equipment call
8TH STREET MUSIC
(800) 878-8882
Philadelphia's Largest Musical Instrument Dealer!!!
8th Street Music, 1023 Arch St.
Philadelphia, PA 19107

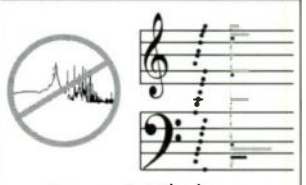
American Pro Audio



Digidesign • Opcode • Otari
Roland • Korg • Prodisk
Yamaha • Fostex • Dolby
Soundtracs • DDA • Ramsa
Trident • Neumann • Tannoy
Eventide • TC Elect • Summit
Great Prices!!!
Digital Workstations • Software
Keyboards • Recorders • Consoles • DAT
Leasing and financing.
(612) 938-7777

XTRA-GATE
RC-12 PRO
12 studio quality noise gates, ONLY... $799.00
Complete parts kit, D.I.Y. for JUST.... $570.00
VISA, M/C, Checks. Prompt delivery!
ENCORE PRODUCTIONS Write or fax for details NOW!
Fax 707 579 0802
P.O. Box 7945, Santa Rosa, CA 95407 U.S.A.

WAVEFORM EDITING?



Tonal Vision™
Makes spectra musically intelligible.
See pitch, intervals, chord structure
Patent pending, concept available for licensing
Call for soundcard demo software (PC)
Comer Lake Technologies
1134 1st Place, Hermosa Beach, CA 90254
(310) 372-2420

DATRAX®
Originator in DAT Tape Storage Systems.
- **DATRAX 60 Solid Oak in Natural or Black Finish**
- **Nylon DAT Tape Carrying Cases**
- **NEW! DAT Tape Storage Drawers 320**

NEW PLASTIC LINE: *▲ DATRAX 40 ▲ Video 8mm Rax ▲ Cassette Rax ▲ All $21.95*
Tel: 310.305.0317 ▲ Fax: 310.305.9167
CALL TOLL FREE: 800.9.DATRAX
BRYCO PRODUCTS, 8701 Falmouth Ave., Suite 201, Playa del Rey, CA 90293
DATRAX BRYCO PRODUCTS

MidiVox® Sale
(800) 433-MIDI (6434)
Growl a trumpet–Croon a sax
Hum a bass–Scream a guitar
Laugh a clarinet–Yell a cello.
2 yr. warranty. Free Demo.
MC/VISA

Looking for used or new MIDI equipment? We've got tons of super clean Yamaha, Roland, Korg, Kawai, and E-mu products in stock. **Come in, or do it all through the mail.** Call, write, or fax for prices & details. ¡Si, Hablamos Español! **Caruso Music**, 20 Bank St., New London, CT 06320, USA. **(203) 442-9600**; fax: (203) 442-0463.

Mr. Mike's Music—Save Big $$$ on used keyboards and recording gear. Look at these deals! Ensoniq ESQ-1, $459; Yamaha TX16W, $750; KX76, $750; SY22, $550; Roland MT-32, $199; R-8, $550; DEP-5, $245; RS-101, $135; Oberheim DMX, $230; dbx, 463X, $99. Call or write for free price list. **Mr. Mike's Music**, 816-A East Main St., Carbondale, IL 62901. (618) 529-3444; fax (618) 457-6605.

HORN PLAYERS!
Digital MIDI Horn connects to any MIDI sound source to open up a whole new world of sounds. So affordably priced that every musician should have one! Call C.E.C.
(414) 784-9001.

World Radio History

CLASSIFIEDS

Sound Deals, Inc.

Specialists in *Samplers, Synths, Pro Audio, Analog & Digital Recording, Effects, Drum Machines, Computer Software/Hardware & more!*

(800) 822-6434/(205) 823-4888

Sound Deals, Inc.

230 Old Towne Rd.
Birmingham, AL 35216.

We want your used MIDI equipment and well-maintained recording gear. We'll give you **cash**, or take it in on trade. Come in, or do it all through the mail. Call, write, or fax for prices and details! ¡Si, Hablamos Español! **Caruso Music**, 20 Bank St., New London, CT 06320. **(203) 442-9600**; fax: (203) 442-0463.

Chapman Stick. Buy and sell vintage, used. Rent, trade, layaway, strings, supplies. Credit cards OK. Free newsletter subscription, lessons, cassette reviews. Traktor Topaz. 24-hour recorded info: (415) 435-7504.

CLOSEOUT PRICED
Casio VZ-10M MIDI sound module
• 128 Analog Presets • 128 multi-patch storage • 16-note poly • IPD sound synthesis • Also in stock: VZ-1 synths, FZ-1 samplers, CZ-1 synths, and MIDI Horns.
C.E.C. (414) 784-9001

OB8 MIDI mint, $895; Korg BX3, $895; MPU101, $400; VFX, $600; S50 w/Mon, $700; EPS, $750. (601) 845-2822; 7-10 p.m. CST.

Otari MX-5050 MK III-8 (pristine, 250 hrs.), stand, 4 dbx 150 type I mounted and wired, CB-110 time/switching remote, take-up & 13 Ampex 456, packing, manuals. Soundbites, Inc. (212) 889-9445. Sorry to see you go—$4,850.

SPECIAL LOW PRICE. ADA, Hartke, BBE, Hughes & Kettner, Charvel, Samick, Washburn, ART, E-mu, dbx, Lexicon, AKG, Shure, Samson, Crest, QSC, AB, DENON, Rane, Ramsa, JVC, Cerwin-Vega, Sonic, SoundTech, BullFrog, Ross, Premier, Stanton, Numark, MTX, American DJ. DYNAMIC PRO 447 Harrison, Panama City, FL 32401. (800) 752-0125.

WORLD'S SMALLEST EQUIP. DLR. GET ON THE MAILING LIST NOW! R-8, $375; QuadraVerb, $275; D-50, $600; S-900, $650; M1R, $700; TSR-8, $1,500. Mics, Mixers & Processors aplenty. Call for today's availabilities. TELESIS (714) 998-3001.

REMOVE VOCALS from music. Tanco-Voice Decoder, $79.95. Fully guaranteed. Call (813) 847-9319 for prerecorded demo/ordering information.

APO or **FPO** as a mailing address? Then call, write, or fax our special department for **absolutely** all of your new or used musical equipment needs. Worldwide delivery! ¡Si, Hablamos Español! **Caruso Music**, Dept. OS, 20 Bank St., New London, CT 06320, USA. Phone: **(203) 442-9600**; fax: (203) 442-0463.

SUPERIOR GUITAR EFFECT + FREE 3D. Wild-hot sound, also drives headphones, floor or belt clip operation, preamp ability. Build in 1 evening for <$25 using Radio Shack parts. Plans and theory only $12.95 (+s/h). Sample /info: (407) 727-0137, 24 hours. Visa/MC/Disc/AmEx.

NEW, USED, DEMO EQUIPMENT
BEST SELECTION OF DIGITAL/ ANALOG RECORDERS, CONSOLES, DAWs, OUTBOARD GEAR
Otari Concept One, Trident series 90, Mackie 8•Bus, Ale X2, Trident 24, Trident 24x24, Pro Tools, Sonic Solutions, Dolby, ADAT, Tascam ATR-60 16-trk, TLA tube gear, Focusrite rack gear, Neumann TLM-193, Roland S760, JD-990, SampleCell II, CD recorders, E-mu modules, Summit tube processors, AKG C-12VR tube mics, Apogee converters, TCE M-5000, Lexicon reverbs, Genelec 1030s, Tannoy, JBL monitors.
Studio and System Design, financing, factory service/installation, experienced and knowledgeable sales staff.

EAR Professional Audio/Video
(602) 267-0600

YRS M·I·D·I SYSTEMS
STATE-OF-THE-ART TECHNOLOGY WITH SERVICE IN:
MIDI-COMPUTER DIRECT-TO-DISK RECORDING-CONSULTING-SALES
176 Oxford Rd., Fern Park, FL 32730
(407) 331-6333
FAX (407) 331-8239

NEW TB-303 BassStation!
Full MIDI. 31 Real-time controls for Tweaking. Full-Size, Polyphonic, Velocity-Sensitive Keyboard. Emulates MC-202 & SH-101, too! Much More! Low $. Mandala Percussion, (800) 858-2822.

Sound thinking

The Best Prices, The Best Service
you'll ever find on...
digidesign
and related products
800-822-2029

ROGUE MUSIC—The world's largest dealer in used electronic gear. Sample prices: SP1200, $1,595; SP12, $675; EPS 16+, $1,295; Roland Juno 60, $279; Octapad, $295; Octapad II, $395; JD-800, $1,295; JD-990, $1,095; JX8P, $375; D-110, $319; MT-32, $199; SBX-80, $479; Casio FZ1, $650; Studio 3, $150; Yamaha FB01, $119; 1040ST, $350; Voce DM164, $395; Tascam 388, $1,295; JLC CS10, $595; Simmons 8:2, $225. We buy & do trade-ins; we ship COD or take credit cards. All gear warrantied for 3 months. We handle most new lines. We buy & sell used computers & software. Sound Tools, Pro Tools, SampleCell, Performer, Vision, Alchemy, Cakewalk, Cubase, etc. Call or write to get on our mailing list: Rogue Music, 251 W. 30th St., NY, NY 10001. (212) 629-5073; fax: (212) 947-0027.

OMNIRAX
STUDIO FURNITURE for the discriminating musician

800-332-3393
P.O.BOX 1792 SAUSALITO, CA 94966

INSTRUCTION

Computer and Video Imaging, Bachelor of Arts Degree. The only integrated media degree in the country concentrating in graphic design, imaging concepts, 2D/3D animation, scriptwriting, storyboarding, authoring, video and sound technology, UNIX environment, C and C++ programming. PC and SGI platforms. Accredited. **Cogswell College**, 1175 Bordeaux Dr., Sunnyvale, CA 94089-1299. (408) 541-0100.

PRACTICE SOFTWARE "The Practice Supervisor" organizes practice time, music theory drills & more. ('286+, DOS 3.3+, 2MB RAM, Hard Disk, Mono/EGA/VGA), $39.99 + $4.50 S/H. $3 for more info. The Guitar Workshop, Dept. 30, POB 40605, Redford, MI 48240.

CLASSIFIED AD DEADLINES

OCTOBER 1ST
DECEMBER '94 ISSUE

NOVEMBER 1ST
JANUARY '95 ISSUE

800-544-5530

World Radio History

CLASSIFIEDS

INSTRUCTION

Frustrated
with owner's manuals?
Get a free copy of our catalog, which features tips and techniques books for equipment by Roland, Alesis, Yamaha, Casio, Korg, Ensoniq, Kawai, Kurzweil and Oberheim.
All titles reviewed and guaranteed!
MIX BOOKSHELF
6400 Hollis St. #10
Emeryville, CA 94608
(800) 233-9604 • (510) 653-3307

Be a recording engineer. Train at home for a high-paying, exciting career, or build your own studio. **Free** information. **Audio Institute of America**, 2258-A Union St., Suite F, San Francisco, CA 94123.

Music Engineering Technology, Bachelor of Science Degree. The only program in the country where you can learn MIDI from A to Z, synthesizer and sampler hardware, digital audio, and software design. Fully equipped individual MIDI workstations. Careers for music, electronics, and computer industries. Accredited. **Cogswell College**, 1175 Bordeaux Dr., Sunnyvale, CA 94089-1299. (408) 541-0100.

Teach yourself how to play keyboards with **FAST FINGERS® MIDI KEYBOARD LESSONS** for **IBM PC**. FROM $49.95. VISA/MC/AMEX. Call **(800) 327-0209**, or write: FAST FINGERS® MUSIC SOFTWARE, Dept. EM10, PO Box 741, Rockville Centre, NY 11571.

Short cuts to developing awesome Blues, Jazz, Rock, Gospel, New Age, R&B, Latin styles. Book/tape w/optional MIDI disk shows you how. Free info (800) 748-5934. A.D.G. Productions, 15517 Cordary Ave., Lawndale, CA 90260.

EM classifieds WORK

PARTS & ACCESSORIES

AKAI • ENSONIQ
KURZWEIL • EMU
ROLAND • KAWAI
KORG • YAMAHA
PEAVEY • CASIO
SOUND LOGIC
SCSI DRIVES
SyQuest 44MB 347
SyQuest 200MB 674
SyQuest 270MB 694
SyQuest 44/CD-ROM 847
270MB, 9ms Fixed 394
1080MB, 10ms Fixed 894
CASES SANS DRIVES
Atari AMIGA MAC IBM
INFO & FREE CATALOG
619-789-6558
ORDERS 800-753-6558
FAX 619-789-4170
1125 ELEVENTH STREET
RAMONA, CA 92065
EXPANDERS
EPS16 2X/SCSI 237/127
EPS-4X/SCSI 247/127
Ensoniq Seq. Mem 157
Akai S950/MPC60 174
Akai MPC60 SCSI 294
S760 8MB/16MB Call
TX81Z 5X RAM 137
ASR10 & TS10 Call
K2000 RAM Call
FREE SHIPPING
HARD DRIVE SALES & REPAIR
WE SPECIALIZE IN KEYBOARD ACCESSORIES

PUBLICATIONS & BOOKS

VIRTUAL MUSIC SOCIETY is now accepting members who submit original songs in Standard MIDI Format. The annual cost of a standard membership is $45 and includes a monthly diskette newsletter and membership certificate. A participation membership costs $30 and original musical works must be submitted and accepted for distribution to the society on a regular basis. For info write:
The Virtual Music Society
7151 E. Speedway Blvd. Ste. 312,
Tuscon, AZ 85710

Books, Tapes, Videos
Get our free catalog featuring resources on
• MIDI • Instrument-specific guides
• Synthesis & Sampling
• Drum machine patterns
• Recording • Composition
• Music business • A&R Lists and more
All titles reviewed and guaranteed!
MIX BOOKSHELF
6400 Hollis St. #10
Emeryville, CA 94608
(800) 233-9604 • (510) 653-3307

RECORDING SERVICES AND REPAIRS

DRUMS-ON-LINE
Affordable Live MIDI Drum Tracks
Have a New York pro add live digital drums to your MIDI song files via modem or by mail. For information, demo, and resume call or write to Drums-On-Line: PO 251E Lake Peekskill, NY 10537 (914) 528-0900, or send E-mail through Entertainment Consultants International BBS in conference #2 (914) 683-3665.

Equipment Financing
★ New or Used Equipment
★ True Lease or $1.00 Buyout
★ No Financial Statements Required for Transactions Under $50,000
to apply or request information contact John McMindes
1-800-477 LEASE
AMERICOM LEASING, INC.

****A great deal!****
Real-time cassettes—Nakamichi decks, chrome tapes—the best! Album length $1.50/100. On-cass. printing/inserts avail. Grenadier, 10 Parkwood Ave., Rochester, NY 14620. (716) 442-6209 eves.

Cassettes duplicated in 3 days! Including B/W J-Card, on-shell printing, shrinkwrapping, and box (100 or less). We will beat any advertised price on real-time duplication! Accurate Audio Labs, Inc.
(800) 801-7664

RELEASE YOUR OWN CDs!
500 CDs and 500 Cassettes only $2,590 with B&W inserts
• FREE Graphic Design • Ready In 3 Weeks
• Major Label Quality • Money Back Guarantee
DISC MAKERS
1-800-468-9353
Call today for our FREE full color catalog
Outside USA (215) 232-4140 • FAX (215) 236-7763

DIGITAL FORCE
MASTERING
REPLICATION
PRINTING
TOTAL PACKAGING
GRAPHIC DESIGN STUDIO
POSTERS
PERSONALIZED EXPERT SERVICE
COMPLETE CD AND CASSETTE PRODUCTION
The Power of Excellence™
212 - 333 - 5953
330 WEST 58TH ST. NEW YORK, N.Y. 10019

Need A Few CDs Made?
We Do It
For Much Less Than You Would Expect!
CD Recording Service includes:
- High Quality Marking on Disc
- Sharp Color Insert for Jewel Box
- Digital Sample Rate Conversion
- Standard Shipping
- *Unconditional Guarantee*

Quantity Replication available also!
SOUND CONCEPTS
FREE Brochure
(310) 796-0424 x-135

World Radio History

CLASSIFIEDS

Factory Direct.. Best Values!

EUROPADISK,LTD.

All Manufacturing In Our Plant!

SPECIALS - "With This Ad Only"

500 - Cassettes - $715
(1,000 Cassettes - $1,025)
Retail-Ready: FULL COLOR J-Card, Test Cassette, Graphics Layout, Typesetting & Film, Cassette Label, Norelco Box & Shrink-Wrap (to 50 Min.)

500 - 12" Vinyl - $1,075
(1,000 12" Singles - $1,450)
Retail-Ready: 12" Single Package Direct Metal Mastering, 5 Test Pressings, Label Layout & Printing, Plastic Sleeve, Black or White Die-Cut Jackets & Shrink Wrap (to 14 Min. per side)

500 - Promo CD's - $995
(1,000 CD's - $1,550)
Delivery in 15 Business Days!
Promotional Package includes: CD-R Reference, One Color CD Label with Layout, Typesetting & Film (to 25 Min.)

500 - Color CD's - $1,995
(1,000 CD's - $2,265)
Retail-Ready: FULL COLOR Front & Tray Card, free CD-R Reference, 2-Color CD Label, Graphics Layout & Film, Jewel Case & Shrink-Wrap (to 58 Min.)

Best Values in The Industry!

Call For Our Complete Catalog

EUROPADISK,LTD.

75 Varick Street, New York, NY 10013
☎ (212) 226-4401 FAX (212) 966-0456

Custom Loaded Cassette Blanks

utilizing
MAXELL XLII HIGH BIAS TAPE
or your choice of
AMPEX, AGFA, BASF PREMIUM TAPE

Any length up to C-96 rushed to you in minimum runs of 100 cassettes.

TR TRUTONE INC.
310 Hudson St. Hackensack, NJ 07601
201-489-9180 Fax: 201-489-1771

Shift into Blue.
PAUL KURZWEIL
blueshift

The new CD release now available on Bluxo Records. CD $15 Postage Paid. Major credit cards accepted. Call 1-800-933-3054

or send check or money order to
Bluxo Records
4901 NW 17th Way Suite 606
Ft. Lauderdale, FL 33309
FL residents add 6% FL sales tax

bluxo records
Uh oh it's a Bluxo!™

CRYSTAL CLEAR SOUND

REAL-TIME CASSETTE DUPLICATION
The lowest real-time prices anywhere.
COMPACT DISC MANUFACTURING
Low prices and fast, dependable shipments.
CUSTOM (ONE-OFF) COMPACT DISCS
Ever needed just one-os two CDs? No problem.
DIGITAL EDITING AND MASTERING
For CD & cassette mastering, remixes, de-noising, etc.
24-TRACK STUDIO
Studer, SR, DDA with moving fader & switch automation.
MUSIC DISTRIBUTION
Distribution to over 100 chain and independent retail music stores.

4902 Don Drive
Dallas, TX 75247
(214) 630-2857

---

everybody needs cassettes

real time duplication
chrome tape
shell imprinting
J-cards
fast turnaround

OLDE WEST

800-739-3000

SYNTRONICS MUSIC SERVICE
Factory Authorized
Ensoniq, Kurzweil, Akai, Fostex, Kawai & Oberheim
Vintage Synthesizer Repair
MIDI Upgrades Installed
466 Comm. Ave. Boston, Ma. 02215
617-266-5039

KABA

CASSETTES • CDS
QUALITY DUPLICATION & GRAPHICS, FULL PACKAGING

CALL FOR A FREE PHONE ESTIMATE!!
1-800-231-8273

Good Vibrations
RJR DIGITAL

MASTERING & PRODUCTION
Short Run CD Replication Starting At 50
KABA cassette duplication using SAKI heads
• Artwork • Printing • Packaging
San Diego 619-267-0307
1-800-828-6537 • FAX 619-267-1339

MASTERING • MANUFACTURING • PRINTING

DIGI-ROM™

FOR COMPACT DISCS • CD-ROM
REAL TIME & HIGH SPEED AUDIO CASSETTES
COMPLETE PACKAGES • COMPETITIVE PRICING
GRAPHIC DESIGN STUDIO • PERSONALIZED
EXPERT SERVICE • FAST TURN-AROUND

CALL HARRY HIRSCH
(212) 730-2111

130 WEST 42ND STREET • NEW YORK, NY 10036

CD Singles
$35
1 day turnaround
w / b/w Inserts
Big Dreams Studio, Ltd.
708-945-6160

PRODISC
CD MANUFACTURING
BEST No.1
IN PRICES
IN DELIVERY
DESIGN/PRINTING
LOWEST COSTS !
1-800-800-4769

Design Doctors

1000 CD's-$1950 1000 Cassettes-$925
5000 CD's-$1,150 500 Cassettes-$569
Complete packages for the budget-minded
Major Label Quality Quick turn around time
Special Graphics Package
Tel: 201 675 2515
464 Central Ave., East Orange NJ 07017

3M AGFA AMPEX SONY
Audio, video & digital tapes
Sony Professional Pro Audio,
Neumann, Sennheiser, B & K,
AKG, Fostex, Shure & Crown
Products.
R & M PRO AUDIO
691 10th Ave., SF, CA 94118
(415) 386-8400/fax 386-6036

RECORDS, TAPES & CDS

WE'LL BEAT ANY PRICE ON CD's

• CD
• CASSETTES
• HIGHEST QUALITY
• QUICK TURNAROUND
• PERSONALIZED SERVICE
• TOTAL COMPLETE PACKAGES
• LOWEST PRICES, CALL US LAST!

(813) 446-8273
Total Tape Services
639 Cleveland St / Clearwater, FL 34615

SHORT CUTS
SO MUCH MUSIC-SO LITTLE TIME

	length in minutes			
* MAXELL MS CASSETTES	20	30	60	90'S
* SHAPE MARK 10 PRO	10	30	60	90'S
* TDK SM CASSETTES	10	20	30	60'S
* DAT TAPE - ALL BRANDS!	10	15	20	30'S
* MAXELL XLII BULK CUSTOM LOADED 2-100 MIN				

* SUPPLIES : J-CARDS, LABELS, BOXES,etc
* CALL OR WRITE FOR FREE CATALOG !

Ask about our
TELEPHONE ORDER SPECIALS !
Recording Supplies for the ENTERTAINMENT Industry!

SOLD NATIONALLY BY...
SONOCRAFT
520 MAIN STREET, BOONTON, NJ 07005
Fax (201) 335-4562 ask for Ed Stern (80H) 274-7666

PCSW pacific coast sound works

1,000 CD'S FROM:
$1,500!

► SONIC SOLUTIONS ► GRAPHIC DESIGN
► NoNOISE™ ► PRINTING
► MASTERING ► PACKAGING
► CD-R ► SONY 1630

1 (800) 423-2834
TEL: (213) 655-4771 FAX: (213) 655-8393
8455 Beverly Blvd., Ste. 500 L.A., CA 90048

Anything Audio•Video

Cassette & CD Manufacturing
Any length Blank Cassettes
Single CD's · Audio, Video Supplies
Any Size Orders·Warehouse Prices
Visa · Mastercard · Discover
800-483-8273 (800-GUD-TAPE)

TDK AMPEX MARANTZ
MAXELL BASF FUJI 3M

Personal Service THE WAREHOUSE Since 1975
2671-20em Emerson St., Jacksonville, FL 32207 · 904-399-0424

World Radio History

CLASSIFIEDS

RECORDS, TAPES & CDS

HEALEYdisc Manufacturing

LOWEST PRICES IN THE USA

1000 CD's Complete Package $1668.

500 CD's Complete Package $966.

1000 cassettes Complete Package $741.

500 cassettes Complete Package $520.

Package Includes: digital master - high quality HCR5 cassette (40 to 50 min.), 1 color J-card, cassette shrinking, box and shrink wrap (Does not include film.)

Call toll Free 1-800-835-1362

HEALEYdisc

Premier Quality CD and Cassette Duplicating Services

CASSETTES, CDs, DISKS

Real Time Cass., CDR Copies, CD Pkgs.
TDK SA Blanks, 3.5 Disks.
Low Prices!
708-298-8555
INTERNATIONAL AUDIO

1000 CD's $2495.00

You provide your DAT Master & Film Ready Artwork. We do the rest. There's no hidden cost!

HIGHEST QUALITY• INCLUDES PRINTING: 4 PAGE • 4 COLOR BOOKLET & TRAY
2 COLOR CD SILK SCREENING
SHRINK WRAP • JEWEL BOX
• ALL MASTERING & MORE! •
Ask about our Special Graphics Package!
GoldHouse • Cassette & CD Manuf.
1-800-476-8211

SOFTWARE & PATCHES

DANCE BEATS

Drum Sequences For Today's Music!

MONSTER LIBRARY OF MIDI SEQUENCED DRUM PATTERNS AVAILABLE ON 3.5" DISK FOR IBM & MAC. WORKS WITH ALMOST ANY SEQUENCER INCLUDING HARDWARE AND WORKSTATION ENVIRONMENTS!
Over 300 Patterns ONLY $49.95
INTROS, BEATS, BREAKS, FILLS, & ENDINGS
TECKNO • HOUSE • FUNK • RAP
POP • INDUSTRIAL • HIP-HOP
NO BASIC BEATS!
Send Check or Money Order to:
BIG CITY PRODUCTIONS
P.O. Box 263 • Humble, TX 77347
FOR FASTER DELIVERY CALL (713) 852-0444

BEATBOY

Live Studio Drumming in Real Time!

Pop, Top 40, Jazz, New Age, Rock, Latin Percuss on Loops. 3.5" Std. MIDI File Disc (General MIDI). Works w/all computers & Roland seq.
Beatboy Drum Sequences,
HCR1 Box 1A 193,
Lackawaxen, PA 18435.
(800) 838-BEAT(2328)

Emax, Emax II users try our copyrighted advanced synthesis designed samples. Super memory efficient. Over 70 titles includes: Acid, Rap, Techno, New Age, Orch., & more. Free demo.
(412)279-8197 Stoklosa Prod.
PO Box 13086 Pgh., PA. 15243

HYPERCHORD
RIFFING, JAMMING, REAL-TIME MIDI COMPUTER INSTRUMENT
PLAY CIRCLES AROUND ANY OTHER INSTRUMENT, PLAY *FASTER*, MORE INTRICATELY WITH RICH HARMONIES. CONTROL RIFFS, SCALES (62), KEY, TEMPO, ORCH. PHRASING, TRILLS, DYNAMICS AND MUCH MORE—*ON THE FLY!*
EXCLUSIVELY FROM
HOLOGRAMOPHONE
39 E. 14th St., 4B, NY, NY 10003
ONLY $149 212-529-8845
IBM Amiga DEMO DISK $8/VIDEO $15

MIDI CoolTools

Our 8 Visual Basic custom controls allow anyone to write Pro MIDI Windows applications!

Artic SOFTWARE
PO Box 28, Waterford, WI 53185
(800) 892-0677
INTERNATIONAL (414) 534-4309
VISA, M/C or CHECK

Custom VBX controls for MIDI In, MIDI Out, Standard MIDI file Read/Write, VU Meters, Mixer Faders, Pan/Stereo Knobs and program examples. Only $59+$5 s/h

$10 for Inspirational INFINITY Looped Samples? **We've got 'em!!** DPM3/4, EIII, SP, S1000!! **Sound Engineering**, PO Box 945, Attn: E10, Frazer, PA 19355. (610) 519-WAVE.

Arranger's Tool. A unique harmony program. Searches for the right chord in any key. **Harmonizes** your melody. Spells 720 chords. Plays thru MPU401 compatible i/f. Writes SMF. For PC compat. with VGA. $29.95 + $3 S&H. VHV, 24690 Saddle Peak Rd., Malibu, CA 90265. (310) 456-2207. CA residents add $2.

CANADIAN SOUND CANVAS User Group. 101-page tutorial manual. SC sequences. Demo pack available, $10. MARTUNES, 4845-C Linden Dr., Ladner, BC V4K 3A2. (604) 940-8494.

MIDI TOOLKIT FOR WINDOWS

for Windows programmers

MIDI DLL makes it easy to write MIDI programs for Windows. Easy-to-use functions support MIDI input/output, synchronization, timing, SMF access. Includes full doc's, sample programs, all source code. $99.95+s&h.

call toll-free
1-800-876-1376
Music Quest
1700 Alma Dr. #330, Plano TX 75075
214 881-7408 Fax: 214 422-7094

COUNTRY SEQUENCES We do country best CUZ country's all we do. **C.J. MIDI PRODUCTIONS**, 24 Hinkleyville Rd., Spencerport, NY 14559. (716) 352-5493.

DETROIT'S FUNKY LOOPS Sampling CD, $59.99. Over 400 Fresh Samples. A must for any hip-hop producer. Send check or money order for $59.99, plus $3 S/H to: OLD SCHOOL PRODUCTIONS, 17336 Harper, Suite #156, Detroit, MI 48224. To order COD, call (313) 881-0001.

IDAL: CLASSICAL MUSIC SEQUENCER For music lovers/techno haters. Input: notes, rests, repeats, tempo, acc/rit, rubatto, dynamics, key/time sg, pedal, MIDI control. Output: MIDI via COM or file. Precise 1 ms timing. All PCs. Windows s-ware & h-ware. Lo cost. Write: ELDERSOFT, Box 2435, Idyllwild, CA 92549 for details.

SEQUENCES

Finest Sequences & Documentation Available.
Most Computer & Dedicated Sequencer Formats
DAT & Cassette Format
Top 10 Country Hits &
Top 10 Pop Hits Always in Stock
Orders: 1-803-293-3767
Technical Support: 1-803-293-4598
Ask About Our Membership Plan
TrackBusters, Inc.
P.O. Box 20279
Myrtle Beach, SC 29575

****MidiGig™ Sequences**** 169 songs for $169. Call for free list and demo cassette.
****A Better Production****
PO Box 8544, Riverside, CA 92515. (909) 351-4528

Best of the Real Book Jazz Sequences—IBM, Roland, Korg, Ensoniq & Alesis. Sound Mind. About $0.30 per song. Send for free list;160 songs $50. Robert Williams, 520 N. Pegram St., Alexandria, VA 22304, or call (703) 370-2943.

MIDITRON—The easy way to preview sequences from the leading MIDI vendors, artists, and composers. New releases, original compositions & special promotions. **MIDITRON** 24-hour line: (614) 888-0802. Info: Data Assist, Inc., 659-H Lakeview Plaza Blvd., Columbus, OH 43085. Phone: (614) 888-8088.

ENSONIQ SOUNDS! The best patches and samples for **all Ensoniq keyboards**. Also available: factory libraries for Mirage, ESQ-1, and SQ-80. New patches for Casio synthsizers. Syntaur Productions, (800) 334-1288.

MIDI SEQUENCES

TRAN TRACKS—quality service, great prices & a large selection of popular songs. All computer formats and most dedicated sequencers supported.
ORDERS: 1-800-473-0797
Fax: (201) 383-0797
Technical Support: (201) 383-6691
Major credit cards
TRAN TRACKS MIDI SEQUENCES
350 5th Avenue #3304 NY, NY 10118

World Radio History

CLASSIFIEDS

Give Your Act A Good Kick In The Gas...!

Now In Our 4th Year

Over 5,000 sequences Available

Pop, Country, Classic Rock, Jazz, Big Bands, Standards, Top 40, Gospel, & Italian

Free Catalog

Now The Largest Sequence Company In The World...
Supporting many formats including General Midi.

Midi Hits

3 Shratton Ave. ★ San Carlos, CA 94070

1-(800) 593-1228

Fax (415) 637-9776
Int'l (415) 637-9637

MIDI Guitar Sequences

Renaissance to rock! Noad's Renaissance Guitar, $9.95. Hundreds of songs **Visa/MC**. ORDER NOW! CALL **(800) 787-6434**. FREE catalog. Dept. E, **MIDI Classics**, 81 Latimer Lane, Weatogue, CT 06089.

ENSONIQ OWNERS: Convert Sequences to/from Standard MIDI Files on IBM-PCs. Each pkg. TS-10, ASR-10, EPS/EPS-16, VFX-SD/SD-1, SQ-80, or SQ-1/2/KS-32 costs $54.95. Convert SD-1 to TS-10 w/our SD1TS10 Conversion for $54.95. **Alesis, Kawai, Korg, Yamaha** avail. Visa/MC. **Giebler Enterprises**, 26 Crestview Dr., Phoenixville, PA 19460. **(610) 933-0332**; fax: (610) 933-0395.

THE WAIT IS OVER!!

New, Super-User Style Disk #3 for BAND-IN-A-BOX is ready! **FREE** info; send legible address to: Norton Music & Fun, Box 13149, Ft. Pierce, FL 34979. Voice mail/fax (407) 467-2420.

COMPUTER PAPER

XTRA HEAVY WEIGHT FOR YOUR MUSIC PRINT-OUT!!!

500 SHEETS Single-sheet.....$24.95
NEW Legal Size...$34.95 (8 1/2" x 14")
Continuous-Feed..$34.95

VISA/MC • Check/MO • S&H-$5.00 • NJ add 6%

***NEW* CASSETTE LABELS & INSERTS FOR YOUR LASER PRINTER!!! CALL FOR INFO!**

Fine Music (908)873-0764
FAX: (908)873-1867
23 Gates Road, Somerset, NJ 08873

NEW! At Last... MIDI SONG FILES from London Orchestrations, the UK's Premier Specialist Music Publisher

GALAXY GOLD brings to you, exclusively...

THE ORIGINAL PROTRACKS MIDI SONG FILE COLLECTION

CHART HITS, BIG BAND, ROCK/POP, TV/FILM, & JAZZ COMBOS

REQUEST OUR FREE CATALOG & DEMO TAPE

* Inquire about PRINTED BIG BAND arrangements

GALAXY GOLD, INC.
13-15 Parsonage Street, Providence, RI 02903
Tel: 401-351-3470 • Fax: 401-751-2604

ORDERS ONLY: 1-800-334-7299
Visa and Mastercard Accepted

MIDI SUPPLIES

MIDI software, all major brands: Cakewalk, Master Tracks Pro, Notation, Educational, Composing, Sequencing, Digital-Audio Programs, Sound Cards, MIDI Interfaces, Sync Boxes, Cables. LOW PRICES! Call today **(800) 646-4362.**

MIDI SEQUENCES

All types of music available on most formats. Call or write for **FREE** catalog and demo tape. Specify sequencing software and hardware.

THE MIDI INN
P.O. Box 2362, Dept. EM
Westmont, IL 60559
(708) 789-2001

Anniversary SALE PriceBuster!

IBM Win Dos Amiga Mac C/64 IIe GS Atari

COMPUTER MUSICIANS & EDUCATORS

SOFTWARE--SEQUENCING•NOTATION•TRAINING
DISCOUNTS •INTERFACES •Keyboards •Modules
CALL SOUND MANAGEMENT 800-548-4907
P. O. BOX 3053• PEABODY, MA 01961• FAX: 508-532-6106•Open Weekends! •Price Quotes

Awesome 240 pp. MIDI BUYER'S GUIDE

South Point Sounds offers MIDI Sequences, gig proven. Formatted for Standard MIDI Files to be played on General MIDI only. PO Box 390126, Kailua-Kona, HI 96739. **(808) 329-6533.**

Software Tools for Artists

Algorithmic Music Software for DOS

If your musical chops are more mental than manual, now you can use your computer for something more interesting than a glorified tape recorder.

We offer several different algorithmic composing programs. They are real time and interactive with the feel of a fast paced video game, but with the depth of a good game of chess.

Sound patterns or full compositions may be built from pure algorithms or from data such as DNA, poems, stock quotes, etc.

Call for a free info flyer. Better yet, order our Info Disk and get manuals, tutorials, etc. from all our products. It cost just $7, and is refundable with any order.

Orders/Info: 1-800-900-3070 • M/C or Visa
718 SW Alton Circle, Port St. Lucie, FL 34953
Email: 73642.1721@CompuServe.com

SAMPLER OWNERS
We have the sounds you need!

Akai	S900-950/S1000-1100/MPC-60
E-mu	EMAX/EMAX II/EIIIxp & EIIIxs
Ensoniq	EPS/EPS 16+/ASR-10
Korg	DSS-1/T-Series/Wavestation
Kurzweil	K2000
Peavey	SP
Roland	S-330/S-550/S-50/W-30/S750-770

Call for FREE CATALOG - Demo disks Available.

CD-ROMS - $299.00 - Now Available For...
AKAI S1000/S1100 - Over 400 Megabytes
Digidesign SampleCell - Over 600 Megabytes
E-mu Emax II - 100 banks (Packed Full)
Ensoniq EPS-16/ASR-10 - Over 240 Megabytes
Kurzweil K2000 - 500 Megabytes
Peavey SP - 500 Megabytes

NEW! **Sampling CD's - $99.00 each**
Killer Loops
Rap • Techno • Rave
Industrial • House • Rock

With the help of Producer/Songwriter Chris Lang we've come up with Volume 2 of Chris' latest work. 150 loops and 170 samples that were used in creating the loops.

Classic Keys/Vintage Synths
Hammond B3's, Vox Organs, MOOG Modular, Oberheim SEM's, Mellotrons, Chamberlins, Fender Rhodes, Arp 2600, Jupiter 8, Prophet 5, Clavinet, Wecoders, and many more!

greytsounds

501 4th Street S.E. • Bandon-by-the-Sea, OR 97411 • USA
503-347-4700 • FAX: 503-347-4163 • Order Line (800) 266-3475

ClearTone Music — New High Quality Sounds!! Dual/Single switchable programs w/ no reverb!! KORG 01W Series, 03RW, X3

ClearTone Music Ask about our update policy
8112 Nairn Austin, TX 78749
(512) 892-6655

COMPUTER MUSIC PRODUCTS

for IBM/PC musicians. Great prices & selection of popular MIDI software/hardware. Call for FREE catalog. **(813) 751-1199**. Beginners Welcome!

ATARI ☆ PC SPECIALISTS

★SALES★REPAIRS★UPGRADES★

(310)867-0626

Falcon 030*D2D for Atari & PC
MUSIC*DTP*HARD DRIVES*Accs.

Mid-Cities Computers 9406 Flower St.
Bellflower, CA. 90706-5706

KID NEPRO

KID NEPRO IS THE PATCH KING !

SINCE '84 MORE QUALITY SOUNDS, FOR MORE INSTRUMENTS THAN ANYONE IN THE ENTIRE UNIVERSE!

KORG•
01W SERIES 03WR ALL
WAVESTATIONS "-SERIES
M1 M1R M1REX M3R
DS8 707
EX-DW8000
EX-POLY800
POLY 800-2
ROLAND•
JV80 JV880
JD800
JD990U20
ALL D SERIES
U220 MKS70
MKS80 MKS50
JX8P JX3P JX10
JUNO-1 JUNO-2
JUNO-106 JUNO-60
JUPITER-8 JUPITER-8
YAMAHA•
ALL SY, TG, DX, TX,
PLUS V50, AND FB01
CASIO•
ALL CZ & VZ SERIES
FZ1 FZ10M FZ20M

OBERHEIM•
MATRIX-6 6R
1000-XPANDER
OB8 OPX1
SEQUENTIAL•
PROPHET-5-VS-
2000-2002
KAWAI•
K1 K1R K1M
K4 K4R
ENSONIQ•
MIRAGE EPS
EPS 16+ASR10
ESQ1 SD1
VFX-SD
EMU•
EMAX EMAX-2
ENTIRE PROTEUS
SERIES SP1200
AKAI•
S900 S950 S1000 S1100
S2800 S3000 S3200
S04 MPC60
KURZWEIL•
K2000

NEW! -50 Disk Library for AKAI MPC 60

AVAILABLE FORMATS:
ROMS•RAMS•CASSETTES•DATA SHEETS•ALESIS DATA-DISK•MAC•ATARI•IBM. AUTHORIZED DEALER FOR MOST COMPANIES. WE SELL HARDWARE TOO. SEND $2 FOR CATALOG (SPECIFY INSTRUMENTS) AND •••• LATEST SOUND LISTINGS.••••

KID NEPRO PRODUCTIONS • PO BOX 360101 (DEPT E) BROOKLYN, NY 11236 • 718-642-7802 • 212-629-3708 • FAX:212-947-0027 •

• AMEX • DISCOVER • VISA • MC •

The PATCH KING has it all!

World Radio History

CLASSIFIEDS

SOFTWARE & PATCHES

IBM Mac Atari ST C64/C128
Hundreds Of Music/MIDI Software Disks From $3.00 Per Disk! Call Or Write Today For Your Free Catalog Disk! Please Specify Computer Type.
Music Software Exchange
Post Office Box 533334
Orlando, FL 32853-3334
Telephone 407/856-1244

KURZWEIL
K2000 SAMPLES
Sound programs created by Marty Friend (the simple wizard who gave the world many of the unbelievable sounds found in the original KURZWEIL 250 and the new K2000 sound libraries!)!
Tired of samples that are less than claimed when you get them home? Try our "Hearing is believing" cassette demo tape before you buy ($3.00 refundable on order)!
- Available on floppies or 45 meg. Cartridges.
- Program spec. sheet included for every program.
- Ask about the 16 meg. "Ultimate Piano"!
- MasterCard & VISA accepted.

R.S.I. (219) 262-1324
300 Oakwood Ave. •Elkhart, IN 46514

GENERAL MIDI FILES
Romeo Music MIDI Editions™
630 Potter Rd., Suite 100
Framingham, MA 01701
World's largest library of royalty-free music on disk
Pop, Jazz, Folk, Classical.
Free catalog! (508) 877-8778.

SOUNDS-SAMPLES-SONGS-HELP
DOWNLOAD ALL YOU WANT! 708-949-MIDI (6434)
No hourly fees - 25,000 messages online - 75,000+ music files
ENSONIQ EPS-ASR-TS
SAMPLES FROM $3 DISKFULL WRITE FOR FREE LIST
YAMAHA SY-77 SOUNDS
18 DISK COLLECTION 5700 SOUNDS ORDER VIA MAIL $85.00
VISA/MASTERCARD/M.O.
SOUND MANAGEMENT BBS a MIDILink Net System Linking Music Pro's Worldwide
P.O. BOX 396 MUNDELEIN, IL 60060

Pro-Quality ASR-10 Samples!
Rubber Chicken Software has the samples you need for your Ensoniq® ASR/TS. ***Great Synths, Brass, Basses, Organs, Pianos! 1,000 of samples - 300mb CD-ROM - $299! FREE sound disk*** and ***catalog.***
This Month's Special - *(call only - mention EM!)*
Ultimate Organs ! - $39.95 - 10%
1-800-8-PRO-EPS

L.B. Music Sequences.
We sell sequences for Ensoniq, Korg, Roland, Yamaha, IBM/SMF. General MIDI. Call for a free demo kit.
(800) 3-LBMUSIC
(352-6874)

MIDI JAZZ COMBO. Looking for GM, standard format jazz sequences? We got 'em. Get our sequences disk–12 songs, an hour of jazz, for $24.95. **Musicraft Studio**, PO Box 1272, Laurel, MD 20725. Call (301) 604-6297 24 hrs. Visa/MC

MISCELLANEOUS

SILENT Sound
58 Nonotuck St., Northampton, MA 01060
Your Source for Acoustical Products
BEST PRICES-NATIONAL DELIVERY
800-484-1003 ext. 0032 ORDER
413-584-7944 FAX OR INFO
MC/VISA Accepted

IMPROVE YOUR SOUND RIGHT NOW WITH STUDIOFOAM
SOUND ABSORBENT WEDGES
BEATS SONEX COSTS UP TO 80% LESS!
LOTS OF SIZES, STYLES & COLORS!
Long Lasting Formulation • Passes California Firecode
Min. Just One Box • Prices Quoted Are 2'x4' Sheets
1"-$6.99 (20/box) 2"-$9.99 (12/box) 4"-$19.99 (6/box)
We Have A Wide Range Of Acoustical Products At Prices You Can Afford. Call For Free Sample Kit!
1-800-95-WEDGE

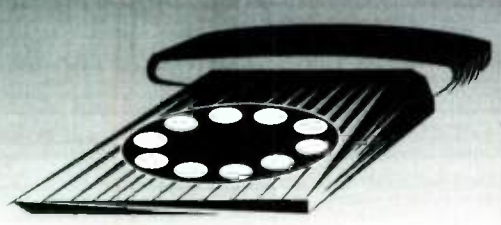
DusKuvir™
DUST COVERS
Protect Your Valuable Keyboards, Consoles and Audio Equipment
- Premium quality vinyl
- Black, clear or gray
- Custom-fit sizes
- *SATISFACTION GUARANTEED!*

VISA MasterCard
Order Today (800) 472-7707
j•pro P.O. Box 41 Minneapolis, MN 55316 (612) 427-7707 Fax: 427-8865

BE AN AUDIO RECORDING ENGINEER
On-the-job training at major recording studio **IN YOUR AREA**. Keep present job, train around own schedule. Call for Free brochure: **Recording Connection (800) 795-5750.**

MAKE BIG MONEY SCORING SOUNDTRACKS AND JINGLES! Turn your music into cash! For a **FREE** Report, write: Doely-Jones Music Productions, Concordia College Faculty 253, 901 S. 8th St., Moorhead, MN 56562.

MAKE A FORTUNE IN THE JINGLE BUSINESS ! ! !
Call 1-800-827-1366 for a FREE RECORDED MESSAGE 24 HOURS and learn how. I'm a 17 year veteran with jingles in every state. My complete jingle course shows you exactly how to do the same. Part-or-full time, locally-or-nationally. CALL NOW This information will save you years of trial and error. MAKE MONEY WITH YOUR MUSIC.



ELECTRONIC MUSICIAN CLASSIFIEDS

ORDER BY PHONE

call Robin Boyce

(800) 544-5530 or fax (510) 653-8171

World Radio History

CLASSIFIEDS

EM CLASSIFIEDS WORK FOR YOU

Text rate:	**$8 per line (approximately 25-32 character spaces per line); seven-line minimum. Add $0.50 per bold word. Each space and punctuation mark counts as a character. $56 MINIMUM CHARGE for each ad placed.**
Enhancements:	$10 black border, $15 for a grey-screened background, $25 for a reverse. $25 for Post Office box service. Charges are based on a per-insertion basis.
Display rate:	$95 per inch (1" minimum/half-page maximum). Logos or display advertising must be camera-ready, sized to EM column widths and specs. Frequency discount rates available, call for information.
Special Saver rate:	$25 for up to four lines, including first word in bold. **Only available to individuals not engaged in commercial enterprises.** No additional copy allowable for this rate.
Closing:	**First of the month,** two months preceding the cover date (for example, the April issue closing is February 1). Ads received after closing will be held for the next month unless otherwise stated. **Cancellations will not be accepted after the closing date.** Copy changes and cancellations must be submitted in writing.
Other requirements:	Full street address (PO boxes aren't sufficient) and phone number must accompany all requests, whether included in ad or not. All words to be **bold** should be underlined. Copy must be typed or printed legibly in standard upper/lower case. Publishers are not responsible for errors due to poor copy. Arrangement of characters may be altered in typesetting process due to space. The publishers are not liable for the contents of advertisements.
The small print:	Only ads dealing with music, computers, or electronics will be accepted. No stated or implied discounts allowed on new equipment sales. Publishers reserve the right to refuse or discontinue any ad deemed inappropriate.
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) 653-8171.
Payment:	**Must be included with copy: check, Visa, MasterCard, or American Express accepted. Sorry, no billing or credit available.**

INSERT THIS AD IN THE _____ **ISSUE OF EM.**

Categories available (check one):

- ☐ EMPLOYMENT
- ☐ EQUIPMENT FOR SALE
- ☐ INSTRUCTION & SCHOOL
- ☐ PARTS & ACCESSORIES
- ☐ PUBLICATIONS & BOOKS
- ☐ RECORDING SERVICES & REPAIRS
- ☐ RECORDS, TAPES & CDS
- ☐ WANTED TO BUY
- ☐ SOFTWARE & PATCHES
- ☐ MISCELLANEOUS

ATTACH YOUR CLASSIFED AD COPY ON A SEPARATE SHEET, TYPED DOUBLE-SPACED OR PRINTED CLEARLY IN CAPITAL AND LOWER-CASE LETTERS.

Company Name _____

Name _____

Address (no PO Boxes) _____

City _____

State _____ **Zip** _____

Phone (**)** _____

Signature _____

_____	**Display ($95 per inch)**	**$** _____
_____	**Lines @ $8**	**$** _____
(seven-line minimum)		
_____	**Bold @ $0.50 additional**	**$** _____
_____	**Border @ $10**	**$** _____
_____	**Reverse @ $25**	**$** _____
_____	**Screen @ $15**	**$** _____
_____	**Blind P.O. box @ $25**	**$** _____
_____	**Special Saver Rate =**	**$ 25**

TOTAL PAYMENT INCLUDED $ _____

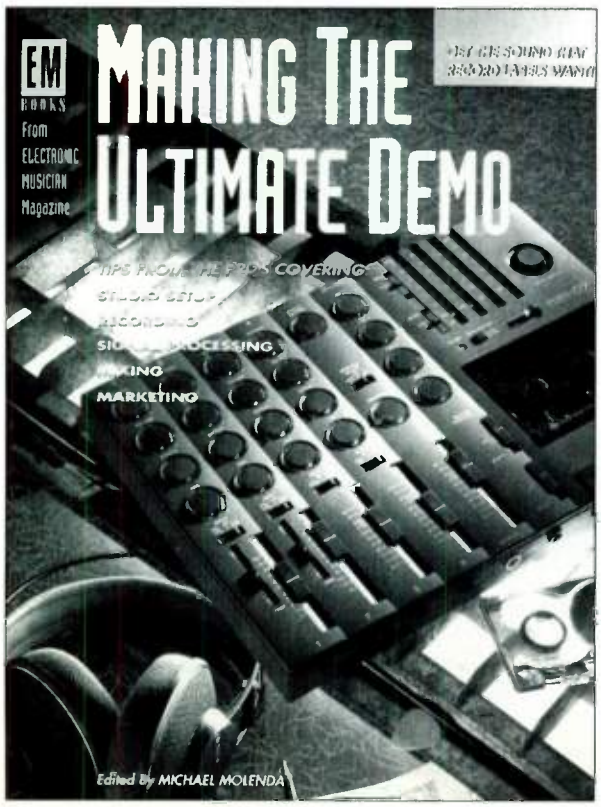
☐ Visa ☐ MC ☐ AmEx

☐ Check/Money Order # _____

Card # _____

Exp. _____

New From EMBooks



MAKING THE ULTIMATE DEMO

Michael Molenda, ed.

Recording and marketing a demo tape are critical steps toward gaining exposure for your music. How can you ensure that your demo will be your best shot at the top? **Making The Ultimate Demo** is designed to help you in every stage of the process, from setting up your studio through recording and mixing to getting your tape into the right industry hands. You'll learn how to record killer vocal and instrumental tracks, use signal processing like the pros and make intelligent mixdown decisions. And once your ultimate demo is "in the can," you'll find out how to release and promote your recording on a budget and approach record labels without wasting your time. Packed with proven techniques and tips from industry veterans, **Making The Ultimate Demo** will improve both the sound of your recordings and your prospects for success in the music business. ©1993, 128 pp. (P) **$17.95.**

ORDER NOW!

Call toll-free, U.S. & Canada (800) 233-9604 or (510) 653-3307; fax (510) 653-5142.

We accept Visa, MasterCard, American Express, Discover, personal checks or money orders, payable to:

Mix Bookshelf, 6400 Hollis Street, Suite 12, Emeryville, CA 94608

All items backed by our 60-day, money-back guarantee.

FREE CATALOG of instructional books, videos, tapes and sounds on CD available upon request.

EM BOOKS

World Radio History

TECH PAGE

Sixteen Will Get You Twenty

Apogee's UV22 finds digital audio not guilty.

By Scott Wilkinson

In the Supreme Court of the State of Sound, 16-bit digital audio stands accused of sounding harsh, brittle, and downright unanalog. Although it is capable of an impressive 96 dB dynamic range, low-level signals are not well represented by the last few bits. As a result, these signals are sentenced to die when they fall below the noise floor.

Analog tape is much more forgiving. Its noise floor is higher than 16-bit digital audio, but you can clearly discern signals at levels that fall below the threshold. This is somewhat like being at the beach with a friend. The sound level of the surf may be higher than your friend's speaking voice, but you can still hear what is said. However, if a signal sinks below the digital noise floor, it's completely lost in a sea of grunge called *quantization noise.*

One way around this difficulty is to digitize audio signals with a resolution greater than sixteen bits. In fact, many professional engineers now use 20-bit resolution, with its theoretical noise floor of -120 dB, to improve the situation. However, they must ultimately squeeze this information into CD's 16-bit straightjacket, or few people will hear their music. The same problem arises when digital EQ, gain change, or compression is applied to 16-bit signals, as these processes require increased resolution for accurate calculations.

Of course, you could simply truncate the extra four bits as you master for CD, but this results in audible distortion. A better approach is called *dithering,* in which a small amount of controlled, pseudorandom noise is added to a 16-bit signal to smooth out the behavior of the last few bits.

More recently, a process called *noise shaping* or *bit mapping* has been developed by Sony and other companies. As a 20-bit signal is converted to 16-bit resolution, the extra four bits are treated as quantization noise. Instead of a flat, white CD noise floor, the level of the noise is reduced in the mid range, where our ears are most sensitive, which inevitably raises the noise level in the high and/or low ends. (This is analogous to a bowl of Jell-O; if you push down in the center, the outer area rises.) However, our ears are less sensitive in the extreme frequency ranges, so higher noise levels in these areas shouldn't be audible (see "Tech Page: Sony Super Bit Mapping" in the February 1993 **EM**).

Despite the improvement these techniques represent, some engineers remain unsatisfied. These engineers point out that dithering and noise shaping alter the noise level and noise-floor profile of the final signal, which can't help but alter the signal itself. Many professionals believe this is audible, rendering these techniques unacceptable.

Apogee Electronic's UV1000 applies UV22 Super CD Encoding to digital signals. The encoding process retains the detail of 20-bit recordings while reducing the resolution to sixteen bits.

Enter Apogee Electronics, a Santa Monica, California, company that has specialized in digital audio for more than eight years. Their latest development is a process they call UV22 Super CD Encoding. In this process, the fine audio detail in the extra four bits is encoded into the last few bits of the 16-bit compact disc using the frequency range of 18 to 22 kHz, well above the upper limit of most people's ability to hear. The noise floor throughout the audible range remains flat at the theoretical limit of 16-bit digital audio.

Amazingly, this process lets you hear signals as much as 24 dB below the noise floor, much like analog tape. According to Apogee, UV22 not only preserves the detail of material converted from twenty to sixteen bits, but it also improves any material originally recorded with 16-bit resolution by slightly varying the instantaneous levels of consecutive samples, which effectively evens out the inconsistent quantization steps of most digital-to-analog conversions during playback.

Even better, UV22 is a single-ended system that requires no decoder. Clearly, this process is an important witness for the defense of digital audio, which is well on its way to being acquitted of its harsh reputation. ●

World Radio History

32-note polyphonic digital piano, expandable to 64-note fully-weighted 88-key piano action 64 presets including
Grand Piano samples, Fender Rhodes™ electric pianos, Clavinet™ & harpsichord, rock & jazz organ, bass, acoustic
guitar, vibes, marimba & Orchestral String Ensemble On-board digital stereo effects processor Full GM
compatibility with 205 more presets on optional expansion card Full MIDI functionality 50 pounds light

From Stage to Studio, it's Kurzweil's new PC88 Performance Controller. Get the picture?

KURZWEIL®

Kurzweil is a product line of Young Chang America, Inc.

Pure Inspiration

13336 Alondra Blvd., Cerritos, CA 90701 Tel: 310/926-3200 Fax: 310/404-0748 All products indicated by trademark symbol are trademarked and/or registered by their respective manufacturers

World Radio History

Are you writing a song or launching the space shuttle?

When it comes to creating music, computers are great because they give you a band at your fingertips. But they can also bog you down with annoying technical distractions.

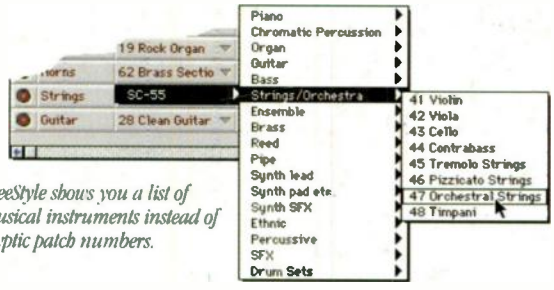
Work with players in an ensemble. FreeStyle remembers all your takes so you can easily choose your favorite parts.

The problem is that until now, nobody's made a sequencer specifically designed for those spontaneous moments when inspiration strikes.

That's why we created FreeStyle.

With its Riff Metronome™, FreeStyle lets you play to an inspiring drum riff instead of the usual boring click—instantly choose among dozens of riffs to find the one that gets you pumped.

After recording your first take, there's no need to mess with loop points. FreeStyle senses when you stop playing and automatically begins looping what you've recorded so you can try another take or add more players.

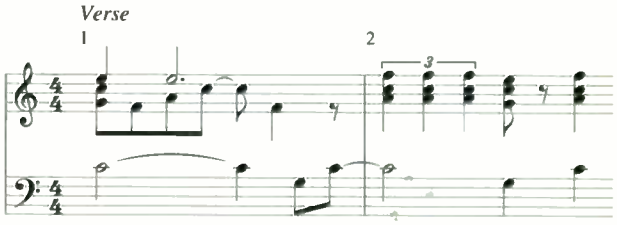


FreeStyle shows you a list of musical instruments instead of cryptic patch numbers.

With its trackless approach to sequencing, FreeStyle allows you to create an entire song without ever taking your hands off your keyboard or guitar controller. You may even forget your computer is in the room.

FreeStyle works with any MIDI interface such as the one-in three-out FastLane™ or the four-in six-out MIDI Express™, Electronic Musician Magazine's 1994 Editors' Choice Award Winner.

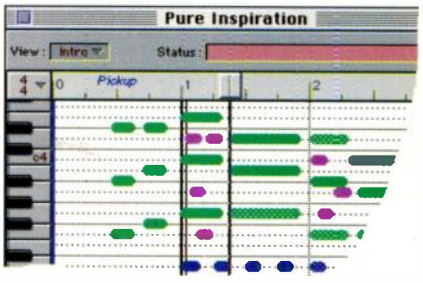
But if you do glance at your computer, you'll see full-color graphic editing and impeccable music notation. And when you're ready to put it all together, FreeStyle's arrangement window lets you easily assemble sections into a song.



Unlike those "EZ" programs, FreeStyle's notation looks great. It's automatic and intelligent with dynamic hand-splitting, multiple voices and engraver spacing.

Best of all, you're never locked into one way of working—you can switch freely between linear recording over your entire song and loop-recording within each individual section.

FreeStyle is also designed to keep MIDI complications out of your face, so it has built-in support for General MIDI sound modules and other popular devices. Just plug in your instrument, select the players you want, and start recording.



Each section of music can have a pickup bar, so you don't have to copy the pickup notes of your chorus into the last bar of every verse.

So, the next time you sit down at your computer to write a song, do it FreeStyle. It's as musical as your computer can get.

FreeStyle™

As musical as your computer can get.

Mark of the Unicorn, Inc. 1280 Massachusetts Avenue, Cambridge, Massachusetts 02138 Phone +1 617 576 2760 FAX +1 617 576 3609

World Radio History