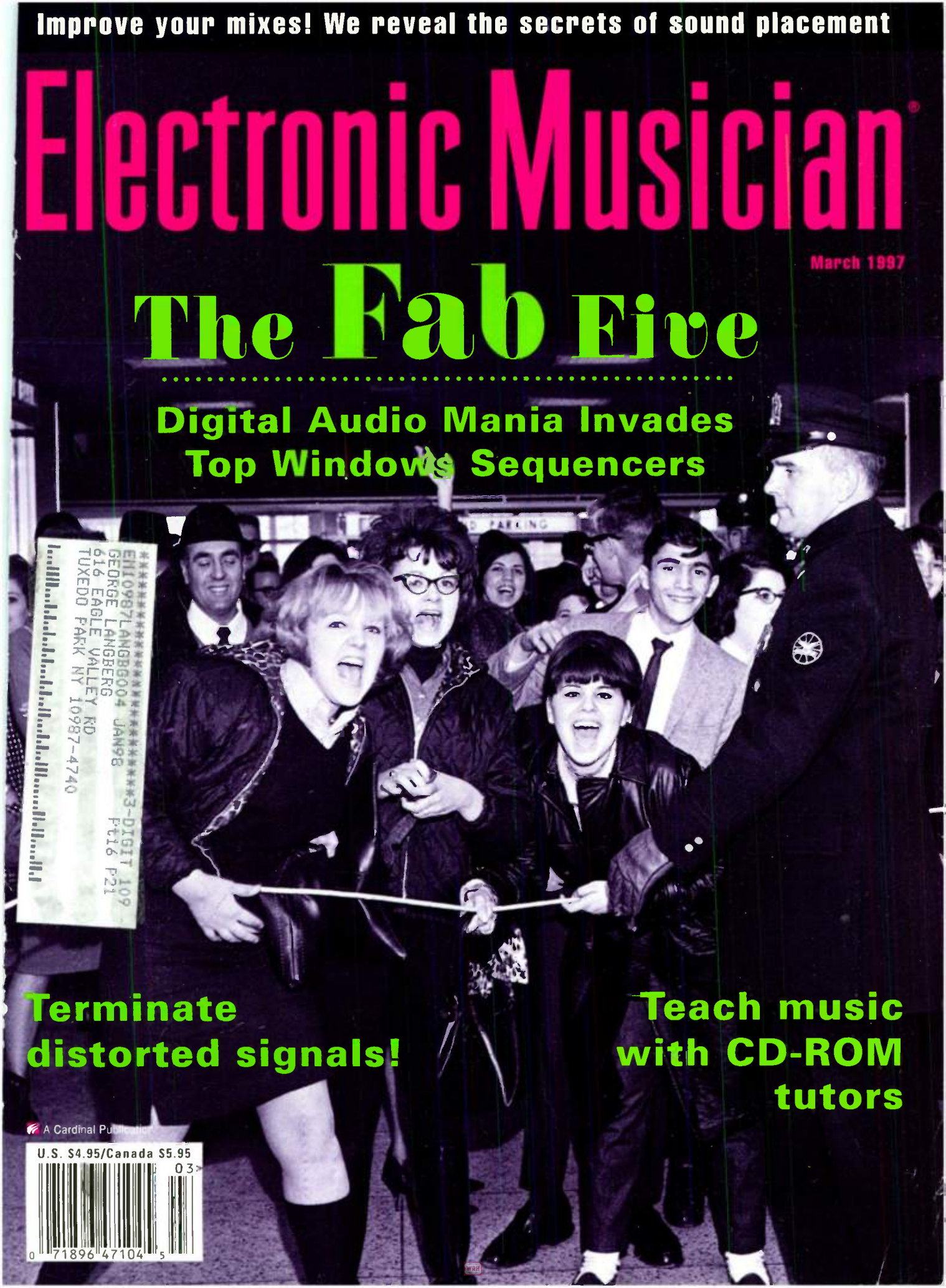
Improve your mixes! We reveal the secrets of sound placement

Electronic Musician®

March 1997

The Fab Five

Digital Audio Mania Invades Top Windows Sequencers



Terminate distorted signals!

Teach music with CD-ROM tutors

**********3-DIGIT 109
EM10987LANGBG004 JAN98 Pt16 P21
GEORGE LANGBERG
616 EAGLE VALLEY RD
TUXEDO PARK NY 10987-4740

A Cardinal Publication

U.S. $4.95/Canada $5.95

03

0 71896 47104 5

REALITY FOR $1500* A PAIR. INTRODUCING

If you've been trusting the quality of your creative product to passive monitors costing $400-$600 a pair, there's an astonishing revelation waiting for you at your Mackie dealer. In our opinion, the active, biamplified HR824 is the most accurate near-field monitor available. So accurate that it essentially has no "sound" of its own. Rather, the Mackie Designs High Resolution HR824 is the first small monitor with power response so flat that it can serve as a completely neutral conductor for whatever signal you send it.

HR HIGH RESOLUTION SERIES™

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

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

Designs sought out the most talented acoustic engineers (being able to live in perpetual drizzle was a plus) and then made an enormous commitment to exotic technology such as scanning laser Doppler vibrometry, analyzers, time delay spectrometers and machines that go "*ping*." The High Resolution Series HR824 is the result of painstaking research and money-is-no-object components. Not to mention thousands of hours of listening tests and *tens* of thousands of dollars in tooling.

SCIENCE, NOT SNAKE OIL.

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

HR824 Active Monitors accept balanced or unbalanced ¼" and XLR inputs. Jacks & removeable IEC power cord face downward so that the speaker can be placed close to rear wall surfaces.

FLAT RESPONSE...ON OR OFF-AXIS.

One of the first things you notice about the HR824 is the gigantic "sweet spot." The detailed sound field stays with you as you move back and forth across the console — and extends far enough behind you that musicians, producers and your mom can hear the same accurate playback.

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

Like biamped speakers, wave guides aren't a new concept. But it takes optimized, internal electronics and a systems approach to make them work in near-field applications.

The HR824's wave guide (Fig. B) maximizes dispersion, time aligns the acoustic center of the HF transducer to the LF transducer's center, and avoids enclosure diffraction (notice that the face of the speaker is perfectly smooth.) The exponential guide also increases low treble sensitivity, enabling the HF transducer to handle more power and produce flat response at high SPLs.

CLEAN, ARTICULATED BASS.

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

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

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

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

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

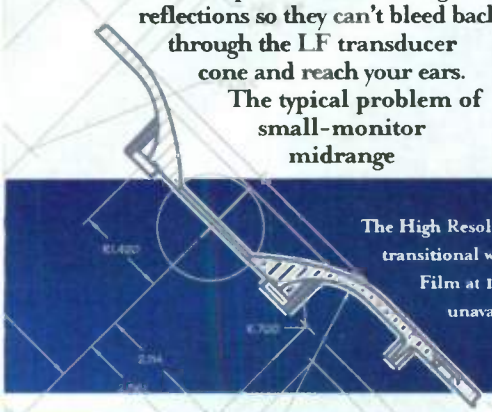
Second, instead of relying on ports or slots, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acoustic-insulated 6.5-inch passive drivers. While typical, undersized ports cause vent noise, power compression and low frequency distortion, our ultra-rigid drivers eliminate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

circle #549 on reader service card

THE HR824 ACTIVE MONITOR.

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

Third, the woofer enclosure is air-displaced with high-density adiabatic foam. It damps internal midrange reflections so they can't bleed back through the LF transducer cone and reach your ears. The typical problem of small-monitor midrange "boxiness" is eliminated.



The High Resolution transitional wave guide. Film at 11 unavailable.

A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected the likely candidates to rigorous evaluation. One test, *scanning laser vibrometry*, gives a true picture of surface vibration patterns. Two test results are shown in the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

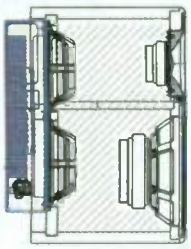


Figure D shows our High Resolution metal alloy dome at the same frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces *exactly* what you're recording.

INDIVIDUALLY® OPTIMIZED.

You won't hear it from other manufacturers, but individual low and high frequency drivers can vary more than 10% in sensitivity due to production variations. Because our monitor is active, we can precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully *hand-trimmed* to ±1.5dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board is 1-inch thick with "radiused" edges to further eliminate diffraction. An "H" brace bisects the enclosure for extra rigidity.

Mackie is one of the few active monitor manufacturers that also has experience building stand-alone professional power amps. Our HR824 employs two smaller versions of our FR Series M•1200 power amplifier — 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low frequencies. Both amps make use of high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

HR HIGH RESOLUTION SERIES™

FR FAST RECOVERY SERIES™

TAILOR THEM TO YOUR SPACE.

Because control rooms come in all shapes, sizes and cubic volumes, each HR824 has a three-position Low Frequency Acoustic Space control. It maintains flat bass response whether you place your monitors away from walls (*whole space*), against the wall (*half space*) or in corners (*quarter space*). A low frequency Roll-Off switch at 80Hz lets you emulate small home stereo speakers or popular small studio monitors.

Fig. C: Uneven fabric dome tweeter motion distorts high frequencies.

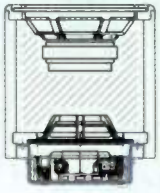
Fig. D: HR824 alloy dome's uniform, accurate pistonic motion.

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

CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER.

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

If you've never experienced an active monitor before, you're going to love the unflinching accuracy of Mackie Designs' HR824s.



If you've priced other 2-way active monitors, you're going to love the HR824's $1498/pair price* AND its accuracy.

*$1498 suggested U.S. retail price per pair.

© 1996 Mackie Designs Inc. All rights reserved.

MACKIE.™

Woodinville • WA • USA • 98072 800/898-3211 206/487-4337 • e-mail sales@mackie.com
For information about distribution outside of the USA 206/487-4333 206/485-1152

Fresh. Not Canned.

Looking for some fresh, new sounds? Well, your search is over. Introducing the JP-8000, an all-new synth that's going to prove you've not heard it all before. This is more than your average synth. Much more. Utilizing Analog Modeling™, this innovative sound source delivers all the classic waveforms, along with variations never before possible. Knobs and sliders allow you to manipulate, and even record, many sound parameters in realtime, for an endless variety of fat, powerful, analog-type sounds. Our newly developed Ribbon Controller gives you the

freedom to control combinations of front panel parameters for maximum expressiveness.

Effects? Of course. Along with other features such as an RPS Sequencer and a performance-oriented arpeggiator for heart-pumping techno and dance applications. Add it all up and you get a totally unique synth of unprecedented versatility and, with it, a whole new way to express yourself.

The JP-8000, another classic Roland original. Check it out at your nearest dealer. It'll have you believing in creation again.

Roland®

JP-8000 Music Synthesizer

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
Fax-Back Information: (213) 685-5141, ext. 271 (Doc. #10160) http://www.rolandus.com

circle #572 on reader service card

I N S I

FEATURES

32 HIGH-TECH TUTORS
Your next teacher's assistant may be a computer! Our survey of educational CD-ROMs proves that technology can help children learn about the wonders of music.
By Meg Ryan

42 COVER STORY: THE FAB FIVE
Scream your hearts out as five totally awesome digital audio sequencers for Windows face off in a "battle of the bands." The players are: Cakewalk Music Software *Cakewalk Pro Audio* 5.0, Emagic *Logic Audio* 2.5.4, Musicator A/S *Musicator Audio* 1.03, Steinberg *Cubase* 3.02, and Voyetra *Digital Orchestrator Plus* 2.11.
By Zack Price

68 CREATIVE SPACE: BARNSTORMING
Trade riffs with Jethro Tull guitarist Martin Barre as he records a solo album in his English barnyard studio, The Presshouse.
By Greg Pedersen

76 MASTER CLASS: A PLACE FOR EVERYTHING
Our advanced mixing seminar studies the fine art of positioning elements within a soundscape.
By Larry the O

DEPARTMENTS

8 FRONT PAGE
12 LETTERS
18 WHAT'S NEW
138 AD INDEX
162 CLASSIFIEDS

D E Electronic Musician®
MARCH 1997 VOL. 13, NO. 3

COLUMNS

28 **PRO/FILE: Surreal Wind**
J. Arif Verner's Aeolian harps "play" with the summer breeze.

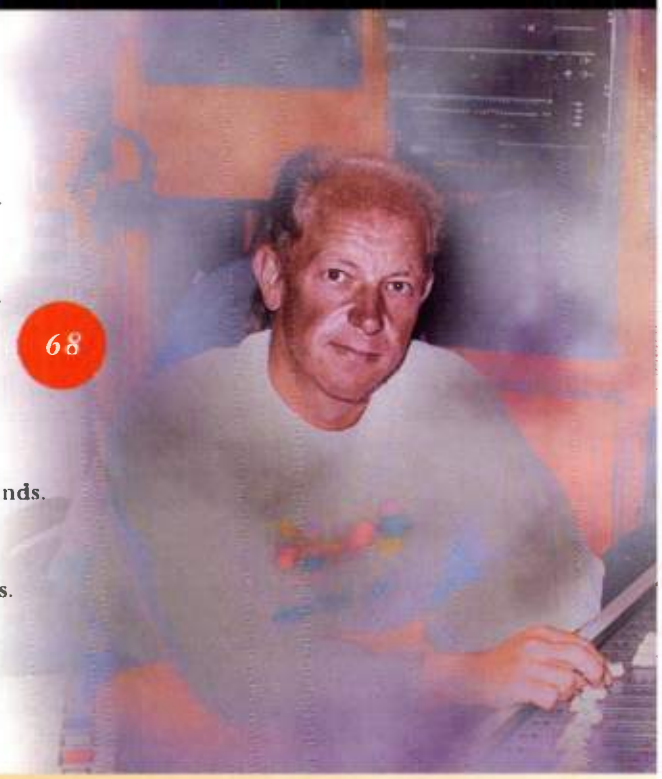
86 **RECORDING MUSICIAN: Optimum Gain Structure**
Avoid butchered audio signals by carefully setting gain levels.

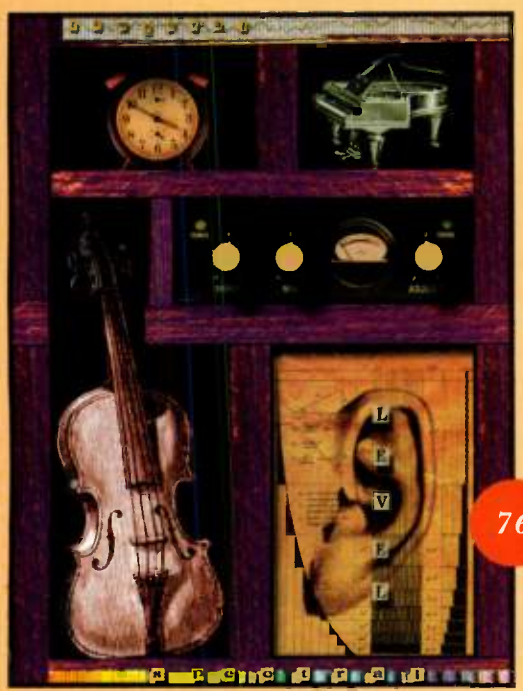
94 **SQUARE ONE: Selecting the Right Bank**
Increase your synth's creative options with MIDI Bank Select.

102 **SERVICE CLINIC: Questions and Answers**
Our techmeister declares the Web a safe source for synth sounds.

108 **WORKING MUSICIAN: Success by Association**
Network your path to bliss by checking out a few users groups.

170 **TECH PAGE: The Need for Speed**
ADSL technology may kick Web access toward warp velocity.





REVIEWS

116 **E-MU E4K** keyboard sampler

126 **MACROMEDIA Deck II 2.5.2 (Mac)** recording software

142 **SOUND FACTORY Groove Construction Kit** sample CD

143 **ROLAND PMA-5** pocket MIDI studio

149 **YAMAHA CS1x** synthesizer

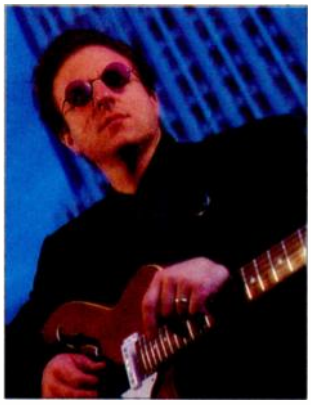
157 **FRONT ROOM PRODUCTIONS Producer Series** sample CD

160 **AUDIX PH-15vs** powered monitor speakers

Cover: Photo courtesy of Michael Ochs Archives/Venice, CA.

Time Passages

What was I supposed to do before I got old?



ROBERT PERRY

In the strutting bravado of youth, Pete Townshend wrote "My Generation" and doomed himself to a lifetime of stupid questions. It has been Pete's misfortune to reach middle age as the author of the line, "I hope I die before I get old." As a result, entire battalions of simple-minded journalists have tormented him with an extremely obvious query that I will not bother to repeat.

Although Pete declined to be martyred by his words, his sentiment was dead on. When you're young, the most horrible fate imaginable is that—*if* you're lucky—you'll end up old, unhip, and clueless. Aging is one of those cosmic jokes, and you have to laugh at your hubris for ever thinking you could beat the clock. For example, in the 1970s, I sneered at 40-year-old record execs prancing around in bell bottoms with their shirts opened to the waist and just prayed I'd never be that lame. Of course, I have become the very thing that I feared. I've turned 41 sporting shoulder-length hair, an earring, and faux Doc Martens. I am a classic caricature: the aging Peter Pan vainly attempting to disguise the road signs of passing time.

In rare moments of lucidity, I know that I'm not fooling anyone. But it's difficult to age gracefully in the eternal youth culture of the entertainment business. In my circle of music and movie professionals, I've encountered enough plastic surgery, hair weaves, collagen injections, liposuction treatments, and other wonders of medicine to warrant an X-File on youth cults. And if you attend any NAMM or AES show, you'll see scores of 40- and 50-somethings wearing the fashions and hairstyles of either their own youth or today's 20-somethings. Now, if you dig your look, more power to you. I suspect, however, that many of us evoke the facade of youthfulness (or coolness) because we don't want the people who use our gear and read our magazines to think we're old and out of it.

Are we being paranoid? Maybe not. Brian Courtney, our new Northwest advertising sales manager, recently mentioned that someone told him the British gear mags were much cooler than the American publications because the U.S. editors were basically old men. Bollocks! I'd never tag a Brit mag for being naive—or for promoting style over content—simply because the editor might be a fresh-faced adolescent. After all, the proof is in the product. A *truly* cool music-technology publication helps you master your tools, improve your recording chops, and produce music at the highest level that your brain, heart, and hands are capable of. "Old" editors or not, **EM** and our fellow American mags certainly deliver the goods on those scores. And sometimes the voice of life experience brings forth creative perspectives that the typical 20-something can't articulate. So there!

It also helps to remember that Picasso, Segovia, Cage, and Casals (to name a few) were vital artists well into their 80s and 90s. Ultimately, the sin is not getting old, it's *acting* old. Think youthful thoughts, and it will not matter what you wear or how you look. I'd like to believe that knowledge still breeds respect, but maybe that's an "old man's" folly. So just to be safe, I'm keeping my earring!

Electronic Musician®

Editor in Chief Michael Molenda

Senior Editor Steve Oppenheimer
Managing Editor Mary Cosola
Technical Editor Scott Wilkinson
Assistant Editors Brian Knave, Diane Lowery
Editorial Assistants Joe Humphreys, Rick Weldon
Proofreader Sally Engelfried
Contributing Editors Alan Gary Campbell, George Petersen

Art Director Linda Birch
Associate Art Directors Tami Herrick-Needham, Laura Williams
Graphic Artist Dmitry Panich
Informational Graphics Chuck Dahmer

Publisher John Pledger

Associate Publisher Carrie Anderson
Southwestern Advertising Manager Dave Reik
Eastern Advertising Manager Angelo Biasi
Marketing Services Manager Jane Byer
Promotions Manager Christen Pocock
Marketing/Operations Assistant Meg Ryan
Sales Administrator Karen Dere
Sales Assistants Jennifer Cobb, Paul James, Elizabeth Myron, Mary Stancatti
Classifieds Advertising Manager Robin Boyce-Trubitt
Classifieds Assistant Jef Linson
Classifieds Sales Assistant Deborah Mapp

Director of Operations and Manufacturing Anne Letsch
Production Director Ellen Richman
Advertising Traffic Manager Joanne Zola
Production Assistant/Reprint Coordinator Sherry Bloom
Computer Systems Coordinator Mike Castelli

Circulation Manager Philip Semler
Circulation Fulfillment Associate Cyndi Lukk
Circulation Promotions Associate Todd Keffury

Business Manager Cindy McFarland
Receptionist Carrie Gebstadt

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. (203) 838-9100, fax (203) 838-2550

Subscriptions, Customer Service
PO Box 41525, Nashville, TN 37204
tel. (800) 843-4086 or (615) 377-3322
e-mail sunbeltful@aol.com

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

President and Chief Executive Officer Robert N. Boucher
VP and Chief Financial Officer Thomas C. Breslin
VP, Publishing Services R. Patricia Herron
VP, Human Resources Dorothy J. Flynn
VP, Sports and Music Division Thomas J. Morgan
VP, Retail Division Marianne Howatson
VP/GM, Information Technology Division Tom Wilson

Electronic Musician (ISSN: 0884-4720) is published monthly by Cardinal Business Media, Inc., 6400 Hollis St., #12, Emeryville, CA 94608. ©1997. This is Volume 13, Number 3, March 1997. One year (12 issues) subscription is $30; outside the U.S. is $49.95. Periodical 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®

everything starts with an idea...

make music, think ENSONIQ

ENSONIQ MR Series Keyboards make ideas explode. While there's power under the hood of many keyboards, the ENSONIQ MR Series keyboards bring that power to the surface!

everything you play... is recorded by the *The Idea Pad*™, all the time. Use it with the *Drum Machine's* many patterns. Send any idea you like to the on-board *16 Track Sequencer* for further developement and easily arrange your sequences into songs with the *Song Editor.*

everything you want... to control your ideas is within your reach. The *FX/Mixdown* strip gives you control over panning, volume, solo, muting, as well as access to each of the effects sections – reverb, chorus, and any of the 40 insert effects.

everything you need... to expand ideas is yours to choose and install.

EXP-1 "The Real World"...
is an expansive array of exotic and authentic world instruments.

EXP-2 "MR-Rack Drum Expander"...
adds 65 exciting new Drum Kits to your MR-Rack!

EXP-3 "Urban Dance Project"...
Kits, Grooves, Hits, Pads, Basses, and more!
The Ultimate Groovemakers' Toolkit!!!

Now is the time to get to your nearest dealer to capture those ideas, before you lose them!

EXP-1

EXP-2

EXP-3

and now...Version 2

- Final Mixdown of volume and tempo
- Step Entry Record
- Sample load of .WAV and .AIF (requires 4 MB MR-FLASH Memory Board)

ENSONIQ™

LEADING THE WORLD IN SOUND INNOVATION

You can reach us at:
800-553-5151 *phone*
610-647-8908 *fax*
http://www.ensoniq.com *on the Web*
800-257-1439 *documents to your fax*

Start by sending me everything on the MR Series

Also, send me additional info on:
ASR Series *Samplers*
DP Series *parallel effects processors*
KT Series *64-voice weighted action synths*

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

Mail to: ENSONIQ Corp. Dept E-67, 155 Great Valley Parkway, P.O. Box 3035, Malvern, PA 19355-0735 (610) 647-3930 fax (610) 647-8908

circle #528 on reader service card

Now:

Audiowerk8, Emagic's new PCI based digital audio recording card, makes hard disk recording as easy as tape. With 8 discrete outputs, stereo analog ins and digital I/O, solutions are solutions without exceptions. Shipping with VMR, the "Virtual Multitrack Recorder", software so transparent, the manual is included in this ad. And for your growing studio needs, Audiowerk8 is fully compatible with the Logic Audio production system. The choice is simple, with a list price of $ 799.– creative expression with professional results is now affordable to all.

Home studio technology takes **a leap in quality** and **a drop in price.**

Introducing Audiowerk8,
the affordable 8 Channel Digital Audio Recording PCI Card featuring:

- 2 analog IN and 8 discrete Outputs
- Professional Quality A/D-D/A Converters
- Stereo Digital I/O (S/P-DIF)
- Easy Installation and Operation
- Up to 8 Tracks with VMR-Software
- Up to 20 Tracks with Logic Audio Software
- PCI Busmaster Technology for maximum System Performance

Mac OS

MacOS and Windows '95 compatible.

1. Tracks

Play back eight tracks while recording two additional tracks. You can name each track and access a virtually unlimited number of alternative takes.

2. High Definition Level Meters

Allows you to accurately monitor the levels of your recordings on each track.

3. Left and Right Locator Displays

Shows you the currently selected in/out points. Values can be easily edited with click/drag mouse operation. Values can be readily selected and dragged into any of the 20 positions in the Position Memory bank and vice versa.

4. Cycle Button

Enables cycle playback and record between the left and right locators.

5. Track Switches

Besides the standard switches such as Solo, Mute and Record, the Stereo Buttons allow you to group 2 tracks together as one track for easy handling.

6. Wave Display

The positive waveforms of your recorded tracks smoothly scroll from right to left during playback and recording. This allows you to easily navigate through your recordings.

7. Set-Locator Button

These buttons allow you to write the current "tape" position into the locator displays on the fly. Controllable either with the mouse or with a keystroke, these buttons allow you to quickly generate new left and right locators.

8. Tape Indicator

Indicates how much space or "tape length" you have left for your recording. It also indicates your current position within the recording.

9. Auto Drop Button

With this button enabled, the VMR will automatically switch to record mode using the currently displayed left locator as record IN and the right locator as record OUT.

10. Tape Button

You'll need to choose a "tape" before making your first recording. Pressing this button gives you a variety of tape length options depending on the size of your hard drive.

11. Copy Button

This button allows you to copy, move or mixdown the data of "soloed" source tracks between the left and right locators to the tape position on a record enabled destination track.

12. Input Selector

Press "A" to choose the Analog Input, or "D" to choose the Digital Input on your Audiowerk8 Card.

13. Pitch Variation

Clicking on this button opens a display where you can simply enter the desired pitch value by clicking and dragging. Pitch ranges are from -9.99% to +9.99% in steps of 0.01%.

14. Position Memory Bank

Up to 24 positions can be stored with each tape. 6 can be displayed simultaneously. To view others, simply click on the slider and drag left or right. Clicking on the "pair" button between 2 position memories gives you a "pair selection" which can be dragged into both locator displays simultaneously. Position memories can also be set and recalled via keystrokes.

15. Position Display

Optimized for legibility, the position display shows you the current tape position. A maximum tape length of 1 hour, 59 minutes and 59.59 seconds can be displayed.

16. Tape Controls

As simple to use as the controls of any conventional multitrack tape recorder.

VMR "Virtual Multitrack Recorder" Software, included with Audiowerk8, Emagic's new 8 Channel Digital Audio Recording PCI Card.

AW8 plus VMR Software

This turnkey solution is your easy introduction to Digital Multitrack Audio Recording.

AW8 plus Logic Audio Discovery

Along with advanced Audio Recording, Realtime DSP and Editing you also get an integrated Sequencing and Scoring Solution.

AW8 plus Logic Audio

The Ultimate Music Production System including Realtime DSP, Sample Editing, Virtual Mixing, professional Scoring and more...

Easy entry – Easy upgrade:

The Audiowerk8 is an integral part of the Logic Audio System. You can add complete MIDI Sequencing, Scoring and Professional Audio Editing Features including Realtime DSP.

The Audiowerk8 will be available in early March at leading music retailers. The suggested retail price is **$799.–** including the Virtual Multitrack Recorder Software. For more information about Audiowerk8, system requirements and all available upgrade options please visit our webpage or give us a call.

Emagic Inc.
Tel. +916. 477 1051
Fax +916. 477 1052

Emagic E-Mail
emagic@emagicusa.com

Emagic Web Site
http://www.emagic.de

All trademarks are property of their respective holders.

emagic

Technology with Soul.

Circle #526 on reader service card

MORE WEB TASTINESS

I just read the article "Desktop Musician: Tasty Web Sites" (January 1997) by Joe Humphreys. I want to thank you for going to such great effort to keep everyone informed. **EM** always presents the good stuff.

I would like to let readers know about *my* site. It was built as part of a general promotion for my small indie label, Emotif. I wanted to create a reason why people would want to visit, without resorting to gimmicks. So I put together a university for electronic musicians with courses that included electronic scoring, film scoring, and other related subjects. These were offered at no charge. We just finished the first semester with 200 students from all over the world.

Soon we will be starting the next semester, and I'd like to invite **EM** readers to check out the course. With nineteen years experience in film and television scoring (including hundreds of TV shows, such as *Star Trek: The Next Generation*) as well as teaching film scoring at USC with Buddy Baker, I created this site as a labor of love and a service to musicians. Please stop by the site at emotif.com, or go direct to the university at emotif.com/701.html.

Ron Jones
Emotif, Inc.
ronjones@emotif.com

AND THE WINNER IS...

Your "Editors' Choice" issue (January 1997) has always been a sort of buying guide for me. I appreciate the time and effort that goes into the awards. However, I feel you really missed the boat by awarding only Mac software in the "Multitrack Recording Software" and "Notation Software" categories. I would hope you realize by now that, to a huge segment of the population, a PC means a Windows, Intel-based machine. I realize the "pro" industry still worships at the Mac altar, but to exclude Windows PCs is like only rating Beta VCR equipment because the television stations still use it, even though everybody else uses VHS. Out here in the wilds of personal home computer–based studios, everybody has Windows, MS Office, etc., and uses *Cakewalk, Master Tracks,* etc., for business and music. In a word, *ketchup!* Thanks for a great magazine.

Mark Gensman
mgensman@ix.netcom.com

Mark—We give **EM** *Editors' Choice awards to the new products we feel are most deserving, regardless of platform. We have considered giving separate awards for Mac and Windows but ultimately decided that one winner should take all in each category, which is also the reason we discontinued the practice of awarding formal honorable mentions. However, we review our criteria and categories each year, so this policy could change if we feel a change is warranted.*

That said, we aren't ignoring Windows products. This year's winning Windows products included Power Technology's DSP•FX (Most Innovative Product) and Voyetra's Digital Orchestrator Plus *(Digital Audio Sequencer). The latter represents the stunning triumph of an inexpensive, relatively simple program over a host of high-end programs for both Mac and Windows. And we gave an informal honorable mention to IQS's* SAW Plus *in the category you mention (Multitrack Recording Software). By the way,* SAW *3.2 won our 1994 award in this category.*

Speaking of past winners, you will also find plenty of Windows products among our 1995 award winners, including Free Play's World Music Menus *for Mac and Windows (Ancillary Software), Sonic Foundry's* Sound Forge *3.0 (Sample-Editing Software), and MOTU's* FreeStyle *for Windows (Sequencer).* Quod erat demonstrandum! *—Steve O.*

SCORE!

After reading the December 1996 article "An Economy of Scales," I was dying to get my hands on a large-diaphragm mic. Not even a week later, I was checking the classified ad section in the local newspaper under musical instruments, and there it was—a Rode NT-2. I remembered the excellent review you gave the mic. The man was selling a whole studio that was going out of business, so I was like a kid in a candy store. I bought the Rode NT-2 with shock mount and warranty card for $450. What a deal! I love the mic, and it's just everything you said it was.

Ron Shelton
audio2midi@aol.com

PROTECT YOURSELF

I was happy to see that *Electronic Musician* advocates the distribution of music over the Internet ("Going Global," December 1996). However, I was very disappointed that readers were not advised of methods to protect their intellectual property. I look forward to seeing a follow-up article that discusses copyright in the Information Age as well as the risks associated with Internet publication.

Mary Simoni, Ph.D., Director,
Center for Performing Arts &
Technology
School of Music
University of Michigan
Ann Arbor, MI

Mary—You are right; protecting intellectual property is of the utmost importance, especially given the increasing popularity of the Web. You should check out "Working Musician: New Frontiers in Copyright" in the February 1997 issue of **EM**. *It has a section on copyright and rights clearance in regard to new media. We plan to continue covering electronic copyright issues in future columns and features. With "Going Global," we intentionally narrowed the focus to address whether musicians should consider using the Internet for music distribution and how to make it happen. Space*

VALERIE SPAIN

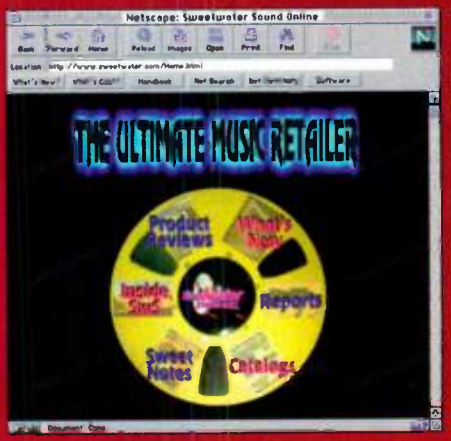
America's Fastest Growing Music Retailer

...for the third straight year!

— Source: Inc. Magazine Top 500

Sure, any dealer can sell you the latest MIDI instruments and recording equipment. Call them — they'll be glad to take your order (and your money). But only Sweetwater offers the kind of old-fashioned, personalized service you deserve from a sales staff that really knows their stuff. You also get dependable on-time shipping and technical support other dealers can only dream about, plus the industry's largest inventory in stock in our giant warehouse.

You've seen our informative, full color ads for years. Now check us out on the Internet. It's the most comprehensive music site on the planet: "www.sweetwater.com"!



Over 100,000 musicians world-wide already get a copy of our exclusive Sweet Notes newsletter. Call us today to receive your free subscription!

make the RIGHT CALL!

Sweetwater Sound first opened its doors in 1979. A whole lot of other music dealers have come and gone since then, but thanks to our innovative customer communications, affordable prices and friendly, knowledgeable sales engineers, we've grown at an astounding rate. We offer thousands of products from the best names in the industry, like **Korg**, **Roland**, **Kurzweil**, **Alesis**, **Digidesign** and **Tascam**, to name just a few. So if you're shopping for equipment, why not **make the right call** and find out why thousands of other musicians have made Sweetwater Sound their first choice for all their hardware and software needs?

(219) 432-8176

5335 BASS ROAD • FT. WAYNE, IN 46808 • FAX (219) 432-1758

sales@sweetwater.com http://www.sweetwater.com

VISA MasterCard DISCOVER

CALL NOW! YOU MAY BE **PRE-APPROVED** FOR OUR LINE-OF-CREDIT ACCOUNT!
(Amount may vary up to $50,000 depending upon individual credit history)

THE ULTIMATE MUSIC RETAILER!

Sweetwater SOUND INC.

circle #584 on reader service card

considerations kept us from deviating too far from that core topic.—Mary C.

WOMEN'S RESOURCES

Thank you for the amazing article "Working Musician: Resources for Women in Music" (January 1997). It's a long overdue subject; too many women go unnoticed and underpaid for jobs their male counterparts hold within the same industries. My small indie label, Zambee-Karlt Records, makes an effort to help promote women in the arts, and we were the indie label Carla DeSantis talked about in the column. In addition, the Kickstart Contest that was also mentioned in the article was a total success.

Jake Smith
Executive Producer
Zahmbee-Karlt Records
zahmbee@aol.com

Congratulations and thank you for the wonderful "Working Musician: Resources for Women in Music" that included the Institute for the Musical Arts. I was extremely proud that a first-class magazine such as EM (which has been so generous with their support of women's projects, including some that I have personally been a part of) would once again be ahead of their time in offering such an article. Bravo!

Janelle Burdell
janelle@sirius.com

TREAT ME RIGHT

The piece on Neil Giraldo and Pat Benatar ("Married to the Music," December 1996) was an excellent article. It struck me because I have been an avid fan of Benatar's work since her first album, *In the Heat of the Night*. It is always nice, useful, and inspiring to hear comments about recording from seasoned musicians and producers whose work has influenced your musical life. My only criticism is that author Greg Pedersen made a reference to the song "Love is a Battlefield" as being from the album *Get Nervous*. It is actually from *Benatar: Live from Earth*.

Tony Buckland
cbuckland@kwasha.com

TROGGS BOOTLEG

I enjoyed the article on the importance of producers ("Production Values: Shop Talk," November 1996), but I have one question. The writer mentioned a tape of the Troggs trying in vain to record a song, and seemed to imply that copies of this tape were floating around somewhere. Where might I obtain one? Being a budding producer myself (that's a guy who tries to convince his musician friends that they need a producer) I'd like to get a listen.

Curt Yengst
Zerro House Productions
zhp@juno.com

Curt—The infamous Troggs tape mentioned in the article has long been distributed amongst musicians who are part of a loose network of "spy" recording collectors. (Other such jewels include Buddy Rich going ballistic on his band, Orson Welles getting sloshed while taping a TV commercial, and Casey Kasem invoking the dreaded F-word over a song dedication.) If you're not in the loop, so to speak, you might want to try

Sound better than you ever imagined...

patented

$249 NOW $299

104 Aphex Aural Exciter® with Big Bottom® - 2 channel

NOW $449

106 Aphex Easyrider® Compressor - 4 Channel

$249 NOW $299

108 Aphex Easyrider® Compressor - 2 Channel

TUBESSENCE®

12AT7 - Used in 107 and 109

Contact Aphex for the full technical scoop.

104: Bigger, deeper, fuller bass. Extended, natural highs and greater presence. Get more sound from your system without increasing peaks. Individual tracks or an entire mix will 'jump' from the speakers.

105: The Logic Assist makes this gate the most accurate and easiest to use in the world - no false triggering, clicking or chattering. The proprietary Aphex VCA 1001 ensures total audio transparency.

106: Invisible. This automatic compressor is so transparent that some people think it isn't working! Effortlessly maintain perfect levels without having to constantly adjust ratio, attack, release and threshold.

107: The award winning, #1 selling Tubessence mic preamp is the perfect marriage of solid state and vacuum tube circuitry. Upgrade the sound of all your mics with uncolored detail, presence and warmth.

These products are covered by one or more of the following U.S. Patent numbers: 4150253, 5359665, 5334947, 5450034, 5424488, 5483600.

searching the Web to see whether anyone has uploaded an audio file somewhere. —Michael M.

STILL INSPIRATIONAL

I wanted to let you know how much I'm still being encouraged by the short article on Craig Chaquico ("Creative Space: Craig Chaquico," January 1995). I know this may sound a little strange, but I can't help but be inspired to reach for my own musical dreams by realizing that Craig did so much, *at home,* with a setup not much different than my own home studio. His tips on using stereo delay made a huge difference in the quality of my overall mixes. And the fact that his recordings are on the same level as the the billion-dollar boys' should be a boost to all of us. We can make it happen! Success doesn't require immense funding, just some good pieces of equipment and the heart and soul of the artist. Dreams can come true! If you can put your passion into your music and get it on tape, people respond.

K. Daniel Menard
kbdm@nexus.xanadu2.net

AMIGA SEARCH

Many Commodore Amiga owners who were interested in hard-drive recording purchased the AD516 or AD1012 from SunRize Industries in Campbell, California. When the Amiga domain crashed, so did many of its primary software/hardware developers. I purchased the AD516 HD recording system, and it is alive and well. My dilemma is, If it goes down, who can I turn to for support? Anthony J. Wood was the AD516 hardware developer and also shared its software credits (Studio 16). Where is Anthony J. Wood? He must be out there working in the HD recording field somewhere as an electronic specialist. To locate his whereabouts could provide some useful help down the line.

John Cannon
jmcmidiman@juno.com

John—After contacting several former Amiga audio software developers and one former SunRize dealer, I'm stumped. I have not located Anthony Wood, who was the head honcho of SunRize Industries, nor have I found anyone who offers tech support for the SunRize AD series. I suppose this is the grim reality of owning an orphaned computer platform, no matter how cool.

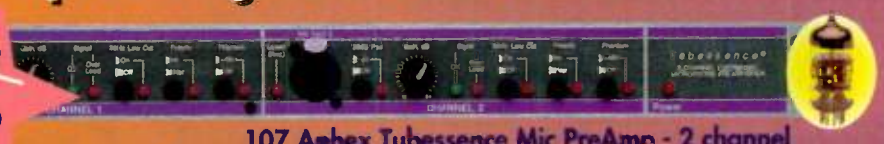
However, all may not be lost. Perhaps by publishing your letter we will find an **EM** *reader who can help you. In addition, I suggest you inquire among the Amiga community on the World Wide Web. One place you can start is the Web site of Safe Harbor (www.sharbor.com), which includes several Amiga-related links. You can also find Amiga-related links and contacts at the Amiga Hot Spot (www.akula.com/~inzane/index.html) and the Amiga Web Directory (www.cucug.org/amiga.html).—Steve O.*

ERROR LOG

January 1997, "Letters," p. 10: The Web address for Synoptic in "Program Change" was incorrect. It should read www.synoptic.net.

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

...at a price you won't believe



107 Aphex Tubessence Mic PreAmp - 2 channel

109 Aphex Tubessence Parametric Equalizer

105 Aphex Logic Assist™ - 4 Channel Gate

Is there really a tube in there?

When Tubessence® was first introduced with the Model 107, some people had trouble believing that it was a real tube gain stage. Skeptics say, 'It's a tube simulator', or 'It's a starved-plate amplifier', or 'The tube's not in the audio path'.

The "Reflected Plate Amplifier" (US Patent #5450034) is a true vacuum tube circuit which has the desired characteristics without the heat, weight, fragility, sonic variability, short life and high frequency roll-off of conventional tube designs.

105: The Wave Dependent Compressor simultaneously controls average and peak levels for the hottest tracks possible without the artifacts of other compressors. Finally, an 'auto' compressor that sounds better.

109: Got enough EQ? Two channels of fully parametric, two band, tube EQ, great for mastering or touch up. Track needs major work? Hit a switch and it's a mono four band. Unparalleled sound and flexibility.

APHEX SYSTEMS
Improving the way the world sounds℠
11068 Randall Street, Sun Valley, CA 91352 U.S.A.
818-767-2929, Fax 818-767-2641

Foreign patents issued or pending. Aphex, Aural Exciter, Big Bottom, Logic Assist and Tubessence are trademarks of Aphex Systems Ltd.

circle #507 on reader service card

REJOICE

Repent. Th

N364 *The N-Series Workstation is available in 61-note (N364, shown above) and 76-note (N264) versions.*

For those craving a new level of performance,

By combining awesome sounds with a variety of new features, the N-spiring N-Series workstations will both enhance and simplify the way you make music.

With 64-note polyphony, a powerful 16-track, 32,000-note SMF compatible sequencer, and 936 spectacular programs and combinations (incorporating the best of our M1, T, 01/W and X-Series workstations, voiced and tweaked to the bejesus), your musical palate is both vast and varied. If you took a scant minute to demo each of the N's sounds, it would take you *over 15 hours!*

Not content with merely providing you with an overabundance of the best sounds of any workstation in its class, we decided to include a few features that will streamline the way you sequence, and enhance your live performances. The N-Series' exclusive Realtime Pattern Play and Record function (*RPPR, see above)* and cool four-octave editable arpeggiator give you more flexibility and creative freedom. You can even combine these two features to record arpeggiated

N-SERIES
WORKSTATIONS

e N is near.

Specifications:

- 936 Programs & Combis (8MB PCM ROM)
- AI² Synthesis System
- 430 Multisounds/215 Drums
- 64-Note Polyphony
- 16-Track Sequencer
- RPPR Function – (Up to 100 patterns)
- 4-Octave Arpeggiator
- 2 Stereo Effects Processors – (47 Effects Types)

Realtime Pattern Play & Record Function (RPPR)

*Our **RPPR** function allows you to create musical phrases as patterns that are assignable to individual keys. Create drum grooves and fills, bass lines, arpeggiated patterns and hits, etc., and fly them into your music like a phrase-based sampler (without the editing and storage hassles!). Arrange and rearrange your ideas at the touch of a finger—it's by far the easiest and best way to trigger these types of phrases. Try the others—we're sure you'll agree.*

the N-Series workstations are a revelation.

patterns back into the on-board sequencer.

In a nutshell, the N-Series workstations allow you to delve into unexplored aspects of your creativity in a fun, fast and intuitive way.

Once we added the two dynamic stereo effects processors, two stereo outputs and various other goodies, we looked upon all that we created and saw that it was good. So get to your Korg dealer for a demo—the surprisingly affordable N-Series Music Workstations may be nearer than you think!

Check out the new NS5R Module:

It's the newest cousin in the dynamic N family. A powerpacked AI² synthesis sound module that features 1433 programs and combinations (more than any module in its class), plus 256 additional RAM locations for loading in your own favorites.

The NS5R also boasts 64-note polyphony, GM compatibility, GS and XG sound maps, and expansion with Wave Blaster™ compatible daughterboards so it's perfect for computer-based recording & multi media. We've also made your life easier by implementing a more intuitive graphic display window. You can even change the color if you want.

So if you crave all the tone generating power of a Korg N-Series workstation in a half-rack module, visit your Korg N-Series dealer today and check out the new NS5R!

KORG®

For the Korg N-Series dealer nearest you call (800) 335-0800. ©1996 Korg USA • 316 South Service Road, Melville, NY 11747 • N-Series and N364 are trademarks of Korg.
circle #545 on reader service card
WRH

WHAT'S NEW

By the EM staff

▲ DYNAUDIO ACOUSTICS BM6A

Dynaudio Acoustics' BM6A active near-field reference monitors (estimated price $1,900) are powered by dual 100W MOSFET amps with photoactive, high-frequency clip protection and front-mounted overload indicators. The amplifiers feature a low-frequency equalizer that can be switched to provide extended low-end response but less overall volume or more SPL but a less-extended low-frequency output. High-frequency trim is also user variable.

The compact monitors feature 7-inch bass drivers and 1-inch tweeters mounted in a matte black or optional wood-veneer cabinet. The front baffles are designed to minimize edge-diffraction effects. The sixth-order electronic crossover provides phase-compensated delay.

Frequency response is rated at 45 Hz to 20 kHz with peak levels in excess of 115 dB SPL. Inputs are balanced XLR. Audio Exchange International (distributor); tel. (617) 982-2626; fax (617) 982-2610.

Circle #401 on Reader Service Card

▶ SPATIALIZER RETRO

With the Spatializer Retro ($649), Spatializer Audio Labs has moved their 3-D audio technology to a lower price point so you can move it into your studio and move your mixes out beyond the stereo soundstage. The 1U rack-mount, analog processor can be patched into a stereo effects send or the mixer's main stereo or stereo group bus inserts, or you can place it between the console's outputs and the recorder's inputs.

According to the manufacturer, you can use the regular pan pots on your mixer to place tracks so they seem to originate from anywhere in a 270-degree arc ranging from over the listener's left shoulder to over the listener's right shoulder. The effect can be heard with any stereo sound system.

The Retro's controls include a Space knob for getting the right amount of effect, a bypass switch, and L/R output gain attenuators with clip LEDs. A Mono Check switch tests the compatibility of the processed signal with mono playback. The inputs and outputs are on balanced ¼-inch jacks, and the unit can operate at +4 dBu or -10 dBV (switchable).

The Retro has an internal power supply and a ground-lift switch. Spatializer rates THD at 0.003% and signal-to-noise ratio at 101 dB (A-weighted). Spatializer Audio Laboratories; tel. (818) 227-3370; fax (818) 227-9750; e-mail retro@spatializer.com; Web www.spatializer.com.

Circle #402 on Reader Service Card

▼ YAMAHA REV500

Yamaha's REV500 stereo reverb processor ($499) uses the same 32-bit DSP chip as the pricier Yamaha ProR3 to create dense, thick, stereo reverbs with smooth decays. The unit features discrete stereo operation.

The REV500's 100 preset and 100 user programs are categorized into four banks of 25 effects each, including halls, rooms, plates, and special reverb effects. Four dedicated knobs control predelay, reverb time, high-frequency decay rate, and the level of the first early reflection. The LCD provides a numerical display of the four parameters' values and projects graphic representations of the decay, predelay, and frequency content of the reverb. The front panel also provides a rotary input-level control and 4-segment LED bargraph input-level metering for each channel.

A unique, built-in demo automatically plays a sampling of all of the REV500's effects while the LCD provides a scrolling text. Better yet, the unit provides two built-in sound samples—snare drum and cross stick—allowing the user to audition sounds and set reverb parameters without an external signal source.

The internally powered, 1U rack-mount box provides balanced XLR and ¼-inch connectors (switchable between -10 dBV and +4 dBm) for both input and output stages. MIDI In and Out ports and a ¼-inch jack that accepts an optional footswitch are also provided.

The device features 20-bit A/D and D/A converters that sample at 44.1 kHz. Dynamic range is rated at 96 dB, typical; THD is <0.03%; and S/N ratio is 72 dB. Yamaha Corporation of America; tel. (714) 522-9011; e-mail info@yamaha.com; Web www.yamaha.com.

Circle #403 on Reader Service Card

▶ NTI EQ3-D DIMENSIONAL EQ

Following on the success of the high-end EQ^3 equalizer (often used as a mastering tool), Night Technologies International (NTI) released the EQ$^{3\text{-}D}$ Dimensional Equalizer ($995). The EQ$^{3\text{-}D}$ is a 6-band, 2-channel equalizer with separate channel controls for each band. The first five bands are 2.5 octaves wide each and can be adjusted ±15 dB. The sixth band, labeled Air, adds high-end presence to a mix and is said to result in a more clear and intimate sound. It provides 20 dB of boost-only shelving at any of five frequencies: 2.5 kHz, 5 kHz, 10 kHz, 20 kHz, or 40 kHz. Like its predecessor, the EQ$^{3\text{-}D}$ includes circuitry that guards against phase shift and its attendant distortions.

The 1U rack-mount device supports balanced or unbalanced XLR inputs and outputs. Frequency response is rated at 10 Hz to 125 kHz (± 0.5 dB) and 5 Hz to 330 kHz (-3 dB). S/N ratio is 89.9 dB (flat), and THD is rated ≤0.005% (flat). Night Technologies International; tel. (801) 375-9288; fax (801) 375-9286; Web www.nightpro.com.

Circle #404 on Reader Service Card

▶ DISSIDENTS SAMPLE WRENCH 4.0

Long popular among Commodore Amiga users, dissidents' audio-file editor is now available for Windows 95. *Sample Wrench* 4.0 ($299; $75 "cross-grade" between Amiga and Windows 95 versions; $99 from versions earlier than 3.0) is a graphic editor for 16-bit, mono or stereo files. The program lets you open up to 99 editing windows with separate attributes. Sounds can be viewed in terms of samples, seconds, SMPTE frames (all frame rates), measures, or beats. You can zoom in the display both horizontally and vertically.

Sample Wrench features an extensive processing section, including several types of EQ, compressor/limiter/expander, time compression, pitch shifting, gain envelopes, FFT analysis, looping tools, reverb, flanger, chorus, and spectral warping. You can preview the effects of many processes in real time, and factory presets and user presets are available.

A Microsoft Visual Basic–compatible macro language lets you create batch processes and automate repetitive tasks, such as bulk file-format conversions. Several example scripts are included. Convenience features include floating toolbars, viewpoint memories, savable user configurations, and integrated online help. An 80486/50 PC or better with at least 16 MB RAM is recommended. dissidents; tel. (315) 797-0343; e-mail dissi@concentric.net.

Circle #405 on Reader Service Card

▼ VESTAX HDR-V8

In a move that brings the studio-in-a-box one step closer to reality, Vestax released the HDR-V8 ($2,495), a modular hard-disk recorder/mixer. The 2U rack-mount machine includes a mic preamp with XLR input; add a microphone and CD burner, and you're in business!

Unlike Vestax's HDR-8—which could record only four analog tracks simultaneously, and then only with the addition of an optional, 2-channel input card—the HDR-V8 can record and play back eight tracks simultaneously. You also get eight virtual tracks (one per real track). The machine comes with eight ¼-inch inputs and ten outputs, including the master outs. All ¼-inch inputs and outputs (including auxes) are on balanced TRS jacks. Other ports include S/PDIF digital I/O and MIDI In, Out, and Thru.

The unit features 24-bit internal processing (with a main processor three times faster than previous versions), 18-bit A/D converters, and 20-bit DACs. The sampling rate is fixed at 44.1 kHz. The machine can be switched between +4 dBV and -10 dBm operation.

The onboard digital mixer is MIDI controllable and features pan, gain, three pre/postfader aux sends and three stereo returns per channel. Its EQ has a parametric midrange band (50 Hz to 12 kHz with bandwidth from ⅓ octave to 4 octaves) and high and low shelving bands at 12 kHz and 80 Hz, respectively. Levels are monitored on 10-segment LED ladders.

Other amenities include a data wheel and a front-panel headphone jack with volume control. For a touch of class, the data wheel and transport buttons are made of real wood finished with a walnut stain.

Editing is real time and nondestructive, with internal track merging and one level of undo for delete, move, copy, and paste edits. An 8-point (per song) autolocator offers zero return, and each song can be set for single or loop play.

The HDR-V8 sends MTC and MIDI Clock with Song Position Pointer and responds to MMC. An optional SMPTE sync interface, the SE-1 (price tba), is also available. Any number of machines can be locked together for unlimited tracks.

The machine comes with a 1 GB hard drive, expandable to 4 GB (two 2 GB hard drives), and can accept an optional internal SyQuest SyJet removable drive. Other options include the MX-1 ($499) remote control; TD-1 DA-88 and Yamaha ProMix interface (price tba); AT-1 ADAT interface (price tba); and SS-2 SCSI interface (price tba). The FX-1 digital multi-effects board ($299) offers 128 preset effects, including delay, reverb, chorus, flanger, and combination effects. Tracoman, Inc. (distributor); tel. (954) 929-8999; fax (954) 929-0333; e-mail hdrtech@tracoman.com; Web www.tracoman.com.

Circle #406 on Reader Service Card

THE CARD DEALER ▲ ▲ ▲ ▲

▼ FRONTIER DESIGN GROUP

As ever more digital I/O cards for Windows PCs hit the market, desktop studio owners have the luxury of picking out the card with the combination of connectors they need. The WaveCenter ($698) from Frontier provides RCA (coax) electrical and Toslink optical S/PDIF and ADAT optical I/O on a half-length ISA card. Two channels of input are available using either form of S/PDIF connection, or you can get eight channels via ADAT Lightpipe. On the output side, WaveCenter lets you use the coax and optical jacks together, giving you four S/PDIF or two S/PDIF and eight ADAT channels simultaneously.

The card accepts 16- or 24-bit digital audio at 39 to 51 kHz sample rates.

Output can be at 44.1 or 48 kHz, and a varispeed function lets you speed up or slow down the audio, which alters the pitch. You can also use WaveCenter as a simple format converter between S/PDIF and ADAT signals or between electrical and optical S/PDIF signals.

One MIDI In and three MIDI Outs are supplied via the included breakout cable. A Windows 95 driver is included with the card, along with a *WaveTray* application that gives you easy access from the task bar to all of WaveCenter's options. An 80486 or better PC is required. Frontier Design Group; tel. (800) 928-3236 or (603) 448-6283; fax (603) 448-6398; e-mail info@frontierdesign.com; Web www.frontierdesign.com.

Circle #407 on Reader Service Card

▶ DIGITAL AUDIO LABS

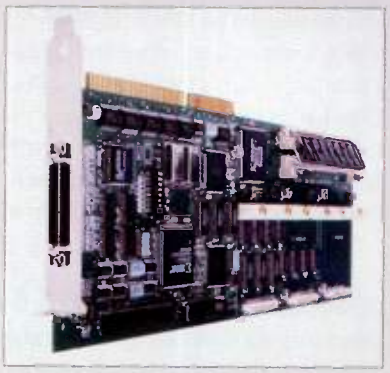
After several extended delays and false starts, Digital Audio Labs is shipping the V8 (starting at $2,500), a modular audio I/O system for Windows PCs. Based on PC ISA cards, the system's bus allows up to sixteen channels of input and output simultaneously. The number of tracks available for recording to disk depends on system performance. The unit is software switchable between +4 dBu and -10 dBV operating levels.

The V8 Main Board ($1,795) provides mixing and routing, 44.1/48 kHz internal clock, and two Motorola 80 MHz 56002 DSP chips. Three slots are provided for DSP Supercharger boards ($495 each), each of which contains two more DSP chips and can be fitted with a RAM Induction Module (32 KB module, $295, 128 KB module, price tba) to improve the performance of time-based algorithms.

A variety of I/O options are available. The Big Block is an external, half-space rack-mount unit that provides eight channels of analog I/O using balanced ¼-inch connectors and two channels of digital I/O on AES/EBU, electrical (coax) S/PDIF, or optical (Toslink) S/PDIF connectors. The analog I/O employs dual 16-bit delta-sigma A/D and D/A converters.

The Deuce Coupe ($695) is a half-length ISA card that offers two channels of analog and two channels of digital I/O using the same connectors, converters, and specs as the Big Block. ADAT optical I/O and ADAT sync are available on a separate card, the MDM Custom for ADAT ($695). The MDM Custom card for DA-88 (price and release date tba) has a TDIF-1 connector for TASCAM MDMs. Up to sixteen external and sixteen internal peripherals can be daisy-chained. The Main Board also has a connector that lets you use a DAL CardDPlus for stereo I/O.

DAL has lined up some impressive partners to provide software support:



Cakewalk, Emagic, SEK'D, Minnetonka, Waves, and Wave Mechanics have all announced the development of V8-compatible programs or plug-ins. The V8 system also comes with a driver that makes the system appear as one or more CardDPlus cards to Windows music software. Digital Audio Labs; tel. (612) 559-9098; fax (612) 559-0124; e-mail dalinfo@digitalaudio.com; Web www.digitalaudio.com.

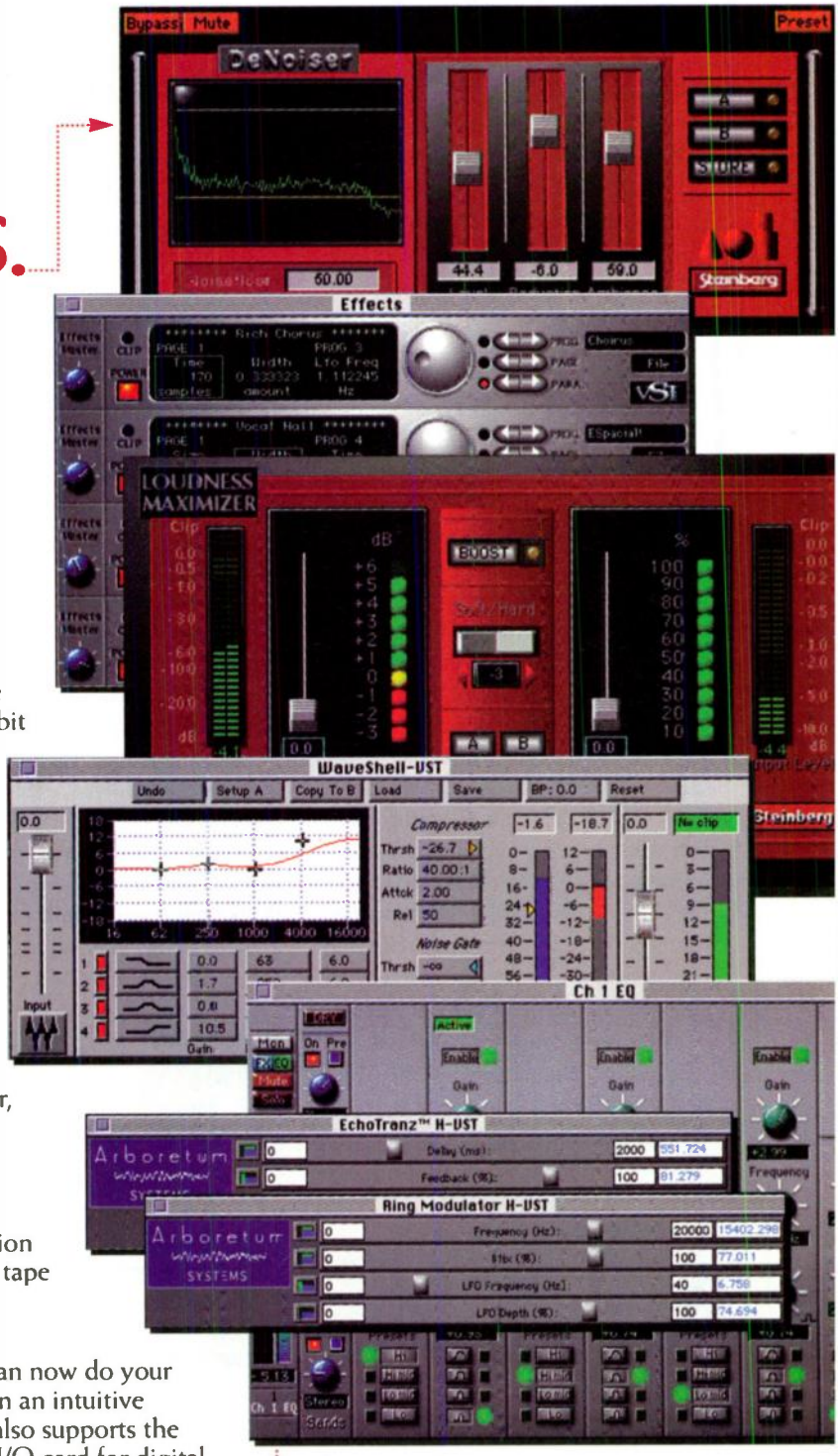
Circle #408 on Reader Service Card

▼ AdB

AdB announced two new standard features on their MultiWav Digital PRO18 card: full 24-bit digital I/O and Quad Output, which allows simultaneous independent output from two analog and two digital outputs for a total of four discrete output channels. Existing cards can be upgraded for free by downloading software from the company's Web site. AdB International; tel. (770) 623-1410; fax (770) 623-1629; e-mail info@adbdigital.com; Web www.adbdigital.com.

Circle #409 on Reader Service Card

IT'S MULTIPLE CHOICE AND THERE ARE NO WRONG ANSWERS.



When it comes to raising your audio standards, the days of having few options are finally over. Steinberg's Cubase VST® now takes you to the next level with open-ended plug-in architecture and an expanding range of professional audio plug-ins that turn it into an absolute production powerhouse. Whether you want to edit your mix, master your album or just make some great music, there's a plug-in that suits your needs.

☑Steinberg DeNoiser

Removes broadband noise from any audio source material in a musically intelligent manner. (Adaptive processing with automatic noisefloor detection, 24-bit processing, realtime and offline, mono/stereo)

☑Steinberg Loudness Maximizer

Increases the subjective loudness of your recording, boosting "punchiness" with zero distortion. (Adaptive processing, 24-bit processing, punchy and brilliant sound, no "pumping and breathing," realtime)

☑Audio Track by Waves®

Combines equalization, compression/expansion and gating into one very easy-to-use program. (4-band paragraphic equalizer, compressor/expander, gate, A/B comparison, mono/stereo)

☑Hyperprism VST by Arboretum®

A package of 24 different realtime dynamic sound effects. (Pitch changing, reverb, echo, ring modulation and the unique EchoTranz™ which simulates analog tape delay by adding dynamic transposition)

The processing power of Cubase VST means you can now do your projects entirely in the digital domain, in realtime, in an intuitive manner and with outstanding results. Cubase VST also supports the Digidesign® AudioMedia III™ card and Korg® 1212 I/O card for digital input and output. And with so many different tools to choose from, it also means that upgrading the power and capability of your system is no longer the ultimate test. It's just simple addition. For more information, call your local dealer or contact Steinberg at (818) 993-4091.

Steinberg® NORTH AMERICA

CUBASE VST Virtual Studio Technology

Steinberg North America, 9312 Deering Avenue, Chatsworth, CA 91311-5857 USA
Phone (818)993-4091 Fax (818)701-7452 Fax On Demand (800)888-7510
Steinberg Canada, 589 Marlee Avenue, North York, Ontario, Canada M6B 3J5
Phone (416) 789-7100, Fax (416) 789-1667
All trademarks are registered by their respective companies
To download a demo program, visit our website at http://www.steinberg-na.com

Mac OS

MacUser AWARDS Editors' Choice 1996 Finalist
Best New Music/Sound Product

circle #583 on reader service card

REV UP ▲ ▲ ▲ ▲

LEXICON

Lexicon's Harmony FX Card ($249) for the PCM 80 digital effects processor features four new algorithms that use a pitch-shifting effect followed in series by a chamber reverb. All four are designed for use on monophonic sources.

The Auto Harmony effect provides a 4-voice diatonic pitch shifter for producing harmonies that parallel the melody in the same key. Pitch Correct displays the pitch of the input source as a chromatic note plus or minus cents. You can use a footswitch or other MIDI controller, the Adjust knob, or a MIDI keyboard to control the correction. MIDI Chords shifts the input audio to the chords you play on a MIDI keyboard (up to four voices).

Finally, the Auto Chords effect allows you to specify a different chord and voice leading (with up to four different pitches) to be played whenever the PCM 80 detects one of the twelve notes of the chromatic scale. This lets you create harmonies in any type of scale as well as harmonies that do not parallel the input pitch. Lexicon; tel. (617) 280-0300; fax (617) 280-0490; e-mail info@lexicon.com; Web www.lexicon.com.

Circle #410 on Reader Service Card

STEINBERG

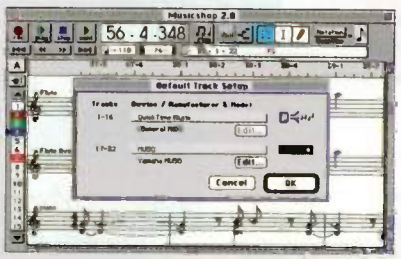
Steinberg's *Cubase VST* 3.02 for Power Mac ($399; upgrade from *Cubase* 3.0 $69) adds support for the Digidesign Audiomedia III and Korg SoundLink 1212 I/O PCI cards. The new version gives you digital mixdown to WAV, AIFF, and SDII files with effects and automation. Other new features include a plug-in architecture, an effects rack with four plug-in slots, direct import of *ReCycle* files, and compatibility with System 7.5.5 and the Mac Performa 6400. Steinberg North America; tel. (818) 993-4091; fax (818) 701-7452; e-mail steinberg@aol.com; Web www.steinberg-us.com.

Circle #411 on Reader Service Card

OPCODE

Opcode has updated its entry-level sequencer and made it available in both Mac and Windows versions. *Musicshop* 2.0 ($149.95 Mac; $99.95 Win; $59.95 upgrade to registered users of *Musicshop* or *EZ Vision*) includes 32 tracks of sequencing, a 32-track automated mixer, real-time editing, virtually unlimited nested sequences, and refined quantization controls. A WYSIWYG Print Preview lets you see, edit, and add text to your scores.

Full OMS support and compatibility



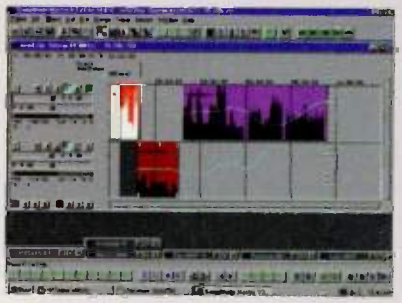
with Opcode's *Galaxy* patch librarian software have been added, and the Mac version supports Apple QuickTime Musical Instruments. The new version also features interactive, online help.

The Mac version runs on 680X0 Macs with at least 8 MB of RAM and System 7.1 or later, or on Power Macs with at least 16 MB of RAM and System 7.5 or later. The Windows 3.1 version requires an 80486/66 or better and 8 MB of RAM, and the Windows 95 version requires a Pentium with 12 MB of RAM. Opcode Systems; tel. (415) 856-3333; fax (415) 856-0777; e-mail info@opcode.com; Web www.opcode.com.

Circle #412 on Reader Service Card

HOHNER MIDIA

Hohner Midia's *Red Roaster 24-Bit* ($944; upgrade $249) has the same CD-writing capabilities found in the 16-bit *Red Roaster*. However, the new package includes a native 32-bit,



Windows 95/NT version of SEK'D's *Samplitude Master* that converts 16-bit audio into 24-bit or records 20- or 24-bit audio directly. All editing and processing is done at 24-bit resolution.

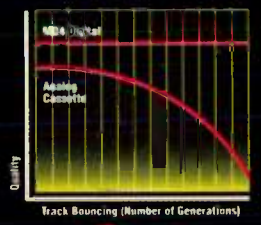
In addition to all the recording, editing, and indexing functions found in the 16-bit version, *Red Roaster 24-Bit* gives you a suite of DSP tools. A 3-band parametric EQ supplies 20 dB boost or cut with a center-frequency range of 10 Hz to 25 kHz and a choice of three displays. The dynamics section lets you apply a noise gate and compressor, limiter, or expander with control over ratio, threshold, and attack and release time. The Declipper module removes distortion from clipped audio signals, and the Denoiser removes unwanted background noise, such as tape hiss. Both of these processes work offline but include real-time preview. *Red Roaster 24-Bit* requires an 80486/66 or better PC with 8 MB RAM, Windows 95/NT, and a CD-R writer that supports disc-at-once recording. Hohner Midia; tel. (707) 578-2023; fax (707) 578-2025; e-mail 100772.1052@compuserve.com; Web www.hohnermidia.com.

Circle #413 on Reader Service Card

If You're Not Recording Your Tunes at CD Quality, Your Career Could Be at Steak.

Medium.

The MD Data recording medium gives you 37 minutes of flawless digital audio on 4 tracks.



Rare.

You won't find another studio-quality recorder at this price. As opposed to cassette, MD4 offers noise-free, loss-less track bouncing.

Well Done.

Introducing the Yamaha MD4 Digital Multitrack Recorder. Never before could you record, edit and mix with CD quality for only ***$1199.*** ***Available now!***

©1997 Yamaha Corporation of America.
Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622.
Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1 (416) 298-1311

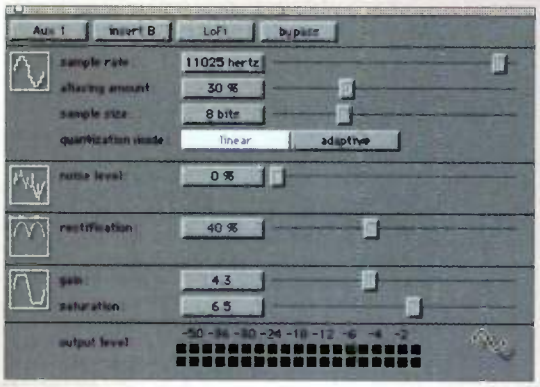
Unbelievable MD4 Deal
Yamaha REV100 Digital Reverb Unit FREE* with MD4 Purchase
*For a Limited Time While Supplies Last

YAMAHA MD4
DIGITAL MULTITRACK RECORDER
REMARKABLE. DIGITAL. AFFORDABLE

Dept. 630
1-800-937-7171
Call for more information

circle #602 on reader service card

AN EMBARRASSMENT OF RICHES ▲ ▲ ▲ ▲



▲ DIGIDESIGN

Two new TDM plug-ins from Digidesign, *LoFi* and *SciFi* ($395 for both), aim to help you re-create that "low fidelity," retro sound. *LoFi* offers several processes that mimic vintage equipment by intentionally degrading the audio quality. These effects include reduction of the sampling rate and resolution; waveform rectification; and generation of noise, distortion, and subharmonics.

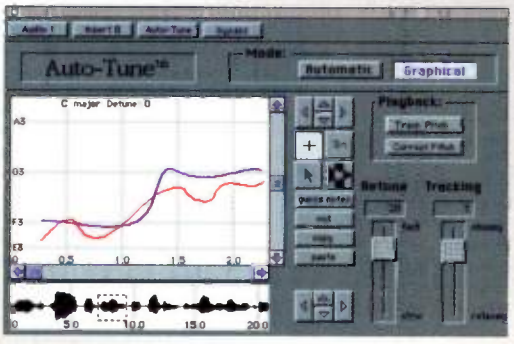
The *SciFi* plug-in offers a variety of classic effects associated with analog synths, including ring modulation, frequency modulation, and variable-frequency resonators. These effects can be modulated by LFO, envelope follower, sample-and-hold, and trigger-and-hold. Digidesign; tel. (415) 842-7900; fax (415) 843-7999; e-mail digimkt@digidesign.com; Web www.digidesign.com.

Reader Service Card Not Available

▼ DRAWMER

The *Drawmer Dynamics* plug-in ($595) for Pro Tools TDM is based on Drawmer's model DS201 noise gate and DL241/251 compressor/limiter. The software includes variable high-pass and lowpass filters for frequency-dependent gating, key inputs with Key Listen, and the ability to trigger the gate from any other audio track within Pro Tools. The compressor includes a choice of manual or automatic attack and release times, and the limiter has a half-sample response time. Digidesign (distributor); tel. (415) 842-7900; fax (415) 843-7999; e-mail digimkt@digidesign.com; Web www.digidesign.com.

Circle #414 on Reader Service Card



▲ ANTARES SYSTEMS

The *Auto-Tune* TDM plug-in ($599) from AnTares Systems provides automated or manual pitch correction of monophonic sources. In Automatic mode, the program detects the instantaneous input pitch and shifts it to the closest pitch in the current scale. Major, minor, chromatic, and 22 microtonal scales are provided. You can control the speed of the correction and introduce vibrato with control of depth, rate, and delay. Graphical Mode displays the detected pitch and lets you draw in the desired pitch. RiCharde & Company (distributor); tel. (800) 446-2356 or (408) 688-8593; fax (408) 688-8595; e-mail richarde@got.net; Web www.richarde.com/web.

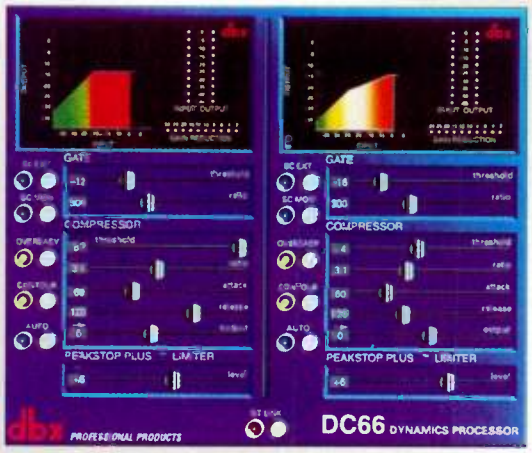
Circle #415 on Reader Service Card

▼ DBX

Based on the dbx 1066, the new *DC66* plug-in ($999.95) for Digidesign's Pro Tools with TDM offers stereo or dual-mono compression, limiting, and gating. The module offers a choice of hard-knee or dbx's Over-Easy soft-knee compression as well as the company's PeakStopPlus limiting for taming transients. Automatic or manual attack and release are available, and a Contour function removes low-frequency peaks from the detector for smooth compression of entire mixes.

Rather than merely emulate the front panel of the 1066, *DC66*'s interface takes advantage of the computer's capabilities to provide a more detailed editing environment. It features input, output, and gain-reduction meters along with dual tricolor graphs that show you whether you're below, at, or above the threshold. Harman/dbx Professional Products; tel. (801) 566-7660; fax (801) 566-7662; e-mail customer@dbxpro.com; Web www.dbxpro.com.

Circle #416 on Reader Service Card



The JBL 6208 Bi-Amplified Reference Monitor

For the power hungry with an appetite for PERFECTION.

RADIO WORLD MAGAZINE
COOL STUFF AWARD WINNER
NAB 1995

The Best System Starts with the Best Parts.

JBL has more experience in designing and building transducers for professional studio monitors than any other company in the industry. We not only use the latest engineering and design equipment, but also the most important test device of all, the human ear. We believe in physics, not fads, so while other companies pick parts off somebody else's shelf, we create our components from scratch. And by utilizing more than 50 years of experience in transducer design, we create the perfect transducer for each system.

Multi-Radial Design - An Ideal Solution to a Complex Problem.

Combining individual transducers into a system is a delicate balance of acoustics, electronics and architecture. Our exclusive Multi-Radial baffle is contoured to bring the drivers into perfect alignment, so the high and low frequencies reach your ears simultaneously. This reduces time smear for a smooth transition between the low and high frequency drivers. In addition, the gently rounded edges of the 6208 provide controlled dispersion and balanced power response. That means even off-axis, you will hear an accurate representation with wide stereo separation and an immense depth of field.

Gold/Titanium Hybrid Dome.

By mating the materials to a large magnetic structure, the 6208 can produce extremely flat frequency response and low distortion for hours of fatigue-free listening. JBL pioneered the use of the light but rigid gold/titanium hybrid construction to provide a transient response that is quick and precise for pinpoint accuracy.

Shielded Drivers for Flexible Placement.

JBL shields all of the drivers so you can place the 6208 right next to your audio workstations without interaction. Gone are the days of compromised monitor placement in your production environment.

Why Bi-Amplification?

It's a simple fact, a separate amp for each speaker produces the most accurate sound. Each of the 6208's two amplifiers is designed to reproduce the assigned frequencies. And by combining the amplifiers inside the cabinet, you improve the amplifier's ability to control the speaker it's driving for controlled low end punch.

> "We played just about every type of instrument through these speakers and they reproduced it with flying colors."
>
> - Bobby Owsinski
> EQ Magazine

Active Crossovers Provide Accurate Response Tailoring.

By carefully tailoring each amplifier's performance to the response characteristics of the drivers, you get the most faithful reproduction possible. By using active crossovers, power is not robbed by passive components like inductors and resistors. The result is clear, accurate sound at the highest levels.

The passive 4200 Series provides accurate, natural and powerful value for about $400 per pair.

TEC AWARD WINNER
Technical Excellence & Creativity
1995

JBL PROFESSIONAL

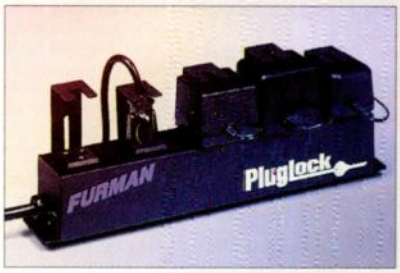
A Harman International Company
8500 Balboa Boulevard, Northridge, CA 91329 • USA

IN SMALL THINGS FORGOTTEN ▲ ▲ ▲ ▲

At the 1996 Audio Engineering Society convention, we saw a lot of cool, inexpensive little items that didn't quite fit into my regular show report (February 1997 **EM**). Small things tend to be overlooked in the excitement of covering the major "hot" items, but the absence of the right small tool at a critical moment can cost you big time. This follows the adage that for want of a shoe, the horse was lost, hence, in turn, the rider, the battle, and the war were lost. Not this time!

Many CD-R users mark their discs with solvent-based, permanent-ink pens (e.g., Sharpies). Unfortunately, the solvent can leach into the disc's dye layer, which can reduce the life of the disc. Apogee Electronics, a manufacturer of CD-R blanks (as well as top-flight ADCs and DACs), has introduced the CD-R Pen. This little $2.99 disc-saver is a fine-point, permanent, black marker with water-based ink. According to Apogee, it won't rub off of the surface of the disc, and it works with any CD-R (among other surfaces). Apogee Electronics; tel. (310) 915-1000; fax (310) 391-6262; e-mail info@apogeedigital.com; Web www.apogeedigital.com.

Apogee Electronics CD-R pen



Furman PlugLock

Another little gem is Furman's PlugLock ($58). This 15-amp, 5-outlet, AC power strip has plenty of space between sockets and an adjustable, forked clamp over each socket. Each clamp locks a wall-wart power supply or regular AC plug in place so it won't fall out. The PlugLock comes with a 5-foot, 14-gauge, 3-conductor extension cord and is protected by a circuit breaker. Furman Sound; tel. (707) 763-1010; fax (707) 763-1310; e-mail furmansnd@aol.com; Web www.furmansound.com.

Also in the "small things forgotten" category is Gold Line's Gold Lite/1k ($39.95), which packages a 1 kHz tone generator and phantom-power detector into a male XLR connector. A bright, red LED lights up and a 1 kHz mic-level tone is emitted when the unit receives phantom power. If you suspect your phantom supply has gone to the opera without you, this little tester will resolve the question. Gold Line; tel. (203) 938-2588; fax (203) 938-8740; e-mail goldline@i84.net; Web www.gold-line.com.

Gold Line Gold Lite

—Steve Oppenheimer

▶ E-MU EMULATOR 4X

With the introduction of the E4X Turbo stereo digital sampler ($4,895), E-mu simultaneously added to the Emulator IV's feature set and lowered the price. Like its predecessor, the E4X Turbo is 128-voice polyphonic and 16-part multitimbral and features 128 Z-plane (sixth-order resonant) filters. It comes standard with 16 MB RAM (expandable to 128 MB using 72-pin SIMMs) and a 1 GB internal hard drive loaded with over 400 MB of sounds.

Also standard on the E4X Turbo is an 18-bit, dual-stereo effects processor with more than 40 reverb algorithms and more than 30 chorus, flanging, and delay algorithms, each with several editable parameters. Another new feature is the 16-track sequencer and SMF player. The E4X Turbo employs the new Emulator OS 2.5, which includes full SysEx implementation; a new, more robust SCSI subsystem with improved Mac and PC support; and stereo, phase-locked time compression.

E-mu also introduced the E4X ($3,695), a 64-voice polyphonic instrument that comes with 4 MB RAM and a 540 MB internal hard drive but is otherwise identical to the E4X Turbo.

The e-6400 ($2,795) is a lower-priced package that offers 64-voice polyphony, 4 MB RAM, and 64 Z-plane filters but lacks an internal hard drive, effects processor, digital I/O, and ASCII keyboard input. Both the E4X and e-6400 hundred can be expanded to 128-voice polyphony ($949) and 128 MB RAM (using 72-pin SIMMs). E-mu Systems; tel. (408) 438-1921; fax (408) 438-8612; Web www.emu.com. ●

Circle #417 on Reader Service Card

THESE 70,000 PEOPLE ONLY CARE ABOUT TONIGHT.

When it comes to taking an act on the road, the bonds of trust are forged anew every night. Tonight's audience doesn't care that last night's show came off flawlessly. They simply trust that the show they have waited months to see will be an historic moment. The concert everyone talks about. The best show they will ever see.

They have placed all of their trust in the artist and, in turn, the artist has placed their trust in you.

For decades, QSC Audio has earned the trust of leading touring sound companies throughout the world. Today, Melissa Etheridge, ZZ Top, Brooks and Dunn, Bryan Adams, and Jimmy Buffett are a few of the artists who turn to touring companies powered by QSC Audio. They know that a company that powers its rig with QSC technology will never break the fragile bond of trust.

THE POWERLIGHT™ 4.0, WHICH DELIVERS 2000 W/CH. AT 2Ω, FEATURES SEVERAL NEW IMPROVEMENTS INCLUDING CLIP LIMITERS AND A DATA PORT CONNECTOR INTERFACE TO QSC'S MULTISIGNAL PROCESSOR (MSP) PROVIDING DIGITAL SIGNAL PROCESSING AND CONTROL AND MONITORING BY COMPUTER OVER AN ETHERNET NETWORK.

Since its introduction, the revolutionary PowerLight™ Series of power amplifiers has become the new standard in performance and reliability for touring professionals worldwide. Our PowerWave™ Switching Technology provides superb bass and transient response, exceptional low-impedance performance, and superior efficiency compared to conventional amps. We have virtually eliminated AC noise (-125 dB), as well as provided a multi-step linear output, also improving efficiency.

And, we quietly rewrote history by engineering all of this in a two or three RU chassis that is 1/3 the weight of conventional amplifiers.

We'd like to earn your trust. Call **1-800-854-4079** and request further information on the PowerLight Series of amplifiers from QSC Audio.

Trust the power of technology on your next tour.

QSC™
AUDIO

QSC Audio Products, 1675 MacArthur Blvd., Costa Mesa, CA 92626 **Tel** 714/754-6175 **Fax** 714/754-6174
EMail info@qscaudio.com **Web** www.qscaudio.com

The Power of Technology is a trademark of QSC Audio Products, Inc. "QSC", and the QSC logo, "PowerLight," and "PowerWave" are registered with the U.S. Patent and Trademark Office.

PRO FILE

Surreal Wind

Verner creates ambient music with Aeolian harps.

By Diane Lowery

On a small farm in upstate New York, J. Arif Verner sits at the top of a hill and waits for the wind to blow. Two Aeolian harps sing in the slight breeze, and Verner hopes he can record the airy, mesmerizing tones without interference from an overhead plane or a distant barking dog. These delicate-sounding, difficult-to-record harps are featured on Verner's new CD, *A Vision beyond Light,* and contribute to what he describes as *ambient surrealism.*

"The sounds the harps make are very eerie and rather mystical," explains Verner, who recorded the instruments with a pair of B&K 4006 condenser mics (set on their cardioid patterns) and a Panasonic SV-255 portable DAT. "When the wind blows, the instruments play by themselves without any human intervention. The harps get louder as the wind blows harder, and as the wind fades away, the sound fades away, as well."

Aeolian harps are typically about ten feet tall and three feet wide, with a dozen strings attached vertically between a bridge and a wooden sound box. Because of the ebb and flow of the wind, the harps have a rather tricky dynamic range that can make it difficult to find a "set and forget" recording level. But Verner discovered that maintaining at least a 6 dB level on the SV-255's input meters allowed him to capture the ethereal sounds of the harps without risking audible hiss (due to recording levels that were too low) or digital clipping (from signal levels jumping unexpectedly into the red).

Another problem with miking the harps was the low-end rumble produced by the wind. Verner attempted to eliminate the howling with various pop filters and windscreens, but the majority of his four hours of recordings were marred by low-frequency garbage.

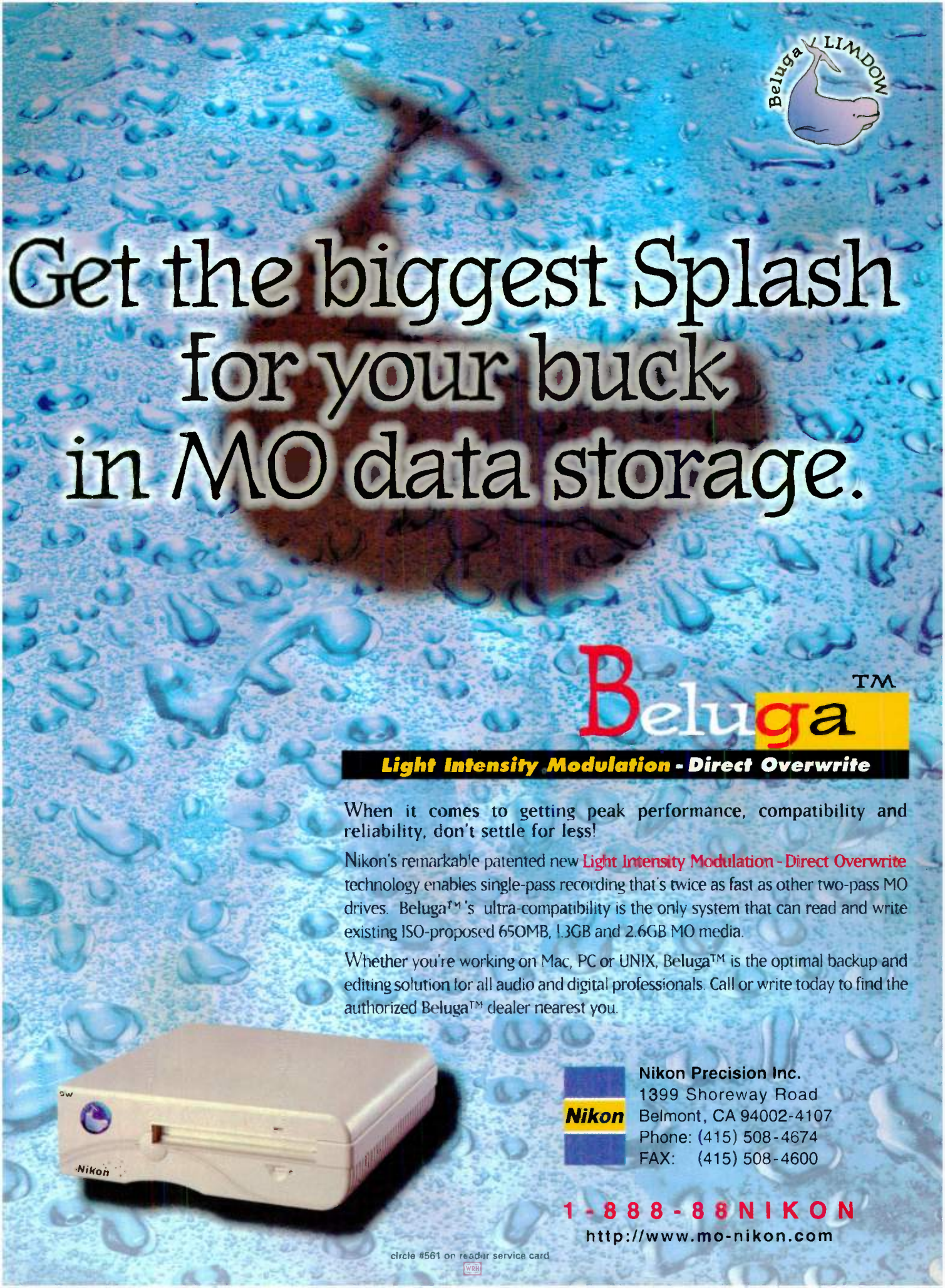
"I spent hours and hours listening to find sections of the harp recordings that were usable," says Verner. "Then, I made timing charts that designated where the best sounds were. Finally, I recorded the good bits onto an Alesis ADAT so I could fade the sections in and out until the pieced-together harp recordings sounded like one continuous track. I also ran everything through a parametric EQ to reduce the low-end rumble."

However, wind and ambient noise were not the only natural hazards that plagued Verner's location recording session. "It was a wonderful sunny day, and sitting out on that hill waiting for the wind to come was not a very painful task. But the B&K 4006s are so detailed that they picked up *everything,* including flies landing on the harp strings. There would be this buzz and then a plucking sound as the flies landed and took off. Sometimes the flies would zoom in front of the mics, and when I listened to the field tapes with headphones on, I'd find myself swatting at nothing. It was pretty funny."

For more information contact Spotted Peccary Music, PO Box 2029, Encinitas, CA 92023-0930; tel. (619) 942-1694; Web www.epix.net/~verner.

If you have a CD you recorded in your home studio, we'd love to consider it for "Pro/File." Send your CD and background information to Pro/File Editor, Electronic Musician, *6400 Hollis St., #12, Emeryville, CA 94608.*

J. Arif Verner



Get the biggest Splash for your buck in MO data storage.

Beluga™

Light Intensity Modulation - Direct Overwrite

When it comes to getting peak performance, compatibility and reliability, don't settle for less!

Nikon's remarkable patented new Light Intensity Modulation - Direct Overwrite technology enables single-pass recording that's twice as fast as other two-pass MO drives. Beluga™'s ultra-compatibility is the only system that can read and write existing ISO-proposed 650MB, 1.3GB and 2.6GB MO media.

Whether you're working on Mac, PC or UNIX, Beluga™ is the optimal backup and editing solution for all audio and digital professionals. Call or write today to find the authorized Beluga™ dealer nearest you.

Nikon

Nikon Precision Inc.
1399 Shoreway Road
Belmont, CA 94002-4107
Phone: (415) 508-4674
FAX: (415) 508-4600

1-888-88NIKON
http://www.mo-nikon.com

circle #561 on reader service card

THE GREAT-SOUNDING, INCREDIBLY POWERFUL, EXTREMELY AFFORDABLE, TOTALLY EXPANDABLE SYNTHESIZER IS HERE.

NOW AVAILABLE IN SMALL, MEDIUM AND EXTRA-LARGE.

Ask yourself what you really want out of a synthesizer.

Thousands of incredibly musical sounds that inspire your very best creative talents?

A great-feeling keyboard with lots of innovative controllers?

Open-ended expandability that lets you pull in nearly any new sound, whenever you need it?

An included CD-ROM software package that combines the power of your computer and your synth to create a full-blown MIDI production workstation?

Not every keyboard can give you all of these capabilities. But ours can. Affordably. And in three different sizes.

Creative inspiration has never been this simple. Try the Alesis QS Series™ at your Authorized Alesis Dealer today.

Keyboard:
QS6/QS7: 76-zone, 61/76 semi-weighted keys. QS8: 76-zone, 88 fully-weighted piano-action keys. All: velocity, release velocity and aftertouch.

Programs:
640 Programs and 500 Mixes internal, expandable to 1664 Programs and 1300 Mixes. Includes GM compatible bank.

Sample ROM:
16 bit linear 48kHz samples. QS6: 8MB internal, expandable to 16MB. QS7/QS8: 16MB internal (includes enhanced Stereo Grand Piano and Keith Emerson organs and modular synthesizer waves), expandable to 32MB.

QS6™

PCMCIA Expansion:
QS6: 1 8MB card slot. QS7/QS8: 2 8MB slots. QCard™ and Sound Bridge™ compatible. 8MB QCards include Hip Hop, EuroDance, Vintage Keyboards, Sanctuary, Classical, and more. Sound Bridge imports new samples and plays back SMF sequences from a card.

Synthesis Engine:
64 voice polyphonic, 64 part multitimbral, Tracking Generator, Modulation Matrix.

Controllers:
QS6: Pitch and Mod wheels, 1 assignable control slider, sustain pedal and assignable pedal inputs. QS7/QS8: Pitch and Mod wheels, 4 assignable control sliders, sustain pedal and 2 assignable pedal inputs.

QS7™

Effects:
Alesis 4-bus multieffects with reverb, chorus, flange, delay, overdrive, EQ, rotary speaker emulation and more.

Interfaces:
QS6: Audio, MIDI, high speed Serial Port for direct connection to Mac® or Windows® computers. QS7/QS8: Above plus ADAT® Optical Digital output.

QS Series CD-ROM:
CD-ROM includes free software for sequencing, editing and much more. Includes Steinberg Cubasis™, Mark of the Unicorn Unisyn™ for the QS Series, Opcode Galaxy™ module, 3000 extra Programs and Mixes, software demos and MIDI files.

QS8™

® Alesis and ADAT are registered trademarks, QS6, QS7, QS8, QCard and Sound Bridge are trademarks of Alesis Corporation. All other trademarks are property of their respective holders. For more information on the Alesis QS Series, see your Alesis Dealer or call 800-5-ALESIS.

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

ALESIS

circle #503 on reader service card

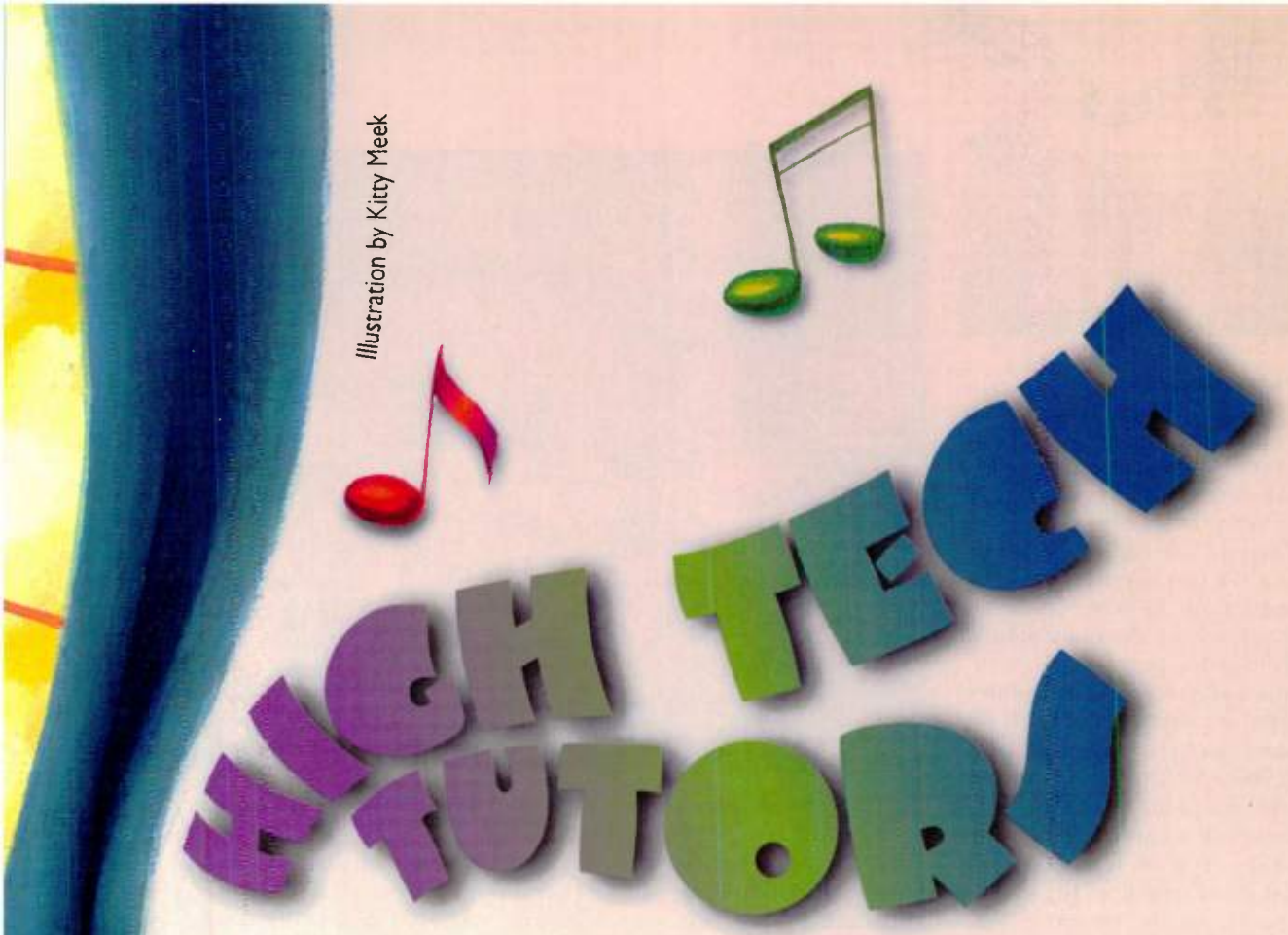


Illustration by Kitty Meek

CD-ROMs turn music-making into child's play.

By Meg Ryan

As a music teacher, you want your students to get the best musical education you can provide them. But your time with them is limited, and you can't cover everything in the depth that you would like to. If you teach an instrument or conduct an ensemble, there may be little room for music theory, world music, or improvisation and composition. How can you provide a fantastically well-rounded musical education with limited resources?

Enter the CD-ROM. If your students have access to a multimedia computer, they've got a tutor on call. Educational music software can provide supplemental instruction in music theory, performance, and literature; encourage practice; and incite creativity. However, the abundance of software for kids can be overwhelming, so it's important to know what to look for. Ideally, the software should encourage creativity, enable students to work at their own pace with little direction from a teacher, and help them learn to love music. The audio-visual nature of multimedia adds another dimension to learning that an entirely aural approach can't match, and good CD-ROMs take advantage of this to hold the students' interest. CD-ROMs generally take one of three approaches to teaching music. First, there's the traditional "tutorial" presentation, with lessons, exercises, dictionaries, and the like. Then there's "edutainment," a combination of instruction and game playing. Finally, there's creative play, an open-ended set of musical activities designed to encourage exploration and discovery.

FIG. 2: Fiddle leads you through a series of musical puzzles in Theatrix's *Juilliard Music Adventure*.

THE OLD SCHOOL

A classic example of the traditional approach to instructional software is Harmonic Vision's *Music Ace* (see **Fig. 1**). Created in 1994 with Professor Donald E. Casey of the School of Music at Northwestern University, it's now available on CD-ROM for Mac and Windows, and it's still the best software I've found for teaching the fundamentals of music to young people.

Lessons and games in 24 "modules" cover content areas from pitch discrimination and recognition through basic keyboard harmony, treble and bass clefs, sharps and flats, key signatures, half and whole steps, and the major scale. Progress is automatically recorded in a database as the student advances through the system.

Music Ace's nonevaluative, self-paced approach encourages students to master each module. The lessons present concepts and provide relevant practice; a game in each module allows the student to apply the content of the lesson and build on previous knowledge. Unlike newer educational software, this program keeps lessons and games separate.

The visual element of music-education software demonstrates its usefulness here. Although traditional exercises in pitch recognition and melodic dictation are often only aural, *Music Ace* provides visual cues that make it easier to master the concepts, especially for students with a more visual learning style. But there are none of the fancy bells and whistles here that you can find in newer products; simple graphics and animation let students see a pitch move while it changes. Two-dimensional note heads move up and down on staves, and placing a note on the staff instantly plays the corresponding pitch.

The games serve as formative tests. In other words, there's never a penalty; students can't lose points, and they can play as many times as they want to improve their scores. The games are directly related to the lessons and set clear goals and criteria for scoring, which is based on response time and accuracy.

As an added bonus, *Music Ace* includes a Doodle Pad for practice, play, and composition. Students drag and drop note heads and rests on a staff to be saved and played back, and they can control tempo and volume settings. In addition, you can play and edit music from a "jukebox," which includes a mostly classical repertoire. If you want to provide supplemental instruction in the basics of written theory, aural skills, and keyboard harmony, this is still the software to get.

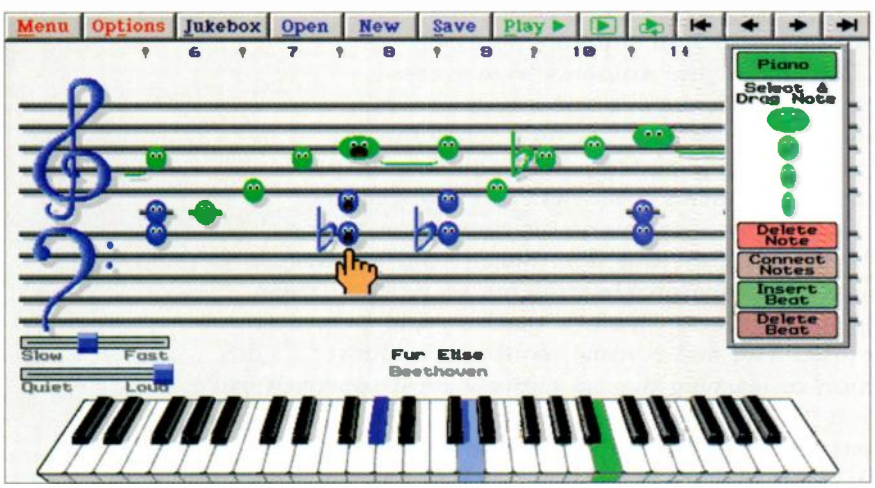


FIG. 1: Harmonic Vision's *Music Ace* provides a solid grounding in the fundamentals of music theory to children eight years old and up. Maestro Max and his choir of singing notes lead users through a series of lessons and games.

FROM A/V TO MULTIMEDIA

With the advent of multimedia CD-ROMs, interactive instruction has acquired several new tools. QuickTime and AVI videos allow students to get up close and personal with the techniques of master performers. Sophisticated graphics and animation hold the student's attention, and better user interfaces make navigating and controlling your own instruction easy and immediate.

Multimedia is particularly well suited to teaching instruments. For example, eMedia's *Guitar Method* provides thorough instruction in classical, blues, rock, and folk guitar styles using a

r a d i c a l

Knobs...No GM

d e p a r t u r e

- It's about SOUND.
  New sounds never heard before. Your sound. Being different from everyone else.
- It's about CONTROL. Knobs, switches and jacks... not menus and screens. The ability to twist a knob and hear a change. The ability to control sound the way YOU want to control it.
- And it's about CREATIVITY. **Your Music**. Who you are.
- It's about Advanced Additive™

The K5000S Advanced Additive Synthesizer gives you complete control over a radically new generation of sound synthesis.

Don't cry for GM; you don't need it any more. Call your Kawai dealer.

K5000S
Advanced Additive Synthesizer

KAWAI

For info about Advanced Additive Synthesis and the K5000 Series visit www.kawaius.com on the web.

circle #543 on reader service card

repertoire of popular songs. Sixty lessons and 100 excercises and songs offer instruction in guitar technique and tablature using text, audio, and video instruction. Close-up shots coupled with instructional text demonstrate proper fingering techniques, while a master guitarist guides you through the lessons. This CD-ROM is also equipped with a built-in metronome and guitar tuner as well as a chord dictionary for reference.

One major advantage of such a program is its potentially unlimited use. Unlike a busy tutor in a 1-hour lesson, this teacher will explain any concept it knows ad infinitum. Unfortunately, though, the program can't answer the student's specific questions, improvise, or provide feedback on the student's playing.

EDUTAINMENT

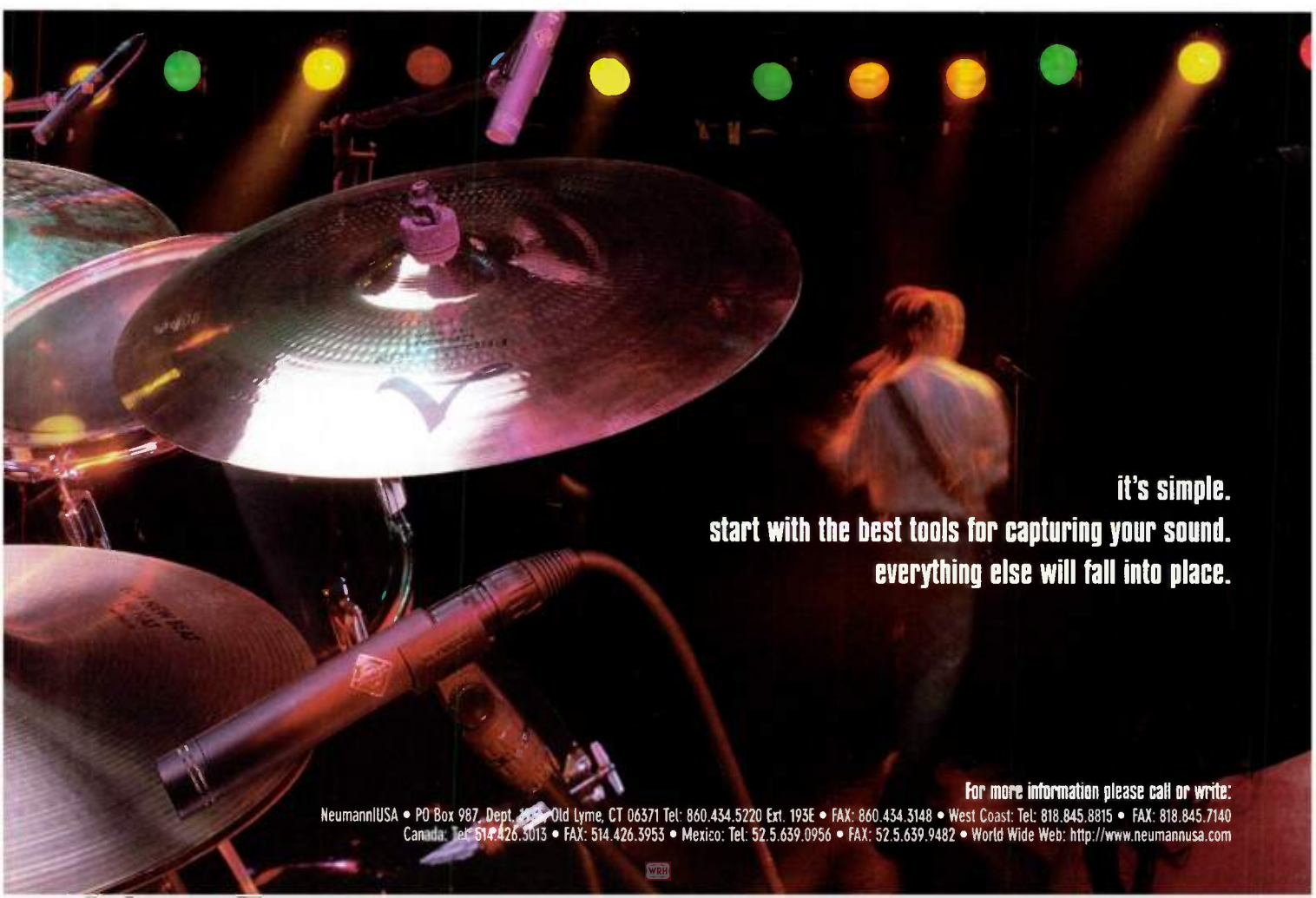
Until a few years ago, most educational software separated game-like practice from tutorial instruction modules. In "edutainment" software, instruction is incorporated into the structure of a game that develops skills in its specific content area as well as general problem-solving skills. In order to succeed in such a game, students must master the relevant concepts. *Juilliard Music Adventure* by Theatrix Interactive is possibly the best music-education software of this kind (see **Fig. 2**).

Creative-play programs tend to be lean on fundamental concepts.

Juilliard Music Adventure's animated guide, Fiddle, leads the student through the rooms of a queen's castle, each of which contains an interactive musical puzzle that both instructs and entertains. Each solution leads the student closer to the game's ultimate goal: the queen's throne room, which is a virtual compositional playground. By the time you get to this point, you should have all the knowledge, skills, and tools you need to start creating your own music, which you can save and play back. That's edutainment!

Theatrix developed this CD-ROM with the help of the Juilliard School of Music. Juilliard's content experts worked with the software's producers, offering pertinent musical information and pedagogical advice. In addition, all the music on the CD-ROM was performed by students at Juilliard, which makes for great listening and a model of fine playing.

The musical concepts introduced in *Juilliard Music Adventure* are more than the basic, sterile theory endured by music students everywhere. Instead, the content is designed specifically to lead students on a path to composition. In addition, the material is presented in a way that instills confidence



Multimedia Mentors

Manufacturer	Product	Price	Platform	Ages
eMedia	*Guitar Method*	$59.95	Win	7+
Harmonic Vision	*Music Ace*	$49.95*	Mac/Win	8+
IBM	*Kid Riffs*	$31.50	Win	Any
Theatrix	*Juilliard Music Adventure*	$29.95*	Mac/Win	9+
Voyager	*Making Music*	$39.95*	Mac/Win	5–10
Windy Hill	*Menlo the Frog*	$39.95*	Mac/Win	3–7

* Teacher's editions available; contact manufacturer for pricing.

and a sense of ease toward an often intimidating practice.

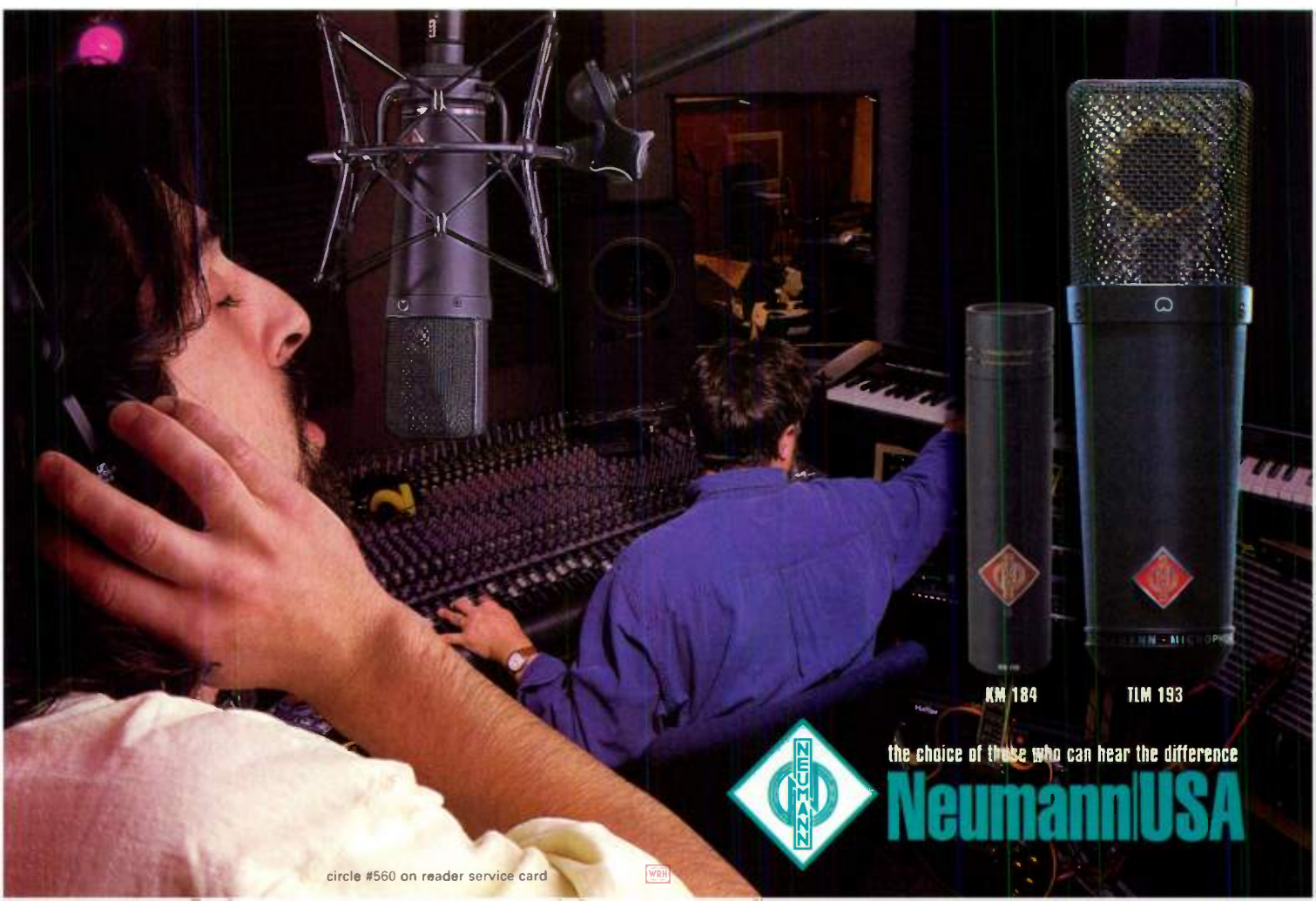
The instructional content of the program includes concepts relating to melody (pitch recognition/repetition, hearing and creating antecedent/consequent phrases, sequence, symmetry, and major and minor scales), rhythm (subdivision, meter, tempo, and rhythmic dictation), and basic information on how to make interesting music (syncopation, variation of melody and rhythm, imitation, and retrograde motion).

One of the great features of *Julliard Music Adventure* is that the user can approach the castle on three different levels, each of which is progressively more advanced in content and contains more challenging puzzles (and requires more keys to get that darn door open!).

The only drawback to this title is its heavy classical orientation. Although *Julliard Music Adventure* has some lessons about jazz, rock, and ragtime, it mostly covers classical styles from Baroque to twentieth century, including a fair number of relatively obscure composers, such as Alexander Scriabin and Cecile Chaminade.

Juilliard Music Adventure is packed with high-quality information and activities, all directed toward building a solid musical foundation. Even with my advanced musical knowledge and the ability to breeze through all the exercises, it took me almost five hours to get through every room on all three levels. And that didn't include reading all the information on music history, literature, and theory found along the way or spending eons in the throne room honing my mediocre compositional skills! Whew!

This game is loaded to the gills. Its sound quality is fantastic, its breadth of information is excellent, and its educational value is incomparable. It is suitable both as a primary instructional tool and as a supplement for independent or small group study. *Juilliard Music Adventure* belongs in the library of everyone serious about turning kids on to great music while instilling creativity and confidence.



CREATIVE PLAY

Some instruction doesn't look like instruction at all. Did you know you were learning when you were playing silly games and singing songs in kindergarten? Creative play allows kids to learn in the way they learn best, and it fosters a love of music that is often lost when children are forced into sometimes boring or intimidating music lessons.

Many CD-ROMs teach by giving students the opportunity to play with new tools and explore a virtual world of sound, which provides indirect musical instruction and encourages their creativity. These titles are generally designed for children of ages three to ten years. The CD-ROM is an excellent medium for this type of instruction because it is easy for kids to use on their own and offers a lot of cool stuff in one little package.

For example, IBM's *Kid Riffs* includes enough activities in each section to occupy a person for hours. This is evident from the list of standard tools that appear in every virtual room of Kid Riffs Park. To start with, an onscreen keyboard—called a *playboard*—can be operated via either the mouse or the computer keyboard. A music stand allows you to control riffs from a conductor's podium with playback, stop, and repeat commands. A backpack contains several editing tools and a magic genie's lamp that allows you to choose new instruments, scales, and riffs. A metronome tool lets you adjust the tempo from 40 to 240 beats per minute at any time, and a clickable light bulb provides suggestions. When you get stuck, you can click on a character called Kid Riff, and she'll offer verbal help with any part of the room. All the rooms also let users create, save, and play back riffs of their own. All this and more is found in five play rooms that explore rock, blues, jazz, reggae, Latin, and classical music.

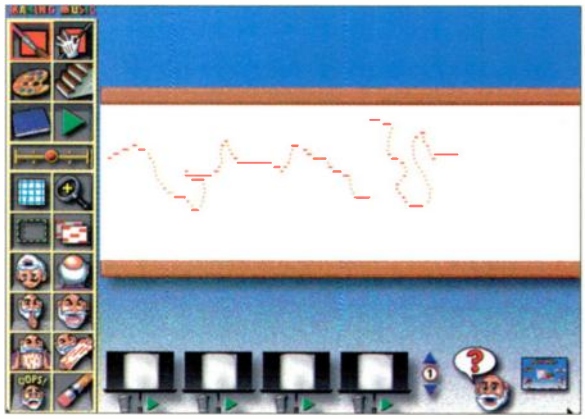


FIG. 4: The main composition space of Voyager's *Making Music* program allows you to "paint" a song using the mouse and a palette full of tools.

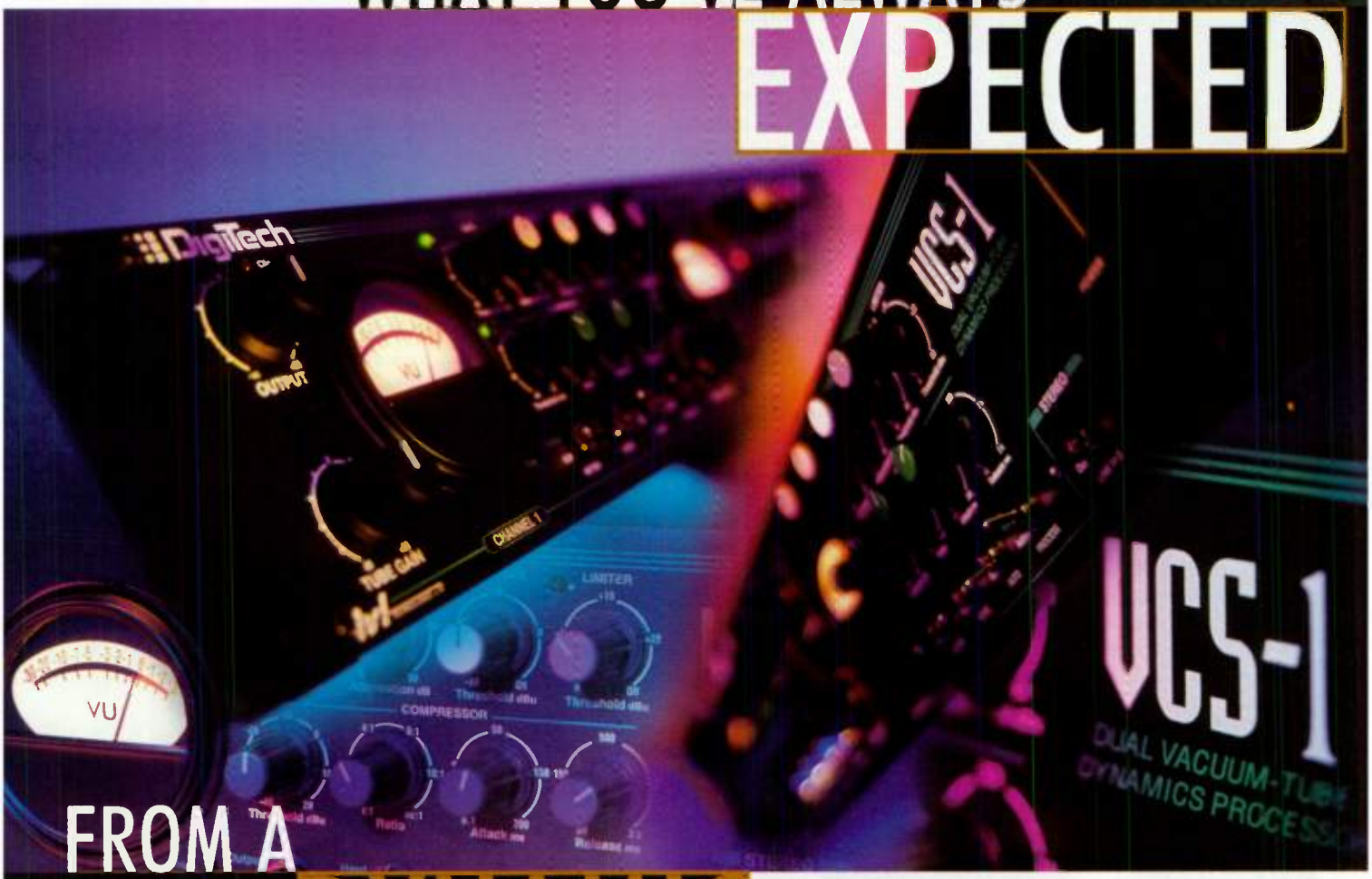
Kid Riffs' accompanying coloring guide briefly introduces the vocabulary of the basic musical concepts the program uses, including octave, riff, tempo, instrument family, scale, interval, arpeggio, chord, rhythm, and measure. Unfortunately, none of these concepts are clearly and explicitly defined or discussed in the program itself. Kid Riff and the suggestion light bulb do offer excellent advice on how to apply the tools, though, and the program definitely accomplishes its goal of flinging open the doors to musical creativity and exploration.

Another interesting creative-play title is *Menlo the Frog: A Musical Fairy Tale* from Windy Hill Productions (see **Fig. 3**). Valuable introductory musical instruction is hidden within the elaborate and very cute story of Menlo the Frog and Princess Winnicent. The two must save the Land of Once upon a Time from losing its music forever by finding the key to wind up the gigantic Melody Man, bearer of all the music in the land. The four musical activities are not essential to the story (very little problem solving is required) and are designed to give students the foundations of musical literacy.

Menlo the Frog contains excellent introductory exercises in pitch discrimination and rhythm. In Windy Hill's classroom tests, children have enjoyed the program for a year or more. However, I feel that the activities in *Menlo* can be quickly mastered, even by young children. Although the program retains its entertainment value, ongoing exploration into musical concepts is minimal. Furthermore, the story is more cinematic than interactive; in many instances, the user must wait for part of the story to play out before going on to another activity. This may frustrate veteran *Menlo* users and limits the program's prolonged use as an educational tool.

FIG. 3: The Can Be Critter Musical Composition Activity in Windy Hill Productions' *Menlo the Frog* uses woodland creature icons that represent parts of musical phrases on tonic and dominant harmonies in 2, 3, and 4 beats.

WHAT YOU'VE ALWAYS EXPECTED



FROM A DYNAMIC PERFORMER

- Full Function Stereo Compressor/Limiter
- Classic Vacuum Tube Circuits
- Convenient Single Control De-esser
- Balanced XLR or 1/4" TRS Connectors
- Illuminated Averaging VU Meters
- Stereo Linking of Both Channels
- Selectable Auto Attack and Release
- Sidechain Audio Path

Dynamics processing is a critical part of any recording. You need the proper tools to help capture the performance and bring it to life. A tube-equipped compressor/limiter and de-esser, the VCS-1 will help add punch to instrument tracks or help your vocal tracks jump out in a crowded mix. Using the adjustable Tube Gain control, you can add tube warmth to any source signal, especially one that is digitally recorded. Let the VCS-1 from DigiTech be your tool of choice for dynamics processing.

DigiTech

A TRADITION OF INNOVATION

A Harman International Company

circle #521 on reader service card

Visit DigiTech on the Web at http://www.digitech.com

8760 South Sandy Parkway, Sandy Utah, USA 84070 · (801) 566-8919 · Fax (801) 566-7005 · Int'l Fax (603) 672-4246

BON VOYAGE

Renowned composer and California Institute of the Arts faculty member Morton Subotnick served as the musical brains for Voyager's *Making Music*, a musical playground full of toys to pick up and fiddle with.

The primary toy in *Making Music* is the main composition space (see **Fig. 4**). Modeled on the user interface of visual-art applications, such as Adobe *Photoshop*, a blank window and toolbar let the student "paint" sounds. There is no staff, notation, or key signature; just sweep the brush to generate music that corresponds to the resulting visual image. You can apply new instrument sounds, turn your composition upside down or backwards, and alter the tempo and amplitude. It takes a while to get the hang of this approach, and the introduction that Subotnick narrates is quite long and laborious, albeit necessary if you want to use the tools to their fullest potential.

Three other activities in *Making Music* seem to be targeted at younger users. The first, a mix-and-match game, offers users the chance to hear various combinations of melodies, rhythms, and instrumentation. The second is a building-block activity in which kids learn about the various parts of a melodic phrase and the beginnings of form (e.g., binary, rondo). The third activity is a series of simple games that teach pitch differentiation and rhythm.

Creative play introduces kids to musical concepts informally, providing a safe place to explore. However, open-ended programs like these tend to be lean on fundamental concepts that must be mastered eventually. Another unfortunate drawback to the entire *Making Music* CD-ROM is that the music examples are mediocre and synthetic-sounding, at least on the Macintosh. Nonetheless, *Making Music*'s composition space is a wonderful way to show kids that music improvisation and composition are fun and easy to learn.

EDUCATIONAL CD-ROM MAKERS

eMedia
tel. (206) 329-5657
fax (206) 329-0235
Web www.emedia.org

Harmonic Vision, Inc.
tel. (800) 644-4994 or (847) 467-2395
fax (847) 467-3008
e-mail maestromax@harmonicvision.com
Web www.harmonicvision.com

IBM
tel. (800) 426-7235, ext. 4777
Web www.pc.ibm.com/multimedia/kidhome.html

Theatrix Interactive
tel. (800) 955-TRIX or (510) 658-2800
fax (510) 658-2828
e-mail info@theatrix.com
Web www.theatrix.com

Voyager Company
tel. (800) 446-2001
fax (212) 431-5799
e-mail orders@voyagerco.com
Web www.voyagerco.com

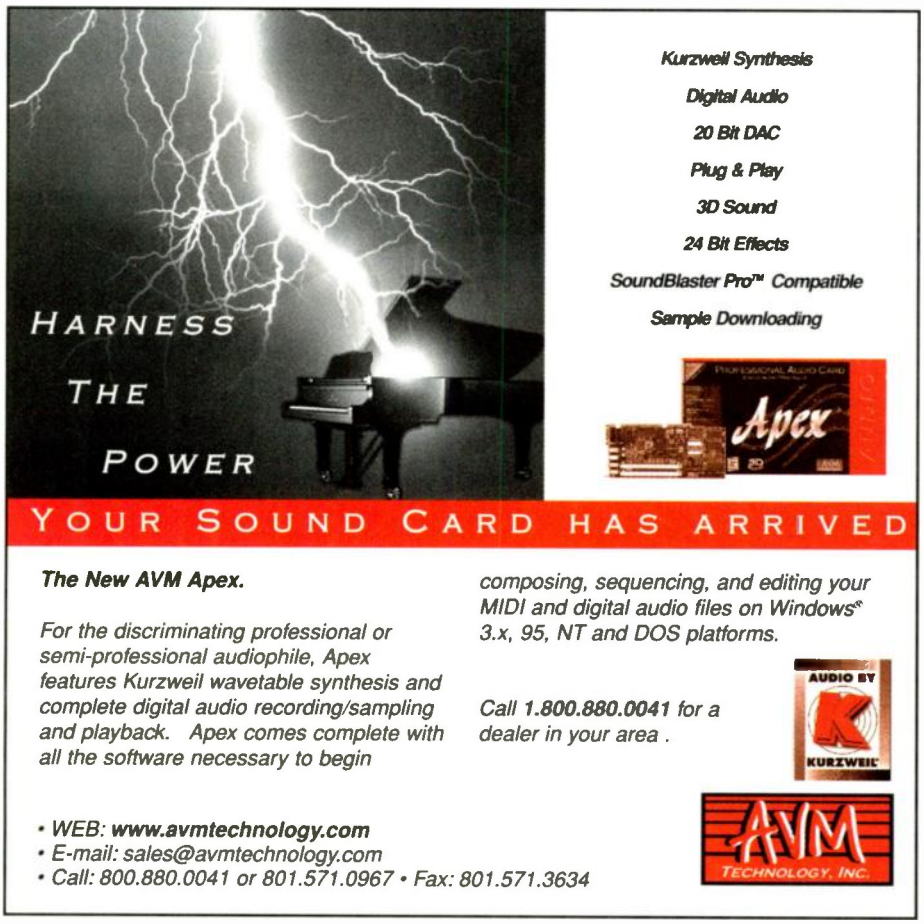
Windy Hill Productions
tel. (415) 854-6127
fax (415) 854-6128
e-mail windyhil@aol.com
Web www.windyhil.com

SCHOOL'S OUT

CD-ROMs will never replace good teachers, but they can certainly add a new dimension to your students' learning experience. Narrative story lines, recorded speech, cute characters, and even the appeal of computers themselves help hold children's attention. Play spaces encourage exploration, and educational games can take some of the pain out of practice. Best of all, with so many titles out there, you can probably find one that fits your students' particular needs so you can help them become more well-rounded, creative, and inspired musicians.

Meg Ryan *has amassed a library of music-related CD-ROMs, which she uses to teach flute and other things to kids in the San Francisco Bay Area.*

circle #511 on reader service card



DP/Pro. Profection.

DP PRO

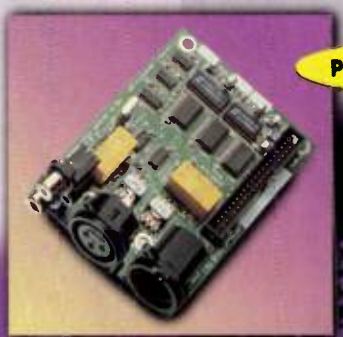
ENSONIQ is known for its award-winning effects processors. With the DP/4, we gave the audio industry the best sounding 4 In/4 Out effects processor ever. We are raising the standard again: introducing the *DP/Pro*, a *24-bit true stereo* effects processor.

We give you quality. A professional effects processor must have impressive components, sound quality, features and programs – the DP/Pro meets all of these requirements. The new 24-bit stereo reverb algorithms have the density and smooth decays that your final mixes demand. The 24-bit stereo Multi-Tap Delay provides up to 32 separate taps and the new dynamics and equalization algorithms provide the precise control and sonic integrity you need to put the finishing touches on your mix. The DP/Pro is powered by two of our next generation ESP-2 Digital Signal Processors running at sample rates up to 48 kHz, and with a Dynamic Range of better than 100 dB, the DP/Pro will appeal to your golden ears.

We give you control of all of this power by providing an intuitive and intelligent user interface. The Effect Finder™ helps you to find the right effect quickly and easily, while the Tweak™ feature provides instant access to the most important parameters for each algorithm.

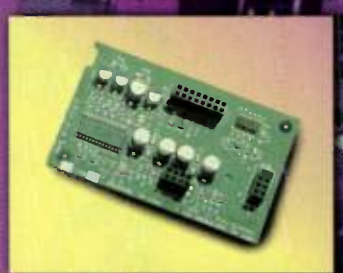
We give you more. The DP/Pro is *expandable*. The user-installable digital I/O option gives you a fully professional 24-bit digital interface. Even the A/D and D/A converters are upgradable.

We give you choices. With the DP/Pro, DP/4+ and DP/2, ENSONIQ now has a complete line of signal processors. The 24-bit DP/Pro meets the most demanding requirements of professional studios. The DP/2, with its 65 algorithms, is truly an audio "Swiss Army Knife." Finally, if you need the flexibility, we have the DP/4+, the audio industry's benchmark for 4 In/4 Out signal processors.



Pro expansions

The DI-Pro allows you to use either 20-bit S/PDIF or 24-bit AES/EBU. (You can even mix the analog and digital signals.)



The 20-bit converters can be upgraded with the ADC-24, a true 24-bit user-installable converter kit.

You can reach us at:
800-553-5151
610-647-8908
800-257-1439
on the Web
http://www.ensoniq.com

ENSONIQ™

LEADING THE WORLD IN SOUND INNOVATION

Send me more info on *turning Pro* with the DP/Pro.

I'd also like info on:
- ASR Series *samplers*
- DP Series *parallel effects processors*
- KT Series *64-voice weighted action synths*
- MR Series *64-voice rack and synths*
- 16x2 Series *mixing boards*

Name _____

Address _____

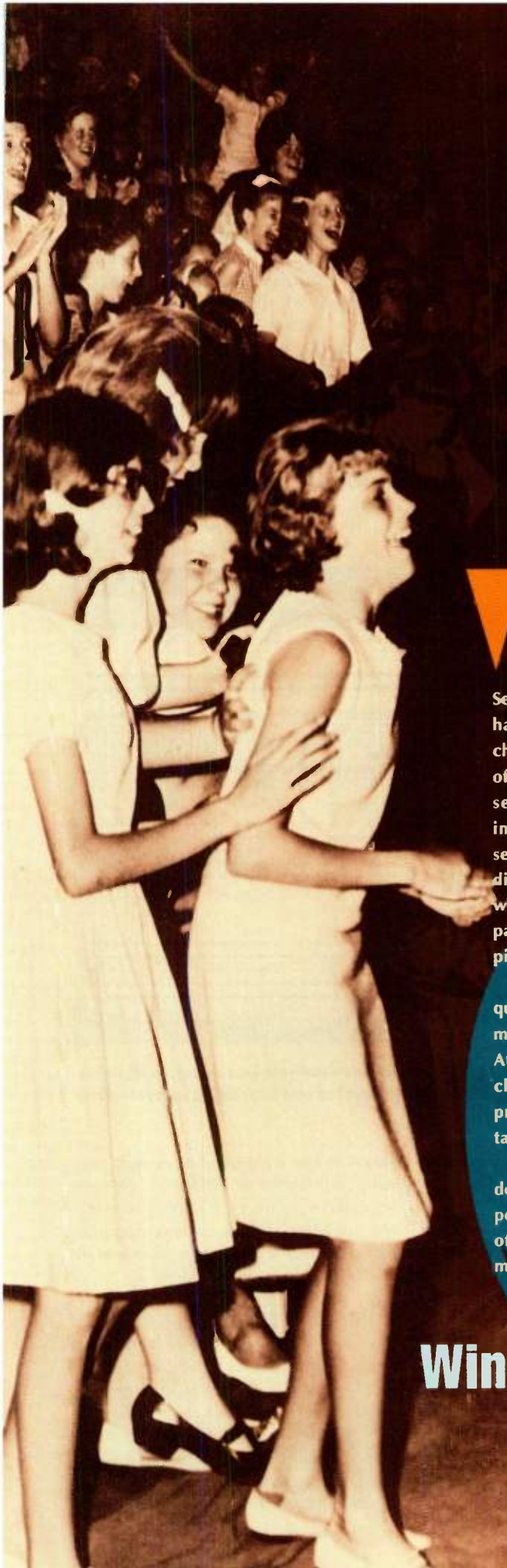
City _____ State _____ Zip _____

Phone ( ) _____

Mail to: ENSONIQ Corp. Dept X-46, 155 Great Valley Parkway, PO Box 3035, Malvern, PA 19355-0735 (800) 647-3930 (610) 647-8908 fax

circle #529 on reader service card

Photo courtesy of Michael Ochs Archives



The Fab Five

BY ZACK PRICE

Sequencing software for Windows has undergone a revolutionary change in the last year. The name of the game is now digital audio sequencing, which denotes an integration of traditional MIDI sequencing with multitrack hard-disk recording. The ability to view and edit MIDI and audio information within a single program, and even within a single window, represents a paradigm shift. Today's digital audio sequencer can truly be the centerpiece of a complete desktop studio. And the best may be yet to come.

Mac users have had these tools for years, of course. But the arrival of quality digital audio sequencing on the Windows platform, with its gigantic market share, has already led to a much larger user base for such programs. At least two of the Windows digital audio sequencers discussed in this article were ported from the Macintosh, where they are among the leading programs of this type. That means the gap between Mac and Windows digital audio sequencers is fast closing.

True, as of this writing there are still some missing pieces on the Windows side. For instance, Windows currently has no equivalent of Digidesign's powerful TDM real-time DSP system for the Mac and the associated blizzard of TDM DSP plug-ins. But a strong foundation is being laid, and the remaining Mac tools are likely to come over to Windows eventually.

Windows mania grips five groovy digital audio sequencers.

Not all Windows digital audio sequencers are designed to compete at the high end. Several of the programs I'll discuss here are tailored for the budget-conscious musician or for a particular type of niche user. These programs may be less expensive and often offer friendlier interfaces than top-of-the-line digital audio sequencers, making them competitive in markets where high-end programs are unattractive. In addition, several programs come in multiple versions; for these, I tested the versions that seemed aimed at similar parts of the market.

THE PLAYERS

The five Windows digital audio sequencing programs I evaluated form quite an international cast. Steinberg's *Cubase* 3.02 ($399) and Emagic's *Logic Audio* 2.5.4 ($599) both come from Germany, and Musicator A/S' *Musicator Audio* 1.03 ($399) is from Norway. From the U.S. come Voyetra's *Digital Orchestrator Plus* 2.11 ($159) and Cakewalk Music Software's *Cakewalk Pro Audio* 5.0 ($399).

In general, these digital audio sequencers are the star performers of their respective companies. The exception is *Cubase,* which is not Steinberg's top-of-the-line product. *Cubase Score* includes all the MIDI and digital audio features found in *Cubase* as well as professional scoring capabilities normally associated with stand-alone notation programs. Not unexpectedly, the price of *Cubase Score* is higher, too ($549). Steinberg also sells *Cubase XT* ($799), which has all the features of *Cubase Score* plus support for higher-end digital audio input devices such as Digidesign's Session 8 and Audiomedia III and the Yamaha CBX-D3 and CBX-D5.

Three of the aforementioned companies also have lower-cost, scaled-back versions of their digital audio sequencers. *Cakewalk Professional for Windows* ($249) differs from its big sibling in that it is limited to recording and playing back a maximum of four digital audio tracks. *Cakewalk Home Studio* ($129) also records and plays back four digital audio tracks, but it doesn't have the SMPTE/MTC synchronization capabilities of its bigger siblings. *Musicator Win* ($299) has all the MIDI and scoring features of *Musicator Audio,* and *Musicator Intro* ($129) has reduced MIDI and scoring capabilities, but both limit digital audio playback to a single stereo track.

Similarly, *Cubasis Audio* ($199) has fewer sequencing, editing, and digital audio features than *Cubase.* Emagic, too, has a lower-end version of its program. Compared to *Logic Audio, Logic Audio Discovery* ($299) has fewer DSP features in the Sample Editor, pared-down sequencing and scoring features, a minimized Environment section (discussed later), and support for eight audio tracks. Each of these scaled-back programs is designed to run comfortably on slower, 80486-based computers. Even so, the preferred minimum platform is usually an 80486 DX2/66 MHz computer.

Most of the five Windows digital audio sequencers examined here claim a minimum requirement of a 80486 DX2/66 MHz with 8 MB of RAM for proper operation. Realistically, however, all of these programs work best running on at least a Pentium 90 computer with 16 MB of RAM. (I tested them using a Pentium 166 with 32 MB of RAM.) Otherwise, performance is closer to that of the downsized, less expensive versions.

Although all five programs run under Windows 95, only *Cakewalk Pro Audio* and *Logic Audio* are designed specifically for that operating system. *Cakewalk Pro Audio* comes with a second version designed to run specifically in Windows 3.1 and Windows for Workgroups. Version 4.5 is identical in function to the Windows 95–only version 5.0, but it doesn't take advantage of the 32-bit operating environment or support long file names.

Musicator Audio and *Digital Orchestrator Plus* were written for Windows 3.1 or Windows for Workgroups. Interestingly, *Cubase,* which also was written for Windows 3.1, comes bundled with *WaveLab Lite,* a digital audio editor that runs only under Windows 95. (A full-featured version of *WaveLab* is available for $499.) To use the two programs together as intended, you must install *Cubase* under Windows 95.

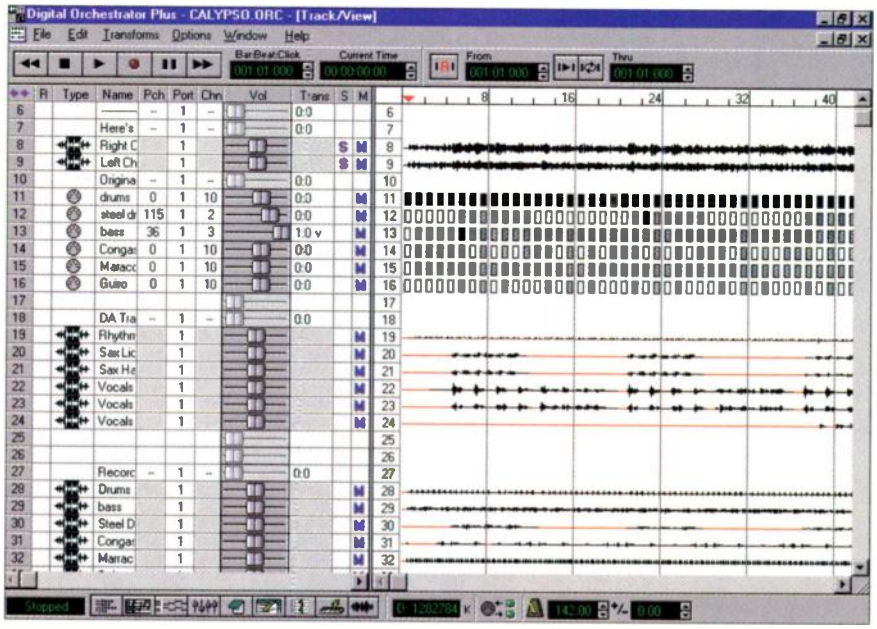


FIG. 1: You can choose between MIDI and audio tracks from the Track Type column on *Digital Orchestrator Plus*'s main screen. Also note the Slider Control column for adjusting volume levels in both MIDI and audio tracks.

COMMON THREADS

Our five Windows digital audio sequencers share several features. For example, each program is, at heart, a MIDI sequencer with an extensive pedigree. *Musicator Audio* and *Cakewalk Pro Audio* are descended from well-known MS-DOS and Windows sequencers whereas the ancestors of *Cubase* and

We Want To Make Something Perfectly Clear.

You've recorded the best performances yet. Captured on the finest digital recorder. Collected with the ultimate microphones. You're almost done. The only thing left is the mix. You need a great mix, because without it your project is lost in a fog. Stay crystal clear with the **20/20bas Direct Field Monitors** from Event.

Clarity. True, it does take the right ingredients for a monitor to reproduce with clarity. Each **20/20bas** cabinet has the right ingredients, put together by pros with years of studio monitor design experience....Bi-amped with 2 hi-powered amps, an extra-large, front-mounted bass port, an active 4th order crossover, calibrated trim controls, circuit breaker, 8" woofer, natural silk dome tweeter...we could go on.

But these are just features. The sound these monitors deliver is the important thing. A sound truly pleasing and amazingly accurate.

"The sweet high end and the massive tight bottom made me think I was listening to a much larger cabinet."—**FRANCIS BUCKLEY, EQ MAGAZINE**

"I heard details in imaging and ambience that I had never noticed before. ...the 20/20bas is exceptional."—**ROB SHROCK, ELECTRONIC MUSICIAN MAGAZINE**

"The Event 20/20s turned out to be damned fine monitors."—**PAUL WHITE, SOUND ON SOUND**

"If the 20/20 monitors are any indication of what we can expect from Event Electronics, this is a company worth keeping a close eye on."—**LOREN ALLDRIN, PRO AUDIO REVIEW**

The 20/20bas Monitors from Event... Make your next mix perfectly clear.

ELECTRONIC MUSICIAN 1997 EDITORS CHOICE

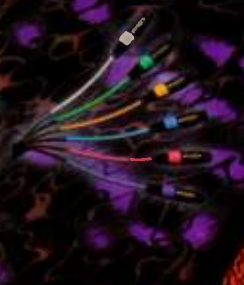
EVENT ELECTRONICS INC

Post Office Box 4189
Santa Barbara, CA 93140-4189
Voice: 805-566-7777
Fax: 805-566-7771
http://www.event1.com

circle #531 on reader service card

Our new 1x4 Active Concert System delivers the superior performance of active electronics with the benefits of transformers!

U.S. Audio mixers, amplifiers and specialty electronics are found at the best venues, broadcast facilities, studios, theme parks, and international sporting events. They combine innovative features and great sound with the rock-solid reliability Whirlwind products are famous for.



Check out our new Cable Armor !

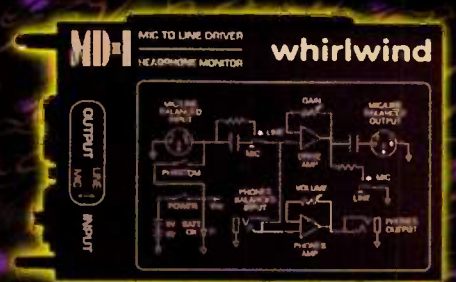
Your Sound whirlwind Is Worth It.

• CABLES • TUBES • PATCH BAYS • MIXERS • AMPLIFIERS • ADAPTERS • CONNECTORS •

WHIRLWIND • 99 LING RD • ROCHESTER • NY • 14612 • 888-733-4396

Call for more information Toll-Free!

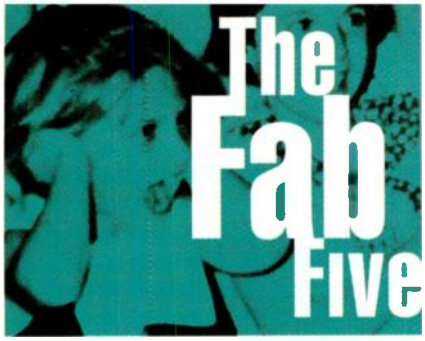
The new MD-1 battery powered Mic Pre/ Headphone Amp features 18V phantom power, Gain and Headphone Level controls, mic/line input and output level selection, and excellent audio performance.



PM tubes are Precision Manufactured versions of classic tube designs, plus new designs for new sounds. All duets and quads are computer matched for great, consistent sound and high reliability. ***PM*** tubes are "The Tubes for Music™."

PM

circle #595 on reader service card



Logic Audio came from the Atari platform. *Digital Orchestrator Plus* is the only program to have been written originally for Windows.

Given their lengthy histories, it should be no surprise that each program's MIDI features have been well defined for some time. This info has been covered in earlier issues, so I won't discuss each program's MIDI capabilities in detail, but I will briefly mention particular MIDI features as they relate to a specific program's strengths or weaknesses. (Consult the sidebar "EM Covers Digital Audio Sequencers" for further reading.)

On the other hand, multitrack digital audio recording, editing, and playback functions are relatively new additions to these programs. Fortunately, all five software developers have been successful in designing programs that treat digital audio tracks much like MIDI tracks, thus keeping the user interface consistent.

Each program uses Windows-compatible sound cards for recording and playing back digital audio. Although many of the programs are limited to using just one sound card, *Musicator Audio* supports up to two sound cards for recording and (at least in theory) four cards for playback. *Cakewalk Pro Audio* and *Digital Orchestrator Plus* support the use of two sound cards—one for recording and one for playback—which is handy if your cards are not full duplex. In fact, *Digital Orchestrator Plus* can play back (but not record) through as many sound cards as you can fit in your PC, though you can't assign specific tracks to specific outputs.

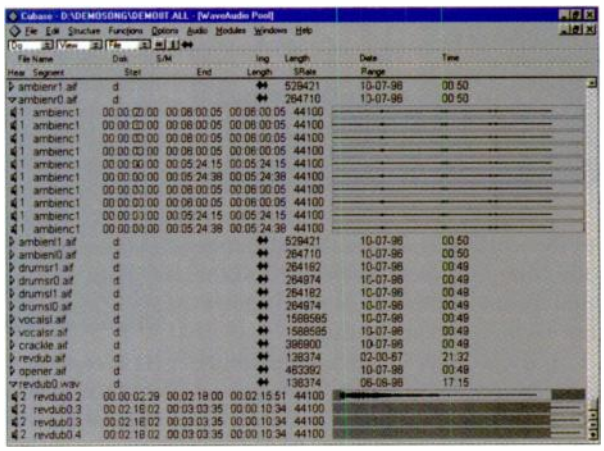


FIG. 3: The Audio Pool window in *Cubase*. Most of the digital audio sequencers use region lists like this to keep track of all the audio segments created from the different WAV files.

Cakewalk also works with specialized multichannel hardware such as Soundscape's SSHDR1 and Digidesign's Session 8. *Cakewalk Pro Audio* and *Logic Audio* can use the Audiomedia III card's onboard DSP to accomplish real-time EQ, level control, and panning.

All five programs support the standard Windows 16-bit sample rates of 11.025, 22.05, and 44.1 kHz. *Cubase* and *Logic Audio* support additional sample rates, depending on the sound card used. For example, I work with the Digital Audio Labs CardD Plus, which can sample at 48, 44.1, and 32 kHz. But only *Cubase* and *Logic Audio* can handle 48 or 32 kHz samples when used with the CardD Plus.

In addition, all five programs can synchronize to external devices (analog tape decks, MDMs, video decks, etc.) through MTC or SMPTE, provided the proper interface or synchronization hardware is used. The situation becomes more complicated when playing both digital audio and MIDI tracks because most digital audio sequencers use the sound card's internal digital clock as the source for synchronizing MIDI playback. Introducing an external MTC or SMPTE clock source does not affect the sound card's internal digital clock.

With *Cubase, Digital Orchestrator Plus,* and *Musicator Audio,* the result is that the program has no way to guarantee synchronized playback among the external devices, MIDI tracks, and digital audio tracks when an external clock is used. The only solutions are to make the program (actually, the sound-card clock) the master clock or slave the program via MTC to an outside clock source and let the sequencer tracks freewheel once playback commences.

Cakewalk Pro Audio does not freewheel. Instead, the program chase-locks to SMPTE via MTC and periodically adjusts the playback rate of the audio to keep it in sync with the SMPTE clock. *Logic Audio* has a Trigger Sync feature that accomplishes the same goal as *Cakewalk Pro Audio*'s sync technology

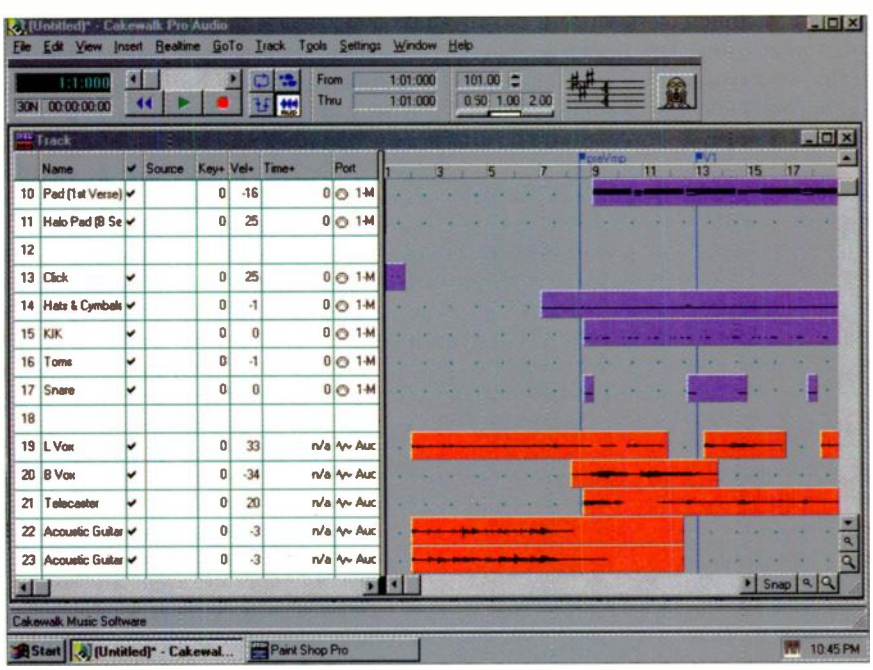
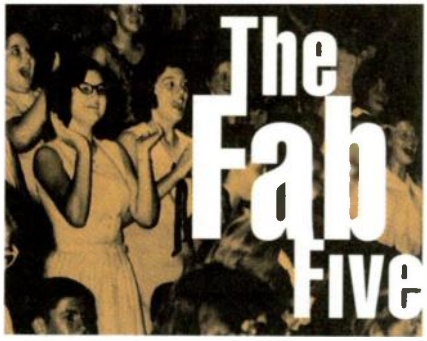


FIG. 2: In *Cakewalk Pro Audio*'s main screen, the left and right audio channels are assigned to separate program tracks. Each track's volume and pan controls can be adjusted with the program's mixer window or with MIDI Control Changes.



but in a different way. As SMPTE time code comes in, *Logic Audio* looks at the fluctuations in the time code and triggers each region accordingly.

Finally, all five programs provide some degree of notation editing and score printing. Scoring is not a strong suit for *Digital Orchestrator Plus, Cakewalk Pro Audio,* and *Cubase.* Still, they have enough notation features to generate lead sheets, basic multistaff scores, and the corresponding individual parts. On the other hand, *Musicator Audio* and *Logic Audio* (and *Cubase Score* and *Cubase XT,* which are not evaluated here) rival stand-alone notation programs in terms of scoring features. *Logic Audio* can convert a single-note (monaural, monophonic) audio part into MIDI data, which can be displayed as notation. None of the other programs currently can convert audio to notation in any form.

WORKING THE DIGITS

All digital audio sequencers follow the same basic steps for recording, editing, and playing back digital audio tracks, but they don't perform these tasks in an identical manner. Let's examine some key differences in the way each digital sequencing program handles digital audio.

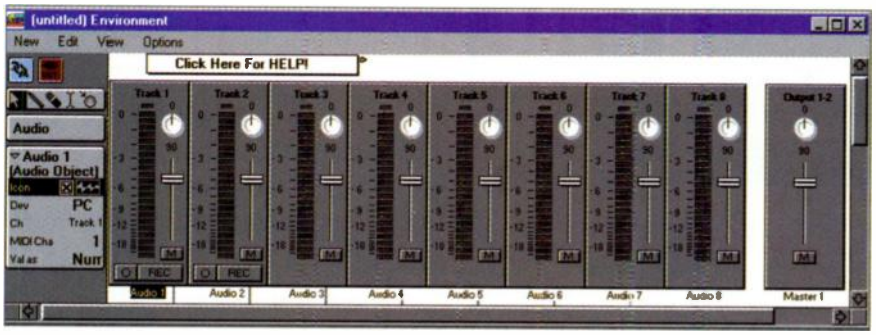


FIG. 5: *Logic Audio* uses a separate mixer to control audio volume and panning. It can use MIDI Pan (CC 10) and Volume (CC 7) messages to record and edit mixes by linking its controls to the Hyper Editor or Hyper Draw windows.

The first step in recording an audio track is to select the track that will refer to the digital audio information. Often, this procedure closely imitates the way the program deals with MIDI tracks. For example, in *Digital Orchestrator Plus* and *Cakewalk Pro Audio* (see **Figs. 1** and **2**), the user simply switches between the MIDI icon and the digital audio icon in the desired track. With *Logic Audio,* you simply click on the Instrument list and select an audio or MIDI Object.

Musicator Audio and *Cubase* force the user to create a track type or part first (in this case, an audio part). This is initially more complicated than the Voyetra/Cakewalk approach, but it establishes a structure by which track data can be more readily accessed.

The programs also differ significantly when it comes to recording mono and stereo files. For instance, each audio track in *Cakewalk Pro Audio* and *Digital Orchestrator Plus* is a monophonic track. To record stereo material in these programs, you must record each channel on a separate track. *Cubase* and *Logic Audio* record mono material on one track but record stereo on available odd/even tracks (e.g. tracks 1 and 2 or 3 and 4 but not tracks 2 and 3). Stereo tracks can be split into two mono tracks later. *Musicator Audio* lets users record multiple tracks using two Windows MME-compatible sound cards but restricts each sound card's function to either a monophonic input or a stereo input. No single card can use its left and right channels to record separate mono tracks.

REGIONAL ACTS

Once audio tracks have been recorded, the next step usually is to remove "dead air" because recorded silence takes up just as much hard-disk space as a nonstop, wailing guitar solo. As with stand-alone digital audio programs, digital audio sequencers perform better when playing only the material that needs to be heard. How digital audio sequencers treat this task differs among the individual programs, but most of them handle the problem the same way stand-alone audio editors do: they let users create regions out of the recorded audio data and place the regions at their proper locations in the audio tracks.

Excluding unnecessary silence often is simply a matter of manually creating a region by setting the start and end points where audible material begins and ends in the audio file. However, *Cakewalk Pro Audio* and *Logic Audio* simplify this procedure by automatically trimming the silent portions of newly recorded tracks. The separate audible portions then become regions that are already placed in the proper track locations.

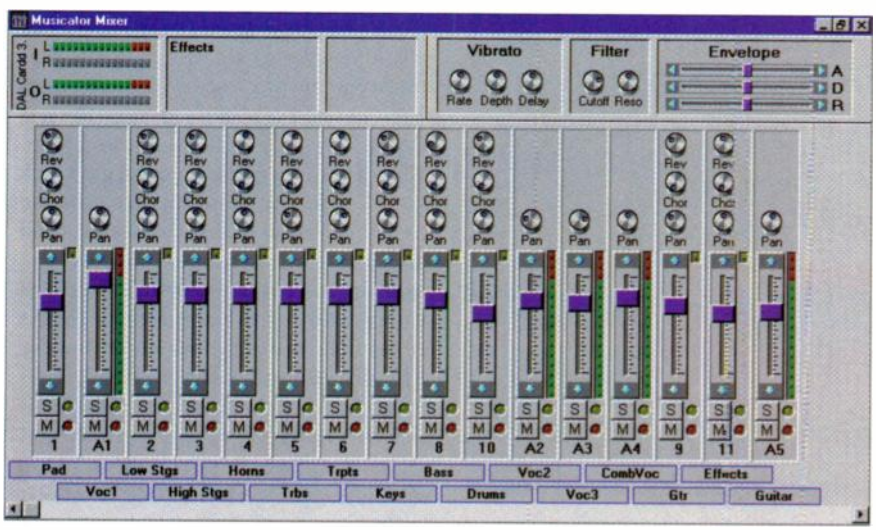


FIG. 4: *Musicator Audio*'s mixer controls both digital audio and MIDI tracks. It is the only program of the five discussed that offers complete editing of Roland GS synth parameters.

The nearest repair shop is roughly 1,783 miles away...

...and you don't care. Your multitrack is a DA-38.

DA-38. The World's most reliable and durable MDM.

We had you in mind when we created the DA-38, the "Musician's Digital Multitrack Recorder.℠" We gave it great sound and full MIDI capabilities (MMC-38) to allow seamless sequencer integration. We designed simplified menus to give you virtually instant access to all its advanced features including an electronic patchbay for input routing to any track, digital track copy for composite edits, shuttle knob control and instant lock up with 100% compatibility to any DA-88.

Want more? **Demand that your dealer give you the best deal in town.**

TASCAM FAXBACK 1-800-827-2268

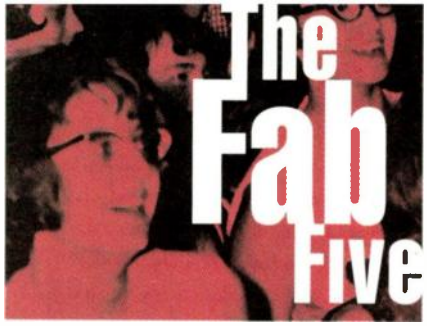
For further information, call TASCAM FAXBACK @ 800.827.2268 and request document #2530

TASCAM
BUILT TO LAST

circle #586 on reader service card

©1996 TASCAM

TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303 • TEAC CANADA LTD. 340 Brunel Road Mississauga, Ontario L4Z 2C2 CANADA (905) 890-8008 • TEAC MEXICO, S.A. de C.V., Privada de Corina #18, Colonia del Carmen Coyoacan, MEXICO D.F. 04100 011 (525) 658-1943



To keep track of the different regions on audio tracks, most of the programs also maintain a region list (such as *Cubase*'s Audio Pool, shown in **Figure 3**) that indicates region name, size, length of time, and other relevant information. *Cakewalk Pro Audio* is the only program in this group that doesn't keep track of regions via a region list. However, all the required information is easily accessible from either the main screen or the Audio Editor window.

Regions have other uses besides simply trimming silence. Smaller sections of music can be created from larger areas, and larger sections can be created by combining smaller regions. Regions can also be duplicated and altered with digital audio processing tools. At some point, though, you'll realize that you have more audio on your hard drive than you actually use in a song. Fortunately, all five programs provide the capability to delete unused data off the hard drive, and some programs (e.g., *Cakewalk Pro Audio*) also optimize the drive for smoother audio playback.

However, no matter how well you trim extraneous silence, delete unused audio data, and optimize your drive, there may come a moment when your system just isn't fast enough to play or record another track. Fortunately, each program lets you do a digital mixdown to a stereo WAV file to free up audio tracks. It's like bouncing tracks on tape, only better. There is no signal degradation because the process and data are digital. Better still, because the mixdown is nondestructive, the original files are still accessible.

Control of audio levels and pan positions for audio tracks varies from program to program. *Musicator Audio*, *Digital Orchestrator Plus*, and *Cakewalk Pro Audio* use one mixer to control both audio and MIDI tracks (see **Fig. 4**) whereas *Cubase* and *Logic Audio* use separate audio and MIDI mixers (see **Fig. 5**). *Digital Orchestrator Plus* also controls volume and panning via a slider control on the program's main screen (see **Fig. 1**), and *Cakewalk Pro Audio* offers separate volume and panning controls for audio tracks in the Track view.

Alternatively, each program provides static (set and forget) control of pan and volume at the mixer level. You can alter the output levels for selected regions using the gain-change editing tool to mimic changes in volume-slider position.

Because the digital audio mixer controls appear similar to MIDI mixer controls in these same sequencers, you might think that changes in digital audio track levels and pan position can be automated by editable MIDI messages recorded from a controller. However, only *Cakewalk Pro Audio* and *Logic Audio* explicitly map audio mixing controls to MIDI pan and volume data that is stored on a dedicated sequencer track. *Musicator* stores the audio volume and pan messages within the associated audio track. *Cubase* lets you record external controllers and edit the messages in the List Editor; the difference is that the messages are not stored in a dedicated track. *Digital Orchestrator Plus* doesn't store control messages in a track where you can edit them.

Besides, using MIDI messages to control audio tracks isn't always a smooth process because of problems with Windows' multimedia drivers. There may be noticeable time lags between the moment you send a MIDI message to an audio track and the time the message takes effect. This problem generally occurs on slower systems or systems being taxed to their limits.

PORTRAITS IN MINIATURE

It should not be forgotten that the programs' audio features operate in an integrated sequencing environment. The developer's implementation of this audio-MIDI integration is part of the user interface, which ultimately determines a digital audio sequencer's worth. In fact, the user interfaces of our five programs display remarkable differences. By examining some of these differences, you will come much closer to figuring out which program is best for you.

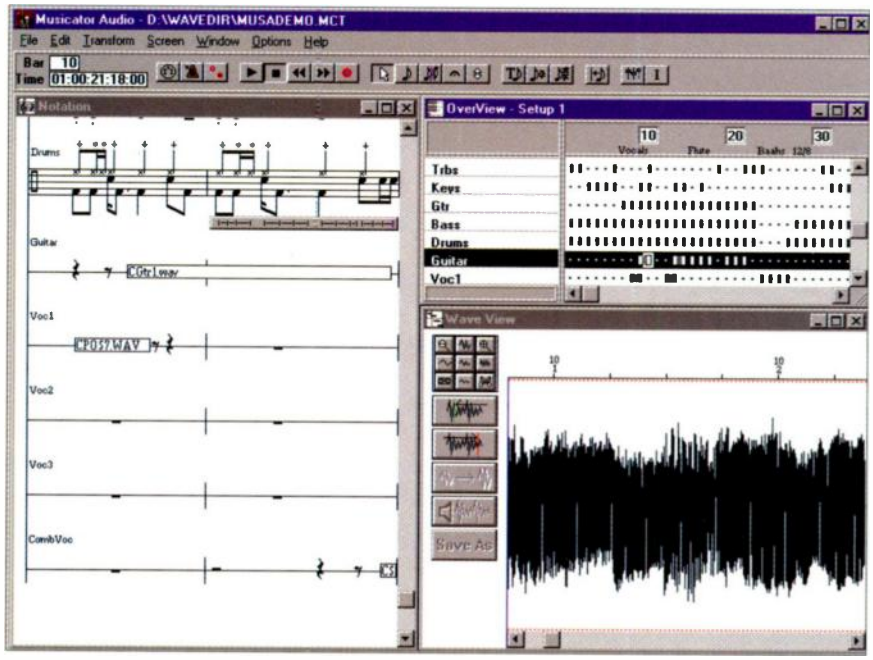


FIG. 6: Although finished audio productions can be accomplished in *Musicator Audio*, its notation-oriented environment is better suited to creating musical scores.

Unfortunately, limited space precludes a detailed comparison of every program's features. Instead, I'll provide miniature portraits that can be used as points of reference for more detailed investigation.

MUSICATOR AUDIO

Musicator Audio's operating environment is oriented toward notation editing and score printing rather than audio production work (see **Fig. 6**). However, the program views data in the same type of windows traditionally found in MIDI sequencers, such as Track and Piano Roll views. Moreover, *Musicator*

PRO TOOLS

More professionals use Pro Tools than all other workstations combined. *Why?*
Because Pro Tools provides powerful features for recording, editing, mixing, and mastering. With up to 48 tracks of record and 64 channels of digital and analog I/O, Pro Tools has become an industry standard with unsurpassed price performance.

Patch in your favorite gear from Apogee, dbx, Dolby, Drawmer, Focusrite, Lexicon, and t.c. electronic, — or expand Pro Tools' capabilities with software Plug-Ins from these companies and 100 others.

And now Pro Tools 4.0 has arrived.
Among the dozens of new features are:

- **THE MOST POWERFUL MIX AUTOMATION IN THE WORLD AT ANY PRICE**
- **PROFESSIONAL DIGITAL VIDEO**
- **MULTIMEDIA AUTHORING TOOLS**
- **EDITING–DURING–PLAYBACK**
- **LOOP RECORDING**
- **SPEED, SPEED, SPEED — POWERMAC NATIVE!**

Whether you're using Pro Tools III, Project, Audiomedia, or PowerMix systems, you can rest assured that Digidesign's new Pro Tools 4.0 software will take you to new heights in creativity and productivity.

To remodel your studio with Pro Tools 4.0 or any of Digidesign's audio solutions for music, post, multimedia, and radio broadcast, call **1-800-333-2137 ext 284**. And ask about our *free* Pro Tools video.

remodel your studio

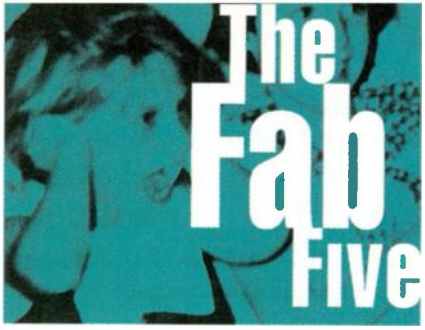
NEW
Pro Tools 4.0
from Digidesign®

Pro Tools.
The Perfect Fit for
Your Audio Needs.

digidesign® AVID
A Division of Avid Technology, Inc.

©1997 Digidesign, a division of Avid Technology, Inc. All features and specifications subject to change without notice. Audiomedia, Digidesign, Pro Tools, Pro Tools Project and Pro Tools PowerMix are trademarks or registered trademarks of Digidesign or Avid Technology, Inc. Apogee, dbx®, Dolby®, Drawmer, Focusrite®, Lexicon, and t.c. electronic® are trademarks or registered trademarks of their respective owners

www.digidesign.com



Audio is the only one of the five programs we examined whose Mixer view offers integrated editing capabilities for all GS parameters, not just changes in patches, chorus, and reverb types (see **Fig. 4**).

But when push comes to shove, the program often works most efficiently when operating within the Score window. For example, step entry is performed only in the Score window, and audio region placement is also best viewed from there. (Compare the large boxes representing audio region placement in the Score window with the little gray highlighted boxes showing the same placement information in the Part window.)

Furthermore, *Musicator Audio* has barely enough MIDI-editing tools to warrant being called a sequencer. Quantize options are limited to basic quantizing, quantizing by percentage or endpoints, and Swing Quantize. Velocities are adjustable by an absolute value (Level Shift), and by a compression or expansion factor determined by the average Velocity values of the selected note data. On the positive side, Parts (tracks) can be shifted in time and transposed, and controller data can be graphically inserted or edited. Still, *Musicator Audio* doesn't have what I consider creative MIDI manipulation tools, such as Retrograde (playing the MIDI data in reverse order) or pitch inversion around a selected note or key signature.

On the other hand, *Musicator Audio* handles audio recording and playback surprisingly well. Users can play back up to sixteen Lines (tracks made up of multiple audio regions), subject to the usual constraints of computer-system performance. Also, of the five programs I examined, only *Musicator Audio* supports the use of up to two sound cards during recording and four for playback, giving users the potential for recording two stereo audio tracks simultaneously and playing back four stereo tracks simultaneously. The claim that *Musicator Audio* can address four cards seems incredible on the face of it, and unfortunately, I was unable to test this feature.

In addition, the program makes it easy to create, move, delete, and adjust region start and end points; split regions; crossfade between regions; and even join regions together (Concatenate) to make new regions. Sadly, these abilities are offset by *Musicator Audio*'s limited set of digital signal processing tools. (The table "The Fab Five: Audio Processing Tools" shows each program's DSP features.)

Musicator Audio's greatest strength by far is its notation features, which are good enough to give any midlevel notation program a run for its money. With *Musicator Audio*, you can create a 32-staff master score and extract individual instrument parts from it. To speed up note entry, you can quantize note values on the fly as they appear

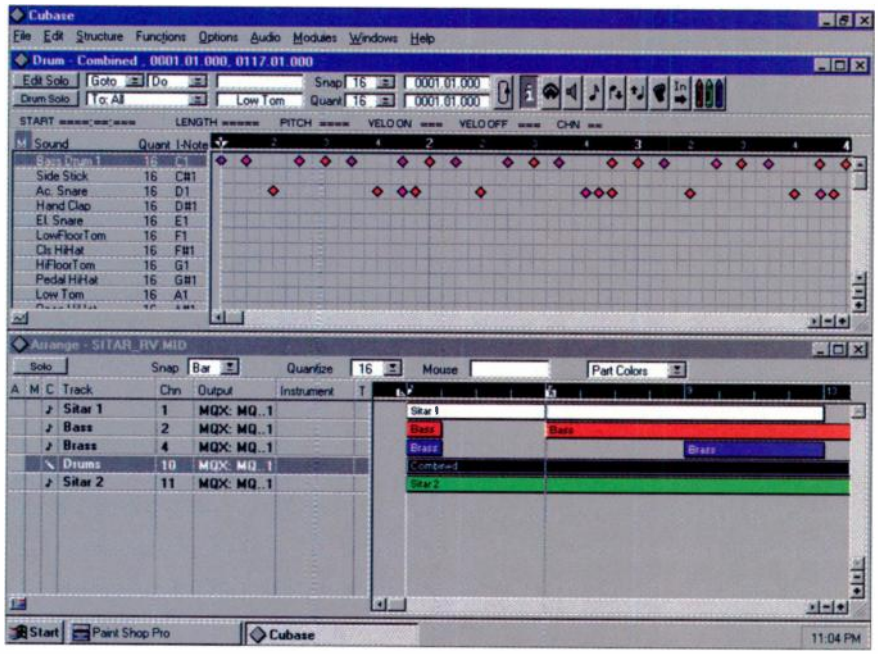


FIG. 8: *Cubase*'s Drum Edit window (top) can be accessed from its associated Drum Track created in the Arrange window (bottom). Compare this with *Logic Audio*'s appearance in Figure 9.

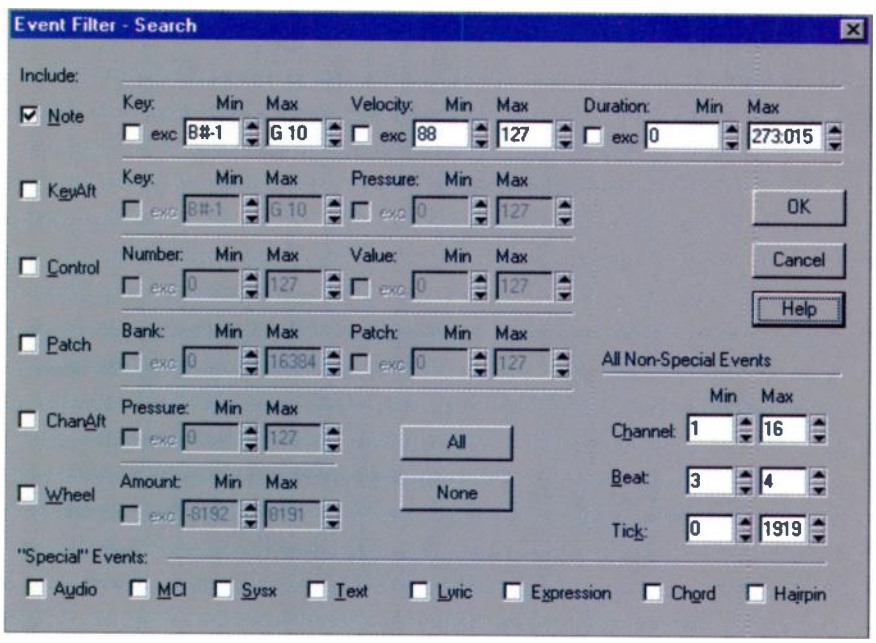


FIG. 7: *Cakewalk Pro Audio*'s Interpolate feature uses the Event Filter to perform logical operations on MIDI data that has been selected according to various parameter definitions.

Do You Want The Original, A Copy Of The Original, Or Something Clearly Better?

MX12/4 High quality, medium quality and low quality mixers have a lot in common these days. They look alike and so do their ads. Success breeds imitators.

The look and the ad are easy to copy. Lots of our competitors are proving that everyday. Look around in this magazine and you'll see some disturbing similarities.

Yamaha has been among the most successful mixer manufacturers for years. We've had a lot of imitators through the years ourselves. It's hard to know which one to buy without looking inside. Remember, they all look alike and they're all trying to act alike.

But take heart. There are some differences you can hang your hat on. Look for the name Yamaha. Even if you don't know mixers, you know Yamaha is known for being "clearly better" in all we do.

If you do know mixers, you know that Yamaha supplies the largest touring sound companies with their world famous PM Series mixing consoles. The most demanding sound engineers in the world demand Yamaha's large PM consoles more than any other. Does this help us do small mixers better? You bet it does.

In the case of the new Yamaha MX 12/4, if you look closely, you can see some innovations that will save you money and make you look and sound better. Clearly better.

- $599.95 Suggested retail price
- 14 Inputs with 4 "real" buses at the other guy's 2 bus price range (After you buy your mixer, you'll have to buy a reverb and a graphic EQ, unless you bought something clearly better; The Yamaha MX 12/4.)
- An on-board digital reverb (No extra charge. Yamaha is world famous for its DSP technology.)
- An on-board 7-band graphic EQ (Again, no extra charge.)
- No Radio

When you cut corners you might get more than you bargained for. Like radio. Designing mixers with solid RF rejection is not easy. It's one of those "inside things" you can't see. We've been dealing with the most demanding customers in the world using mixers in the most demanding environments. We do it better than anyone.

If you're in the market for a 12x4x2 mixer and you can accept better quality and value than you expected for the money, the new Yamaha MX 12/4 offers you a clearly better choice.

Ext. 661
1-800-937-7171

Call for more information.

YAMAHA

SMART MIXING

©1997 Yamaha Corporation of America, Professional Audio Department, P.O. Box 6600, Buena Park, CA, 90622-6600. (714)522-9011. www.yamaha.com

circle #603 on reader service card

in the Notation window. This technique only alters the notation display, not the actual placement or playback of recorded MIDI note data elsewhere in the program. Some scoring marks—but not all—can affect playback. For instance, inserting an ottava mark in a MIDI part transposes it by an octave on playback.

Overall, I'm not a big fan of this particular program for digital audio sequencing applications, primarily because of its notation-oriented environment and limited editing tools. However, many people (especially music educators and church choir or musical directors) like *Musicator Audio* for this very reason. Some of these people are more comfortable with sight-reading than they are with sequencing, preferring to just play the music, see the notes onscreen, and print out the score. They may edit the sequence, but the typical *Musicator Audio* user is more likely to edit to correct problems than to use the program for creative data processing. This program is an excellent fit for them.

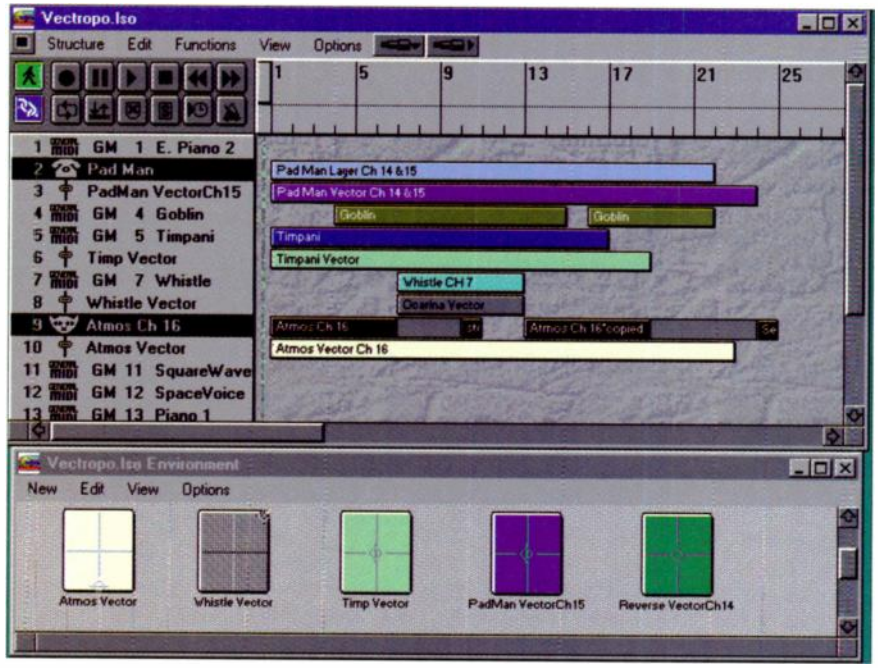


FIG. 10: The Vector controls in *Logic Audio* (bottom) provide 4-pole control between two MIDI parameters. This group of vectors is controlling pan and volume in four different MIDI tracks.

DIGITAL ORCHESTRATOR PLUS

What can you expect from a digital audio sequencing program that costs less than half as much as its closest competitors? In the case of *Digital Orchestrator Plus,* quite a lot! Admittedly, Voyetra's program is not as full-featured as *Cakewalk Pro Audio, Cubase,* or *Logic Audio* in the sequencing and digital audio departments. Its scoring capabilities are minuscule compared to *Musicator Audio*'s. But *Digital Orchestrator Plus* has enough music-making features to render a good account of itself.

Its working environment is simple, familiar, and straightforward thanks to its traditional sequencer appearance (see **Fig. 1**). *Digital Orchestrator Plus* also has the basic MIDI editing features most of us expect in a sequencer. For example, all MIDI data can be quantized to a designated value, offset by a particular amount, or scaled according to a percentage value. Furthermore, all MIDI data can be swing quantized, and the different quantize transforms can be set to operate at different levels of sensitivity to quantization points. Creative MIDI features include Humanize; Randomize Pitch; Diatonic Transpose; Invert, which flips a note's staff position relative to a central pitch; and Diatonic Inversion, which flips note positions according to scale position within the designated key signature.

Digital Orchestrator Plus handles digital audio editing tasks in the workmanlike manner described earlier. In addition, the program has a good basic digital audio processing toolkit (see the table "The Fab Five: Audio Processing Tools"). Surprisingly, it is the only one of the five programs I evaluated which provides compression, limiting, noise

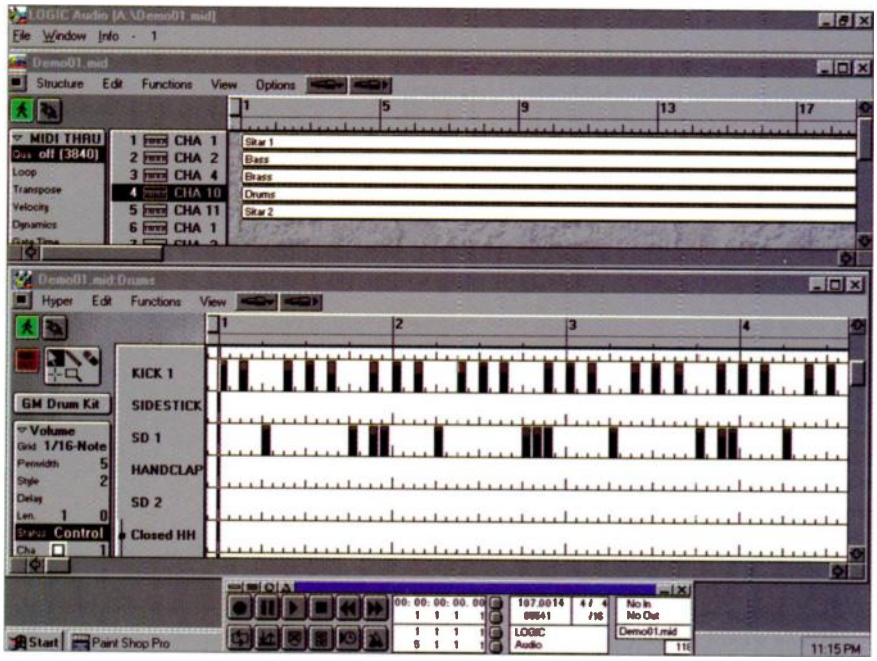
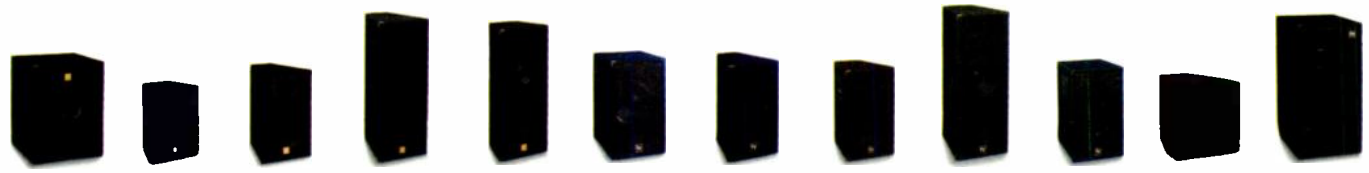


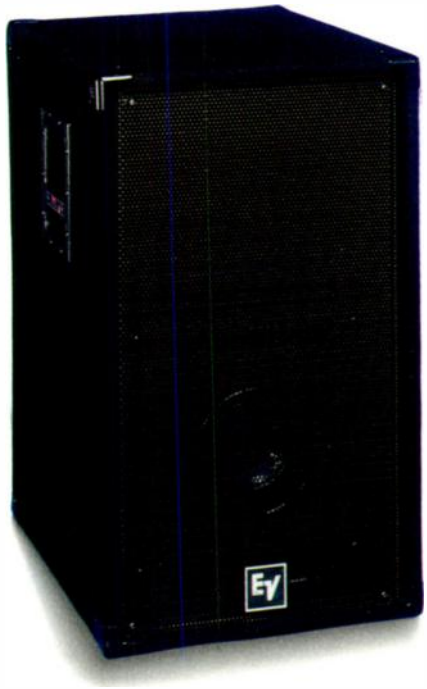
FIG. 9: *Logic Audio*'s Hyper Edit window (top) and its Track window (below). One feature of Hyper Edit is the ability to create a rhythm editor similar to that used in *Cubase*.

So Much Fidelity, So Much Power, So Little Competition.



T18 18" SubScoop™ | **T22** 12" Two-Way | **T52+** 15" Two-Way | **T53** 15" Three-Way | **T55+** Dual 15" Two-Way | **T180** 18" Subwoofer | **T221** 12" Two-Way | **T251** Biampable 15" Two-Way | **T252** Dual Biampable 15" Two-Way | **T351** 15" Three-Way | **MTH-1** Two-Way | **MTL-1** Dual 18" SubScoop™

In today's professional music store, you can't buy a stage speaker system with more fidelity or power than our new T-Series. Each of the twelve models was designed for a specific application and budget, and offers the very highest performance value. And, given a serious listen, the full-range fidelity will at least impress you, if not make you fold your arms, grin, and say, "Wo." Compared to any speaker line, the T-Series is lighter, better-sounding, and more powerful. And we can prove it.



T351: The world's smallest high-Q 15-inch three-way speaker.

If you can imagine a full-range speaker system with the clarity of a studio monitor and the muscle to push concert levels, that's the T351. The T351's New Generation Midrange speaker has a 16 lb. magnet structure and control device that gives you warm, even mids. The 60° x 40° horn provides the even, constant coverage most often preferred in mid-sized systems. About the same size as a typical two-way, the T351 three-way speaker by far out performs any competition we could find. But you'll have to hear for yourself.

See your Electro-Voice dealer for a real demonstration and we'll send you a T-Shirt. For the dealer nearest you, call 1-800-234-6831

Introducing The New

T-Series

Electro-Voice

Electro-Voice, Inc. a MARK IV company
600 Cecil Street, Buchanan, Mi 49107
800/234-6831 616/695-6831 In Canada: 613/382-2141

circle #525 on reader service card

gating, and delay processing of digital audio data from within the program itself.

Compared to its MIDI and digital audio features, *Digital Orchestrator Plus*'s scoring tools are weak. (Voyetra never intended the program to be used for serious scoring.) It's the only program of the bunch that does not let you edit notes and add dynamics or articulation marks within the Score window. In fact, the Score window's only purpose is to transcribe MIDI note data into a printable score. Unfortunately, the program's abilities in this area are mixed. On one hand, parts can be displayed on all possible types of clefs (e.g., grand staff or treble, bass, alto, or tenor clef). Furthermore, note values for individual staves can be transposed for scoring instruments that are not at concert pitch (such as saxes, trumpets, and clarinets) without affecting MIDI playback.

However, these features are counterbalanced by the program's inability to show or print more than ten staves at a time. In addition, lyrics and chord changes can't be entered in the Score window. That's too bad, because I expect every sequencing program that includes scoring to at least generate a proper lead sheet.

However, *Digital Orchestrator Plus* is a fine choice for those who want a good digital audio sequencer that won't overwhelm them with too much power. Also, the program is easy on the wallet. That's good to know if you've just spent a hunk of cash on your powerful new computer and have only a little cash left over to buy software. Best of all, you get a surprisingly powerful program for less than what you'd spend on downsized digital audio sequencing programs that record and play back a limited number of audio tracks.

CAKEWALK PRO AUDIO

In the Windows world, "Cakewalk" has long been practically a synonym for "sequencer," and with good reason. *Cakewalk Pro Audio*, like the many *Cakewalk* versions before it, is a solid workhorse that does its job well and consistently with a minimum of fuss.

This is not to say that *Cakewalk Pro Audio* is the most powerful Windows digital audio sequencer available: *Cubase* and *Logic Audio* share that distinction. Sometimes, though, the more powerful programs dazzle, even overwhelm, the eyes with an attractive appearance while the decidedly more plain-looking *Cakewalk Pro Audio* unassumingly goes about its business.

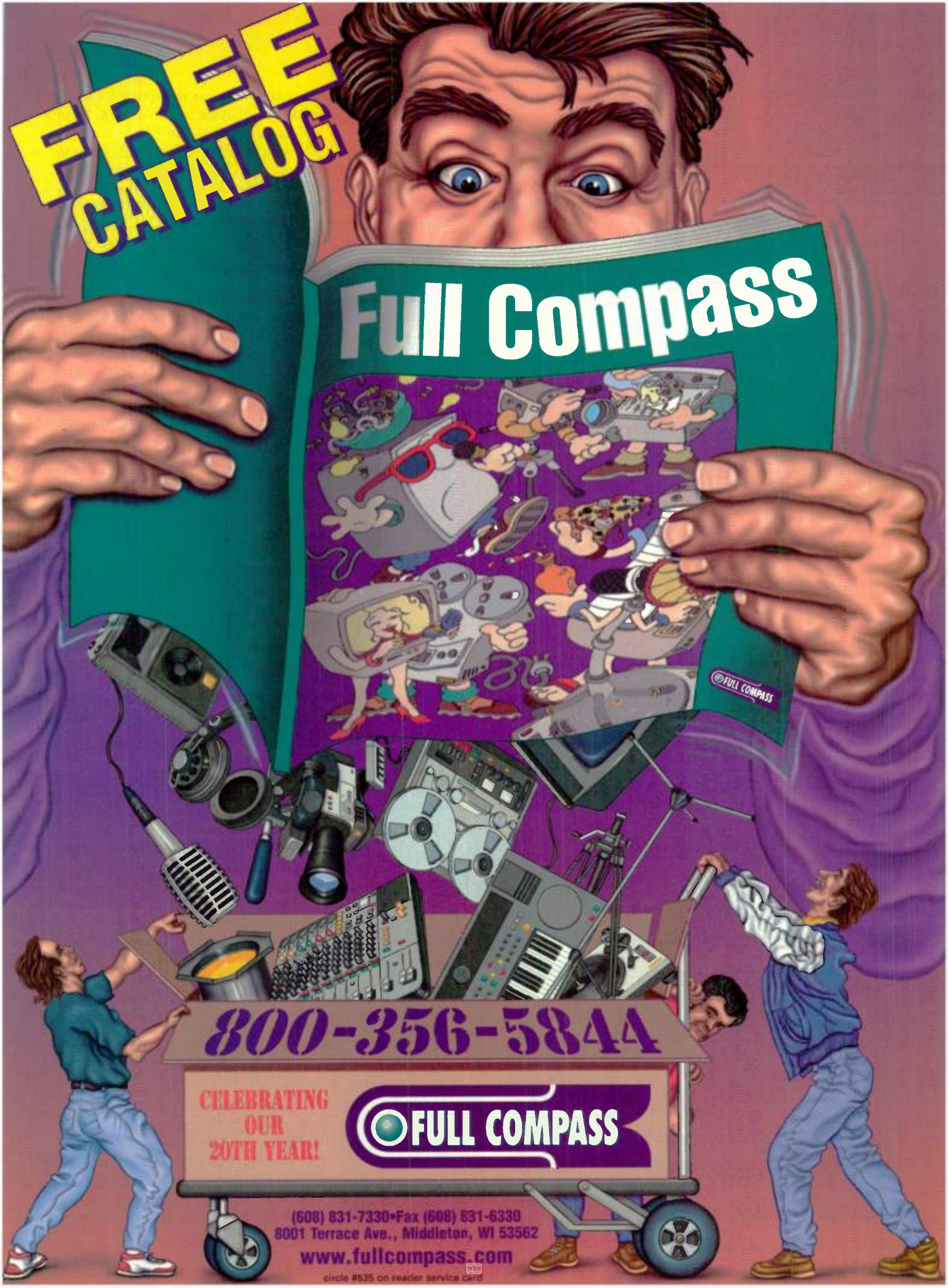
For instance, *Cakewalk Pro Audio*'s main screen (see **Fig. 2**) displays track information in the traditional manner but shows recorded MIDI and audio data in the Measure Pane area as tape strips, or "clips." These clips can easily be split, combined (joined), dragged, copied, and deleted in a manner similar to that of *Cubase* and *Logic Audio*.

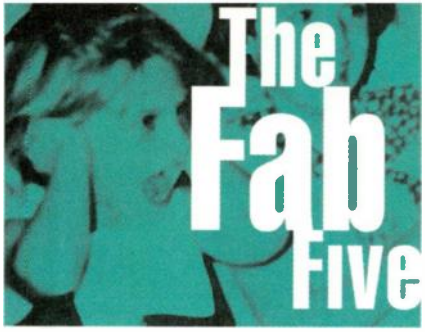
The Fab Five: Audio Processing Tools

	Musicator Audio	Digital Orchestrator Plus	Cakewalk Pro Audio	Cubase	Logic Audio
Normalize	yes	yes	yes	yes	yes
Reverse	no	yes	yes	yes	yes
Fade In/Out	linear	exponential	linear/exponential/ custom	linear/custom inverse exponential/	linear (WL)
Crossfade	linear	no	linear/exponential/ inverse exponential	linear (WL)	linear/exponential/ inverse exponential
Gain Change	yes	yes	yes	yes (WL)	yes
EQ	no	no	graphic/ parametric*	parametric (WL)	parametric*
Delay	no	yes	no	no	no
Compression/Limiting/Expansion/Gate	no	C/L/G	no	C (WL)	no
Trim Silence	n/a	no	yes	yes	yes
Extract Timing from Audio	yes	no	yes	no	yes
Pitch Shift/Time Correction	no	no	no	yes	yes
Varispeed	no	no	yes	yes	yes
Split Stereo/Join Mono Tracks	no/no	yes (imported files)/ yes (exported files)	yes (imported files)/ yes (exported files)	yes/yes	no/no
Invert Phase	no	no	no	yes (WL)	yes
Noise Reduction	no	no	no	no	yes
Sample-Rate Conversion	yes	yes	yes (imported files)	yes (WL)	yes
DC Offset	yes	yes	no	yes (WL)	yes
Audio-to-MIDI Conversion	no	no	yes (percussive pulses only)	no	yes (monophonic, monaural)

WL = Feature of *WaveLab Lite*, which is bundled with *Cubase*.

* = Feature only available with supported hardware.


FREE
CATALOG
Full Compass
FULL COMPASS
800-356-5844
CELEBRATING
OUR
20TH YEAR!
FULL COMPASS
(608) 831-7330•Fax (608) 831-6330
8001 Terrace Ave., Middleton, WI 53562
www.fullcompass.com
circle #535 on reader service card



Just select the clip, click on it, and you're immediately transported to the editing window.

Cakewalk Pro Audio has a variety of MIDI tools that are useful for both corrective and creative editing. There are the standard quantization tools, as well as a Groove Quantize feature that gives tracks a particular stylistic feel.

A more sophisticated MIDI editing tool is the Interpolate dialog box (see **Fig. 7**). Interpolating works in two steps, taking advantage of the program's Event Filter. First, you select the type of MIDI events you want to alter. For example, you may want to select all notes with a Velocity value of 88 or higher that appear on the third beat of any measure. Once you've decided on the MIDI events you want to affect, the next step is to set the desired values. After you do that, click on "OK," and the task is carried out.

Creative MIDI editing tools include Retrograde, which plays events in reverse order, and Length, which is actually two tools in one. Length can shorten or lengthen note durations while maintaining their original time position. Similarly, Length can stretch or shrink playing time (timebase expansion/compression) while maintaining note durations. You can use both tools together to alter both duration and playing time.

One of *Cakewalk Pro Audio*'s most powerful tools is the Cakewalk Application Language, better known as CAL, which allows you to create and run little programs called "CAL routines" from within *Cakewalk Pro Audio*. The program comes with some CAL routines that do tasks such as humanize quantizing, generating random notes, and creating major seventh chords from root notes. In case you haven't the time or inclination to create routines yourself, there are plenty of CAL routines available for downloading at Cakewalk Music Software's Web site.

Working with digital audio data in *Cakewalk Pro Audio* is almost as easy as dealing with MIDI data. In fact, I think it's the easiest program to work with in terms of dealing with digital audio tracks. And when you compare each program's audio-editing feature set, you realize that *Cakewalk Pro Audio*'s toolkit is pretty extensive. For instance, It has more tools than *Cubase* has without the companion *WaveLab Lite* program, and in some ways it even exceeds the *WaveLab Lite* tools.

In case you really want to muck with your audio, *Cakewalk Pro Audio* lets you set up a hot link to a dedicated audio-editing program, such as Artic Software's *Cool Edit 97* and Sonic Foundry's amazing *Sound Forge* 4.0 2-track editor, which supports digital signal processing plug-ins for additional audio mangling. (The upcoming *Cakewalk Pro Audio* 6.0 will raise the ante by supporting Microsoft's ActiveMovie real-time plug-in architecture.)

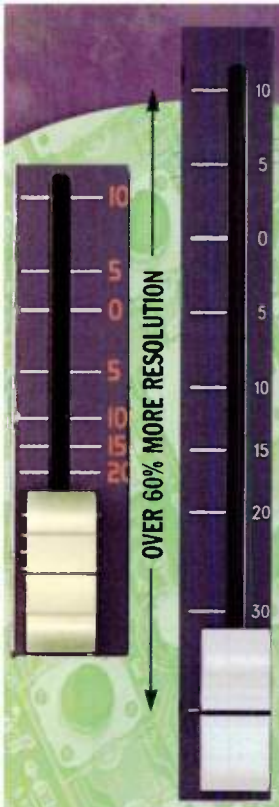
Cakewalk Pro Audio even offers a limited ability to convert audio data into MIDI notes. The tool works best on percussive material, and MIDI note conversion is limited to a preselected MIDI note value regardless of the audio's original pitch. Still, it's useful in

circle #564 on reader service card

FOLIO F1 FADER 100

SPIRIT

High Performance Audio



100mm FADERS

Of all the small mixers on the market, ONLY Folio F1 offers the extra control and creativity of 100mm faders used on large professional consoles.

As you can see, the longer the fader, the smaller the change in level between each movement - making it easier to make fine level changes during complex mixes. With standard 60mm designs even the smallest movements can lead to large leaps in level, especially near the bottom of the fader's travel.

• UltraMic™ preamps

Copied but never equaled, our pudless UltraMicPre Amp design with up to 22dB of headroom and noise-free transparent professional performance is the best MicPre you can buy at even 10 times the price. There's alot of marketing hype about MicPre's out there but simply put, Spirit's UltraMic Pre is as good as anything we've made for 25 years - comparable to Mic Pres in $50,000 consoles. We've had customers call and say "I've never heard a mixer sound so open and clean". Give us a listen... You'll be amazed!

• British EQ

Ask any major engineer why the top recording consoles in the business are British designs and you will soon discover that the SOUND of the EQ is at the top of their list. It's a knack they have for designing warm musical turnover filter points by paying attention to the selection of good sounding quality components - like polyester capacitors in the critical audio path. Spirit is no stranger to these specifications and we refuse to compromise (as others have) simply to reduce our cost.

• Total control

We believe that all of the elements in the signal path of a mixer should allow the engineer the widest range of control—afterall, YOU are the engineer and subtle changes can make or break the quality of a final mix. Unlike other small mixer manufactures that use off-the-shelf components, at Spirit we've paid meticulous attention to the "Law" of the rotary controls so you can use the entire 360 degrees while mixing without the worry of small movements creating large jumps in level or clipping the summing amps. We've also added 100mm faders (not 60mm) allowing 60% more fader resolution - putting YOU back in control.

• Surface Mount Technology

As one of the largest mixing console manufactures, Soundcraft has invested in the most advanced production systems available. Our new leading edge circuit construction using Surface Mount double-sided glass epoxy PCBs means lower manufacturing cost without any downside. The result: much more mixer for your dollar.

APPLICATIONS

Live Sound - Bands, Small Venues and Installations, Conferences, Schools, Places of Worship

Recording - Project Studios
Home Studios
MIDI programming Suites
Video Post Production Suites

Submixing

Location Sound

PROFESSIONAL FEATURES

- 2 versions - 16 AND 18 TOTAL INPUT frame sizes (including Tape Return to Mix)
- 6 OR 8 MONO MIC/LINE CHANNELS with high quality ULTRAMIC™ mic preamps
- 8 OUTPUTS including Aux's
- DIGITAL SOUND QUALITY
- 4 STEREO INPUTS
- 100MM FADERS for extra fine control over mixdown
- INSERTS on every mono channel and mix outputs for signal processors
- Authentic BRITISH 3-BAND EQ with creative SWEPT MID control
- Steep 100Hz 18DB PER OCTAVE HIGH PASS FILTERS to eliminate low frequency rumble
- 3 AUX'S, with up to 2 pre- or post-fader for foldback or effects, plus Aux Master controls
- 48V PHANTOM POWER
- CHANNEL ON switches
- Separate MONO OUTPUT with level control
- Professional IMPEDANCE-BALANCED XLR OUTPUTS
- Rackmount option
- CE Approved for protection against RF emissions
- Ultra reliable spaceage SURFACE MOUNT PCB design

6 Channel $499* USD
8 Channel $599*

SPIRIT
By Soundcraft

H A Harman International Company

Spirit by Soundcraft, Inc., Harman International Industries Ltd.,
11820 Kemper Road • Auburn, California 95603
Tel: (916) 888-0488, Fax: (916) 888-0480

http://www.spirit-by-soundcraft.co.uk

a variety of situations, such as when MIDI drum sounds need to replace or mask audio drum beats.

Scoring and notation editing in *Cakewalk Pro Audio* is basic but functional. The program generates a maximum of 24 staves, and each part can be printed out separately. However, printing out individual parts is not an automated procedure, as in *Musicator Audio*. Realistically, the score-printing feature is most useful when you limit yourself to printing lead sheets or piano/vocal music. After all, there are also no provisions for creating note articulation marks, and dynamic marking tools are minimal. However, it's easy to enter lyrics into the music, and *Cakewalk Pro Audio* is the only program in the group that lets the user create and insert guitar-chord diagrams.

In summary, *Cakewalk Pro Audio* is a solid, though perhaps stolid performer. What it lacks in raw power it makes up for in ease of use and consistency. Longtime *Cakewalk* users will feel right at home in this program, and new users will be attracted to the *Cakewalk* name and reputation and the fact that it isn't hardware copy-protected, as *Cubase* and *Logic Audio* are.

THE GLIMMER TWINS

Allow me to deviate from the pattern of discussing each program separately so that I can talk about *Cubase* and *Logic Audio* together. These two programs have so much in common that what can be said about one can often be said about the other.

This is not to say that the two programs are indistinguishable from each other. On the contrary, *Cubase* and *Logic Audio* are more like fraternal twins whose differences complement their obvious similarities. They are so well matched that if you were to ask me which program was better, my answer would vary depending on the features I preferred to use on any given day.

A quick look at each program's main screen shows how much the two programs look and act alike. For instance, all tracks are "tape strips" that you can move around and copy, and you can nondestructively adjust their start and end times. In *Cubase* you can make Ghost Parts, which are virtual parts that derive their data from preexisting parts. The same type of part is called an Alias in *Logic Audio*. Both programs have built-in rhythm editors. *Cubase* uses a Drum Edit window (see **Fig. 8**), and *Logic Audio* allows you to create a rhythm editor in its Hyper Edit window (see **Fig. 9**). Both programs can also vertically combine multiple tracks into a single entity to manipulate entire sections of songs. *Logic Audio* calls these types of tracks Folders; *Cubase* calls them Group Tracks.

Unfortunately, the two German programs have similar dark sides. Both use hardware dongles for copy protection,

EM Covers Digital Audio Sequencers

Currently there are five major digital audio sequencers for Windows. All have been reviewed in EM, as have several older, nonaudio versions. In addition, EM has published Master Class articles about *Logic Audio* and *Cubase*, two face-offs of nonaudio sequencers for Windows, and a face-off of Macintosh digital audio sequencers that includes *Logic Audio* and *Cubase*.

Logic Audio and *Cubase* existed first on the Atari and Macintosh (actually, *Logic*'s Atari ancestor was called *Notator*), so some reviews and features were about those versions. Fortunately, *Logic Audio* is virtually identical on Mac and Windows, and *Cubase* has almost the same features on both platforms (except for the new, Mac-only VST DSP technology).

Cakewalk Music Software (formerly Twelve Tone Systems)	
Cakewalk Pro 3.0 (DOS)	December 1990
Cakewalk Pro for Windows 2.0 (Win)	March 1994
Cakewalk Home Studio 1.0 (Win)	August 1994
Cakewalk Pro 3.0 (Win)	May 1995
Cakewalk Pro Audio 4.01 (Win)	April 1996
Emagic	
Notator Logic Audio 1.0 (Mac)	March 1994
Logic Audio 2.0 (Mac; sidebar on v. 2.5)	May 1995
Master Class: "Advanced Logic" (Mac)	June 1996
Musicator A/S	
Musicator 1.0 (DOS)	March 1990
Musicator GS 1.0 (Win)	July 1993
Musicator Audio 1.0 (Win)	August 1996
Steinberg	
Cubase (Atari)	January 1990
Cubase 2.0 (Atari)	March 1991
Cubase 1.01 (Mac)	December 1992
Cubase Score 1.0 (Mac)	July 1993
Cubase Score 2.0 (Mac)	January 1995
Cubasis Audio 1.0 (Win)	March 1996
Master Class: "Cubist Art" (Win)	August 1996
Voyetra	
Digital Orchestrator Plus 2.11 (Win)	December 1996
Related "face-off" features:	
"Windows Shootout" (Windows sequencer face-off)	November 1992
"All for One" (Mac digital audio sequencer face-off)	April 1994
"Musical Windows" (Windows sequencer face-off)	September 1995

L E G E N D S · I N · R O C K

Shure SM58. The world's best selling microphone and the overwhelming choice of history's most famous rock groups.

For more information and a free poster of this ad,

Call 1-800-25-SHURE. The Sound of Professionals... Worldwide.

SHURE

circle #575 on reader service card

a notoriously troublesome feature that many people prefer to avoid. Moreover, *Cubase* and *Logic Audio* are maddeningly complex. Their learning curves can be most accurately described as perpendicular, and you should expect some major down time before you become proficient with either program. However, their complexity really does equal power and flexibility, and once you know your way around either program, you'll deeply appreciate their work environments.

Despite their similarities, *Cubase* and *Logic Audio* have some major differences. Sometimes these are just feature preferences that perform functions in different ways but often lead to the same result. For example, one person may prefer *Cubase*'s traditional approach of viewing and editing data within different types of editing windows (Score, Piano Roll, Drum, Event List, etc.); another person may prefer to manipulate data in *Logic Audio*'s Hyper Edit or Hyper Draw windows.

Both programs have features the other three contenders can't match. Few power users would want to do without any of these features, and that makes it difficult to ultimately decide which program to buy.

For example, *Cubase* and *Logic Audio* have a dazzling array of MIDI manipulation and creative tools, such as several forms of quantization, and they offer extensive logical editing capabilities. In addition, *Cubase* features the Interactive Phrase Synthesizer, a sort of on-the-fly algorithmic music editor; a MIDI Processor that operates on MIDI data in ways that functionally mimic audio effects processors; and Style Tracks, an auto-accompaniment player and editor similar to PG Music's *Band-in-a-Box*.

Logic Audio has fewer specific tools for MIDI editing than *Cubase* has. It actually gives you every bit as much MIDI editing power, and all of it is nondestructive and in real time; you just have to know where to find this power. On the obvious side, the program has a Vector control function that lets the user edit two parameters together (often pan and volume) on a 4-pole (*x-y*) axis (see **Fig. 10**). Moreover, its Hyper Draw and Hyper Edit windows are fantastic for easily manipulating multiple groups of MIDI data. To get at the deeper features, though, you will need to delve into the Environment window and other mysteries.

When it comes to audio editing, *Logic Audio* is more powerful than *Cubase*. For one thing, it can read a monophonic, monaural audio file and convert it into MIDI information. This feature is so powerful that it could be a deciding factor for some people who are in the market for a digital audio sequencer. With this capability, you can do things like notate a vocal track without having to re-record the melody using MIDI, easily double up or harmonize an audio track with a matching MIDI track, or record a bass line using a guitar, convert it to MIDI data, transpose it down an octave, and play it back with a selected bass synth patch. Though it's not entirely accurate in every situation, it is definitely effective with certain types of audio.

Perhaps more important, Emagic's program also has an integrated stereo sample editor, so you don't need to use a separate application such as Steinberg's *WaveLab* or Sonic Foundry's *Sound Forge*. This includes Emagic's Digital Factory DSP editing tools, which provide such features as time expansion/compression, pitch shifting, audio quantizing, and audio-to-MIDI groove templates. (Formant-based pitch shifting will be added in *Logic Audio* 2.6, which should be available by the time you read this.)

Although its audio-editing features are less powerful than those in *Logic Audio*, *Cubase* lets you set up a hot link to your favorite audio editor, which need not be *WaveLab Lite*. This works much like the similar feature in *Cakewalk Pro Audio*, and it provides considerable flexibility.

Logic Audio clearly has the steepest learning curve of any digital audio sequencer. But once you learn your way around, you'll be able to work faster in *Logic Audio* than in any of the other programs. One reason for this learning curve is *Logic Audio*'s Environment

circle #567 on reader service card

true 4-bus design • AFL/PFL • swept mid eq • 16 mic preamps

MORE BUSES, MORE PREAMPS, MORE EQ, MORE FEATURES. INTRODUCING THE NEW CR1604-VLZ.

Five years of user input, new materials, new technologies and the soul of our 8•Bus...we packed a lot in for just $1199*

The original CR-1604 defined the modern compact mixer. Now we've "raised the standard" by adding over 20 new features like true 4-bus design, our famous mic preamps on every channel, flexible routing and monitoring, and swept mid EQ — for just $100* more than the original CR-1604. Call for a free 40-page brochure.

16 STUDIO-GRADE MIC PREAMPS *means the new CR1604-VLZ actually costs $100 less than our classic CR-1604 & XLR10 extender combination!*

VLZ (Very Low Impedance) CIRCUITRY *developed for our 8•Bus consoles, further reduces noise and crosstalk in critical signal path areas.*

SOLID STEEL *main chassis.*

SEALED *rotary controls.*

TRIM *control on the channel strip! 60dB total mic gain; –10dB "virtual pad" for line inputs.*

6 AUX SENDS *per ch. Aux 1 & 2 switch-able pre/post. Post-fader Aux 3-4 /5-6 selectable via Snift switch.*

HI EQ. *±15dB shelving at 12kHz.*

SWEEPABLE MIDRANGE. *Wide, musical peaking EQ with 100Hz to 8kHz range. ±15dB range.*

LO EQ. *±15dB shelving at 80Hz.*

LOW CUT FILTER *is a must for live sound and acoustic (microphone) recording. Sharp, 18dB/octave @ 75Hz high-pass filter lets you add Lo shelving EQ to vocals without boosting undesirable mic thumps, stage rumble, wind noise, P-pops, etc.*

PAN *control with constant loudness to maintain stereo perspective.*

MUTE *switch.*

MUTE & OVERLOAD *LED.*

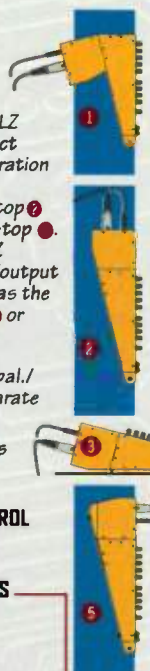
–20dB SIGNAL PRESENT & SOLO *LED.*

SOLO. *In-place AFL or PFL.*

BUS ASSIGN *for Subs 1-2, 3-4 & Main L/R.*

60MM FADERS *with 8•Bus log taper, special lip seal & long-life wiper material.*

5-WAY PHYSICAL CONFIGURATION *via our famous rotating input/output "pod." In minutes you can switch the CR1604-VLZ between ultra-compact 8-rack space configuration with pod to back ❶, rackmount jacks-to-top ❷ or tabletop/jacks-to-top ❸. Optional RotoPod-VLZ bracket places input/output jacks on same plane as the controls (tabletop ❹ or rackmount ❺).*



MONO OUTPUT *(bal./unbal.) has separate level control.*

RCA TAPE *inputs and outputs- (unbalanced).*

Separate **CONTROL ROOM OUTPUT** *(bal./unbal.).*

DIRECT OUTPUTS *(bal./unbal.) channels 1-8.*

SUBMASTER OUTPUTS *(bal./unbal.).*

AUX SEND 1 & 2 MASTERS.

Stereo **AUX RETURNS 1 & 2** *with 20dB gain above Unity for boosting weak effects.*

EFFECTS TO MONITORS *controls fold Aux Return 1 & 2 back into Aux Sends 1 & 2 so that on-stage performers can hear effects.*

AUX SEND 1 & 2 SOLO *switches with LEDs.*

Stereo **AUX RETURNS 3 & 4.**

Aux Return 3 **ASSIGN SWITCHES** *to Main Mix, Subs 1 & 2 or Subs 3 & 4.*

Aux Return 4 **ASSIGN** *to Control Rm/Phones.*

CONTROL ROOM/PHONES *level control.*

TAPE INPUT LEVEL *control and* **TAPE TO MAIN MIX** *switch.*

SWITCHING MATRIX. *This fantastic creative feature lets you route any combination of Tape, Subs 1 & 2, Subs 3 & 4 or Main Mix to Control Room/Phones bus. Lets you create custom headphone or broadcast mixes, monitor 2-track output or route a cue/click track to phones, create a second stereo main output with its own level control & more (covered in the extensive manual).*

Global **SOLO** *level control.*

Global **AFL/PFL SOLO** *switch.*

SUB ASSIGN *to Left or Right Main Mix.*

*Suggested U.S. retail; higher in Canada.

MAIN MIX FADER.

BNC *lamp socket.*

Global **AUX RETURN SOLO** *with LED.*

LED **METERS** *with –30 to +28 range &* **LEVEL SET** *LED.*

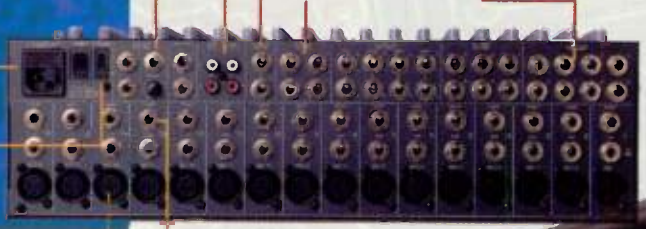
RUDE SOLO *LED.*

HEADPHONE *output.*

60mm **SUB-MASTER** *log-taper faders.*

BUILT-IN *power supply.*

PHANTOM POWER *switch.*



Studio-quality **DISCRETE MIC PREAMP** *on every channel.*

Pre-fader **INSERT** *on every ch.*

©1996 MACKIE DESIGNS INC.
ALL RIGHTS RESERVED

MACKIE™

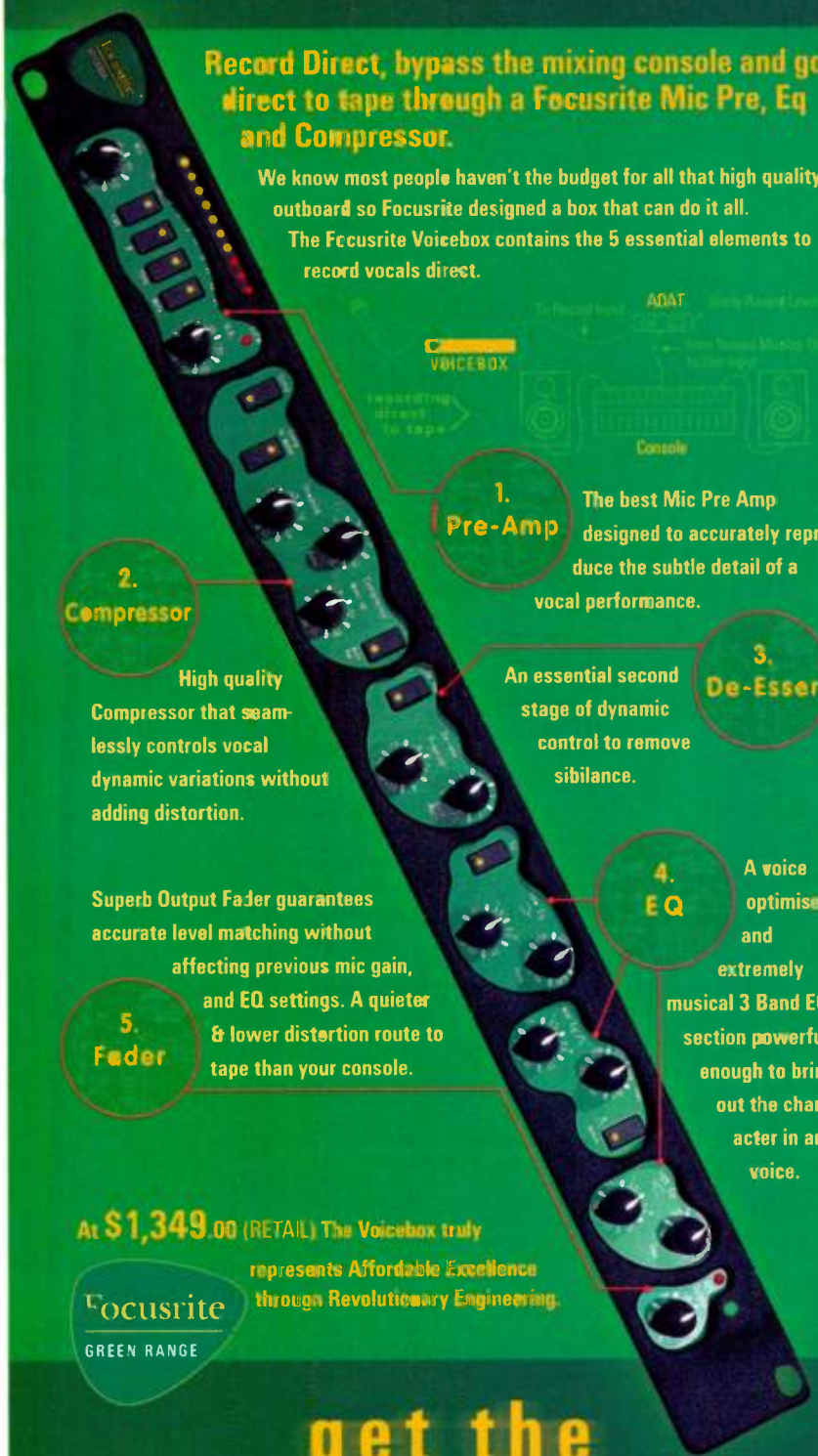
16220 Wood-Red Road NE• Woodinville • WA • 98072 800/898-3211 206/487-4337 • e-mail sales@mackie.com
Represented in Canada by S.F. Marketing 800/363-8855 • Outside the USA 206/487-4333 206/485-1152

circle #550 on reader service card

want great vocals?

Record Direct, bypass the mixing console and go direct to tape through a Focusrite Mic Pre, Eq and Compressor.

We know most people haven't the budget for all that high quality outboard so Focusrite designed a box that can do it all.
The Focusrite Voicebox contains the 5 essential elements to record vocals direct.



1. Pre-Amp The best Mic Pre Amp designed to accurately reproduce the subtle detail of a vocal performance.

2. Compressor High quality Compressor that seamlessly controls vocal dynamic variations without adding distortion.

3. De-Esser An essential second stage of dynamic control to remove sibilance.

4. EQ A voice optimised and extremely musical 3 Band EQ section powerful enough to bring out the character in any voice.

5. Fader Superb Output Fader guarantees accurate level matching without affecting previous mic gain, and EQ settings. A quieter & lower distortion route to tape than your console.

At $1,349.00 (RETAIL) The Voicebox truly represents Affordable Excellence through Revolutionary Engineering.

Focusrite
GREEN RANGE

get the VOICEBOX

Brochure & further Information:
Focusrite USA: Group One Ltd. (East) Tel: 516 249 1399 (West) Tel: 310 656 2521
Email: mania68@ibm.net Focusrite Home Page: http://www.focusrite.com

circle #534 on reader service card

window, where all MIDI and audio data is routed. The Environment also contains a number of MIDI processing tools and allows you to create customized Multi-Instruments, which are multitimbral "virtual" instruments that comprise sounds from any combination of connected MIDI devices. Although very cool, the Environment window is decidedly unintuitive and takes getting used to.

Even more critical to the *Logic* user interface is the unique Screensets feature, which lets you configure the program's windows any way you choose and save multiple configurations (Screensets). For each window you can set a custom size, zoom level, view filter, and so on. Each Screenset is mapped to a user-definable key command so you can switch between them instantly.

Logic Audio windows also can be linked so that changes made in one are

FAB FIVE SOFTWARE DEVELOPERS

Cakewalk Music Software
tel. (800) 234-1171 or (617) 926 2480
fax (617) 924-6657
e-mail sales@cakewalk.com
Web www.cakewalk.com

Emagic USA
tel. (916) 477-1051; fax (916) 477-1052
e-mail emagic@emagicusa.com
Web www.emagic.de

Musicator A/S
tel. (800) 551-4050 or (916) 759-9424
fax (916) 759-8852
e-mail musicator@musicator.com
Web www.musicator.com

Steinberg North America
tel. (818) 993-4091; fax (818) 701-7452
e-mail steinberg@aol.com
Web www.steinberg-us.com

Voyetra Technologies Inc.
tel. (800) 233-9377 or (914) 966-060
fax (914) 966-1102
e-mail info@voyetra.com
Web www.voyetra.com

Making Waves Just Got Easier

Waves Introduces a Tsunami of Processing Power — In Three New Cost-Effective Bundles

Complete audio processing solutions for Pro Tools TDM, Sound Designer II, Studio Vision Pro, Cubase VST, Peak, Sound Forge, Deck II, Sound Edit 16, Premiere, WaveLab and CakeWalk.

NPP — NATIVE POWER PACK

Professional-Quality Processing on Your Mac or PC Without Additional DSP Hardware!

Waves Native Power Pack has all the professional audio processing you need for multimedia and Internet authoring, sound design, or music production — without expensive DSP cards. From EQ to Reverb, its complete system of software processors plug into your favorite audio programs using only the CPU of your PC or Macintosh. Enhance your professionalism and unleash your creative power with the new Waves Native Power Pack.

A $4000 value
— NPP Bundle Price: $600

MULTIRACK REAL-TIME BUNDLE — MR

Replace Racks of Noisy Hardware With a Waves Comprehensive Software Solution

Waves MultiRack bundle lets you convert any audio DSP card equipped Mac into a multichannel effects processor — for a fraction of the cost of a dedicated unit. Even if you only own a single DSP card, such as Audiomedia II, Waves MultiRack will let you run effects in the background while you run your DAW or sequencer program. Unlike rackmount effects, Waves MultiRack Mac interface makes previewing, editing, and saving effects a snap. Get the most from your Sound Designer II and DSP cards — turn your computer into a high-quality rack processor.

A $4500 value
— MultiRack Bundle Price: $600

TDM — TDM BUNDLE

The Essential Tool Set for TDM Owners Now Includes Five New Processors

Thousands of Pro Tools owners know that sonic excellence, and fast, intuitive user interfaces, are just two reasons why Waves TDM Plug-Ins crest above all others. Plus, only Waves lets you do more with less hardware, with proprietary WaveShell™ implementation that lets you run multiple Waves Plug-Ins on a single DSP Farm chip! With more than $1500 worth of new products included for the same price as the original bundle, the new Waves TDM bundle is more essential than ever. When there's no compromising your performance, these are the Waves to catch.

Over three times the cost if purchased individually
— TDM Bundle Price: $2300

Waves MultiRack & TDM bundles also include:
PAZ PsychoAcoustic Analyzer, Full C1 Compressor/Gate, and MultiRack Utility.

All new Waves bundles include:
L1 Ultramaximizer Mastering Limiter, Q10 Paragraphic EQ, C1 Compressor, C1 Gate, S1 Stereo Imager, TrueVerb Virtual-Space Reverb,** WaveConvert (a stand-alone, high-fidelity application that converts formats, bit depths and sample rates while simultaneously maximizing levels), TrackPack Lite (a loss-less SDII audio file compression program).

©1997Waves Inc. Waves, NPP-Native Power Pack, MR MultiRack, MultiRack Utility, TrueVerb Virtual-Space Reverb, Q10 Paragraphic EQ, S1 Stereo Imager, PAZ Psychoacoustic Analyzer, TrackPack Lite, L1 Ultramaximizer Mastering Limiter, and WaveConvert are trademarks of Waves. All other trademarks are the property of their respective owners. *If purchased individually. **Currently, all non-TDM versions of TrueVerb run in Native mode only, with or without a DSP card.

WAVES

Our new bundles make it easier and more affordable than ever to put the power of Waves to work on your next project. Call us for the complete story (including upgrade options), or visit www.waves.com today.

us Waves • 6716 Central Ave. Pike, suite 8, Knoxville, TN 37912 USA
tel: 1.423.689.5395 • fax: 1.423.688.4260 • e-mail: waves@waves.com
uk Waves • Europe/Middle East • tel: 44.1637.877170 • fax: 44.1637.850495
Waves Headquarters • Tel-Aviv, Israel • tel: 972.3.5107667 • fax: 972.3.5105881
e-mail: support@kswaves.com

then reflected in all linked windows. Combined with the Screensets, that means you can instantly switch between multiple custom views of your data, and when you make a change, it is reflected in all linked windows—and only those windows. All this translates into seriously speedy editing, and it's a major reason that many Mac-based professionals flocked to *Logic Audio*. Now we on the Windows platform can enjoy these features, too.

By the way, *Musicator Audio* also has configurable screens, although you don't get selectable window linking. (All windows are always linked.) It's a handy feature that every program should offer.

For those who have narrowed down their choice between *Cubase* and *Logic Audio*, the final decision may become one of economics. For instance, *Logic Audio* has extremely powerful scoring capabilities whereas *Cubase*'s notation features are little better than *Cakewalk Pro Audio*'s. If you need powerful scoring features but prefer the *Cubase* sequencing environment, you can buy *Cubase Score* and save $50 over the price of *Logic Audio*.

Buying *Logic Audio* or *Cakewalk Pro Audio* makes economic sense for owners of Audiomedia III cards because these programs directly support that card. To get the same support in a *Cubase* environment, you need to purchase *Cubase XT*. That costs an additional $200.

Clearly, *Cubase* and *Logic Audio* are the top two programs to consider if you need the ultimate in power digital sequencing for Windows. If you don't need all that power, though, you might be better off with one of the other three programs I've discussed. Of the two power-user programs, which is better for you? I don't envy anyone struggling with that choice.

THE NEXT GENERATION

Windows users finally have a variety of good digital audio sequencing programs to work with, and it's about time. Integrating MIDI with digital audio is a major step forward, and we can look ahead to further improvements this year thanks to the advent of new DSP plug-in architectures and the introduction of improved, multichannel audio cards with digital I/O.

The five programs examined here are, for now, the best digital audio sequencers available on the Windows platform. Will any of these programs be on the leader list next year? I think most of them will be there, and possibly all of them, but they are sure to face serious challenges. The Windows music market is exploding, and you never know who will come up with the next hot product. If you compare the current crop with the programs covered in **EM**'s previous Windows sequencer face-off (in the September 1995 issue), you'll see just how fast the players change in this game. That vitality offers wonderful prospects for Windows-based electronic musicians.

Zack Price *owns and operates Tin Ear Productions, a digital audio editing service located in the Chicago area.*

SHOPPING FOR ALESIS PRODUCTS?
MAKE THE RIGHT CALL

Alesis products have always delivered maximum performance and innovation at a price just about every musician can afford. It's just one reason why we here at Sweetwater have always been high on Alesis products and why we're probably one of the the largest Alesis dealers in the world. But we don't just *sell* these great products, we *know* them, inside and out. Our sales engineers have hands-on experience using all of the many Alesis innovations, from the award-winning **QuadraSynth Plus Piano** and new **QS6 64-Voice Expandable Synthesizer** to the landmark, second-generation **ADAT XT**, affordable **MicroVerb 4** and the critically-acclaimed **Monitor Two** speakers. Whatever your needs may be in the studio (or on stage), chances are Alesis has the perfect product to do the job.

Close to 100,000 musicians around the world already choose Sweetwater Sound for all their hardware and software needs! Shouldn't you be one of them? Give us a try! We're willing to bet you'll be a Sweetwater customer for life.

Sweetwater offers products from over 100 of the best names in the business plus personalized service from our superbly qualified sales engineers and the finest technical support in the entire industry!

219•432•8176
FAX: 219•432•1758
5335 BASS ROAD
FT. WAYNE, IN 46808
sales@sweetwater.com
http://www.sweetwater.com

THE ULTIMATE MUSIC RETAILER!

Sweetwater SOUND INC.

CALL NOW! YOU MAY BE PRE-APPROVED FOR A $10,000 LINE OF CREDIT ACCOUNT!

circle #585 on reader service card

Make money in electronic music technology!

NRI's breakthrough training gives you everything you need to build your own computer-controlled music studio, then start a new career or business of your own!

SEND FOR FREE CATALOG!

☑ **Check one FREE career catalog only.**
High school diploma or GED recommended for all courses, required for degree programs.

- ☐ **Microcomputer Servicing**
- ☐ Industrial Electronics & Robotics
- ☐ TV/Video/Audio Servicing
- ☐ Basic Electronics
- ☐ Networking with Windows NT
- ☐ Computer-Aided Drafting
- ☐ Electronic Music Technology
- ☐ Computer Programming
- ☐ Telecommunications
- ☐ Multimedia Programming
- ☐ Desktop Publishing with PageMaker
- ☐ PC Applications Specialist
- ☐ Computer-Based Bookkeeping
- ☐ Visual Programming in C**
- ☐ Mastering Microsoft Office
- ☐ Webmaster
- ☐ Air Conditioning/Refrigeration/Heating
- ☐ Electrician
- ☐ Building Construction
- ☐ Home Inspection
- ☐ Auto Servicing
- ☐ Paralegal
- ☐ Writing

OR GET YOUR DEGREE!
- ☐ **New! AAS Degree in Accounting**
- ☐ **New! AAS Degree in Business Management**

Name _____ *(Please Print)* Age _____

Street _____ *(No P.O. Box numbers please)*

City _____ State _____ Zip _____

A Division of The McGraw-Hill Companies

Accredited Member, Distance Education and Training Council 0370-0397

For career courses approved under G.I. Bill, ☐ check for details

CARD E

Gain expertise and confidence, step by easy step

Study at your own pace, with the committed support of NRI's uctors just er, phone or e-mail age away. begin with led lessons move from ronics umentals music ion to sound genera- routines, digital logic, processors, and sampling ecording techniques. Then on to get first-hand experi- with MIDI, waveshaping, ing, sequencing, mixing, al effects, and much more.

out more— today!

ll-color catalog has all the nd for yours today! If the ssing, write to: NRI Schools, ticut Avenue, NW, DC 20008. Or . . .

1-800-321-4634, Ext. 2337

Netscape Navigator™ Web browser

- 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 Blaster-compatible sound card with built-in MIDI interface
- 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

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!

SEND TODAY FOR FREE NRI CATALOG!

NRI Schools
4401 Connecticut Avenue, NW
Washington, DC 20008

☑ **Check One FREE Catalog Only**

- ☐ **Electronic Music Technology**
- ☐ Microcomputer Servicing
- ☐ TV/Video/Audio Servicing
- ☐ Basic Electronics
- ☐ Multimedia Programming
- ☐ Computer Programming
- ☐ Desktop Publishing with PageMaker
- ☐ Fiction/Nonfiction Writing
- ☐ PC Applications Specialist
- ☐ Networking with Windows NT

OR GET YOUR DEGREE!
- ☐ NEW! Associate Degree in Accounting
- ☐ NEW! Associate Degree in Business Management

Name _____ Age _____

Address _____

City _____ State _____ Zip _____

A Division of The McGraw-Hill Companies

Accredited Member, Distance Education and Training Council 0370-0397

WRH

By Greg Pedersen

BARN

Jethro Tull's Martin Barre Makes Music in His Barn.

Being the lead guitarist for a famous rock group that's still enjoying commercial success after nearly thirty years might seem reason enough to rest on one's laurels. But for Martin Barre of Jethro Tull, the music has always been *la raison d'être*—and why should success interfere with that? Rather than squander his good fortune, Barre has opted to invest his time and money in mastering music production. The fruits of that commitment can be heard on *The Meeting*, Barre's first solo album and his debut as a producer.

Barre's career got underway in an era when musicians typically lacked the technical savvy necessary to challenge the designated savants behind the mixing console. "In the '70s, the recording studio was a great mystery to me, so initially I left everything to the producer and engineer," says Barre. "After all, those double panes of glass between the control room and the studio not only kept out noise from the band, they also kept out musicians like myself who wanted to know exactly what the engineer and producer were doing and how they were doing it!"

Of course, Barre couldn't help but pick up bits and pieces of information during countless Tull recording sessions, and in time he learned a fair amount about recording. But it wasn't until he installed a home studio in an upstairs bedroom that he began putting his newfound skills to the test. Doing things from the

Make money in electronic music technology!

NRI's breakthrough training gives you everything you need to build your own computer-controlled music studio, then start a new career or business of your own!

Hands-on course includes a Pentium 100 computer — the most powerful computer in home study today — plus a Kawai X50-D professional-level synthesizer, Cakewalk MIDI sequencing software, Sound Blaster-compatible sound card, Netscape Navigator™ Web browser, and more!

Prepare for an exciting, multifaceted career

In the booming music industry, NRI training opens up unlimited opportunities. 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.

Includes Pentium 100 computer, Kawai X50-D synthesizer

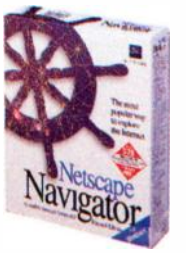
Build your own electronic music center with all this real-world equipment:

- Powerful Pentium 100 computer featuring 8 meg RAM, 1 gigabyte hard drive, Super VGA color monitor, 28,800 baud fax/modem with 10 free hours of *America Online*, and Netscape Navigator™ Web browser
- 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 Blaster-compatible sound card with built-in MIDI interface
- 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.*

Gain expertise and confidence, step by easy step

Study at your own pace, with the committed support of NRI's instructors just a letter, phone call, or e-mail message 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 more— send today!

NRI's free, full-color catalog has all the details — send for yours today! If the coupon is missing, write to: NRI Schools, 4401 Connecticut Avenue, NW, Washington, DC 20008. Or . . .

CALL 1-800-321-4634, Ext. 2337

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

SEND TODAY FOR FREE NRI CATALOG!

NRI Schools
4401 Connecticut Avenue, NW
Washington, DC 20008

☑ **Check One FREE Catalog Only**

☐ **Electronic Music Technology**
☐ Microcomputer Servicing
☐ TV/Video/Audio Servicing
☐ Basic Electronics
☐ Multimedia Programming
☐ Computer Programming
☐ Desktop Publishing with PageMaker
☐ Fiction/Nonfiction Writing
☐ PC Applications Specialist
☐ Networking with Windows NT

OR GET YOUR DEGREE!
☐ NEW! Associate Degree in Accounting
☐ NEW! Associate Degree in Business Management

Name _____ Age _____

Address _____

City _____ State _____ Zip _____

A Division of The McGraw-Hill Companies

Accredited Member, Distance Education and Training Council 0370-0397

BY GREG PEDERSEN

BARN

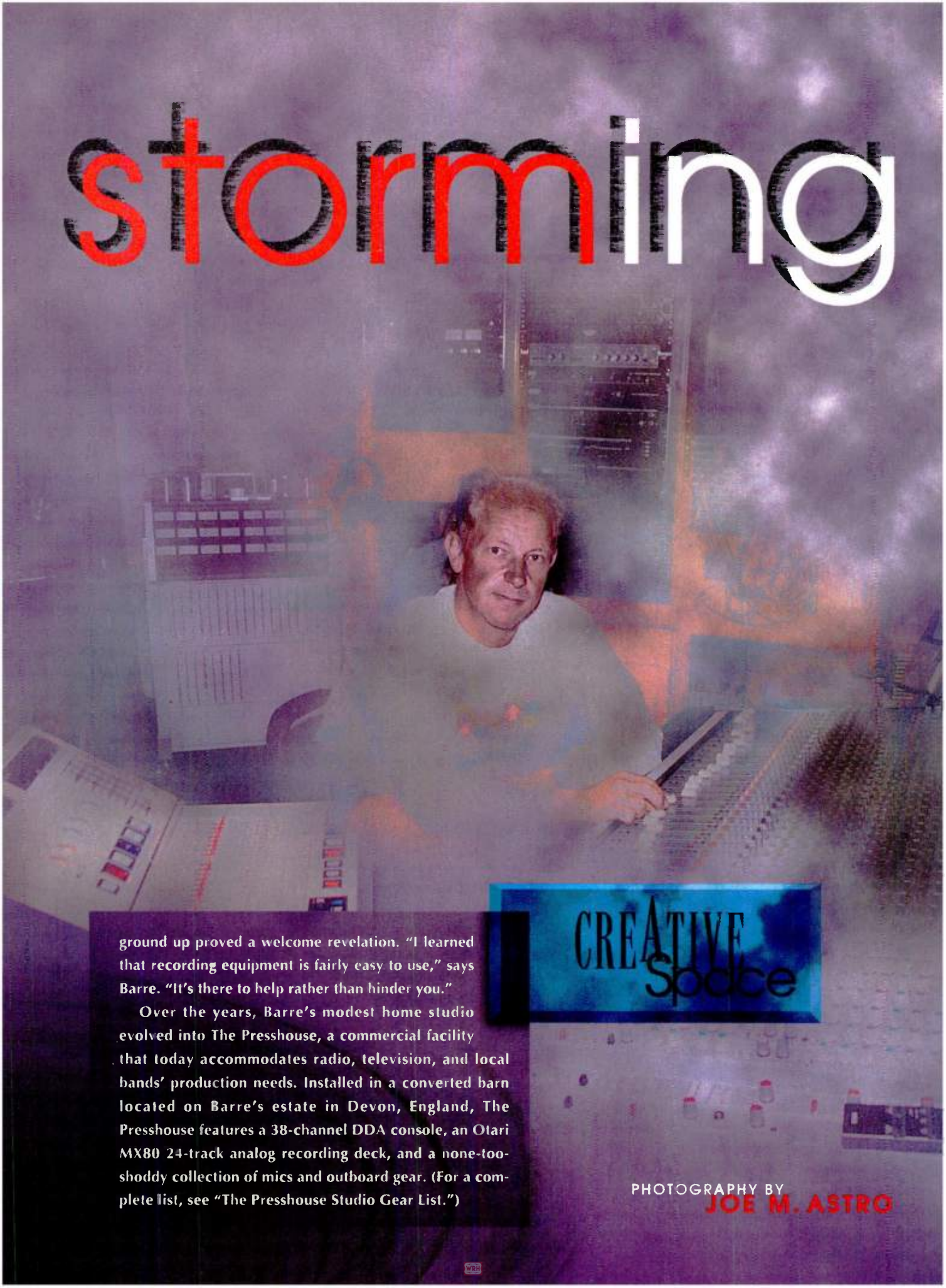
JETHRO TULL'S MARTIN BARRE MAKES MUSIC IN HIS BARN.

Being the lead guitarist for a famous rock group that's still enjoying commercial success after nearly thirty years might seem reason enough to rest on one's laurels. But for Martin Barre of Jethro Tull, the music has always been *la raison d'être*—and why should success interfere with that? Rather than squander his good fortune, Barre has opted to invest his time and money in mastering music production. The fruits of that commitment can be heard on *The Meeting*, Barre's first solo album and his debut as a producer.

Barre's career got underway in an era when musicians typically lacked the technical savvy necessary to challenge the designated savants behind the mixing console. "In the '70s, the recording studio was a great mystery to me, so initially I left everything to the producer and engineer," says Barre. "After all, those double panes of glass between the control room and the studio not only kept out noise from the band, they also kept out musicians like myself who wanted to know exactly what the engineer and producer were doing and how they were doing it!"

Of course, Barre couldn't help but pick up bits and pieces of information during countless Tull recording sessions, and in time he learned a fair amount about recording. But it wasn't until he installed a home studio in an upstairs bedroom that he began putting his newfound skills to the test. Doing things from the

storming



ground up proved a welcome revelation. "I learned that recording equipment is fairly easy to use," says Barre. "It's there to help rather than hinder you."

Over the years, Barre's modest home studio evolved into The Presshouse, a commercial facility that today accommodates radio, television, and local bands' production needs. Installed in a converted barn located on Barre's estate in Devon, England, The Presshouse features a 38-channel DDA console, an Otari MX80 24-track analog recording deck, and a none-too-shoddy collection of mics and outboard gear. (For a complete list, see "The Presshouse Studio Gear List.")

CREATIVE Space

PHOTOGRAPHY BY JOE M. ASTRO

Despite its growth from bedroom operation to full-blown studio, The Presshouse has remained Barre's personal playroom as well as a commercial venture, and it was there that he recorded *The Meeting*. Made up of eleven original songs—five instrumentals and six with lyrics—the album showcases Barre's songwriting and arranging skills as well as his inimitable (though much mimicked) guitar work.

TRACK HAPPY

Most of *The Meeting*'s rhythm tracks were recorded live in The Presshouse's main room, a moderately sized space that measures 13 by 30 feet and has a 15-foot ceiling. Thanks to its construction and unusual shape, the room has naturally great acoustics. "I was very lucky because the barn is made of stone and has rounded walls. The curved surfaces and the irregularity of the walls help break up and diffuse the sound waves nicely," explains Barre. "You don't get the standing waves, flutter echoes, and other problems typically found in newer buildings that have square rooms, plaster walls, and glass surfaces."

Jethro Tull fans will be happy to hear that on several of the album's cuts, Barre flaunts his signature guitar sound from Tull classics like "Minstrel in the Gallery" and "Aqualung": majestic, chunky rhythm guitars; fat, soaring leads; and lush acoustics. The electric-guitar sounds are massive, but surprisingly, Barre usually achieves them without resorting to a huge rig. In addition, he typically eschews layering multiple guitar tracks. "If you've got five tracks of guitars," he explains, "the continuity is lost, and it sounds like overdub city."

One of Barre's favorite amps is an old 15-watt Marshall Studio which he removed from its combo case and rack mounted. "That one Marshall 15-watt amp," he admits, "did three Tull albums: *Crest of a Knave, Under Wraps,* and *Rock Island*. Actually, I *had* to use a small rig because we recorded in Ian Anderson's studio, and he didn't have a live room. So all the tracks were done in the control room."

Barre generally uses Schecter guitars for a clean sound and Tom Anderson guitars for nastier tones, plugged into either Soldano or Marshall amps. As for Marshall amps, he prefers those that don't have a master-volume control. "The master-volume models are just pure distortion—too much!" says Barre. "Also, I don't use the tone controls on my old Marshalls because usually they just add hiss."

To achieve his classic rhythm-guitar crunch at low volumes, Barre relies on two additional pieces of gear, a Scholz Power Soak and a Boss compressor/limiter stomp box. "I don't play loud at all, so the Power Soak is a good resource when you want chunky, overdriven chords on the backing tracks," explains Barre. "For example, I set my Soldano amp to 4½ and the master volume on 7, and then put the Power Soak straight in between the amp and the speaker. Even cranked all the way up, the unit is whisper quiet."

Barre is equally fond of his Boss compressor/limiter. "It's a great way to get more sustain without having to overdrive the amp. You get more of the guitar's own tonality without all those nasty overtones from the amp. My Boss compressor/limiter pedal is on all of the time. It's a cheap, nasty unit, but it sounds great!"

MIC MAGIC

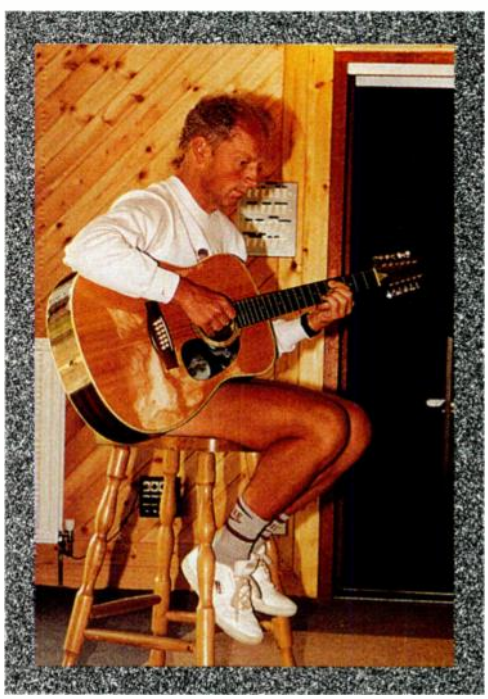
A key component of Barre's home-brewed guitar magic is careful—and inventive—placement of microphones. "I utilize both close and distant miking," says Barre. "Usually I close-mike with Shure SM57s or 58s because they suit the guitar frequencies so well. I start with one mic positioned halfway between the center of the cone and the edge of the speaker and have the engineer move the mic around while I'm playing until I hear the right sound. I usually position a second close mic about six feet away, pointing in whatever direction sounds best. Finally, I'll place a mic at the back of the studio facing against the wall or a glass surface. The far mic gives a close reflection and some natural reverb which can later be added to the mix in varying degrees. If you're recording guitars in a big room, why not use the room for a natural reverb?"

"The Outer Circle," one of *The Meeting*'s superb offerings, displays the kind of memorable guitar heroics fans have come to expect from Barre and offers a prime example of his knack for blending several guitar sounds without losing each instrument's unique tonal qualities. "For the gritty, tough-sounding guitar parts, I used an Anderson guitar with humbucker pickups played through a Soldano 50-watt head and a Marshall 2 × 12 cabinet," says Barre. "I also used a walnut Schecter guitar plugged into an early '70s Marshall 50-watt head and the same Marshall 2 × 12 cabinet. For that rig, I placed a Neumann U 87 microphone eight inches from the speaker and mixed it with some room ambience from a Tandy PZM microphone."

ACOUSTIC VERITIES

The acoustic guitars on *The Meeting* are as impressive sounding as the electrics. Barre uses a variety of acoustics, including models from Martin, Manson, Santa Cruz, and Taylor. To capture a great sound, he routes the signal through a tube mic preamp rather than the mic preamps on the console.

For songs on which the acoustic guitar is one of many other elements in a



JOE M. ASTRO

Barre relaxes before a take by warming up on one of his 12-string acoustics.

Sound Forge Heats Up With ActiveMovie

Sound Forge 4.0, the award-winning digital sound editor for Windows, now supports ActiveMovie audio plug-ins. Sonic Foundry has selected ActiveMovie (a component of Microsoft's Interactive Media technology) as the foundation for the Sound Forge plug-in architecture. ActiveMovie plug-ins will be supported by a variety of audio software companies including Sonic Foundry and Waves.

Sound Forge also supports the ActiveX Streaming Format (ASF) – the new audio and video Internet and intranet streaming standard used by Microsoft's NetShow On-Demand.

Produce the hottest audio possible with the latest technology from Sonic Foundry.

SOUND FORGE® 4.0

digital audio solutions for windows

1 800 57 SONIC or www.sfoundry.com

SONIC FOUNDRY®

1100 South Baldwin, Suite 204, Madison, WI 53703 Tel: (608) 256 3133, Fax (608) 256 7300, CompuServe: 74774,1340 or GO SONIC, Internet: sales@sfoundry.com
Sonic Foundry and Sound Forge are registered trademarks of Sonic Foundry, Inc. Other products mentioned are trademarks or registered trademarks of their respective manufacturers.

circle #576 on reader service card

dense mix, Barre typically records using only one microphone—usually a Neumann U 87—positioned at the front of the guitar; if he knows in advance that the acoustic guitar will occupy a lot of space in the track, he stereo-mikes it.

"For stereo-miking acoustic guitars, I tend to use a couple of Calrec 1050C microphones, one positioned a foot away pointing toward the bridge, and the other one three feet away pointing down from about seven feet high. Each one of the microphones goes through a British TLA Pentode tube mic preamp. The Pentode gives a warm, clean sound that is great for acoustic guitars. It captures a better-quality, more natural sound than I can get from the mic preamps on the desk."

Another great-sounding acoustic instrument on *The Meeting* is the drum kit. A large part of that sound results from Barre's use of ambient mics. He mounted a Neumann U 87 on the ceiling about 40 feet from the drum kit and set it to the omnidirectional polar pattern. The room sound captured by the U 87 was then blended to taste with the close-miked drum tracks.

The Presshouse Studio Gear List

Mixing Console	DDA D Series 32 × 8 × 24
Recording Media	Otari MX80; Revox C270 ¼-inch 2-track
Microphones	AKG 451 EB (3), PL20 (2); Calrec 1050C (4); Neumann U 87 (4); Shure SM57 (7), SM58 (4), SM91 (6); Tandy PZM (2)
Signal Processors	Alesis QuadraVerb; Aphex Type C Aural Exciter; Audio 7 Design F760 compressor/limiter, Vocal Stressor; Drawmer DS201 gate; DL221 compressor/limiter; Lexicon PCM 70, PCM 80; MXR pitch shifter/delay system; SPL Stereo Vitaliser; TC Electronic parametric EQ; TLA Pentode tube mic preamp and tube EQ 1; Yamaha REV7, SPX90 MKII
Monitor Speakers	ATC 100A; Yamaha NS10
Power Amp	Quad 303; QSC 400; Rauch DVT 60
Acoustic Guitars	Martin 000; Manson Raven; Taylor dreadnaught
Electric Guitars	Tom Anderson Drop Top; 1957 Reissue Gibson Les Paul; 1957 Fender Stratocaster; Manson Custom; Schecter Stratocaster
Guitar Amps	Marshall 15W and 50W heads; vintage Marshall cabinets; Soldano 50W head

NOT SPACE OUT

A critical component of any good arrangement, of course, is the musical relationships (harmonic, rhythmic, textural, etc.) between the instruments and how they fit against the space or silence. To help ensure that no one element overshadows another, Barre tries to take this into consideration as early as possible—preferably while composing the song.

"The space in music is vital," says Barre, "and a good place to create it is during the writing process. On 'Time after Time,' which has a lot of instrumentation, it was difficult to get people to underplay and leave enough space. The backing guitar was already doing most of the work, so I had to make sure the other parts fit around it so as to leave sufficient space for the layered vocals, which I wanted to sound big."

To create the big vocal sound on "Time after Time," Barre and engineer Mark Tucker used an old trick. They stacked numerous unison and harmony tracks onto the Otari 24-track and then mixed them down—along with time code—to ¼-inch tape. This freed up tracks on the multitrack deck for other instruments. Once everything else was recorded, they bounced the stereo vocal tracks back to the multitrack in the appropriate places.

JOE M. ASTRO

No guitarist's home studio is complete without a healthy assortment of axes! Here's a glimpse of Barre's current guitar collection.

THE VIBE'S THE THING

Not all the songs on *The Meeting* were recorded in The Presshouse. "The Audition," for example, is an eight-year-old track originally recorded when Barre's studio was still located in his house. The song is a prime example of Barre's facility for combining clean acoustic and distorted electric guitars into a seamless, musical whole. (It also features snippets of poetry read by Barre's children, Jennifer and Elaine.)

At that point in the evolution of Barre's studio, he was recording on a TASCAM MS16 reel-to-reel deck. The

It's time to step up and kick some axe.

But to do it, you're really going to have to put your foot into it. Introducing the GR-30 Guitar Synthesizer, your ticket to a whole new level of creativity. Now you can play 384 different instruments including classic and modern synths, juicy basses, lead sounds, nylon and 12-string guitar and even exotic instruments right on your guitar. And, to help you make the most of these great sounds, the GR-30 has unique features like a specially designed guitar Arpeggiator and a synth Harmonist that plays correct harmonies from a single note. Features all designed to enhance your playing, not your confusion. Plus you can have all of this for a price much easier to afford than believe.

So come check out the newest star of the six-string universe at your nearest Roland dealer, or call (800) 386-7575, ext. 729 for our demo video ($5.00). And then kick some axe.

Roland®

GR-30 Guitar Synthesizer

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
http://www.rolandus.com
CompuServe : GO ROLAND
Fax-Back Information: (213) 685-5141, ext. 271 (Doc. #10161)

Online

circle #573 on reader service card

WRH

original master for "The Audition" was processed with dbx noise reduction, something that Barre normally detests. "Usually, dbx sounds horrible, but I liked the vibe of the track so much that I kept it anyway. Fortunately, the MS16 ran at 15 ips, and the slower speed (as compared to 30 ips on the MX80) actually helped with the bass response."

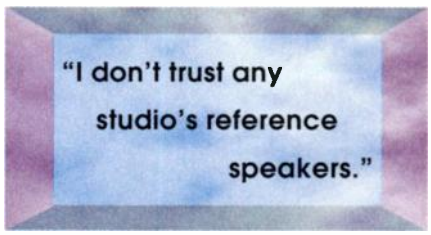
DDA ALL THE WAY

Barre's DDA desk has been a key component of his recording studio arsenal since the TASCAM MS16 days. However, he had to make a few modifications to accommodate the current 24-track setup. "Rather than buying a new desk, we had the DDA extended to handle the 24-track format. After custom building it for me, DDA liked it so much that they marketed it. But they didn't call it the Martin Barre model—the buggers!"

Barre clearly loves his DDA console. "It has big knobs," he says enthusiastically, "so there's none of this nonsense squinting to find the EQ. Also, it's old-fashioned, which I like, and easy to use. But most importantly, it's quiet.

"Actually, being limited to 24 tracks requires real discipline," says Barre, "because you have to make compromises to squeeze in everything. But in the end it's usually for the best, because you end up with a simpler, more focused mix."

Barre uses both Yamaha NS10 and ATC 100A reference monitors, but stresses that they offer merely an initial indication of a track's sonic qualities, not an absolute judgment. "Ultimately, I don't trust any studio's reference speakers," says Barre. "I was working in the garden one day and saw a band run out of The Presshouse and get into their car. I thought they had had an argument, but it turns out they were simply playing a take on the car stereo to get a more accurate assessment of the mix. And you know what—it *was* more accurate! Ever since then, when I want a true representation of a mix, I take it to the car."



BARRE NONE

If you're ever in Devon and decide to book time at The Presshouse, remember to check at the door any preconceived notions of how a rock star should run a commercial recording studio. "The fact is," says Barre, "people tend to think you have to have a fully digital studio with an automated desk and thousands of dollars worth of outboard gear to make a hit record. But that's simply not the case. Truthfully, 90 percent of a great sound comes from the musician's fingertips."

Guitarist and frequent **EM** *contributor* **Greg Pedersen** *has run out of cute things to say in his bio.*

QUIET!

Introducing two new **quiet** babies from Lucid Technology that take your **computer audio from analog to digital and back** without noise, distortion, or a comma in the price.

In your Mac... Make perfect digital audio transfers into and out of NuBus equipped Apple Macintosh. Connect digitally to your DAT recorder or external analog to digital converters. **The NB24** supports applications from these great Mac software companies:

Arboretum Systems
BIAS
Digidesign
Emagic
Macromedia
Opcode
Steinberg
Waves

Turn your Mac into a virtual real-time signal processing rack with MultiRack from Waves. WaveshellRT, the powerful software utility needed to run MultiRack, is included free of charge with the NB24.

In your Rack...
A 20 bit A/D and D/A converter that isolates your analog audio from noisy computer environments. The **ADA1000** is a great way to instantly improve the audio from your sound card. Connect an ADA to any of these great cards:

NB24 from Lucid Technology
Audiomedia II and III from Digidesign
I/O Card-D from Digital Audio Labs
Multi!Wav Digital PRO from AdB
ZA2 from Zefiro Acoustics

Coming soon... PCI24 digital I/O card for the PCI bus. Tune in to our website for the official announcement.

PCI
24

lucid™
TECHNOLOGY

tel 206.742.1518 • fax 206.742.0564 • **www.lucidtechnology.com**

circle #548 on reader service card

So many multimedia features, it'll make your head spin

Unlimited sequences with 99 tracks each • Linear and Pattern-based sequencing • Digidesign Audiomedia • Enhanced Apple Sound Manager • OMS • Record, play and edit 16-bit CD quality Digital Audio and MIDI • Red Book audio, AIFF, WAV, snd, Sound Designer II • MIDI Machine Control • Track Overview, List, Graphic & Notation Editing • Multi-channel Automated Mixing Consoles • Yamaha CBX • Digidesign Pro Tools & TDM • Adobe Premiere Audio Plug-ins • Audio-to-MIDI™ • Audiomorf™ • Groove Quantize • DSP • Sample Rate Conversion • Formant Pitch Shift • MIDI-to-Audio™ • Adjust Audio Tempo™ • Time Scale • Normalize • EQ • Power Macintosh Native • 100 Free MIDI files and more... QuickTime movies synchronized to music tracks •

Studio Vision Pro 3.5

Is your multimedia creation lacking that killer groove? *Sounds* like you need Studio Vision Pro 3.5. Everything for creating audio and music is right here in one package. Open any QuickTime™ movie, edit the audio, then save it. What could be easier?

Whether you're reworking sound clips, or writing original scores, Studio Vision Pro has all the right tools for creating digital audio and MIDI. Get the software that sound experts depend on and put a new spin on your audio.

Now Take us for a spin!

Get a free CD-ROM of multimedia examples created with Studio Vision Pro
1.800.557.2633 ext 262, or check out our web site at **www.opcode.com**

RATED AWESOME NEWMEDIA MAGAZINE
Studio Vision Pro

boo! KICK ASS! PRODUCT
Vision

OPCODE
MUSIC SOFTWARE & HARDWARE

(415) 856-3333 Fax (415) 856-0777 • All trademarks are the property of their respective holders

circle #562 on reader service card

Master CLASS

A PLACE FOR EVERYTHING

Produce majestic mixes by putting sonic elements in the right spot.

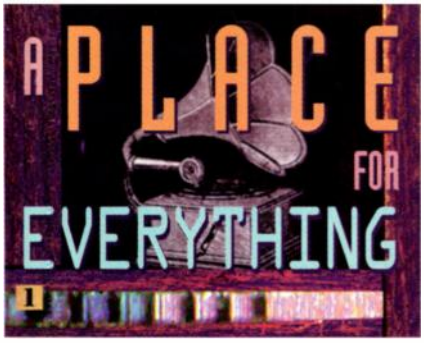
By Larry the O

As with many things audio, mixing is a combination of art and science. Science provides the tool kit for sculpting sound, and art determines the choice of sounds and how they are employed. My approach to mixing is to try to get a gut sense of what I want a soundscape to be and then apply analytical methods to propel me toward my goal. Throughout the process, aesthetic judgment guides creative decisions.

This strategy is tremendously helpful during the aural balancing act of placing elements within a mix soundscape. I define four types of placement that can be applied to a sound in a mix: level, spectral, spatial, and temporal. Level placement refers to the relative amplitudes of the various elements in a mix, and spectral placement deals with how the audible frequency ranges are manipulated within the soundscape of the mix. Spatial placement is where the sounds lie in two-dimensional space: the left-right stereo panorama and the front-to-back axis. (In spite of the claims of several purveyors of "3-D audio," I have yet to hear any convincing azimuth, or vertical, placement techniques using two speakers.) Finally, the most subtle of these techniques is temporal placement, which is the time when a sound is placed within the work.

The ways in which these types of placement are combined determine the prominence of a sound within the overall mix. A sound can be made to stand out and be noticed, blend into another tonal texture, or add some very subtle, psychoacoustic spice. Let's look at some practical uses of these four placement techniques, keeping in mind that rarely is one technique used alone; in fact, it is difficult to give an example of any one of these placement techniques that does not also involve another.

ILLUSTRATION BY TERRY MIURA



LEVEL POSITION

Level is perhaps the most obvious mix parameter: if a sound is louder, it's usually more prominent. That simple truth is what makes level the most heavily used—and most easily understood—placement technique. However, there can be a great deal of subtlety involved in level setting. For example, if other parameters, especially timbre, are strategically matched between two sounds playing similar or identical parts, it is often possible to balance the levels of the sounds so that they create the perception of a single, thicker texture.

A good illustration of this technique is the doubling of rhythm guitar tracks, a favorite studio maneuver of **EM** Editor in Chief Michael Molenda. Molenda will often overdub two tracks of different-sounding guitars—typically a Les Paul and a Stratocaster—playing the same rhythm part through an identical amp and signal-processing setup. The result is two tracks that share significant timbral and performance similarities but still possess essential tonal differences. Proper level balancing of these two tracks yields a single, very fat, and dimensional guitar sound. This type of level balancing is also critical when doubling vocals. For example, you can construct a more robust vocal timbre by boosting frequencies on the doubled voice that are weak on the main vocal track. Those tonal tweaks may leave the vocal double sounding less than wonderful by itself, but when the double is combined with the main vocal track, the effect can be quite striking.

SPECTRAL POSITION

Spectral placement deals with how the myriad frequency ranges of a mix fit together. Good mixes should make use of the timbral balance (or imbalance) of the various sounds. A textbook example of spectral placement can be found on Los Lobos' *Kiko*. Right from the first notes of "Dream in Blue" at the opening of the album, the soundscape is aligned in a logical and full-bodied mix: the kick drum holds down the very low end, the bass sits just above that, the keyboards and guitar fill out the mid frequencies, and so on. To achieve this type of sonic harmony, it helps to think of spectral placement in a vertical sense, with the audible frequency spectrum as a top-to-bottom scale.

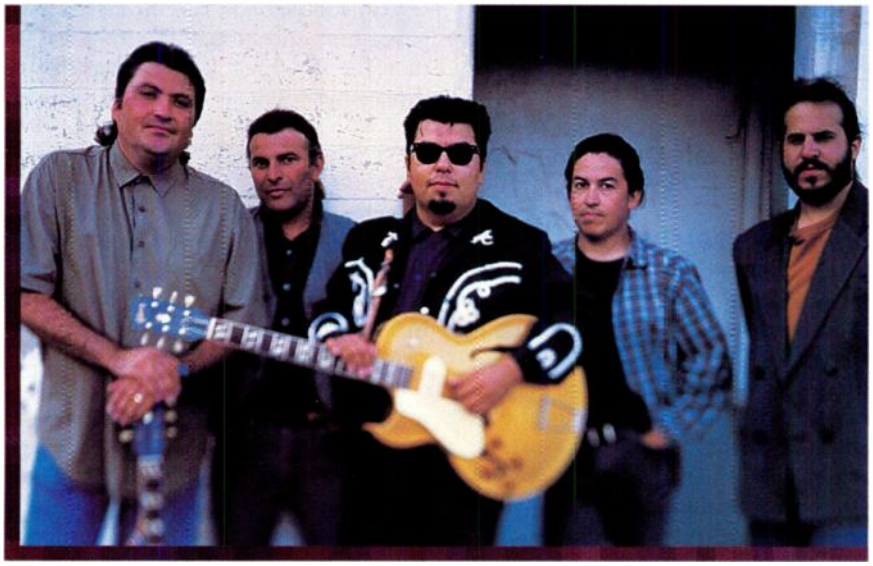
However, in most mix scenarios, frequency ranges cannot be absolutely separated. A kick drum, for example, will typically share much of the low-frequency range of the electric bass. So how can you effectively employ spectral positioning to produce a clean, well-ordered arrangement of frequencies within a mix?

Happily, a perceptual phenomenon called *masking* comes to the rescue here. When presented with several simultaneous sounds in the same frequency range, the ear will generally hear the louder of the sounds, while the quieter sounds will tend to disappear—in essence, the softer sounds are "masked" by the louder sounds. As an analogy, imagine you're sitting in a café, admiring a Rolls Royce parked across the street. Suddenly, a bus pulls up and stops right in front of you. The Rolls is still there, but you are no longer able to see it because the bus is a larger object occupying the same visual space. In the mix, level balancing can help clarify spectral positions, allowing you to create the impression that certain instruments "own" specific frequency ranges.

The converse of masking can also work effectively: two sounds whose primary energies are in different areas of the frequency spectrum are usually both heard distinctly, even if one is somewhat louder than the other. Consider the finale of Tchaikovsky's *1812 Overture*, which uses spectral balance to create a spectacular climax. A lot of the finale's drama and power comes from the entrance of the cannons, which suddenly introduce extreme amounts of low-frequency energy, and the church bells, which contain similar quantities of clangorous high frequencies. With both ends of the spectrum stimulated so intensely, the overall effect is truly awesome, even though, in a really good performance that uses genuine cannon and church

JAY BLAKESBERG

Producer Glen Ballard used spatial and temporal placement to dramatic effect when he expanded Alanis Morissette's voice from a dry monaural image to a wide stereo perspective on the song "You Oughta Know."



ANN SUMMA

With each instrument neatly segregated into timbral niches, the mixes on Los Lobos' *Kiko* album are textbook examples of spectral placement.

bells, the rest of the orchestra is largely drowned out.

As mentioned earlier in regard to *Kiko*, one of the most common applications of spectral placement is a typical pop music mix in which each instrument is given a range of frequencies it can dominate. Let's go back to our kick drum and bass guitar example. A mix engineer's foremost consideration will often be to decide whether the kick drum or the bass will usurp the very low frequencies (around 80 Hz or so). Attempting to let both instruments have a lot of energy in that region will just make the low end sound muddy, so it is usually best to listen to the two instruments, consider the whole mix, and do a bit of EQ to give one or the other the "beef."

Typically, if the decision is made to let the bass dominate, the engineer will tailor the kick drum to have more of a snap by accentuating the sound of the beater against the drum head. Cutting 100 Hz or 80 Hz to diminish the drum's low end and boosting somewhere between 1 kHz and 3 kHz to clarify the beater impact usually does the trick. Don't forget that level positioning is also a critical factor in determining whether a listener perceives the kick drum or the bass to be the low-end brute.

Another common example is the placement of acoustic guitar tracks in a dense mix. An inexperienced engineer may try to fit a very full-bodied acoustic sound into a soundscape crowded with keyboards, electric guitar, bass, and drums. However, in such a thick mix, the percussive sound of the strings is probably the only spectral aspect of the acoustic guitar that will be apparent. Attempting to retain the full, boomy sound of the acoustic will, again, only serve to muddy the mix. Removing some of the body of the acoustic guitar by cutting some low or low-mid frequencies will actually open up the mix and make everything sound clearer. To ensure that the acoustic guitar tracks remain clearly audible, you can accentuate the attack of the strings by boosting the high end.

It should be noted that spectral placement can be a difficult concept to grasp if a musician does not have much studio experience. The desire to make each and every element of the mix sound great by itself—disregarding the fact that a less wonderful sound may work best within the overall soundscape—is a hard habit to break. There have been countless times when I've soloed a guitar track and had the guitarist complain that it sounded "too thin," only to put it back in the mix and have the player exclaim, "What did you do? It sounds better." The big lesson here is: Never audition a sound solely on its "individual" tone. Ultimately, all sounds must work well together in the context of the entire mix.

circle #513 on reader service card

All Manufacturing
In Our Plant...
Since 1977

EUROPADISK, LTD.

• COMPACT DISC
• Cassettes
• Vinyl Records
• Graphics
• Mastering Studios

EUROPADISK QUALITY
Direct Metal DMM Mastering
EUROPADISK SERVICE

BULK CD REPLICATION

Disk Price (Bulk)		Set-Up Cost vs Turn-Around-Days*			
Quantity:	Price Ea.	3 DAYS	5 DAYS	10 DAYS	15 DAYS
200 to 499	$.95	$1,100	$850	$500	$450
500 to 999	.90	1,000	775	375	350
1,000 to 1,999	.80	900	625	200	100
2,000 to 4,999	.72	725	250	no charge	
5,000 to 25,000	.65	no charge		no charge	

From your CD-R, replicated CD, or 1630 master & label film. Prices include: 2-color CD label (1-color on 999 or less).
* Business days, day "0" is day of receipt of materials in acceptable form.
Jewel Case & Shrink-Wrap Packaging. $.28; $.25 @ 5,000 & over
CD-Audio Premastering: Sonic Solutions PMCD Master and Reference CD for your approval - $125 to 25 min.; $140 to 63 min.; $150 to 74 min.

RETAIL-READY CD PACKAGES with *Full Color* Graphics

CDs in Jewel Case + Full Color Booklet and Tray Card					
Booklet:	300	500	1,000	2,000	5,000
1-Panel	$1,627	$1,748	$1,903	$2,893	$5,943
4-Panel	$1,957	$2,078	$2,233	$3,353	$6,643
6-Panel	$2,387	$2,508	$2,663	$3,873	$7,093

Includes graphics layout, typesetting, graphics proofs, film and printing for booklet, tray card and 2-color CD label (1-color for 999 or less), replication and packaging in shrink-wrapped jewel case. You supply a layout sketch, photos and Premastered CD-R - we do the rest.

RETAIL-READY CASSETTE PACKAGES with Full Color Graphics

Full-Color Standard J-Card, Norelco Box - Chrome Tape!					
Length:	500	1,000	2,000	3,000	5,000
to 12 Min.	$720	$1,004	$1,588	$2,090	$2,974
13 - 29 Min.	$750	$1,071	$1,714	$2,267	$3,247
30 - 49 Min.	$791	$1,148	$1,865	$2,478	$3,575
Full-Color O-Card Single - Chrome Tape!					
to 12 Min.	$715	$935	$1,394	$1,918	$2,600
to 29 Min.	$740	$979	$1,476	$2,033	$2,778

Includes graphics layout, typesetting, graphics proofs, film, graphics printing, shell printing, test cassette, and shrink-wrapping - from your sketch, photos and master.

12" VINYL RECORDS incl. Mastering & Plating

12" Single, to 14 Minutes (33 or 45 RPM)				
300	500	1,000	2,000	3,000
$795	$1,015	$1,285	$2,195	$3,065
12" LP, to 26 Minutes, 33 RPM				
$895	$1,115	$1,385	$2,295	$3,165

Includes DMM Mastering, plating, test pressings, label typesetting and printing, plastic sleeves, collation & shrink-wrapping. Jackets, black or white die-cut - $.35 ea.

Call For Our **Complete Catalog**

EUROPADISK, LTD.
75 Varick Street, New York, NY 10013
☎ (212) 226-4401 FAX (212) 966-0456
(800) 455-8555

circle #530 on reader service card

SPATIAL POSITION

As two key aspects of spatial placement are localization and image width, this technique can be rather more complex and subtle than level and spectral positioning. The direction from which a sound is originating relative to the listener (i.e., localization) is primarily determined by three aspects of interaural difference (the difference between how the left and right ears receive a sound). These are amplitude, time delay, and spectral content.

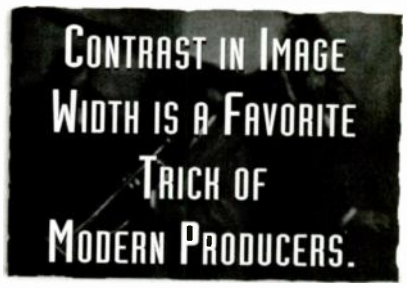
Amplitude is the most prominent of these clues; if a sound is heard louder in one ear than the other, it tends to be localized to the side with the greater level. This concept is the basis of the panning controls found on every mixing console.

Time delay and spectral content are somewhat more subtle and are harder to employ. The time difference is simply the amount of time the sound takes to travel the width of the listener's head. If a sound comes from the listener's right, it takes a fraction of a second longer to travel the small distance to the left ear, and the brain is able to distinguish this tiny delay. Similarly, spectral differences are also perceived because the listener's head blocks some small amount of high frequencies (which have short wavelengths relative to the size of the skull). This means that the sound received by the far ear is somewhat "darker" than that heard by the near ear.

The difficulty in using time and spectrum differences is that only headphones can ensure that each ear receives the proper aural information, because speakers allow the information to mix in the room, corrupting subtle cues intended for a specific ear. Still, skillful (and sometimes even ham-fisted) manipulation of time delay and high-frequency rolloff can produce a variety of useful results.

For example, another common guitar-doubling technique is to feed one side of the stereo spectrum with a dry guitar track and the other side with a version of the original track that is delayed by several milliseconds, run through a low-pass filter, and mixed at a lower level than the dry track. This type of signal processing results in a full, wide sound that is, nonetheless, localized to the "dry" side.

Front-to-back (or *relative distance*) placement is based on similar perceptual traits. The farther a sound source is from a listener, the more energy the sound loses traveling through the air. In addition, high frequencies are more readily absorbed by the air, so a sound that is farther away not only appears softer, but also sounds duller. Finally, if the listener is in a reverberant environment, the ratio of direct sound to reverberant sound is a major auditory clue. The lower the ratio of the direct sound to the reverberant sound, the farther away the sound is perceived to be.



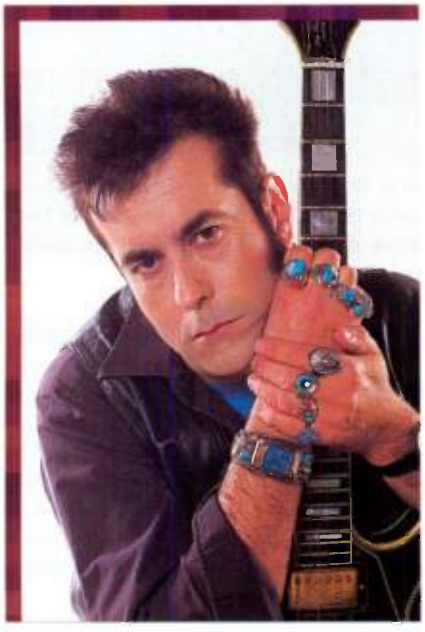
As with left-right placement, these cues can be used individually or in combination. A common example is a musical pad, such as a string arrangement, that is intended to fill out the mix without dominating it. Pads, whether created by a synth or another instrument, are always mixed lower than the instruments of primary interest. In addition, the pads are typically more reverberant and less bright than the primary sounds, with the main idea being to place them "behind" the primary elements of the mix. This technique is also used for ambience in sound-for-picture applications (TV, film, games, etc.), where it's used for a subtle—almost subliminal—effect.

Image width is another aspect of spatial placement and refers to how easily a sound can be localized to a definite point in space. The narrowest image is a dry, monaural track, which provides a crisp, easy-to-pinpoint sound source. On the other hand, a stereo image often makes it difficult to identify the precise location from which a source sound is emanating.

Contrast in image width is a favorite trick of modern producers. For example, producer Glen Ballard used image width as the cornerstone for most of his mixes on Alanis Morissette's *Jagged Little Pill* album. Just check out the way Morissette's voice flips between a dry, center mono image and a very wide, thick stereo image during the song "You Oughta Know."

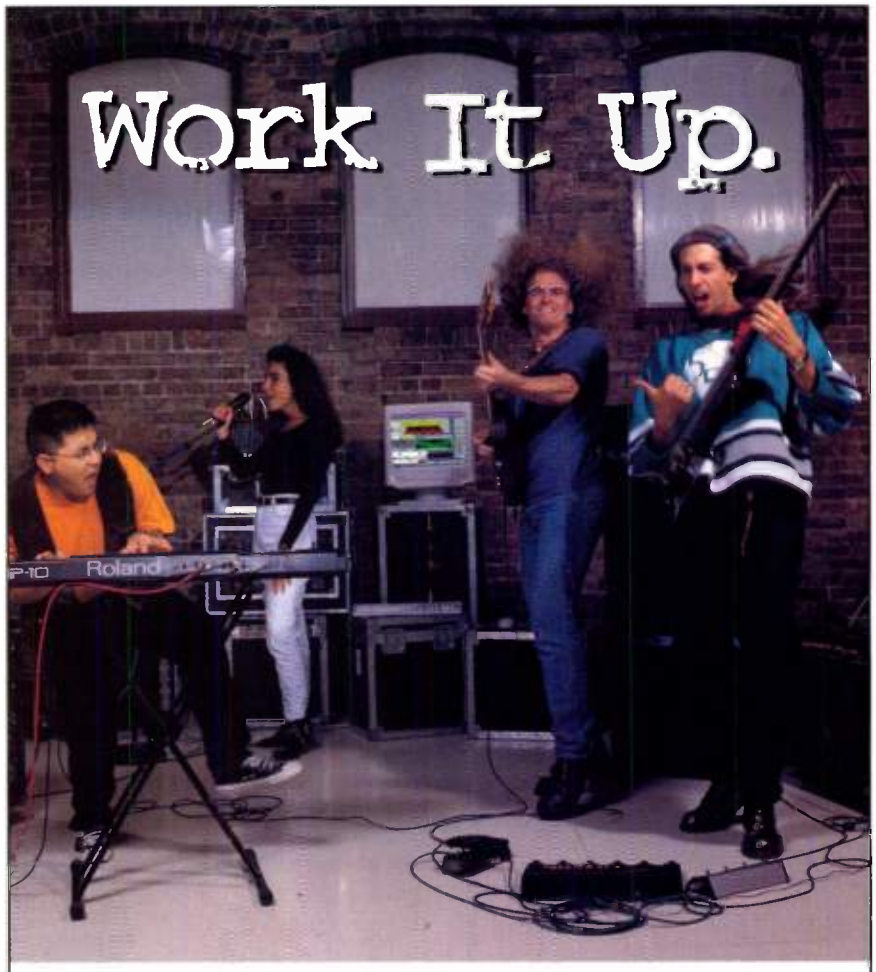
Animating a monaural source sound into a wide stereo image can be as simple as hard-panning two or more slightly delayed (anywhere from 30 ms to 100 ms) versions of a sound to opposite sides of the stereo spectrum. Varying the delay times causes movement in the image.

Reverberation can also be employed as a "stereo-izer" because one of the main traits of reverberation is that it diffuses a sound as the reflections build. Diffusion can be a useful tool for spreading a sound into a stereo image. In fact, one of my favorite mixing techniques for rhythm guitars employs diffusion. I'll run a monaural guitar track through a small, stereo room reverb and then use mostly (or exclusively) the reverb return, panned in stereo. The diffused, stereo reverb allows the track to be mixed fairly loud for a "guitar dominated" rhythm mix yet leaves room for other elements of



JON SIEVERT

On modern rockabilly artist Dave Crimmen's *Where He Left Off* album, EM editor Michael Molenda employed level and spectral positioning to layer multiple rhythm guitar tracks into a single, multidimensional wallop.



Your music is your passion. It's become more than a "weekend thing." And you're taking it to the next level.

Make it Happen with Cakewalk® Professional™

New Cakewalk Professional 5.0 gives you the tools you need to create and edit MIDI and digital audio in one integrated system.

Tweak your audio to perfection with Cakewalk's audio tools. Give your scores the Professional look with flexible notation. Automate your studio with SMPTE sync and MIDI Machine Control (MMC). Put it in the pocket with powerful MIDI editing: Groove Quantize & Swing Quantize, Interpolate, Retrograde, Fit-to-time, Fit Improvisation, and more.

- 4 Tracks of Digital Audio
- 256 Tracks of MIDI
- Notation with Chord Grids, Lyrics, Dynamic Markings
- 96 Assignable Faders
- CAL Programming Language
- MIDI & Digital Audio SMPTE Sync
- Advanced MIDI Editing
- Groove & Swing Quantize
- 256-bank Sysx Librarian
- Windows 3.1 & Windows 95 Versions on CD-ROM
- $249 (suggested retail)

Put Cakewalk to Work.

Cakewalk is available at finer music & computer stores worldwide. Visit our web site, or call 888-CAKEWALK. Ask about our Demo CD-ROM.

CAKEWALK
MUSIC SOFTWARE

http://www.cakewalk.com

circle #514 on reader service card

CD-Recordable by MICROBOARDS Technology, Inc.

Studio Level Recording Under $800

The first Package with PQ subcode editting for Windows

AudioWrite2040 PRO
Professional Audio CD System
Featuring:
Red Roaster Software

DAT to CD-R Conversion

AD Maker. The AD Maker Creates Glass Master Ready CD-R Discs from Unedited DAT Tape Source.

World Wide Distributor of CD-R Media.

Phone (800) 646-8881
Fax (612) 470-1805
Web www.microboards.com

circle #553 on reader service card

A PLACE FOR EVERYTHING

the mix to be more conspicuous. The key is to contrast the rhythm guitar tracks and the tracks you want to be more prominent by making these latter tracks much dryer and less diffuse.

TEMPORAL POSITION

The line between mixing, arranging, and composition is never fuzzier than when temporal placement enters the picture, because the technique involves adding and/or subtracting elements over time to achieve a desired effect. For example, how many heavy metal songs have you heard that start out with just acoustic guitars and the vocalist singing in a low range, only to have the vocalist jump up an octave into screech range when the wall-o-crunch guitars and drums-o-doom enter after the first verse and chorus? This is probably the most unsubtle example of temporal placement, but it is still quite effective (if way overused).

A slightly less over-the-top example of temporal placement is the entrance partway through a song of an additional textural element. For example, the Grateful Dead's studio recording of "Cumberland Blues" is greatly enhanced by the banjo track that sneaks in about two-thirds of the way through the song.

Late entrances are not the only temporal placement technique, however. When multitrack production techniques were being developed in the late 1960s, masterful artist/producer teams such as the Beatles with George Martin, and Simon and Garfunkel with Roy Halee or Bob Johnston, worked extensively with "one shot" effects. Instruments or sound effects would appear just once in a song to emphasize a lyric or an arrangement shift.

Consider Martin's mad calliope interlude in "Being for the Benefit of Mr. Kite!" on the Beatles' *Sgt. Pepper's Lonely Hearts Club Band*, or Simon and Garfunkel's recording of "Patterns," where a relatively simple recording is enriched by sustained organ notes in one verse and "telephone voice" EQ applied to three dramatic words at the end of another verse. Also, listen again to Morissette's "You Oughta Know"—this time not to hear how image contrast is used, but *where*. You should notice that key words, phrases, and structural elements are emphasized by the entrance and contrast between the mono and the stereo images.

FINAL POSITION

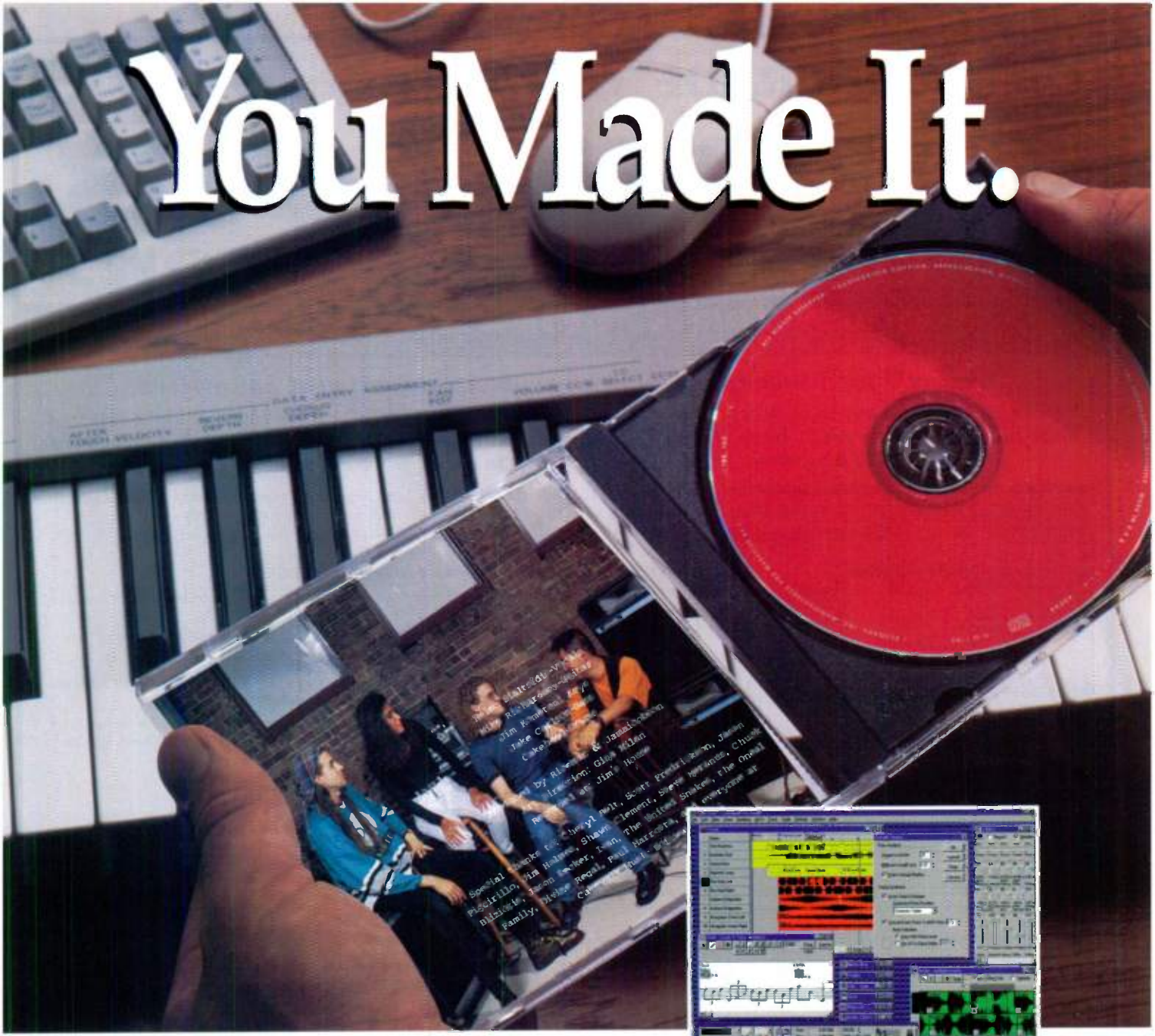
The scientific aspects of sound placement may appear somewhat daunting to the inexperienced recordist, but in practice, mixing skills can be acquired with no more (or less) difficulty than grasping the nuances of arrangement and orchestration. First, assimilate the mechanics and assortment of techniques available. Second, study and analyze the works of the masters to understand how these techniques can be creatively applied. Then, find your own direction, take the ball, and run for all you're worth.

JOAN MARCUS

The legendary George Martin, shown here with Peter Townshend during a session for the original cast recording of The Who's *Tommy*, was one of the pioneers of temporal placement during his tenure as producer for the Beatles.

Larry the O *engineers and produces for Toys in the Attic, performs Gonzo Celtic music with Annwn, and in spare moments, does sound design for games at LucasArts Entertainment.*

You Made It.



It's your music. You recorded it. You made the edits, and mixed every track. And you did it all with Cakewalk® Pro Audio™.

Cakewalk Pro Audio 5.0 is the professional musician's choice for multi-track MIDI and digital audio recording. Powerful MIDI sequencing, support for Windows-based hard disk recorders, and advanced audio editing tools let you produce CD-quality recordings from start to finish.

Cakewalk Pro Audio is ideal for multimedia projects too.

http://www.cakewalk.com

- Unlimited Tracks* of Digital Audio
- 256 Tracks of MIDI
- Support for Session 8, Audiomedia III, and Soundscape SSHDR1
- Notation with Guitar Chord Grids, Lyrics, Dynamic Markings
- CAL Programming Language
- MIDI & Digital Audio SMPTE Sync
- Professional MIDI Editing
- Graphic and Parametric Audio EQ
- Audio-to-MIDI Groove Quantizing
- Groove & Swing Quantize
- 96 Assignable Faders
- 256-bank Sysx Librarian
- Windows 3.1 & Windows 95 Versions on CD-ROM
- $399 (suggested retail); Deluxe Edition $479

* Maximum number of tracks determined by your hardware configuration.

Make It with Cakewalk.

Cakewalk is sold at music & computer stores everywhere. Visit our web site, or call 888-CAKEWALK. Ask about our Demo CD-ROM.

CAKEWALK
MUSIC SOFTWARE

circle #515 on reader service card

NEW! **UPGRADE TODAY!!!**

WINDOWS 95, 3.1 & 3.11 FRIENDLY

ELECTRONIC MUSICIAN 1995 EDITORS CHOICE

BAND-IN-A-BOX™

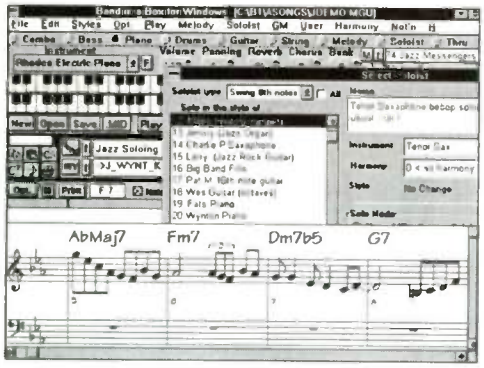
VERSION 7.0 FOR WINDOWS

INTELLIGENT SOFTWARE FOR IBM (WINDOWS/DOS)*

(NOTE: MACINTOSH available in Ver. 6; ATARI Band-in-a-Box available only in Ver. 5)*

Version 7 for Windows is here. Automatic Accompaniment has arrived!

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.*

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.*

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.*

NEW! Additional features in Windows Version 7.0

Band-in-a-Box 7.0 for Windows breaks new ground with over 60 new features!

Band-in-a-Box 7.0 is here! This major upgrade includes over 60 new features. We've added a an amazing new feature called "Automatic Soloing". Choose the type of soloist you'd like (from 100 available) and the program creates and plays a solo in that style, along to any song ! Or create your own soloists. This is hot ! These solos are of the highest professional quality, rivaling solos played by great musicians! And there's lots more in 7.0 – improved notation, step time/notation edit of StyleMaker patterns, style changes at any bar, scroll ahead option for notation, improved synth support, over 60 new features in all!

OUR CUSTOMERS LOVE VERSION 7.0 FOR WINDOWS!

"Wow ! The soloing sounds amazing... how can it do that?"
"I love the notation improvements."
"Another winner – thanks!"
"You guys have added everything I wanted."

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

"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

– 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."

Open LateNite 24 HOURS 7 Days

PG MUSIC INC. *Maker of PowerTracks, The Pianist series & The Jazz Soloist*
266 Elmwood Avenue Suite 111 Buffalo NY 14222
Phone Orders 1-800-268-6272 or 604-475-2874
e-mail orders: Internet:75300.2750@compuserve.com
ORDER FROM OUR WEB PAGE at http://www.pgmusic.com
VISA/MC/AMEX/cheque/mo/po# Fax 604-658-8444

BAND-IN-A-BOX PRICES

NEW CUSTOMERS (IBM/Macintosh/Atari*)

Band-In-A-Box Pro *(first time purchase)* $88
Version 7, Styles Disks 1-3, Harmonies Disk 1 + Soloists Disk 1

SUPERPAK *(first time purchase)* $147
The SuperPAK includes Pro version 7, Styles Disks 1-5, Harmonies Disk 1 + Soloists Disk 1

ULTRAPAK *(first time purchase)* $189
The UltraPAK includes Pro version 7, Styles Disks 1-8, Harmonies Disk 1 + Soloists Disk 1

(MACINTOSH Band-in-a-Box available in Version 6, ATARI available only in Version 5)*

ADD-ONS

Styles Disk #4 ..... $29
Styles Disk #5 ..... $29
Styles Disk #6 ..... $29
Styles Disk #7 ..... $29
Styles Disk #8 *(included with Version 7 upgrade)* $29
MIDI-FakeBook *(100 songs on disk)* $29

UPGRADES

Regular Upgrade to Version 7 *(for Windows)* $49
Includes Styles Disk 8 + Soloists Disk 1, Upgrade from Version 6 for Windows

Complete Upgrade to SUPERPAK $69
Includes Regular Upgrade to version 7 + Styles 1-5. Order this if you have an older version of Band-in-a-Box (pre-version 5) or if you are "cross grading" to a different type of computer, or if you do not have Styles Disk 4

Complete Upgrade to ULTRAPAK $89
Includes SuperPak (above) + Styles 1-8 (these are all the Styles Disks we have made for Band-in-a-Box!)

MEMORY REQUIREMENTS: DOS (640K), Windows (4 mb), Macintosh (4 mb), Atari (1040)

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!

circle #565 on reader service card.

Hot new software programs created by PG Music!

NEW! PowerTracks Ver. 3.5 · The Pianist Vol. 3 · The Blues Pianist · Children's Pianist · New Age Pianist · Bluegrass Band · Jazz Soloist Vol. 3

THE PIANIST SERIES

WINDOWS • MACINTOSH ATARI • DISKLAVIER

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

NEW! The Blues Pianist™ $49

Volume 1 (50 pieces - older styles) $49 • Volume 2 (50 pieces - newer styles) $49

Each volume contains over 50 great down-home blues piano stylings by top professionals! Playing in a wide variety of blues piano styles – Boogie Woogie, Slow/fast boogies, jazz blues, New Orleans style, Chicago blues & more. These are the styles made famous by Pete Johnson, Albert Ammons, Jelly Roll Morton, etc. Hours of listening pleasure! Full of info & trivia on the great masters of piano blues. Slow them down & learn the licks! The perfect gift for any blues lover.

NEW! The New Age Pianist™ $49

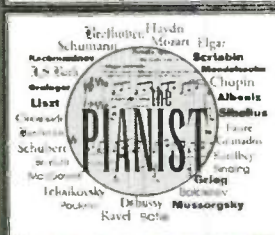
Over 70 "New Age" & "New Age-Jazz" style piano pieces, played on MIDI keyboard by top performers.

A beautiful collection of solo piano compositions which draw their inspiration from the natural world. Full range of "New Age" piano techniques are presented: "ambient" performances in the style of George Winston & "New Age-Jazz" performances in styles of Chick Corea /Keith Jarrett. Includes song memos, biographies & information on important New Age musicians. Includes photo album of stirring nature scenes & real time piano score *(notation in Windows version only)*. Over 3 hours of music!

NEW! The Children's Pianist™ $49

Over 70 of the best-loved children's songs for listening & singalong!

Lyrics to all songs displayed on screen in large type. Chords. Lyrics & music notation. On-screen lessons explain the techniques of piano accompaniment. Examples of alberti bass, embellishments, syncopation, stride style & many more techniques! Over 4 hours of music! Includes words & music for 70 songs: London Bridge, Camptown Racetrack, Home



$49

Nearly 600 of the world's most popular classical piano pieces, performed by world class concert pianists!

Moonlight Sonata, Sonata Pathétique, Minute Waltz, Claire de lune, Mephisto Waltz, Hungarian Rhapsody, Fantasie Impromptu, Military Polonaise... over 400 more!!!

PLUS... *Music Trivia Game, "Guess the Song", program notes, biographies, music dictionary (on disk) & more!*

OUR CUSTOMERS LOVE THE PIANIST...

"Incredible... amazing... terrific... masterful... fabulous... love it... my favorite program!"

NEW! The Pianist Volume 3

Volume 1 (215 pieces) • Volume 2 (200 pieces) • Volume 3 (170 pieces) • Each volume $49

We've added 170 wonderful pieces to The Pianist program. This magnificent library brings to nearly 600 the repertoire of classical masterpieces available in The Pianist series! Lots of new Chopin & Brahms, plus piano arrangements of orchestral favorites by Liszt and others. **PLUS**... New & revised program notes, biographies & dictionary (all on disk)!

The Jazz Pianist™ $49

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 the Song game, program notes, biographies & music dictionary (all on disk).

The Jazz Pianist Volume 2

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

60 more fabulous jazz standards for Volume 2, complete with new program notes and biographies!

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.

The New Orleans Pianist™ $49

Over 60 "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.

The Gospel Pianist™ $49

Over 50 Gospel style piano pieces played on MIDI keyboard by top Gospel pianists Louise Rose, Davell Crawford, Henry Butler, Sam Berfect, Derrick Bethune, Joel Simpson & Jon Cleary. The "Gospel Piano" style underlies much of the blues, jazz & popular music played today.

The Christmas Pianist™ $49

This software includes great piano performances of over 50 all-time favorite Christmas songs and carols – ideal for listening or singalong! On-screen lyrics, notation & piano keyboard, piano notation printout, background playback, Music Trivia & Guess the Song games & more!

NEW! Ver. 3.5 PowerTracks Pro™ ONLY $29 upgrade $15

SEQUENCER/NOTATION/PRINTING/WAVE SUPPORT FOR WINDOWS (IBM)

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

NEW FEATURES in 3.5... Enhanced notation window (32nd notes, etc.) • Karaoke window • Notation Scroll ahead • Notation clean mode • Align music to click track • Force all files to PPQ option • Improved hand splitting • Intelligent enharmonics

In versions prior to 3.5, we added major features like music notation, wave files, lyrics, chord symbols & printout. Now we've added many new features. We've added a big "Karaoke" Style Window to display lyrics. The notation is enhanced with support for finer resolutions like 32nd notes. You can align a rubato piece to a click track. We've enhanced the intelligent piano hand splitting routines. The enharmonics are intelligently chosen based on the chord symbols & more! *Powertracks for DOS included FREE (NOTE: DOS version doesn't support music notation or other graphical features).*

NEW! The Bluegrass Band™ $49

Virtuoso live performances of 50 Bluegrass standards!

These MIDI files are great! As you listen to the tunes, you can single out any of the instruments using the on-screen fretboard display, tablature or notation. **PLUS**... Lots of Bluegrass pictures, bios, & trivia (all on disk) & much more. Our most "feel good all over" program so far. Includes: Wildwood Flower, Sally Goodin, Cripple Creek, Fire on the Mountain, Pigtown Fling, Red Haired Boy, Jesse James & many more!

NEW! The Jazz Soloist™ Vol. 3 $49

Vol. 1 (50 pieces) $49 • Vol. 2 (50 pieces) $49 • Vol. 3 (60 pieces) $49

THE JAZZ SOLOIST™

The Jazz Soloist is a music program with professional jazz quartet arrangements. Each song features a great jazz solo played by top jazz musicians, as well as piano comping, bass & drums. Vol. 3 of the Soloist series features Latin, Blues, & Jazz Waltz stylings. Includes Jazz Soloist program with MIDI files, & also files in Band-in-a-Box format. Sight-reading was NEVER so much fun before the Jazz Soloist series! (NOTE: Mac users get on-screen-notation only when running the files in Band-in-a-Box. Volumes work together or as standalone programs.)

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

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 used in other programs or presentations*
- *Use your existing sound card or MIDI synthesizer*

Other products...

Multi MPU401 Driver for Windows 3.1 $19

Windows driver that allows 10 programs to use the MPU401 at the same time.

NEW! Now for MAC too!

SC-PRO Editor for Windows & Macintosh $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 Sound Canvas GM/GS SCM-15AT interal sound card $399

Full MPU401 interface with 354 total sounds, 9 drum sets, 28 voice polyphony & 16 parts. This is the ideal card for the musician. Free PowerTracks & SC-Pro included.

Roland Sound Canvas General MIDI SCM-10AT internal sound card $199

This card provides the 128 General MIDI sounds, 9 drum sets, 28 voice polyphony & 16 parts. No GS features or higher bank sounds. Full MPU401 interface. Free PowerTracks & SC-Pro included.

☎ PHONE ORDERS:

1-800-268-6272 or 604-475-2874

VISA/MC/AMEX/cheque/mo/po# Fax 604-475-2937 Recorded Demo 604-475-2954
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

RECORDING MUSICIAN

Optimum Gain Structure

Don't lose your sonic edge to mismanaged signal levels.

By Brian Knave

If you're like me, when you dream of upgrading your personal studio, hot new gear tops the wish list: condenser mics, tube preamps, digital effects processors, and so on. But in our enthusiasm for securing the latest and greatest from the technological front, we often overlook the importance of the basic audio-engineering techniques required to coax the best sounds from those hip devices. And sometimes, an "operational upgrade" can do more to improve the quality of your music productions than a bunch of shiny tech toys.

One critical but often misunderstood studio technique is the setting of optimum signal-gain levels. It may sound easy enough—after all, you just have to turn a few knobs, right?—but proper gain structuring can be tricky business. For starters, when a source sound is recorded to tape or disk, there ultimately may be a dozen or more level controls affecting the original input signal. Moreover, these controls work interdependently, with each stage affecting all those that follow in the signal path. To further complicate things, VU meters, indicators, and even operating levels can vary from mixer to mixer and signal processor to signal processor, making it risky to follow pat formulas.

The best approach to gain structuring is to break it down into four basic concepts: understanding the basic principles of gain staging, following the signal path, knowing the idiosyncrasies of each piece of gear in the audio chain, and listening carefully to make sure all the theory is actually working! Let's consider each approach and then look at some step-by-step procedures for setting optimal gain stages.

An 8-bus recording console like the Soundcraft Ghost has numerous gain stages, each with the capability of maximizing or sabotaging the integrity of audio signals.

BASIC PRINCIPLES

Gain stages are simply points in the signal path where you can boost a signal by means of a level control that governs an active circuit element (which is generally an op amp). Gain *structuring* involves setting the levels of those active stages as well as any other level controls (for example, faders or aux sends) that affect a signal.

Gimme a...

Compressor

The compressor in the 286A is a patented hybrid feed forward/feed-back design that was engineered by a guy named Bob Orban. (His stuff is used on almost every radio station on the face of the planet). Using the classic dbx VCA (the heart and soul of a compressor) the 286A compressor is very easy to use with its drive and density controls. Drive is the amount of signal sent into the compressor and the Density is a combination of controls that allow you to achieve anything from a nice transparent gain reduction all the way to a fat squashy compression so popular on heavy rock vocals. The 8 stage LED meter gives you a great visual indication of how much the compressor is working on your vocals or whatever else you may run through your 286A. Now's actually a good time to tell you that you're not stuck just using the 286A as a mic pre, it's got a line input so you can use the 286A's 5 processors on any of your audio: guitars, keyboards, drums - anything!

Expander/Gate

Background noise in the room, sound leakage from headphones, vocalist breathing etc. are all problems that can crop up while recording your vocals. These situations are all easily taken care of with the 286A's Expander/Gate. This multi-use design allows you to gate out any noise during breaks in the intended signal and when used as an expander, will push down any unwanted noise in the signal such as headphone bleed.

Enhancer

Another very cool device in the 286A is the Enhancer. The low frequency detail is a very tnck circuit that not only adds warm low end but fattens up the signal by cutting out some of the mud in the lower mid-band at the same time! The HF (high frequency) detail adds sparkle to your signal. Now if you're thinking that the sparkle that you add with the Enhancer is going to put back the high frequency sibilance the de-esser is taking out, think again. The two circuits are tied together in an ingenious (and patented) way such that they work in tandem to do both jobs beautifully!

De-esser

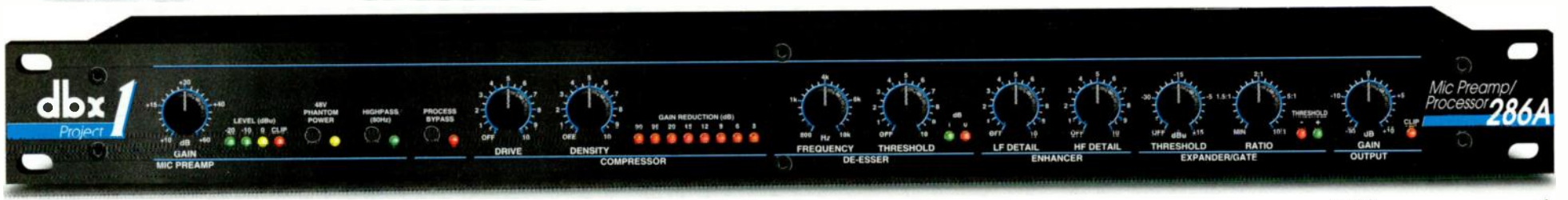
One of the biggest problems with processing vocals are those pesky "ssssssss" sounds. Our dbx de essers are in use in virtually every major recording studio in the world. The 286A's de esser (yet another patented dbx circuit) gives you a frequency control so you can pick out exactly the range where the de-esser will do its thing and a threshold control so you can control the amount of de-essing that will occur. Because of the unique design of this circuit the de-esser monitors the amount of signal coming in and adjusts itself you don't have to constantly change the set tings for different volume levels.

This unit is fully balanced for clean connections, has an internal power supply for reliable power without the wall wart, and knobs that click at each setting for accurately reproducible settings.

Oh... and a GREAT Mic Pre

The 286A utilizes a precision laser trimmed ultra low noise (0.95 nV /√Hz) circuit that translates to an Equivalent Input Noise spec of 128dBu and an extremely wide bandwidth of >200kHz. All this engineering jargon translates to a gorgeous mic pre-amp circuit that you can count on to sound warm, transparent and accurate. With a precise 48 volt phantom power supply built in, you can count on the 286A to work with all your professional standard microphones.

and I want it all in one box!



Better, faster, more, now - in one rack space. I want a Mic Pre to warm my vocals up, a Compressor to keep 'em tight, an Expander/Gate to keep 'em clean, an Enhancer to make 'em shine and a De-Esser to keep 'em natural.

And if I want, let me use the processors for my other gear and I want it all in one box... You got it. The dbx 286A gives you the flexibility and control you need to make your vocal tracks sizzle and your other tracks shine. Visit your local dbx dealer today for a test drive of all the processors in the dbx 286A or call us for more information.

dbx 1 Project

Save The Planet — It's The Only Market We've Got.

dbx Professional Products • 8760 South Sandy Parkway, Sandy UT 84070 • Phone (801) 568-7660 • FAX (801) 568-7662 • email: customer@dbxpro.com • URL: http://www.dbxpro.com
A Harman International Company

circle #520 on reader service card

The primary goal of gain structuring is to maximize signal levels while minimizing circuit noise. You want to prevent the console and other gear from adding audible noise to the source signal. In other words, we're after the highest possible signal-to-noise ratio at each stage. If you think of each gain stage as a little floodgate through which the signal flows, it's easy to see how an upstream gate that's slightly open may require the next gate to be flung wide open to allow enough signal to get through to the *next* gate. But one problem with a wide-open "audio gate" is that it can produce a poor signal-to-noise ratio. In extreme cases, the noise can be nearly as audible as the source signal. That's bad.

This is why fastidious recordists favor short signal paths. Obviously, the more circuits a signal passes through, the more noise it is liable to pick up along the way. Therefore, to produce a clean signal path, it's good practice to make sure that you're not running a signal through more circuits than are absolutely necessary. For example, if your console offers defeatable EQ (which means the input signal can be routed to bypass the EQ circuitry), you should always defeat the EQ section whenever tonal tweaks are not required.

To further illustrate how one gain stage can affect the next, let's consider a guitar amplifier equipped with two volume controls. The first volume knob controls the input preamp while the second—the master volume—controls the main output level. If you crank the preamp volume to ten but keep the master at one, the preamp will distort, but the low output setting will keep the overall volume at a soft level. On the other hand, if you set the preamp volume extremely low, you'll be forced to crank up the master volume to produce ample signal level. The resulting tone will be clean, but it may be marred by audible hiss from the "cranked" output stage.

The point of having two volume controls on a guitar amp is, of course, to offer a range of tones from clean to distorted at practically any volume level. However, when structuring gain in a recording system, we want to minimize noise. So how do you determine the best signal-to-noise ratio for a circuit? A practical rule of thumb is to avoid setting any gain stage to its lowest or highest extreme. Typically, an optimum level for each gain stage is 75 percent of its maximum output. At that level, the signal should be well above the noise floor and still offer ample headroom.

CHART THE FLOW

Knowing the signal path is fundamental to structuring gain. If you get confused, simply start at the source signal (mic, line, or tape) and visually follow the signal flow down the channel strip through each gain stage and level control. Be sure not to overlook signal diversions created by channel inserts, aux send/return loops, subgroups, patch bay connections, and other routing schemes.

When structuring gain, start at the top of the signal path (the source) and work your way down. However, when troubleshooting, always work backwards. That's because each upstream gain stage affects those below it—but not vice versa. By starting at the end of the signal path, you can locate and correct the problem stage without disturbing the correctly set stages above it. Of course, if it turns out that the first gain stage is the one causing the problem, you'll need to readjust all subsequent gain stages.

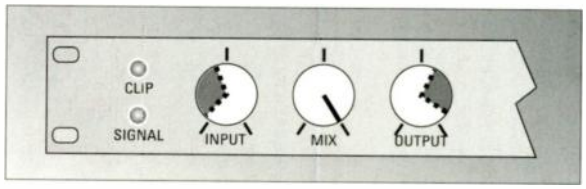


FIG. 1: This diagram depicts a typical range of level settings that might provide optimal gain structure for an effects processor used in an aux send/return loop. Note that the mix knob is set at 100 percent.

KNOW YOUR BOXES

It's important to be familiar with each device in the audio chain. Specifically, it helps to know the unit's behavior patterns: how its level controls work, how to read its meters and indicator lights, how far you can push the level controls before audible distortion occurs, and so on. Don't assume that a red light on one signal processor means the same thing as a red light on the next. For example, one unit's overload indicator may flash red when a signal is 6 dB below clipping whereas another may light up only when the signal actually distorts. In addition, the output stage on one device may be sparkling clean, allowing you to crank it wide open without adding noise to the signal whereas another unit's output may start hissing well before you reach the 75 percent mark.

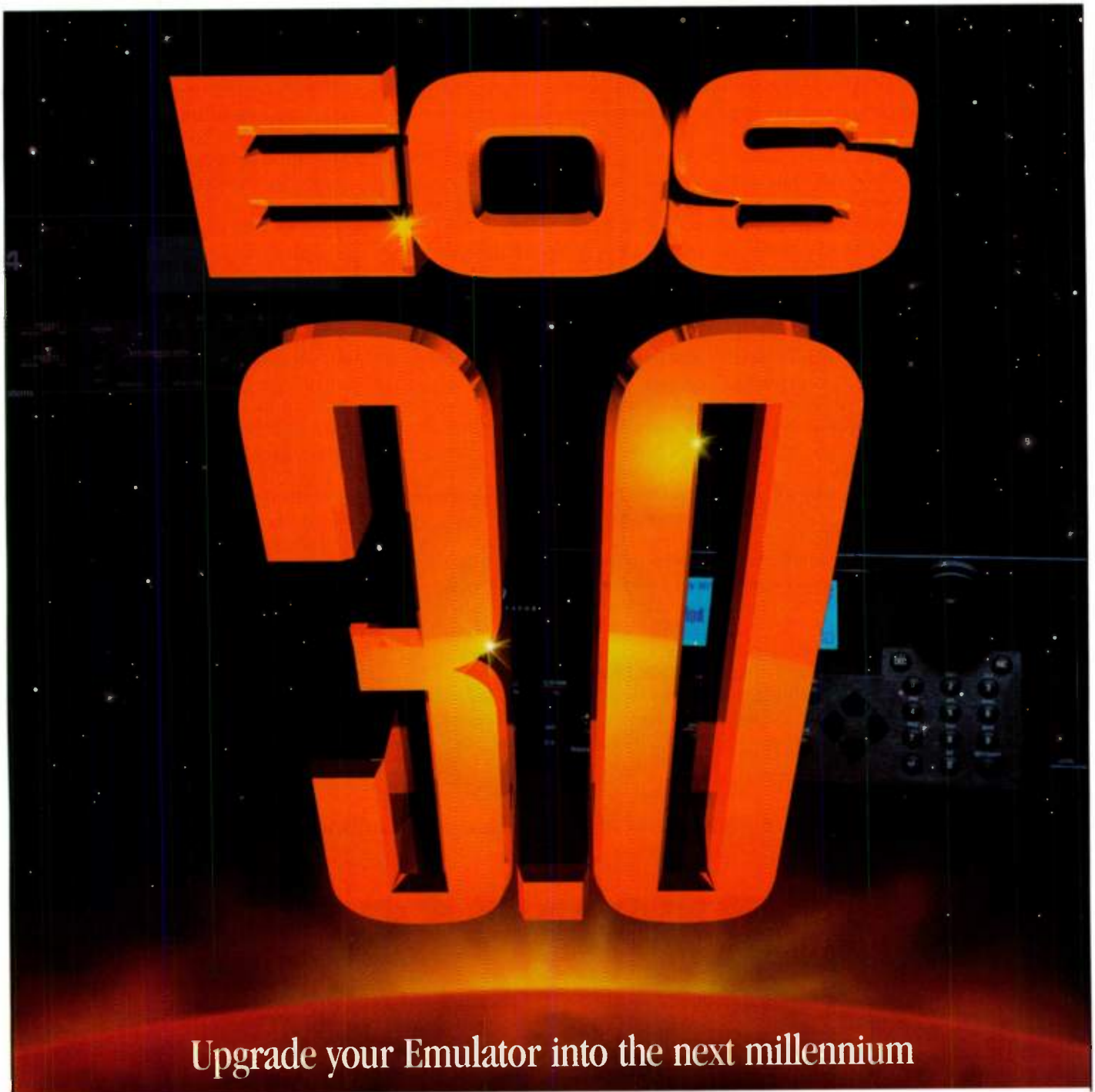
Also, keep in mind that digital and analog devices usually operate differently. Outputs on digital synths and sound modules, for example, are usually very quiet and may even deliver excellent performance at maximum output. (To be on the safe side, I generally set mine at 90 or 95 percent of the maximum level.) Output stages on analog synths, on the other hand, are generally much quicker to distort. Of course, a bit of output distortion on an analog synth patch may be just the sound you're looking for!

Remember, too, that digital recording decks are usually calibrated differently than analog decks. Although it is often acceptable to record in the red (above 0 dB) on an analog deck, the 0 dB mark on a digital recorder usually represents the unit's maximum peak level. To accommodate this difference, manufacturers of DAT recorders sometimes recommend calibrating 0 dB on your console meters to read -12 dB or -14 dB on the DAT deck.

Yet another factor that can radically affect gain structure is a unit's operating level. Obviously, connecting units with different operating levels can present gain-stage problems. For example, feeding a +4 dBu output signal into the input of a -10 dBV signal processor might distort the unit's input stage. Conversely, routing a -10 dBV output signal into a unit with a +4 dBu input may require cranking the input stage on the +4 dBu device until audible hiss results. The best-case scenario, of course, is keeping operating levels the same from one end of the signal path to the other. To help bridge the inevitable gaps, some signal-processors offer switchable or continuously variable operating levels. Knowing the operating levels of all your gear can help you trace, or even prevent, gain-stage problems.

TRUST YOUR EARS

As the main point of gain structuring is to create a noise-free signal path, it's vital you listen carefully to ascertain



Upgrade your Emulator into the next millennium

EOS 3.0 is a software upgrade that adds powerful new functionality to the full line of Emulator® products, featuring:

- 48-track, full-function workstation/sequencer
- Sound ROM support
- Sample flash memory support
- Advanced MIDI controller functions
- Support for computer-based preset editing and librarian functions (PC/Mac)
- Continued support for the EIV, e-64, E4K, E4X, E4X turbo, and e-6400

And if you **purchase any Emulator product** between January 1 and March 31, 1997—receive **EOS 3.0 FREE**.*

Along with EOS 3.0, E-mu® will introduce the 16 MB **E-Synth™ Sound ROM board** and 8 MB and 16 MB **sample flash memory boards.** The E-Synth is loaded with more than 700 new samples to turn your Emulator into a ROM synthesizer.

Prepare to create.

EMULATOR OPERATING SYSTEM

* When EOS 3.0 is released in April, 1997. Contact your local dealer for details.

E-MU **E-mu Systems, Inc.**

P.O. Box 660015, Scotts Valley, CA,
USA, 95067-0015 • Tel. (408) 438-1921
http://www.emu.com

© 1996 E-mu Systems, Inc. E-mu Systems, E-mu, the E-mu logo, and Emulator are registered trademarks of E-mu Systems, Inc. E-Synth is a trademark of E-mu Systems, Inc. All other trademarks are property of their respective owners.

circle #527 on reader service card

that each gain stage is clean. It's not enough to simply set each knob and fader at 75 percent and leave it at that. You should also audition different level settings to find out which combinations result in the quietest signal paths. Sometimes backing off of one level just a bit while boosting an adjacent one can result in a cleaner or more pleasing sound. To elaborate on what we've learned so far, let's look at step-by-step procedures for setting proper gain structures on three pieces of common recording gear: a mixer, an effects processor, and a dynamics processor.

CONSOLE PROTOCOL

The most important gain stage in a mixing console signal path is the first: the preamp trim level. This stage can apply more gain to the signal than any other in the audio chain, so a careful hand (and a sensitive ear) at this point is critical.

To set the trim, first zero all of the controls on the channel strip, and then raise the channel fader to its unity gain setting. (Unity gain means that the signal level going into the circuit equals the signal level coming out of the circuit; that is, there is no cut or boost. On most mixers, the unity-gain setting is about three-quarters of the way to the top of the fader path and is marked 0 dB.)

Now, while applying a mic or line signal to the channel input, turn the trim pot counterclockwise until the level meters regularly register 0 dB while the musician is playing at an average volume level. Have the musician play loud enough to hit a few peak signals, as well, to make sure these don't overload the board and cause distortion.

Generally, once the trim is properly set, you shouldn't have to alter it. For slight level adjustments while tracking, use the channel faders. However, you may want to readjust the trim if you do substantial boosting or cutting to the signal with the channel EQ section (because this, too, will alter the signal level).

IN THE LOOP

An aux send/return loop is a common way to use an effects processor, both for recording and mixing. Again, the trick is to follow the signal flow and work from top to bottom, maximizing each gain stage sequentially.

As always, begin the gain-structuring process with all level controls (aux sends and returns as well as the input and output on the effects unit) zeroed. The one exception is when the unit has a Mix knob; this knob should be set at 100 percent wet. Likewise, when the unit has an internally adjustable mix parameter, set that to 100 percent unless a particular patch specifies otherwise.

Now, set both the channel strip's aux send and the console's aux send master to unity gain (usually straight up). As the input signal hits the box of choice, adjust the signal processor's input-level control until the meters or indicator lights show a sufficiently robust signal. Typically, this will be between 10 and 50 percent of the knob's rotation (see **Fig. 1**). Of course, the means for gauging optimal levels varies from box to box, so be sure to consult the manual. No matter who makes the box, though, you'll get the best signal-to-noise ratio by driving the input stage to a point just below clipping.

Sequencing
Performer
Vision
Cubase
Cakewalk
Metro
Mastertracks Pro
Notator Logic
Musicator
Drummer

MIDI Editors
Galaxy
Unisyn
EditOne
MAX

Notation
Nightingale
MIDISCAN
Mosaic
Musicshop
Music Printer Plus
Finale
Encore
Musictime
Allegro

Educational
Song Works
Rhythm Ace
Play it by Ear
Note Play
Listen
Practica Musica
Music Lessons
Jazz Improvisation

Are you confused about MIDI and music software?

Computers & Music™

We aren't.

1-800-767-6161
http://www.computersandmusic.com

647 Mission St
San Francisco
CA 94105

Serving Performers, Educators, Composers, Programmers, and Sound Designers since 1982

Digital Recording
Audiomedia II
Sound Tools II
Session 8
Hyperprism
Samplecell II
Digital Performer
Cubase Audio
Studiovision
Deck
DINR
Infinity
Time Bandit
Turbosynth

MIDI Interfaces
Translator
PC MIDI Card
MIDI Time Piece
Studio 2-3-4-5
MIDI Express
MQX
Midiator
Dual Port SE

General MIDI
Emu SoundEngine
Roland SC7
Roland Rap 10
Roland SCC1
Roland SC33
General MIDI Files
Band in a Box
Jammer Pro
Pianist
Guitarist

NOW FEATURING FATAR CONTROLLERS

Send for our 88 page Catalog

circle #517 on reader service card

Audiobahn

master port
THE Audio Card

The ideal choice when searching for a card for your MIDI / Audio sequencer. An unmatched value; 4 In / 4 Out tripleDAT hardware, MIDI interface w/full chase-lock sync, S/PDIF, optical, and superb analog to digital converters. Complete with Windows 3.1x or Win95 multimedia drivers, MasterPort allows you to use your sequencer to its fullest - both for audio and MIDI. PLUS! MasterPort includes professional 16 track (stereo or mono) production software with auto-mixing, high-powered editing, a suite of 80-bit DSP modules and realtime EQ. You can upgrade to tripleDAT at any time! $995.00 US MSRP introductory price

$995.00

triple DAT

The complete solution CreamWare's MasterPort hardware combined with our powerhouse hard disk multitrack production & mastering software. 4 channels of I/O, 6 to 16 stereo or mono tracks of simultaneous playback (or more, depending on your PC) , 256 virtual tracks, mixer, realtime volume/panning/fades & crossfades, with volume and pan automation, multiple realtime 80-bit DSP effects modules, loop, scrub, reverse, normalize, peak search, multiple on-the-fly marker options, powerful editing, one button mix-down, chase-lock & master sync, infrared DAT control, mastering to DAT and Red Book CD Writing (within the multitrack window!). All this plus optional plug-ins ... More than 7,000 users already relying on tripleDAT as their system of choice. tripleDAT drives your production home. $1,798.00 US MSRP

$1,798.00

Digital Audio Hard Disk Production Systems

www.creamware.com sales: 1(800) 899-1939

creamw@re©
fidelity at work.

CreamWare US Inc., USA: 446 Harrison St., Sumas, WA 98295 Tel: (604) 527-9924 Fax: (604) 527-9934, Canada: 104 - 822 Richmond St. W., Toronto, Ont. M6J 1C9, Tel: (416) 504-2764 Fax: (416) 504-3624
CreamWare GmbH, Siegburg, Germany, CreamWare UK Ltd, Liphook, Hampshire, UK

circle #518 on reader service card

FIG. 2: To structure gain through a dynamics processor such as the Aphex 661 tube compressor/limiter, the output control is typically used to add an amount of make-up gain equivalent to the amount lost to gain reduction.

Next, set the unit's output-level control as high as it will go until you hear unwanted noise and then back it off a bit. The best setting is usually between 65 and 100 percent, depending on the unit you use. Once you have determined an optimal output-level setting, try turning up the aux *return* master to unity. If too much signal returns, gradually back off of each level—the aux return and the output level on the box—until you hear the desired amount of effect. The point is to find the balance between these two stages that leaves you with sufficient up and down range on the aux return control.

MAKING UP IS EASY TO DO

Dynamics processors are typically included in the signal path via channel insert points. The insert points come after the trim pots but usually before the EQ section, aux sends, and channel faders. The basic trick to setting the gain structure on a dynamics processor is to use the output control to compensate for any signal level lost to gain reduction (see **Fig. 2**). Applying "make-up gain" is easy as long as the unit features meters for both gain reduction and output levels. For example, if the gain reduction is 10 dB, you simply set the output level control to +10 dB. That way, the signal continues down the channel strip at the same level you dialed in at the first gain stage. If the unit doesn't have level meters, you just have to use your ears.

Also, consult the unit's manual to learn its clip point. Then, try pushing a signal past that point and listen to the results. Some models offer extreme headroom above 0 dB and function best when being driven hard; others clip at the first glimmer of red.

END OF PATH

Ultimately, gain structuring is a balancing act. Though the primary goal is to maximize signals and minimize noise, we also want to create a balanced signal path that offers ample "tweakability" and creative control. By keeping each level maximized but also near unity gain, we can maintain clean sound *and* provide sufficient room to safely increase levels, if needed.

The key to proper gain structuring is to proceed step by step, maximizing each gain stage while listening carefully to the result. If you detect noise at any stage, strive to eliminate it before moving to the next stage. But if maximizing one gain stage leaves no elbow room at the next, you may need to compromise somewhere along the signal path. It's all about balance.

Assistant Editor **Brian Knave** *wishes it were as simple as turning a few knobs to gain some structure in his life.*

Multimedia Hot Tip!

Put our MIDI where your mouse is!

The sure bet desktop combo!... Connect the new FATAR CMS-61 MIDI Keyboard Controller with your sound card for a fantastic 61-note Keyboard/Computer Music Station!

Plug in a MIDI Sound Card, plug the FATAR CMS-61 into your computer's MIDI jack, and add any sound module - than play and program like you never did before! Compare this compact, versatile ***61 full size key*** controller to anything you've ever seen or touched. ***No other controller on the market has the features of the CMS-61...***you can bet on it!

■ 61 Velocity Sensitive Keys ■ Two Parallel MIDI Outputs
■ Sustain Input Jack ■ Volume Input Jack
■ Pitch Bend Wheel & Programmable Wheel
■ Program Change, MIDI Channel Assignment, Transpose
■ Programmable Wheel Includes Volume, Pan, Aftertouch, Pitch & Modulation
■ External Adapter 9V DC500mA Included

FATAR

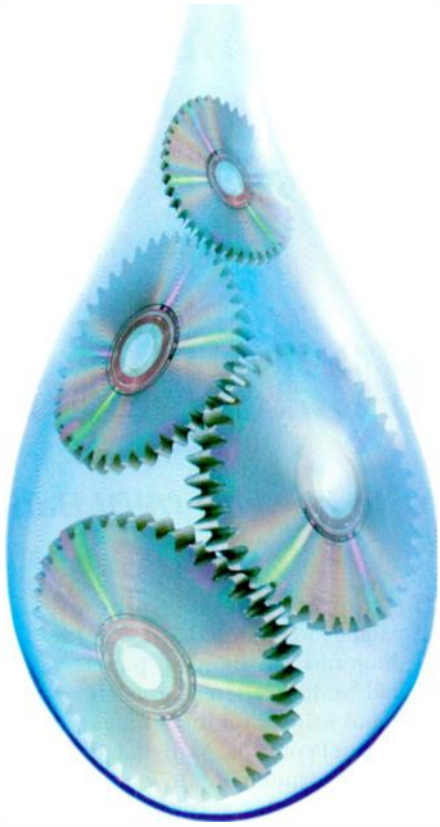
Exclusively Distributed in the U.S.A by
MUSIC INDUSTRIES CORP.
99 Tulip Avenue, Floral Park, NY 11001
(516) 352-4110 • FAX: (516) 352-0754

(Computer monitor, terminal & speakers not included.)

In the U.S. only, send $2.00 for a complete FATAR Keyboard full color catalog or $5.00 for a CD-ROM interactive product demo.

circle #533 on reader service card

©1996 TDK and the TDK logo are registered trademarks of The TDK Electronics Corporation.



INTRODUCING A LINE OF RECORDABLE MEDIA FOR PERFECTIONISTS. THE TDK PRO LINE. IT'S **PURE PRECISION.** BECAUSE EVERY FORMAT, EVERY LENGTH, EVERY GRADE IS 100% SPECIFICATION GUARANTEED. FOR YOUR FINEST WORK. IT'S MORE INNOVATION FROM THE PEOPLE THINKING ABOUT WHAT YOU DO, AND THE TOOLS YOU NEED TO GET AHEAD. FROM THE COMPANY THAT'S TAKING PROFESSIONAL RECORDING FAST FORWARD.

For more information on our complete line of recording products, please call 1-800-TDK-TAPE or check out our site on the World Wide Web.

TDK

http://www.tdk.com

circle #590 on reader service card

Selecting the Right Bank

Banking the way it ought to be with MIDI Bank Select.

By Scott Wilkinson

In the early days of synthesizers, patches were stored as hand-drawn diagrams on sheets of paper. You had to draw where the patch cords went and write down the settings of the front-panel controls. As digital technology was incorporated into synths, these connections and settings could be stored in computer memory.

By the time MIDI was introduced, most synths had enough memory for no more than 64 patches, and you could recall these patches remotely by sending Program Change messages from another device. The Program Change message can call up 128 different patches, which was deemed sufficient at the time.

Of course, the 128-patch limit was exceeded shortly thereafter, and now synths have enough memory for hundreds or even thousands of sounds. However, Program Change messages can address only 128 of them, so a way around this limitation had to be found.

DAVE EMBER

BASIC BANKING

The solution adopted by the MIDI Manufacturers Association was to organize patches into banks of up to 128 and add two new messages to the MIDI Control Change (CC) list. These messages are the *Bank Select Most Significant Byte* (MSB) and *Least Significant Byte* (LSB). To select a patch in a modern synthesizer via MIDI from a controller or computer, you first specify the bank by sending the appropriate Bank Select messages. Once the bank has been selected, you send a Program Change to select the desired patch within that bank.

Bank Select MSB is defined as CC 0. Like all CC messages, its value ranges from 0 to 127. Bank Select LSB is CC 32; its value also ranges from 0 to 127. Used together, they can address 128 × 128 = 16,384 different banks. Each bank consists of up to 128 patches, so when using Bank Select and Program Change together, you can address a total of 16,384 × 128 = 2,097,152 separate patches, which should be more than sufficient for a while.

AKAI professional

the new MPC

The latest generation of the legendary MPC family, featuring:

- 32-voice, 16-bit Akai stereo sampling engine
- 2MB RAM expandable to 32MB with SIMMs
- 16MB Flash ROM capacity
- 64-track sequencer with 100,000 note capacity
- New easy-to-use graphic interface
- Large 248x60 LCD featuring graphic waveform editing
- Standard SCSI interface
- Polyphonic and monophonic playback modes
- Beat Loop function for perfectly sync'd rhythm loops
- 16 velocity- and pressure-sensitive drum pads
- MIDI clock/MTC/MMC
- Compatible with E-mu and Roland sample libraries*
- Note Variation slider for control of level, pitch, attack, decay or filter

Options

- Multi-8/Dm expancer increases outputs from 2 to 10, plus S/PDIF digital I/O $299
- SampleVerb 4-bus effects processor* $399
- SMPTE reader/generator* $299

$1499 MSRP

*to be supported in v1.3 O/S software

half the calories all the phat

AKAI MUSICAL INSTRUMENT CORPORATION
1316 East Lancaster Avenue, Fort Worth, Texas 76102
phone: 817 336 5114 fax: 817 870 1271 email: akaiusa@ix.netcom.com
http://www.akai.com/akaipro

In Canada contact: Power Music Marketing 3349 Bloor St. W. #24, Toronto, Ontario M8X 1E9
phone: 416 234 1226 Fax: 416 234 0824

circle #502 on reader service card

The first 32 CC messages (and a few others) include an MSB and LSB, but most products only use the MSB. For example, most products only use the MSB (CC 7) of MIDI Volume, although there is a Volume LSB (CC 39). As a result, most manufacturers assume that only the MSB will be used for Control Changes.

However, Bank Select is not a normal Control Change. The MIDI spec states that "the transmitter must transmit the MSB and LSB as a pair, and the Program Change must be sent immediately after the Bank Select pair." Nevertheless, many manufacturers use only the MSB or LSB to select banks. This accommodates 128 banks, or a total of 16,384 patches, which is still sufficient for most applications, but it gives rise to much confusion.

The spec also states that the receiving synth must wait to change patches until it receives a Program Change; Bank Select alone should not change the patch. The receiver must remember the Bank Select message in preparation for the following Program Change to ensure that if you send Bank Select and Program Change messages to multiple devices, they will change their patches simultaneously.

In addition to single patches, most synthesizers also include banks of multitimbral combinations that each contain several patches, which provide layers and splits as well as multitrack sequence setups. Some synths also include separate banks of drum kits and/or sound effects (such as door slams, car engines, and screams). Bank Select can often be used to call up these banks. In some cases, the same Bank Select values are used to select a given bank of patches and a bank of combinations, which means you must enter the desired mode (Program, Combination, etc.) from the front panel and then send Bank Select and Program Change messages. In other cases, different Bank Select values are used for these banks so you can send them regardless of the mode selected on the front panel.

Once you have sent a Bank Select message, you normally don't need to send it again unless you want to change banks. You can simply send Program Changes to select different items within the current bank. If you are programming a sequencer to send Bank Select and Program Change messages, include a few clock ticks between each message to give the receiving synth time to digest it.

Depending on how your controller, sequencer, and sound module specify MIDI codes, you might need to convert between decimal and hexadecimal to determine the correct Bank Select value. Unfortunately, most manuals are woefully inconsistent in this regard. Certain calculators, such as the Casio fx-115D, perform this conversion; I recommend getting one for this reason alone. (For more on hexadecimal, see "From The Top: SysEx Hex" in the January 1994 **EM**.) For our purposes here, I'll stick with decimal numbers.

If you have a relatively recent keyboard synth, selecting patches from the front panel normally sends the appropriate Bank Select and Program Change to the instrument's MIDI Out. (This capability can often be enabled and disabled.) The exact nature of the transmitted Bank Select message usually corresponds to how the instrument responds to incoming Bank Select changes. Each manufacturer implements Bank Select differently, so let's take a look at several examples.

Alesis, Ensoniq, and Kawai Bank Select Messages

Alesis QS MSB Value	Selected Bank
0	User (RAM)
1	Preset 1 (ROM)
2	Preset 2 (ROM)
3	Preset 3 (ROM)
4	Preset 4 (ROM)
5–12	Card 1 Banks 1–8
13–14	Card 2 Banks 1–2 (QS7, QS8 only)
Ensoniq KT Sound Mode LSB Value	**Selected Bank**
0	Internal RAM
1	Internal ROM
2	Card A
3	Card B
Ensoniq KT Multi Mode LSB Value	**Selected Bank**
10	Internal RAM
11	Internal ROM
12	Card A
13	Card B
Kawai K5000W MSB Value	**Selected Bank**
0	GM
99	B (Programs 103–116 only)
100	A
101	C

ALESIS

The Alesis QS-series keyboard synths include four preset ROM banks and one user RAM bank onboard, and an optional memory card can hold up to eight more banks. (The QS7 and QS8 provide two card slots, and each card can hold up to eight banks.) Each bank includes 128 Programs and 100 Mixes (multitimbral combinations), and Program Change selects either Programs or Mixes, depending on the instrument's current mode.

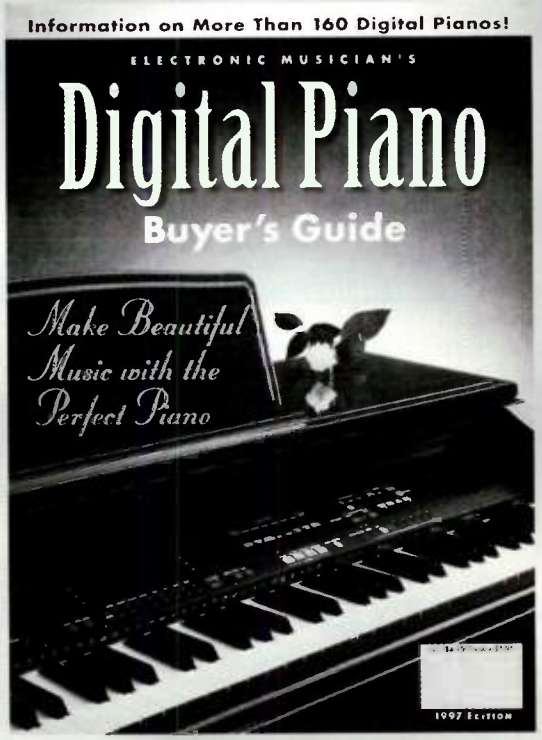
The QS series uses Bank Select MSB (CC 0) to select a bank via MIDI (see the table "Alesis, Ensoniq, and Kawai Bank Select Messages"). In the QS6, values above 12 "wrap around"; for example, a value of 13 selects the onboard User bank, a value of 14 selects Preset bank 1, etc. In the QS7 and QS8, only two banks in the second card are available for remote selection; these banks use MSB values of 13 and 14, and values of 15 or higher wrap around.

When Is a Piano More Than a Piano?

Today's digital pianos give you everything you'd demand from a fine acoustic piano— and more!

In addition to sound and feel that compare with acoustic models, the new digital pianos offer more: MIDI capabilities, portability, headphone compatability, and even built-in educational help. They're great for professional or home performance and recording—and best of all, they never need tuning.

Electronic Musician's 1997 ***Digital Piano Buyer's Guide*** is filled with information about this year's upright, grand and portable digital pianos and acoustic MIDI pianos, including comparative charts and advice on choosing the right keyboard for your musical needs. You'll find information on:



- Grands, Uprights & Portables
- Setting Up & Accessorizing
- Easy Computer Connections
- Sequencing & Notation Basics
- Fun Educational Software
- Exploring music on the Internet

The 1997 ***Digital Piano Buyer's Guide*** is the only complete guide to the new digital pianos. Call toll-free today to order your copy!

NOW ONLINE! http://www.dpbg.com

To Order, Call Toll-Free: (800) 233-9604

SPECIAL OFFER FOR EM READERS: Mention this ad when you order the *1997 Digital Piano Buyer's Guide* through Mix Bookshelf and pay only $4.95 per copy—we'll cover all shipping & handling costs! Call (800) 233-9604 or write to: Mix Bookshelf, c/o Whitehurst and Clark, Inc., 100 Newfield Avenue, Edison, NJ 08837-3817

Electronic Musician

E-MU

E-mu makes many sound modules and samplers that include more than 128 programs. For example, the Orbit and Proteus FX modules include four banks of 128 programs (called Presets) each. Banks 0 and 1 are in user RAM, and banks 2 and 3 are ROM based. The Morpheus and UltraProteus include three onboard banks and two additional banks on an optional memory card. In these modules, bank 0 consists of Presets in RAM, bank 1 includes Presets in ROM, and bank 2 stores multitimbral constructs called Hyperpresets in RAM. Hyperpresets are collections of up to sixteen layered and split Presets per MIDI channel. Bank 3 stores Presets on a memory card, and bank 4 stores Hyperpresets on the card.

The engineers at E-mu decided to follow the MIDI spec to the letter, so all E-mu products use Bank Select MSB and LSB. An MSB value of 0 is followed by an LSB value from 0 to 4 to select the corresponding bank. If the device receives an LSB without an MSB, it assumes the value of the last received MSB. As a result, it is possible to send just the LSB after an initial MSB with value 0. However, E-mu doesn't guarantee the unit's behavior if you don't follow the MIDI spec completely. If you send a Bank Select value higher than the device can accommodate, it assumes the highest possible value.

ENSONIQ

The Ensoniq KT76 and KT88 keyboard synths include one ROM bank and one RAM bank, and an optional memory card holds two more RAM banks. Each bank consists of 80 patches (called Sounds) and twenty drum kits (called Drum Sounds). Bank Select LSB (CC 32) is used to select these banks (see the table "Alesis, Ensoniq, and Kawai Bank Select Messages"). As in most synths, when you select a Sound with a Program Change, its associated effect is called up, as well.

In Multi (sequencer) mode, Bank Select LSB is used to select a bank from which to get a Sound for a sequencer track. In this case, the effect associated with the selected Sound is installed as the new sequence effect. You can select a Sound in Multi mode without its effect by using the Bank Select messages for Sound mode.

The KT series also includes a GM bank, but you must enter GM mode by pressing a front-panel button or by sending a GM On SysEx message. Once the KT is in GM mode, any MSB value from 0 to 126 selects the GM bank, and the LSB is ignored. An MSB value of 127 selects a variation of the GM Program Change map that corresponds to the patch map found in the Roland MT-32, a popular multitimbral sound module that was introduced before

Korg, Roland, and Technics Bank Select Messages

Korg 0/X/N Series MSB Value	LSB Value	Selected Bank
0	0	A
0	1	B
0	2	C
0	3	D
56	0	GM
62	0	GM Drums
Korg Trinity MSB Value	**LSB Value**	**Selected Bank**
0	0	A
0	1	B
0	2	C
0	3	D
0	4	S
Korg i Series MSB Value	**LSB Value**	**Selected Bank**
0	0	A/B (A11–B88)
0	1	C/D (C11–D88)
0	2	Drum
Roland JV-1080 MSB Value	**LSB Value**	**Selected Bank**
80	0	User
81	0	Preset A
81	1	Preset B
81	2	Preset C
81	3	Preset D (GM)
82	0	RAM Card
83	0	ROM Card
84	0	Expansion A (1–128)
84	1	Expansion A (129–256)
84	2	Expansion B (1–128)
84	3	Expansion B (129–256)
84	4	Expansion C (1–128)
84	5	Expansion C (129–256)
84	6	Expansion D (1–128)
84	7	Expansion D (129–256)
Technics SX-WSA1 MSB Value	**LSB Value**	**Selected Bank**
0	0	ROM 1
0	16	ROM 2
1	0	User 1
1	16	User 2
2	0	Ext (Expansion Board)
3	16	Remap 1
3	32	Remap 2
3	48	Remap 3
4	0	Drum (ROM)
5	0	Drum (User 1)
5	16	Drum (User 2)

General MIDI was adopted. To exit GM mode, you must press a front-panel button or send a GM Off SysEx message.

KAWAI

Kawai has just introduced a new synth, the K5000W, that includes two separate sound engines: PCM sample playback and additive synthesis. The onboard memory includes three banks of programs and one bank of multitimbral combinations. Bank A includes 128 additive programs in RAM, and bank B stores 128 PCM programs (including twelve drum kits). Of these programs, 47 are user-programmable (including one drum kit); the others are in ROM. Bank G is a GM bank in ROM, and bank C has 64 multitimbral combinations, which are in RAM.

The K5000W uses Bank Select MSB only (see the table "Alesis, Ensoniq, and Kawai Bank Select Messages"). As you can see in the table, an MSB value of 99 selects the RAM locations 103 to 116 in bank B; other RAM locations in this bank are selected with MSB values from 1 to 9 depending on the exact memory location you want. The ROM locations in bank B are also accessed by sending different MSB values, depending on the location. This allows the programs and banks to conform to the Roland GS standard for Bank Select and Program Change messages.

KORG

The synths from Korg can be organized into three main families. The first family includes the 0-series modules (03R/W and 05R/W), X series (X3, etc.), and the new N series (N364, etc.). These synths all have a GM bank in ROM. The 0 series also has two user RAM banks, called A and B. The X series includes one or more user RAM banks (depending on the specific model) in addition to the GM bank. The N series offers A and B RAM banks as well as C, D, and GM ROM banks. Banks A through D include 100 Programs and 100 multitimbral Combis each, and the GM bank offers the normal 128 Programs.

Both MSB and LSB are used to select a bank. However, this doesn't work quite as you might expect, as you can see in the table "Korg, Roland, and Technics Bank Select Messages." In addition, you can use Bank Select to disable any Multi (multitimbral) track: an MSB value of 58 followed by an LSB value of 0 followed by any Program Change disables the track on that channel. Send any other Bank Select and Program Change messages to turn the track back on.

The second family of Korg synths includes various versions of the Trinity. The basic Trinity includes two banks, A and B, both of which are RAM banks. Two more user banks, C and D, come with the flash ROM option (officially known as PBS-TRI). The Solo Synth option, which adds a Prophecy synth to the sound engine, includes its own S bank. In the Trinity, each bank includes 128 Programs and 128 Combis; the S bank provides an additional 64 Programs (128 with the PBS-TRI option). The Trinity uses both MSB and LSB to select banks.

▼

Using Bank Select, you can address 2,097,152 separate patches.

The third family of Korg instruments includes the i-series instruments, which provide four banks, each with 64 Programs plus eight drum kits. As in other Korg instruments, the banks are labeled A, B, C, and D. However, the Programs are numbered to indicate bank and program, i.e., 11 to 18, 21 to 28, and so on to 88. Banks A, B, and C are in ROM, whereas bank D is in RAM. Both MSB and LSB are used to select banks in the i series.

KURZWEIL

The Kurzweil K2000 and K2500 offer perhaps the greatest number of onboard memory locations in any synth. Ten banks (called the 0s, 100s, 200s, and so on up to the 900s) each include 100 Programs, 100 multitimbral Setups, and 20 Quick Access (QA) banks. (The 0s bank includes 75 QA banks.) QA banks each include up to 10 Programs and/or Setups from any main bank. The 0s and 100s main banks are in ROM; if you have either or both of the expansion boards installed, each one replaces one of the RAM banks with ROM Programs, Setups, and QA banks. Even so, this leaves hundreds of memory locations for user sounds.

These instruments also provide an extremely flexible means of calling up Programs, Setups, and QA banks remotely, including several Kurzweil-specific methods that address the older K1200/K1000 and QA banks. Extended Program Change mode supports normal Bank Select procedures, and you can configure the synth to respond to either MSB or LSB alone or both MSB and LSB together.

Bank Select values from 0 to 9 select the corresponding bank as you would expect, and values from 10 to 127 are ignored. However, Kurzweil provides an alternative to using Bank Select; you can also use Program Change messages to change banks because each bank holds 100 items, not 128. In this approach, Program Changes 100 to 109 select the corresponding bank; for example, if you send a Program Change of 100, the 0s bank is selected. Program Changes 110 to 127 are ignored.

ROLAND

The Roland Sound Canvas has become one of the most popular GM sound modules on the market. Like its predecessors, the current model (SC-88) implements Roland's GS superset of General MIDI and provides a total of 654 programs (Patches) and 24 drum kits. The basic 128 GM sounds are called Capital Tones, and they are located in bank 0. Most of the Capital Tones include several variations in different banks.

The Sound Canvas uses MSB to select banks. The specific value to use depends on the desired Capital Tone and variation; each variation uses a different Bank Select MSB in conjunction with the Program Change of the corresponding Capital Tone. For example, the "Tubular Bell" Capital Tone corresponds to Program Change 15. To call up this Patch, send an MSB value of 0 followed by a Program Change value of 15. If you send an MSB value of 8 followed by a Program Change value of 15, you get "Church Bell," which is a variation of "Tubular Bell." If you send an MSB value of 9 followed by a Program Change value of 15, you get "Carillon."

The JV-1080 synth module provides four ROM banks (including one GM bank) and one user RAM bank onboard. Each bank includes 128 Patches and two drum kits. In addition, the user RAM bank and two of the ROM banks

Sell More CDs!

You're making a significant investment in recording and manufacturing CDs. Do you want to risk your musical career with just any company offering CD services? Expect more from the industry leader thousands of independent musicians turn to every year. Here are a few ways we'll help you:

Look better – Our award-winning graphic design gives you the major-label look that demands attention from consumers and A&R reps.

Sound hotter – Expert SoundLab™ engineers use state-of-the-art mastering equipment to get your master tape ready for airplay.

Spend wiser – One simple package price includes everything you need: design, art proofs, all film and printing, and a Proof Positive® Reference CD.

Move faster – *Never miss another release date!* With our Express service, your CDs are ready in as little as two weeks – cassettes in just one week!

Sell more – You'll always stay a step ahead with the helpful tips and info in our free newsletters, booklets, distributor directory, and Web site. Plus, our top quality posters, post cards, stickers, retail displays, and radio mailings help you promote your release when it's ready.

Sleep easier – Our money-back guarantee is ironclad, and our product experts provide the best personal attention in the business. So you can relax in the knowledge that your project is being made to your satisfaction.

SOUND BETTER. LOOK BETTER. EXPECT MORE. **DISC MAKERS**

Ready to make CDs?

Call today for your FREE full color catalog:

1-800-468-9353

24 HOURS TOLL FREE

Outside USA call 609-663-9030; FAX 609-661-3458

http://www.discmakers.com

DISC MAKERS

AMERICA'S #1 MANUFACTURER FOR THE INDEPENDENT MUSIC INDUSTRY

circle #522 on reader service card

AVL0197-6

Yamaha MU80 A/D Bank Select Messages

MSB Value	LSB Value	Selected Input Level
0	0	Mic
0	1	Instrument (Guitar)
0	2	Line (Keyboard)
0	3	Stereo (line-level inputs panned hard right and left)

each include 32 multitimbral Performances. You can also install up to four expansion boards, each offering two ROM banks of up to 128 Patches; some of these boards also include a few drum kits. Finally, you can insert one RAM card and one ROM card. The RAM card duplicates the onboard user RAM bank (128 Patches, 32 Performances, two drum kits), and the available ROM cards include new samples and up to 63 Patches each.

This synth uses both MSB and LSB to select banks (see the table "Korg, Roland, and Technics Bank Select Messages"). If the instrument is in Performance mode (which is activated by pressing a front-panel button or sending SysEx), one channel is reserved for selecting banks and specific Performances via MIDI; the other channels can be used to select Patches within a Performance. In Patch mode, any of the sixteen channels can be used to select Patches.

TECHNICS

Technics' first professional synth is the SX-WSA1, which includes two ROM banks and two user RAM banks, each with 128 patches (called Sounds). (An editable GM bank is derived from Sounds in the other banks.) Optional expansion boards each hold a bank of 128 additional Sounds. In addition, one of the ROM banks and one of the RAM banks each include 128 multitimbral Combis. There is one bank of sixteen drum kits in ROM, and the RAM banks include two drum kits each. All Sounds, Combis, and drum kits can be remapped to different Program Change numbers in one of three Remap banks.

The WSA1 uses both MSB and LSB to select banks (see the table "Korg, Roland, and Technics Bank Select Messages"). Unfortunately, the manual provides the composite Bank Select number for each bank. For example, the Bank Select value for the User 2 bank is given as 144, which translates to MSB and LSB values of 1 and 16.

YAMAHA

Yamaha's MU80 is another entrant in the high-end GM sound-module sweepstakes. The company's superset of GM is called XG, which includes many enhancements to the GM architecture. The MU80 includes 729 patches (called Voices), nine drum kits, and two banks of sound effects.

Bank 0 is the standard GM sound set. Yamaha calls this the Capital bank, which is surprisingly similar to Roland's nomenclature. The MU80's other banks include variations of the basic sounds, which also resemble the the architecture of the Sound Canvas. Unlike the Sound Canvas' banks, though, these banks are organized by the character of the variations they contain (bright, slow attack, resonant, single-element, etc.).

The MU80 can also operate in TG 300B mode, which is identical to the B mode from the company's earlier TG 300 sound module. The TG300's primary (A) mode evolved into XG, while the module's secondary (B) mode was more or less compatible with Roland's GS standard. The MU80's TG300B mode retains this GS compatibility, offering eight drum kits and two sound-effects banks. In C/M mode, the MU80 emulates the Roland CM-32 computer-card sound module, which was essentially compatible with the MT-32. This mode provides a single bank of 128 Voices and one drum kit.

A separate sound effects (SFX) bank holds 49 special effects, such as a door slam, car engine, scream, and explosion. This bank is intended for game developers and audio post-production. Finally, there are 64 multitimbral Performances in ROM and 128 user (Internal) Performances in RAM.

The MU80 uses both MSB and LSB for selecting banks. In XG mode, the normal Voice banks are selected by sending an MSB value of 0 followed by an LSB value that corresponds to the desired bank and a Program Change to select the Voice. Drum kits are selected by sending an MSB of 126 or 127 followed by a Program Change.

One interesting feature of the MU80 is its set of two audio inputs, which are called A/D inputs because they digitize the analog input signals, send them through the effects, and mix them with the module's internal sounds. These inputs are assigned to MIDI channels, and MIDI messages can be used to control various aspects of their operation. In particular, Bank Select can be used to configure the A/D inputs for various signal levels (see the table "Yamaha MU80 A/D Bank Select Messages"). Once the input level is selected, Program Change messages select different preset effects that are applied to the signal.

In TG300B (GS) mode, the functions of MSB and LSB are reversed. The LSB value is 0, and the MSB selects the bank. The TG300B drum kits do not use Bank Select; drums are always on channel 10 in the GS standard, so a Program Change is sufficient to select different drum kits. An MSB value of 64 selects the separate SFX bank. (TG 300B mode has no Voice bank with an MSB of 64.)

To select Performances, an MSB value of 1 followed by an LSB value of 0 selects the Preset (ROM) bank, and an MSB value of 2 and LSB value of 0 selects the Internal (RAM) bank of Performances.

WITHDRAWAL

As you can see, using Bank Select is not as straightforward as it could be. Unfortunately, manufacturers implement this important message in slightly different ways, making it difficult to manage patches in a complex system. Nevertheless, with a little knowledge, you can use Bank Select to call up virtually any sound in any synth in your studio from a computer or controller, which sure beats selecting banks and patches manually from the front panels of the different instruments.

EM *Technical Editor* **Scott Wilkinson** *uses Bank Select MSB with the K2000 and K2500.*

SERVICE CLINIC

Questions and Answers

ADAT transports, K1000 modules, and a hot TIP on Motorola parts

By Alan Gary Campbell

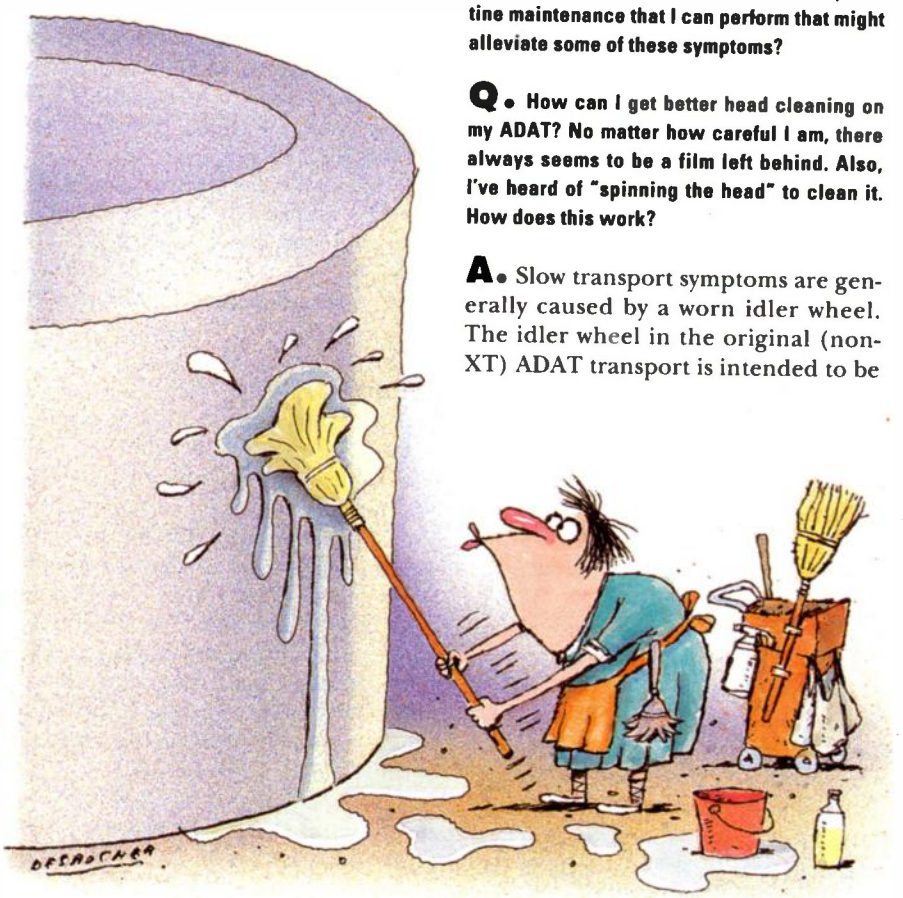
Q. I have an Alesis ADAT with about 1,200 drum hours on it. Recently, the unit has begun to search and rewind slowly, and occasionally it stops playing for no apparent reason. I have no authorized service center for hundreds of miles! Is there any routine maintenance that I can perform that might alleviate some of these symptoms?

Q. How can I get better head cleaning on my ADAT? No matter how careful I am, there always seems to be a film left behind. Also, I've heard of "spinning the head" to clean it. How does this work?

A. Slow transport symptoms are generally caused by a worn idler wheel. The idler wheel in the original (non-XT) ADAT transport is intended to be replaced after every 500 drum hours, though many users are unaware of this. The idler wheel is field replaceable (see **Fig. 1**), and the replacement wheel (available from Alesis; part number 7-14-0010) comes with complete, diagrammatic instructions. Even so, this repair is recommended only for the do-it-yourselfer with considerable technical experience. A few wet head cleanings don't count.

It is a good idea (though not a specific requirement of the instructions) to wear a grounded wrist strap when replacing the idler wheel. This applies when performing any service inside an ADAT. Also, you should use only nonmagnetic tools. (Metal screwdrivers and pliers are okay as long as you're sure they are not magnetized.)

At 1,000 hours and up, the other rubber components (the thread-motor and capstan belts) may require replacement, too. Though these procedures are straightforward in principle, there are many not-so-obvious ways that they can go awry. For example, some transport-component mounting screws must be loosened or removed to replace the belts. A slip when reinstalling the capstan belt may allow the belt to touch residual lubricant from nearby components, rendering it nearly useless. If you attempt to remove stray lubricant from a belt with alcohol or another solvent, you will shorten the belt life considerably. For the nontechnician, these



JACK DESROCHER

Tube Mic Preamps by A R T: Legends in the Making

Professional.

"At $149.00, the A R T TUBE MP is a rockin' good deal. Every recordist working with an MDM or hard-disk recorder should buy this piece of equipment immediately. Trust me, you'll find tons of uses for the TUBE MP."

-Michael Molenda, as reviewed in the February, 1996 issue of ***Electronic Musician***

"The violin player is the kind of guy who likes playing his violin through a vintage tube guitar amplifier. The DUAL MP really warms up his violin sound and fills out the bottom end. I also use it for other instruments, such as acoustic guitar."

*-John Armstrong, Engineer-****Travis Tritt***

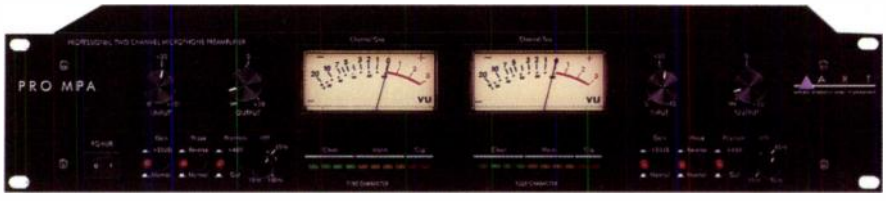
No Compromises.

"The PRO MPA has a friendly face and sound that is both new and old at once. Old as in nostalgically warm and new as in ergonomically clean, quiet and versatile; and most importantly very usable."

-Gino Vannelli, renowned vocal artist

"I haven't mixed a show without the PRO MPA yet!"

-David Norman, Front of House Sound - ***Neville Brothers***

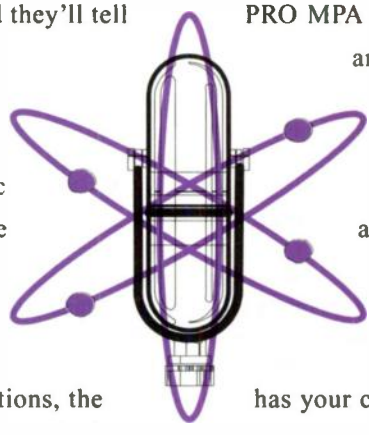


Choose *Your* Sound Solution.

"The Tube Mic Pre Family from A R T is absolutely smokin'! Affordable and rugged. Way, way better than what I've been using."

-John Mattick, Keyboardist currently performing and touring with ***Alabama***

Ask anybody in the recording industry, and they'll tell you that A R T Tube Mic Preamps have *the* hot sound. ¶Our original TUBE MP continues to astound professionals and hobbiests alike with affordable, classic tube sounds. The DUAL MP delivers the same award-nominated sound in a rack-mountable stereo package. With full metering and variable high pass filter for critical recording and listening applications, the PRO MPA has become the tool of choice in studios and on tour everywhere. ¶A R T Tube Mic Preamps don't need to be unjustifiably expensive in order to be considered professional. Nor do they need to be old and rusty to be considered classic. From the plug-and-play personality of the TUBE MP to the studio-grade functionality of the PRO MPA, A R T has your classic sound solution.



A R T
APPLIED RESEARCH AND TECHNOLOGY

APPLIED RESEARCH AND TECHNOLOGY, INC., 215 TREMONT STREET, ROCHESTER, NY 14608
Phone 716/436-2720, Fax 716/436-3942
http://www.artroch.com, artroch@cis.compuserve.com, artroch@aol.com

For complete information on our Tube Mic Preamp family, please contact A R T at the above address, Department F127.
Please list the publication in which you saw this advertisement.

circle #508 on reader service card

repairs are best referred to a service center.

Through its authorized service centers, Alesis provides a program of scheduled maintenance at intervals of 250, 500, 1,000, and 3,000 hours. Each successive service is significantly more comprehensive but also more costly ($30, $60, $120, and $300, respectively). This is an effective way to ensure proper ADAT service, but users in outlying areas still have the problem of getting the ADAT back and forth in one piece.

The random-stop problem affects some early ADATs when excess static charge accumulates on the capstan motor housing and eventually false-triggers the end-of-tape sensor. A simple modification to the associated circuit board cures this. The mod should be performed by an authorized service center.

Some light "film" or residue on heads after wet cleaning is common, though undesirable. Using only the highest quality cleaning materials, such as Miller-Stephenson Magnetic Tape Head Cleaner (product number MS-200) and GC Electronics Video Cleaning Wands (catalog number 32-3088), will reduce postcleaning residue. "Spin cleaning" refers to placing the wand, premoistened with cleaner, against the head and then spinning the head (from the top edge, not the face) with your free hand. This technique gives good results but should only be performed with "clean room" gloves (made from antistatic and lint-free material), and you should wear an antistatic wrist strap.

Q. I have a SCSI Iomega Zip drive that has worked great with my PC, but when I try to use it with my Ensoniq ASR-10, it won't respond to the Format command. I've heard that there is a software update to fix this. Is it on disk or CD-ROM, and is there a charge?

A. There is a fix, but it resides in an update to the Zip drive, not to the ASR-10. Iomega provides the fix at no charge for Zip drives under warranty, but you have to return the drive to Iomega. Contact Iomega's Customer Service Department; tel. (801) 629-7630. The bug is referred to in techspeak as an "A/V format problem"; be sure to mention this. For more information, get Document 0021 from Ensoniq's toll-free fax-retrieval system; tel. (800) 257-1439.

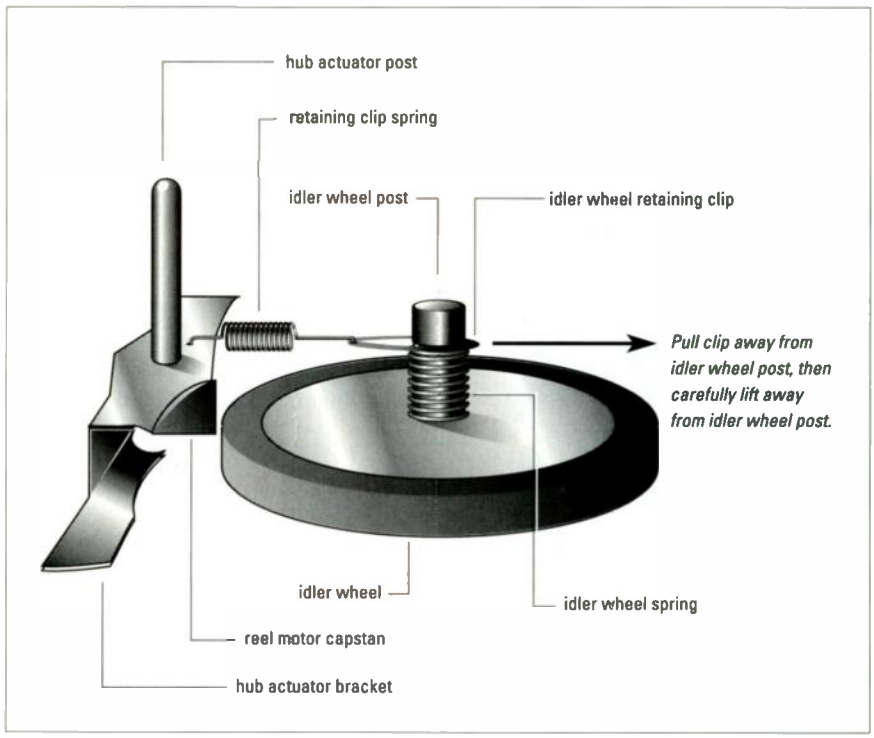


FIG. 1: Alesis ADAT idler-wheel assembly. The idler wheel should be replaced every 500 drum hours to avoid slow-transport problems.

Q. Is it possible to get a computer virus in a synth or sampler by downloading sounds and sequences from the Internet?

A. Sound files and sequence files contain data only; in computer terms, they are not "executable." Moreover, as far as I know, they are not capable of hiding data that can activate common, resident programs that are executable. Even if a sound or sequence file carries a digital "image" of a virus, there is no way for the virus to "escape" and do any harm. In fact, if a data segment in a normal sound or sequence was replaced by the code for a virus, the result would simply be a very weird-sounding sample or a garbled, probably unplayable sequence, much like the garbled data that results from a line transient.

Q. I've had a couple of mysterious floppy-disk failures in a row, and then I noticed that I had left a screwdriver next to my computer—and the disks—without considering that the screwdriver tip was magnetized. Could this have erased some of the data on the floppies?

A. Yes, that could easily happen, and I speak from experience. Magnetized tools, even those magnetized inadvertently through contact with speaker magnets, have surprisingly strong fields and do not have to come in direct contact with magnetic media to obliterate data. Keep magnetized tools away from magnetic media: diskettes, removable cartridges (e.g., Zip, Jaz, and SyQuest), audio and video tape, and so on.

Q. Some of my battery-operated gear is not supposed to be used with nickel-cadmium batteries or, at least, is reported to work poorly with them. Why? Can the new rechargeable alkalines be used instead?

A. Nickel-cadmium batteries have a lower terminal voltage than conventional batteries: about 1.2 volts as opposed to 1.5 volts. The voltage regulators in battery-powered gear tend to need all the voltage headroom they can get, so the lower voltage is a disadvantage. Even so, nickel-cadmiums will usually work, though they may give less operating time than desired.

Rechargeable alkalines are a mixed bag. They do have a higher terminal voltage than nickel-cadmiums and don't exhibit the infamous "memory" effect, but they have less current density, provide fewer charge/discharge cycles before failure, and are pricey. Nickel-cadmium batteries, despite their limitations, are still preferable in most applications.

Q. A lot of components in electronic music gear, especially transistors, are coded with the prefix TIP. What does this prefix mean, and where can you obtain these parts?

A. The TIP prefix originated with Motorola and stands for "Technical, Industrial, Professional," an abbreviation intended to emphasize the broad-based nature of their discrete-components line. Indeed, the line was so successful that TIP parts are now multisourced by various manufacturers. Hybrid synths (e.g., the Memorymoog) use TIP components, and it is a good idea for the service center, equipment manager, or serious do-it-yourselfer to have some on hand. A considerable selection of TIP parts is offered by mail-order supplier Mouser Electronics; tel. (800) 346-6873; e-mail sales@mouser.com.

Q. I have several broken keys on my vintage Korg 707 FM synth. They look the same as the keys on the Yamaha SY35, and my local repair shop has Yamaha keys in stock. Can I use them?

A. There is considerable interchangeability among the keys for some Yamaha and Korg keyboards, specifically the Yamaha DX7, DX7II, DX7IIFD, DX7S, KX76, and SY77 and the Korg M- and T-series instruments. (An extraneous activator tab must be removed in some cases.) The keys for the Yamaha SY35 and Korg 707, however, are subtly different and are not interchangeable. Fortunately, 707 keys are still available from Korg, and any Korg dealer or service center should be able to order them and, if needed, perform the repair.

Q. I have an old Kurzweil 1000PX rack module that has become progressively unreliable. Of late, it frequently powers up with a blank screen. I have almost given up trying to find someone in my area who can work on the thing, but I remembered something about a power supply fix in "Service Clinic." Is there somewhere I can get the info to do it myself?

A. Two power-supply PC-board manufacturing defects frequently affect Kurzweil 1000-series modules, and either can cause this symptom. First and foremost, the PC-board holes that receive the pins of the power-supply output connector (the connector that carries the various regulated DC voltages to the main board) are oversized, and the PC traces around them are too thin. The combination makes the connector-pin solder joints extremely weak and likely to fail.

The solution is simply to dismount the power-supply board—be sure to unplug the power-supply cord and all audio cables first!—and then unplug the DC power cable from the connector, carefully resolder the joints, plug the cable back in, remount the board, and reinforce the cable/connector with a dab of silicone sealer.

Less frequently, the PC-board holes that receive the leads from the main power-supply filter cap (the big, radial cap) are too small, and the cap sits too high off the board and runs into the case above. That makes these solder joints likely to fail. The solution in this case is to dismount the board, desolder the cap, enlarge the holes very slightly with an X-acto or similar knife, remount and resolder the cap, and secure it in place with silicone sealer.

Both of these repairs are straightforward and can be accomplished by

When buying a dubbing machine for your personal or project studio, TASCAM gives you high speed relief from duplicating chores. The 202MKII Dual Auto Reverse Cassette Deck is twin two-head decks in single 3U rack-mount design that can work together or separately with the touch of a button. It's perfect for making high speed dubs or creating composite tapes from multiple sources. Record on one deck while playing back on the other, or program for continuous looping playback. The 202MKII is the perfect blend of multi-function capability, quality sound and user friendliness. And at $529* it's ideal for budget-minded musicians and studios. Best of all, it's from TASCAM, so you know it's built to last.

For complete information and specs on the 202MKII, call TASCAM'S toll-free FaxBack line and request product #1520. We'll fax you within minutes.

DOUBLE DUTY.

The dual deck with some suite surprises. TASCAM has engineered a machine that gives duplicity a great name. The 302 Double Auto Reverse Bi-Directional Cassette Deck is really two fully independent 3-head decks in a single enclosure, adding twice the functionality to your creative suite or commercial application without duplicating your investment. Each deck can function independently or be linked together for normal or high speed dubbing, serial or parallel recording and playback. Capture long performances or get hours of hands-off continuous looping play – the creative uses are up to you. And with 3U rack-mountable design, the 302 won't be dueling the rest of your gear for workspace. A price of just $699* makes it doubly attractive – and because it's TASCAM and built to last, doubly reliable.

For complete information and specs on the 302, call TASCAM'S toll-free FaxBack line and request product #1540. We'll fax you within minutes.

TASCAM FAXBACK

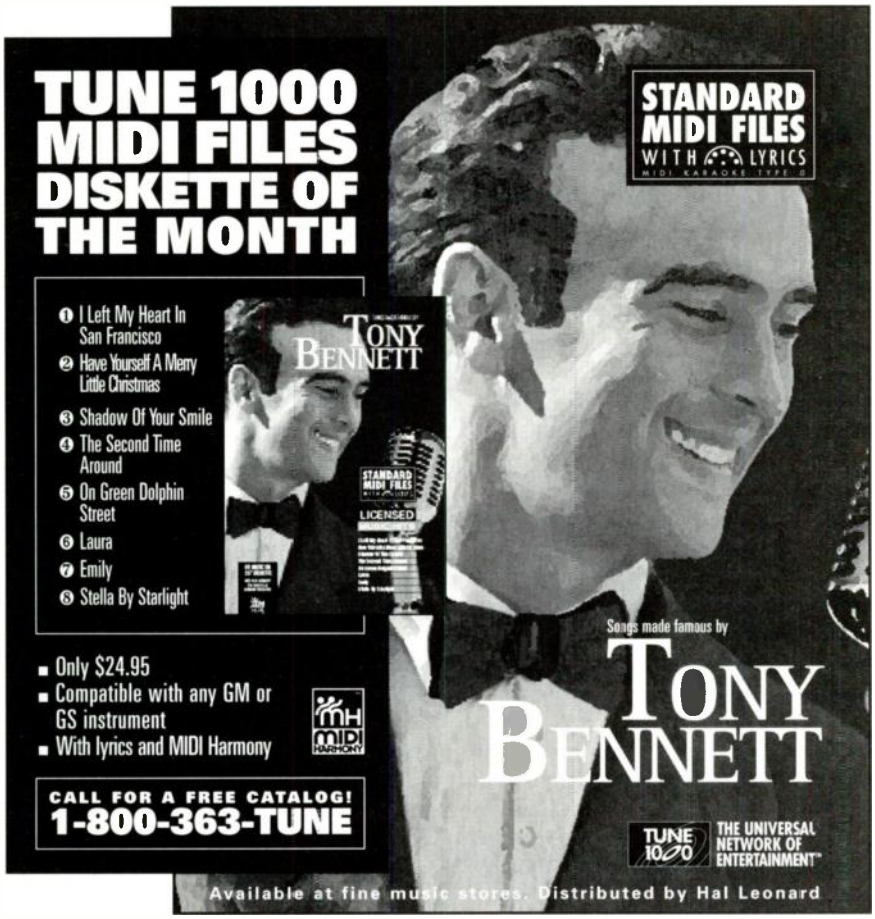
TASCAM®

TAKE ADVANTAGE OF OUR EXPERIENCE.

*Manufacturer's Suggested Retail Price

©1996 TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640 (213)726-0303 • TEAC CANADA LTD., 340 Brunel Road, Mississauga, Ontario L4Z 2C2 Canada (905) 890-8008 • TEAC Mexico, S.A. de C.V., Privada de Corina #18, Colonia del Carmen Coyoacan, Mexico D.F. 04100 011(525)658-1943

circle #587 on reader service card



circle #594 on reader service card

circle #597 on reader service card

WEST L.A. MUSIC

GUARANTEED LOWEST PRICES!

EVERY MAJOR BRAND!

DIGITAL AND ANALOG RECORDING • WORKSTATIONS
MIXING CONSOLES • EFFECTS PROCESSORS • MICROPHONES
DAT AND CASSETTE DECKS • STUDIO MONITORS
CD RECORDERS • COMPUTERS • SOFTWARE
KEYBOARDS • SYNTHESIZERS • SAMPLERS • SOUND SYSTEMS
GUITARS • AMPS • DRUMS AND ACCESSORIES

WE WILL BEAT ANY DEAL!

George Harrison at West L.A. Music with Guitar Department Manager Derek Snyder

The great Henry Mancini visits with West L.A. Music Sales Manager Mark Spiwak

Drummer Tony Thompson of Power Station and Chic with Gary Patterson of the Drum department

"SHOP WHERE THE PROS SHOP"

Phone and Fax orders accepted. We Ship *Everywhere*. Call Now!

"Where The Pros Shop"

WEST L.A. MUSIC

11345 Santa Monica Blvd. West Los Angeles
Two blocks West of the San Diego (405) Freeway
(310) 477-1945 Fax: (310) 477-2476

ALL MAJOR CREDIT CARDS, FINANCING, AND LEASING.

any qualified tech or, with care, by the advanced do-it-yourselfer. If you elect to try this repair yourself, observe all safety precautions. Especially important: disconnect the AC cord and all audio cables before you attempt to open the unit. Take care not to overheat and lift the affected PC pads.

Q. **I have a Roland FP-8 digital piano that is about four years old. Recently, some keys have started to "ring out" loudly and unpredictably. The keys seem spread out; it isn't just a few keys in the middle. A local technician says one of the keyboard ribbon cables is damaged and appears to have always been that way. (It has never had any other service.) Could this be the cause, and if so, why did the problem show up now? If the cable was damaged from the factory, would the repair be covered under warranty?**

A. There have been some problems with ribbon cables on the FP-8. Roland Service Manager Bill Thomas reports that the cables were slightly too long on some early units and tended to become unseated. Some of these may remain in the field. Also, cables are occasionally damaged when they are folded or when crimped by the cable clamps. If one of the cable conductors becomes unseated or intermittent, it can cause velocity errors such as those you describe.

Intermittent problems can be hard to trace, but with cable defects, the key errors should occur in groups of eight keys or on every eighth key. If the cable was crimped or otherwise damaged during assembly, the time before failure would be unpredictable. The unit could fail at any time, or it might never fail.

Because the FP-8 cable problems stem from a well-documented manufacturing error, Roland will replace the cables for the original owner of the instrument at no charge through any authorized service center, even if the unit is out of warranty. If the cable is bad, replacement will solve the problem, and no further repair should be needed. Note, however, that a bad keyboard scanning circuit can cause a similar symptom.

EM *Contributing Editor* **Alan Gary Campbell** *is the publisher and editor of the* New Music Journal *and the owner of Musitech, a consulting firm specializing in electronic-music product support.*

"Check's in the mail."

"My dog ate it."

"Use a live board for recording..."

"No such thing as a quality recording console for $1699."

WE WON'T INSULT YOUR INTELLIGENCE.

Breakthrough: You Can Buy an 8-Bus Recording Console for $1699

It's funny that some companies will try to fool you into believing that their 4-bus mixer designed for live gigs and sound reinforcement will be a great console for your personal or project studio. We know you're much smarter than that. Fact is, you can buy a quality 8-bus recording console for a lot less — from TASCAM.

Live Boards Waste Inputs When Used for Recording

Don't depend on your salesperson to know, but for every track of your recorder, a live board wastes 1 input (8 tracks = 8 wasted inputs). Not very efficient. A true recording console, like the M1600, has dedicated ins/outs specifically for your multitrack, so all input channels remain available for necessities like guitars, keyboards, mics — whatever you need.

No Patching and Repatching

Another thing a recording console will save you is hassling with cables. That live board has only 4 sub-masters. So, if you want to send multiple signals to any of the 8-tracks, you'll need to patch and repatch. And forget about soling that submaster. Can't do it! With the M1600 just push buttons. It's that easy.

Killer Mic Preamps and the Sweetest EQ

The M1600 has the EQ you need. Three bands including a semi-parametric mid sweep with more range than anything in its price class. Plus, the M1600's next-generation mic preamps are optimized for digital recording. Much cleaner and quieter than those on a live board. Check out the specs.

Serious Monitoring. Inputs a Plenty

You'd be hard pressed to find the M1600's monitoring capability on another mixer — let alone a live board. With 6 AUX sends you can create stereo cue mixes and still have plenty of AUX power to spare. Plus, you get 4 fully assignable effects returns. Thanks to its inline design the M1600/16 gives you 32 inputs at mixdown.

You Can Expand It, Too!

Best part is you can buy the M1600 and its optional meter bridge for about the price of a basic live board. How can TASCAM do it? By not making you pay for stuff you'd never use — like mic inputs. When was the last time you used more than 8 microphones simultaneously for recording? Chances are never. But if you ever do, you can easily expand your M1600 with the optional TASCAM MA8 eight channel mic preamp — giving you 8 more killer mic preamps.

You're smart. So buy the right tool for the job. For gigs and sound reinforcement, get the live board. But for recording on a tight budget, get the TASCAM M1600. At only $1699* for 16-inputs; or for more bang get 24-inputs — only $2199. You won't find a better value. Want to know more? Read the M1600 story. Call TASCAM FaxBack today. Document #6610.

TASCAM FAX-BACK 1-800-827-2268

TASCAM®

TAKE ADVANTAGE OF OUR EXPERIENCE.

circle #588 on reader service card

*16 input model gives you 32 mix positions. 24 input model gives you 48. Manufacturers suggested list prices: $1699 for 16 inputs and $2,199 for 24 inputs

© 1996 TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640 (213)726-0303 • TEAC CANADA LTD., 340 Brunel Road, Mississauga, Ontario L4Z 1T9 Canada (905) 890-8008 • TEAC Mexico, S.A. de C.V., Privada de Calle 2 #18, Colonia del Carmen Coyoacan, Mexico D.F. 04100 011(525)658-1943

WORKING MUSICIAN

Success by Association

Users groups and niche magazines help musicians stay in touch.

By Mary Cosola

There is no shortage of tools for the modern musician. Just flip through any issue of **EM** and you'll see an abundance of sounds, samplers, synthesizers, and software that can enhance your musical productivity. Unfortunately, it just might be this availability of technological resources that keeps us from utilizing the richest resource of all: other musicians.

By seeking out musicians who have interests similar to yours, you can expand your professional and creative horizons. Listed below are several organizations that were started by musicians who saw large information gaps and set out to fill them. A few are active only in certain geographical areas, but most of these organizations boast international memberships. That these groups have been around for several years with constantly growing memberships demonstrates their necessity. I have provided a sampling of different types of organizations, from technical users groups to manufacturer-specific magazines. In addition to a general description of each group, I have listed the membership fees where applicable. Contact information for the organizations is given in the sidebar, "How to Hook Up."

DMITRY PANICH

PEOPLE WHO NEED PEOPLE

The most prevalent forums for networking are those that meet in person. These types of organizations are usually restricted to a specific geographical region and often host seminars, workshops, and showcases for their members. But with the growing popularity of the Internet, many groups have taken to the Web as a way of drawing on a vast pool of potential members.

Crescendo. Established in 1992, Crescendo is a bulletin-board service (BBS) for musicians in the mid-Atlantic area (primarily Maryland and Washington, D.C.). Crescendo serves musicians from all genres, functioning as a common medium for local musicians and music lovers. The BBS features free

How to buy your next reverb without listening to it.

The first criteria in choosing a reverb is always sound quality. Everyone claims they sound the best but ONLY the Yamaha REV500 has 32-bit internal processing and 20 bit A/D and D/A conversion. Everyone else has 24-bit or less processing and 16 or 18-bit conversion.

The difference between 32-bit and 24-bit is audible: 32-bit processing gives you significantly smoother decay so your reverb fades imperceptibly into "silence." The difference between 20-bit and 16/18-bit conversion is also dramatic; 20-bit A/D D/A means the REV500 is exceptionally quiet, eliminating noise in recordings and adding headroom in live applications.

Stereo professional +4dB/-10dB balanced inputs and outputs.

The second criteria is the actual effects—what are they and how do they sound? The REV500 includes 100 top quality halls, rooms, plates and special reverbs. These simulations of actual environments place your signal in "real" locations for unparalleled realism. And the REV500 also gives you 100 spaces to store your own settings.

The third criteria is the ease of accessing the effects. REV500 true stereo halls, rooms, plates and special reverbs are instantly recalled from the front panel. The REV500 has front panel controls for reverb time, pre-delay, high-frequency decay and early reflection level. If you want to change these settings, just turn that control and the LCD instantly shows a picture of what's happening. You can **see** what you're hearing.

If you want to hear it, too, only Yamaha has built-in drum samples so you can hear the effects without an external sound source. Just hit the "audition" button as you select and customize your effect.

The fourth criteria is price. Once again, the REV500 delivers like no one else: $499 for a professional reverb. But if you'd rather pay more, you can buy the $1299 Yamaha **ProR3** which has the same 32-bit engine and 20-bit A/D D/A with a keypad for calling up effects, two types of EQ and a gate which can be placed around any reverb.

Now that you know enough to buy the REV500 sight unseen, we recommend you go listen to it. The sound quality will

Large LCD display shows effect type, name and current settings.

Turn the reverb time control, see the reverb time displayed graphically.

Turn the HI-RATIO control, the REV500 instantly shows high frequency decay.

blow you away. Call (800) 937-7171 ext. 680 to find the Yamaha REV500 dealer nearest you.

Ext. 680
1-800-937-7171

YAMAHA®

REV500

32-BIT DIGITAL REVERB

©1997 Yamaha Corporation of America, Pro Audio Products, (800) 937-7171 Ext. 680. www.yamaha.com. P.O. Box 6600, Buena Park, CA 90622. Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3RI (416) 298-1311.

circle #604 on reader service card

public access to chat rooms, downloadable data files and software, message areas for discussions on various topics, member bios, notices of members' gigs and releases, and many other types of forums.

The group is also active in local and national causes. In November 1996, Crescendo held a benefit concert featuring eight local bands. Proceeds went to the Sexual Assault and Domestic Violence Center in Baltimore. In April 1997, the group is sponsoring another benefit. This one will be held in Washington, D.C., and will benefit the area's Rape Crisis Center. (April is Sexual Assault Awareness Month.) According to Roger Wood, Crescendo's founder, the group plans to do at least two such benefits a year, featuring bands that are Crescendo members.

Just Intonation Network. Established in 1984, the San Francisco–based Just Intonation Network (JIN) is an international organization for composers, musicians, instrument designers, and theorists who work with just intonation. (Just intonation is any tuning system in which the frequencies of any two pitches form a ratio of whole numbers. For example, the A at 440 Hz and the E at 660 Hz form an interval of a perfect fifth, and their frequencies form a ratio of 660/440, or 3/2.) The group's Web site features announcements of upcoming events; updates on musicians working with just intonation; access to the Just Intonation Store, which sells books, recordings, and educational materials; and links to tuning-related sites.

Members receive four issues of *1/1*, the group's journal; access to the membership database; occasional personal consultations; and discounts at the Just Intonation Store. From time to time, the group releases compilation albums of members' works. In 1992, a JIN committee created the "MIDI Tuning-Dump Specification," an extension of the MIDI specification enabling synthesizers and samplers to transfer microtuning data.

The price of individual memberships is $17.50 (U.S.), $20 (Canada and Mexico), and $25 (outside U.S., Canada, and Mexico). Library or institution memberships cost $30. A membership is considered valid for four issues of *1/1*, rather than a specific time period, because publication of the journal is not on a regular schedule. JIN offers the *Just Intonation Primer* for free to new members, but shipping and handling charges apply. Contact the Just Intonation Network for further details.

Performing Artist Network. The Performing Artist Network (PAN) started out in 1981 as a mailing list–based networking group of self-managed musicians. In the last sixteen years, it has grown into an international network of professional and semipro musicians, studio owners, and music-industry execs. Based in Skippack, Pennsylvania, the group now operates primarily through their Web site.

PAN services include their GigBank online job center; e-mail for members; Web server space (prices vary depending on specific plan); special interest groups (SIGs) for specific manufacturers and publications; bulletin boards on a variety of topics; downloadable data files; and many other music-related services, including StarBase, PAN's new Web-based music-promotion service for record labels and musicians.

To join PAN, there is a $225 one-time sign-up fee and a monthly membership fee of $15. (PAN waives the initial sign-up fee for **EM** subscribers. Contact PAN for more information.)

Women in Music, Inc. Women in Music, Inc. (WIM), is a national, New York City–based, not-for-profit group supporting women in the music business. WIM president Daylle Deanna Schwartz is a lecturer and author of *The Real Deal: How to Get Signed to a Record Label from A to Z* (Billboard Books). WIM publishes a quarterly magazine and sponsors showcases, song Pitchathons, seminars, and workshops, including master classes on topics such as recording and songwriting. Members congregate at the monthly WIM brown bag dinners, where they can network and listen to prominent industry speakers. The organization is also implementing a yearly Women Who Make a Difference awards ceremony, which will honor five influential women in the music industry.

An upcoming WIM production is "Sisters of the Sixties," to be held April 11, 1997, at Town Hall in New York City. The show will feature WIM members performing songs of female artists of the 1960s. Artists such as Ronnie Spector, Leslie Gore, and Mary Wilson, among others, will also perform and join in the celebration.

Membership is open to men and women in the creative and professional areas of the music business. Most activities currently take place in and around New York City, but WIM plans to expand to other cities soon. An Associate membership costs $45 per year, and a Professional membership costs $75 per year. (The group hosts some separate events for Professional members only.)

HOW TO HOOK UP

Club MIDI tel. (860) 647-9518; e-mail 70621.3671@compuserve.com

Crescendo tel. (800) 372-7230 or (410) 792-7230; fax (410) 792-7792; BBS (301) 490-4775; e-mail rwood@shendo.com

International MIDI User's Group (MUG) tel. (800) 569-5232 or (212) 465-3430; fax (914) 961-0785; e-mail g4prod@aol.com; Web www.nowopen.com/mug

Just Intonation Network tel. (415) 864-8123; fax (415) 864-8726; e-mail jinetwk@dnai.com; Web www.dnai.com/~jinetwk

Performing Artist Network (PAN) tel. (610) 584-0300; fax (610) 584-1038; e-mail info@pan.com or pan@pan.com; Web www.pan.com

Roland User's Group (RUG) tel. (213) 685-5141; fax (213) 722-0911; Web www.rolandus.com

Transoniq Hacker tel. (503) 227-6848; e-mail info@transoniq.com; Web www.teleport.com/~trnsoniq

Women in Music tel. (212) 459-4580

PLAY MIDI FOR ME

The advent of MIDI in 1982 allowed instruments to interface with each other, and many musicians using it found that they needed a way to interface with other musicians. Some of them started magazines (you're reading one such publication right now),

Good-looking and loaded.

No wonder it's so popular.

With its sleek front panel and jog shuttle, the new PCM-R500 DAT Recorder certainly catches your eye. But it's not just another pretty face.

It's packed with professional features not usually found in this price range. Like four direct-drive motors, which give you better tracking, a lower error rate, longer motor and tape life, and precision high-speed cueing and shuttling.

It has a software set-up menu for easy, customized operation. And then there's Super Bit Mapping,® the technology that delivers superior, near 20-bit resolution sound without sacrificing compatibility with the industry standard 16-bit format.

Call 1-800-635-SONY, ext. R500 right now to learn more about the PCM-R500 DAT recorder. You'll love it because it's loaded. But hey, being good-looking never hurt.

The PCM-R500 Professional DAT Recorder

SONY

- 4 Direct-Drive Motors
- Variable Shuttle/ Cueing Wheel
- AES/EBU and SPDIF Digital I/O
- New High Resolution Pulse A/D
- SBM (Super Bit Mapping) Filter in Conversion Circuitry
- A/D and D/A Monitoring Modes
- Balanced XLR Analog I/O
- User Set-up Menu

Choosing between an empty wallet and a watered-down version is no piece of cake!

DON'T PANIC!

We'll give you awesome features at a price that will make you, well... Smile.

$159.95 Suggested Retail Price

Digital Orchestrator Plus
for Windows 3.1 and 95

- More than 1000 tracks of MIDI or digital audio
- Multitrack hard disk recorder and sequencer
- MIDI transforms and digital audio effects processors
- Music notation
- SMPTE and SysEx
- Sample songs, video tutorials and more!

Download a FREE DEMO — http://www.voyetra.com

Voyetra

1.800.233.9377

Voyetra Technologies • Dept. EM23
5 Odell Plaza • Yonkers, NY 10701
914.966.0600 • Fax: 914.966.1102

circle #595 on reader service card

and some turned to users groups as a means of gaining technical and creative support.

Club MIDI. Club MIDI started out in 1990 as a users group for Korg M1 owners. In 1993, club president Ken Kittredge reoriented the group's focus to encompass all things MIDI. The goal was to create a network for MIDI musicians to communicate.

The group publishes a 24-page quarterly newsletter that has sections on new products, upcoming events, software and hardware applications, online resources, tips on MIDI basics for beginners, songwriting techniques, reviews of books, synth voices, drum patterns, and other MIDI tools. Club MIDI members can communicate via the newsletter's "User to User" forum. The publication also features a classified ad section for buying and selling gear and a section spotlighting the music of Club MIDI members.

The club is based in Manchester, Connecticut, and holds monthly meetings for members in the Manchester-Hartford area. At these gatherings, members can network and check out demonstrations of new MIDI hardware and software products. You don't have to live in the area to be a member, though; you can join and participate through the club's newsletter. The Club MIDI membership fee is $15.95 per year (Canada, $19.95; outside U.S. and Canada, $23.95).

International MIDI User's Group. Just as Club MIDI started out as a group for M1 users, the International MIDI User's Group (MUG) started out as a group for Ensoniq Mirage owners. Gordon Gebert founded the group in 1985 as a way of trading samples with other Mirage users. As more synths and samplers came into the mainstream of electronic music, a greater need for sounds and samples followed. In 1988, the organization moved to a general electronic music and MIDI orientation.

Members receive a monthly newsletter that has technical questions and answers, product reviews, and articles on electronic music. The group has expanded into the cyber realm with an extensive Web site that features access to sequences, software, sounds, patches, and links to other sites. Members can also network and get tech support via the MUG site.

MUG is headquartered in Yonkers, New York. Membership costs $29 for

RØDE™. A Mic For All Seasons.

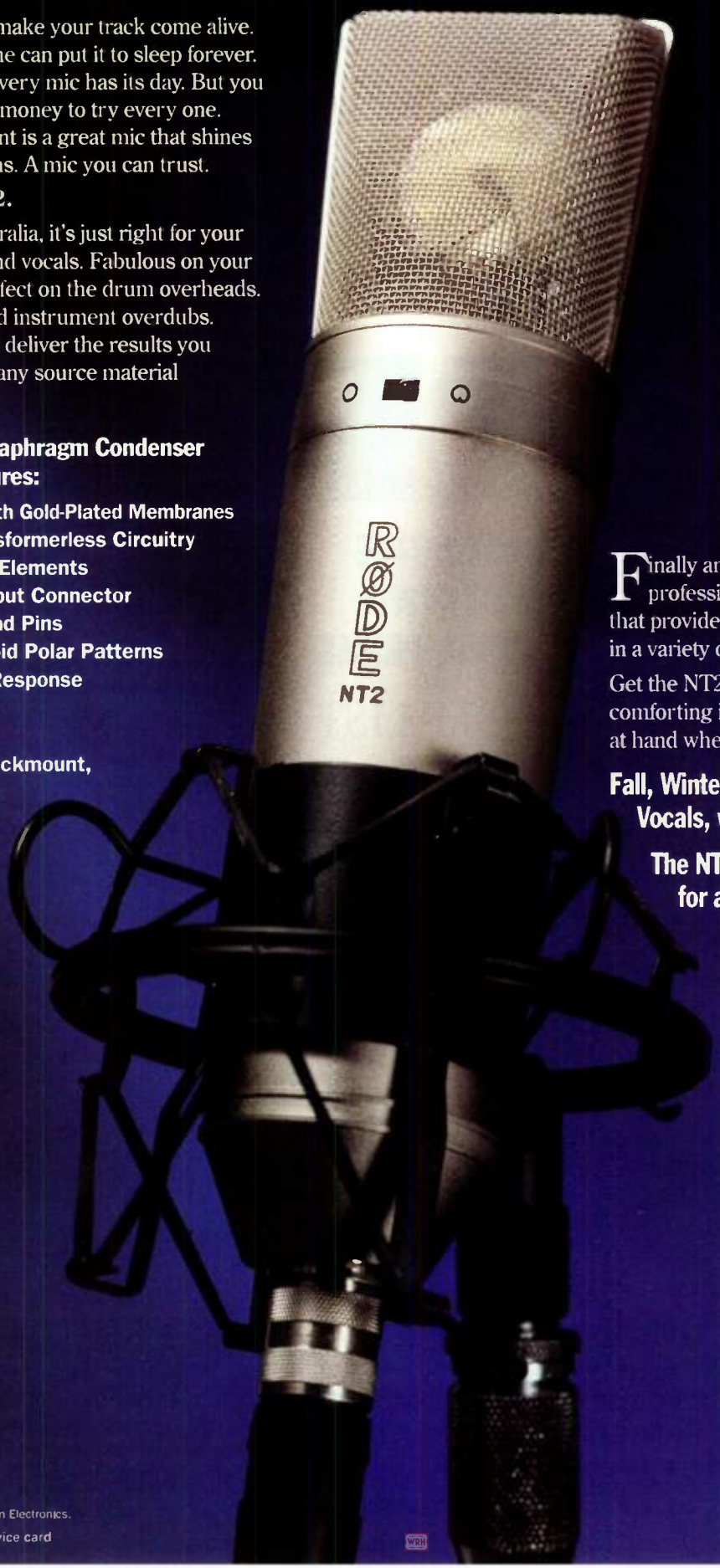
A great mic can make your track come alive. The wrong one can put it to sleep forever. You've heard that every mic has its day. But you haven't the time or money to try every one. What you really want is a great mic that shines in multiple situations. A mic you can trust.

You want the NT2.

Hand made in Australia, it's just right for your lead and background vocals. Fabulous on your acoustic guitar. Perfect on the drum overheads. Great on those wind instrument overdubs. In fact, this mic will deliver the results you need on just about any source material you throw at it.

The NT2 Large Diaphragm Condenser Microphone features:

- **Large Capsule with Gold-Plated Membranes**
- **Low Noise, Transformerless Circuitry**
- **True Condenser Elements**
- **Gold Plated Output Connector and Internal Head Pins**
- **Omni and Cardioid Polar Patterns**
- **Full Frequency Response**
- **Highpass Filter**
- **–10dB Pad**
- **Flight Case, Shockmount, and Windscreen**



Finally an affordable, multipurpose, professional recording microphone that provides outstanding performance in a variety of uses.

Get the NT2 and discover how comforting it is to have a great mic at hand whenever you call on it.

Fall, Winter, Spring or Summer...
Vocals, winds, strings, or other...

The NT2 is truly a mic for all seasons.

DISTRIBUTED BY

EVENT ELECTRONICS INC

Post Office Box 4189
Santa Barbara, CA 93140-4189
Voice: 805-566-7777
Fax: 805-566-7771
http://www.event1.com

RØDE is a trademark of Freedman Electronics.

circle #532 on reader service card

one year ($49 outside the U.S.) or $99 for a lifetime membership ($149 outside the U.S.).

GEAR FAB

Users groups that cater to specific manufacturers are not as prevalent as more inclusive groups. As a matter of fact, I found only two manufacturer-specific groups while researching this article.

Roland User's Group. Roland Corporation U.S. started the *Roland User's Group* (*RUG*) magazine in 1984. The Roland-specific sections of *RUG* include a new products guide and articles on getting the most from your Roland gear. The magazine also features a technical question-and-answer section, interviews with various artists (the most recent issue features an interview with Joni Mitchell), information on Roland-compatible third-party products, and articles of a more general-music nature, such as tips on setting up your home studio.

In addition to *RUG*, which is published twice a year, Roland also publishes specialty newsletters four times a year. These publications feature more in-depth coverage of specific areas of music making. The newsletters are *In the Loop*, which focuses on using samples; *Backbeat*, which has articles on electronic percussion; and *Axe Facts*, which covers guitar-related topics.

RUG and the three specialty newsletters are free of charge. They are carried at most major retail instrument dealers, including Sam Ash Music and Guitar Center.

Transoniq Hacker. Also established in 1984, the *Transoniq Hacker* is a monthly magazine focusing on Ensoniq gear and related third-party products. It is not affiliated with Ensoniq in any way, although Ensoniq is supportive of the magazine and company reps respond to reader inquiries in every issue.

The *Hacker*'s content ranges from articles specific to Ensoniq products (e.g., "Setting up a Home Studio with the SD-1" and "Vintage Synth Corner: SQ-80" in the December 1996 issue) to reviews of readers' tapes and sample CDs. Regular departments include "Hypersoniq," a new products guide; "Interface," a reader's forum that dedicates several pages to advice; a general question-and-answer section; and "Transoniq-Net," a list of volunteers willing to help *Hacker* readers with tech support for Ensoniq gear.

Subscription price is $23 ($32 outside the U.S.). The *Hacker* also offers an introductory price of $14 ($27 outside the U.S.) that includes $50 worth of coupons from third-party vendors.

WRAP IT UP

Of course there are many more music-related associations and specialty publications than could be mentioned in one article. (For an extensive list of organizations and music-related businesses, check out the *Recording Industry Sourcebook*, available through Mix Bookshelf; tel. 800/233-9604 or 908/417-9575; fax 908/225-1562.) But by making some phone calls, cruising the Internet, and picking through a few magazines, you'll be sure to find a group that offers the support and contacts necessary to make the most of your music and your career.

Mary Cosola *is managing editor of* Electronic Musician *and needs to find a support group for college hoop-aholics. (She even rescheduled her wedding so it wouldn't conflict with the Final Four.)*

INNOVATIVE QUALITY SYSTEMS
SPECIALIZING IN AFFORDABLE SOLUTIONS!

Direct from the Manufacturer's Retail Outlet

LIMITED TIME
ACT NOW!
WHOLESALE PRICES!

$$$ OFF LIST

SAW Plus $CALL ~~999.00~~ List Price
16/32 Track Digital Audio Editor, accepts FX Plug Ins.

SAW 6.x $CALL ~~599.00~~ List Price
4/8 Track Digital Audio Editor, accepts FX Plug Ins.

SAW Classic $CALL ~~299.00~~ List Price
4 Stereo Track Affordable Audio Editor.

SAMM $CALL ~~499.00~~ List Price
Mixing Automation for the Yamaha Pro Mix-01

Turn-Key Systems
200 MHz Pentium Pro • 64MB EDO RAM 2MB PCI Video Card • (2) 2.1 GB IDE Western Digital HD Mode 4 • DAL CardD Plus Sound Card &Digital I/O • 17" Nokia 447L Monitor • 8X EIDE CD-ROM Drive • Focus 2001 Keyboard • Logitech Mouse • SAWPlus • Windows 95 • Turn it on and start recording!
Call for special pricing!

Sound Cards
MIDI/SMPTE Interfaces
Video Capture Boards
Bundle Deals

Major Credit Cards Accepted

1-800-844-1554
From outside the U.S. Call 702-433-5668
one call for it all!
SAME DAY SHIPPING!
http://www.iqsoft.com

circle #540 on reader service card

DIGITAL AUDIO FOR THE REST OF THE WORLD

DMAN™

MSRP $249.95

PC DIGITAL AUDIO CARD

- High quality digital audio specs: 80 dB S/N.
- Stereo line level inputs and outputs.
- Full-duplex for simultaneous stereo record and playback.
- Built-in, standard wave table header for adding any wavetable daughter board (optional).
- High impedance microphone input.
- Built-in 1 in / 1 out MPU-401 UART mode MIDI interface.
- Windows 95 Plug-and-Play compatible. Windows 3.1 drivers also included.

DMAN DIGITAL STUDIO™

MSRP $299.95

DMAN with SAMPLITUDE™ MULTIMEDIA HARD DISK RECORDING SOFTWARE

Samplitude features include:

- Full-duplex, simultaneous record and playback.
- Direct synchronization with all major MIDI sequencers.
- Real time cross fade with various curves.
- Accurate synchronization of audio playback to incoming MIDI Time Code -- a must for synchronizing music, ADR and sound effects to video.
- MIDI and AVI files can be linked to Samplitude. Perfect for film music composition using MIDI and audio synchronization.
- And much, much more.

EQ MAN™

MSRP $99.95

PC ANALOG AUDIO EQUALIZATION CARD

- Stereo 7-band, programmable graphic EQ with volume control.
- Studio quality analog equalization so EQ MAN works with any audio source.
- Volume of each channel can be independently controlled for automated mixing and cross fading.
- Disk save and load of multiple EQ presets.
- Any EQ band can be individually adjusted or ganged as stereo-pairs.
- Windows control software and drivers included.
- EQ and volume settings can both be controlled via MIDI.

MIDIMAN introduces three new standards in affordable digital audio for the PC.

DMAN is the world's most affordable two track, full-duplex, audio card that can record and playback stereo audio tracks simultaneously. DMAN also includes a 1 in / 1 out MIDI interface and a wavetable header for using any wavetable daughter board.

For only a few dollars more, DMAN Digital Studio adds Samplitude, the full featured four track, multimedia, hard disk recording software.

And to round out your new sound, add our EQ MAN PC audio equalization card. EQ MAN provides stereo programmable, graphic, 7-band, EQ to your audio tracks. EQ and volume can both be controlled via MIDI.

Ask your dealer about these new worldwide standards from MIDIMAN.

midiman®

GUARANTEED FOR LIFE

45 east st. joseph street
arcadia, ca 91006
tel: (818) 445-2842
fax: (818) 445-7564
http://www.midifarm.com/midiman
toll free: (800) 969-6434

circle #554 on reader service card

Reviews

116 • E-mu E4K
126 • Macromedia Deck II 2.5.2 (Mac)
142 • Sound Factory Groove Construction
143 • Roland PMA-5
149 • Yamaha CS1x
157 • Front Room Producer Series, Vol.1
160 • Audix-15vs

E-mu E4K

By Jeff Burger

A high-end keyboard sampler rocks the world.

When the conversation turns to samplers, most musicians think of E-mu, which was among the first companies to offer high-quality digital sampling instruments. Starting with the original Emulator, E-mu has evolved its line of samplers into an entire family tree, including the EII, EIII, and EIV, in addition to various permutations.

It has been over a year since I reviewed the rack-mount EIV, heir to the Emulator legacy. The folks in Scotts Valley, California, have followed it with a keyboard version dubbed the E4K. Much of the guts and operation are identical, so in the interest of preserving a few trees, I will just cover the basics here and refer you to **EM**'s November 1995 review for details. The primary differences between the EIV and E4K fall into four categories: the performance controls you'd expect in a keyboard version, the onboard sequencer, built-in effects, and updates to the EOS operating system.

E-mu's E4K sampler offers superb sound quality and the highest available polyphony of any electronic keyboard instrument, but its sequencer is weak and its effects lack advanced features.

BASICS

The E4K features a 76-note, semi-weighted keyboard that is sensitive to Velocity and Channel Aftertouch. The stock instrument provides 64-voice polyphony (32 stereo voices), floppy drive, 540 MB internal SCSI hard drive, external SCSI port, S/PDIF digital I/O, and 4 MB of RAM. The sampler can be upgraded to 128-voice polyphony by adding a card ($945), and the memory slots accept standard 72-pin SIMMs (unlike the EIV's, which take 30-pin SIMMs), accommodating a maximum of 128 MB of RAM. A 128-voice Turbo version ($5,195) with 16 MB RAM and 1 GB hard drive is also available.

The unit incorporates E-mu's now-predictable eight audio-output jacks: left and right balanced mains on ¼-inch TRS jacks and three unbalanced stereo pairs on ¼-inch TRS jacks. These unbalanced pairs can be used as aux outs for any combination of MIDI channels, as send/return loops for direct external processing, or even as external ins that sum to the main outs when you need a few more mixer channels. Another card slot accepts an optional MIDI card ($199) that provides an extra sixteen channels for a total of thirty-two channels.

The E4K ships with about 150 MB of sounds on the hard drive and a CD-ROM with over 400 MB of sounds, many of which are programmed to take advantage of the instrument's real-time performance controllers. (Some of these sounds are also found on the hard drive.) Although there are a few obligatory "what would anybody use those sounds for" presets, the stock sounds are mostly very useful (e.g., the punchy Clav, classic Moog and Prophet-5 sounds, and grand pianos) or inspirationally lush. (The patch "And You & I," inspired by Rick Wakeman's work

"These puppies keep on barking"

Dear Audix,

"After years as a session bassist and music teacher, I finally decided it was time to start making my own albums at home. In this digital age, choosing recording equipment isn't very difficult until it comes to studio monitors. A friend loaned me some "well known" speakers but they really lacked bottom end and lower-mids. (A major problem if you're a bass player!) A local music store recommended I try some Audix PowerHouse speakers and I got the self-powered PH15-vs. Man, I just love the little brutes!! I not only tracked my last two CDs on them.... I mixed on them as well. On my new record I came up with some super-fat, clean, low end kick and bass grooves that make me crazy! I see no reason to upgrade because these puppies just keep on barking." Kudos to you and your design team!

Keep up the great work,

Dann Glenn

Bassist—Recording Artist, Nightvision Records

PH15-vs

SPECIFICATIONS

frequency range	*50Hz-20kHz*
power capacity	*45 watts RMS per ch.*
nominal impedance	*4 ohms*
sensitivity	*88 (1w@1m)*
crossover frequency	*2.6kHz*

Thanks for the letter Dann!

Audix offers a full range of powered monitors to suit any studio's needs. The ultra linear frequency response and greater dynamic range of the PH15-vs make it the perfect choice for mixing in the studio.

PH15-vs are constructed with a 5 1/4" polypropylene long throw woofer and a 3/4" ferrofluid tweeter. Every woofer and tweeter are matched with a custom crossover and front ported cabinet for the most balanced sound possible.

Like Dann, you'll be amazed at the definition and punch these compact speakers deliver. Best of all, suggested retail for the PH15-vs is only $479 per pair.

Audix PowerHouse Speakers—a musician's best friend

AUDIX

For more information call: 1 800 966 8261
or 714 588 8072 fax: 714 588 8172
...or visit our website at AUDIXUSA.COM

circle #509 on reader service card

© Audix Corporation 1996. All rights reserved. Audix, the Audix logo and PH15-vs are trademarks of Audix Corporation. All other trademarks are the property of their respective owners. Corporate Headquarters: 9730 SW Hillman Court, Suite 620, Wilsonville, OR 97070 USA MADE IN USA

WRH

GET COMPLETE, PRECISE CONTROL OF ANY MIDI DEVICE OR SEQUENCER.

Starr's MIDI controllers give guitar and bass players the MIDI composition and performance power that guitar synths have only promised.

Imagine being able to really play pedal steel, 5 string banjo, Middle Eastern flutes, African talking drums, authentic-sounding Asian stringed instruments or powerful orchestral sweeps.

At the touch of a few buttons you can get 8 octaves on the controller neck, play 24 note chords with two fingers, produce stunning percussion effects —

and you're just scratching the surface.

With zero delay, zero conversion error, and lots of built-in processor power, the Starr is a natural for sophisticated music composition.

Get one custom built to your specifications — then go out and scare some keyboard players.

Starr Labs

http://www.catalog.com/starrlab
1717 5th Ave. • San Diego • CA • 92101
+1 619-233-6715 • +1 619-233-1231 [FAX]

circle #532 on reader service card

on Yes' *Close to the Edge*, is my personal favorite.)

The sound engine is identical to that of the EIV and has earned E-mu a well-deserved reputation for excellent audio quality. One of its hallmarks is the ability to stretch and transpose samples with a minimum of sonic artifacts. The modulation routings include over 50 sources and destinations per voice, which are connected with software "patch cords." As a result, the architecture easily spans the gap between sampling and synthesis (see **Fig. 1**). Seamless resampling and a cadre of 21 filter types (some of which are cousins of E-mu's morphing technology, introduced in the Morpheus) round out the sonic highlights.

PERFORMANCE FEATURES

One of the first things you notice about the E4K is its classy aesthetics. The semiweighted action has a solid feel. The black keys are more rounded and nearly a sixteenth of an inch narrower than the standard plastic fare, giving chubby fingers a bit more room to breathe. An ersatz wood-grain texturing on the black keys also subtly enhances the tactile experience. The subliminal message of elegance is enhanced by the word "EMULATOR" emblazoned in gold on the face plate and a strip of red felt below.

The unit also includes pitch and modulation wheels that feel reasonably solid. The adjacent Thumby button (that's what E-mu calls it) is a momentary switch that can be routed to control any of the E4K's modulation destinations. This is handy for performance effects such as trills, bringing in additional octaves/layers, or filter jumps. The Thumby button can also latch; for example, you can toggle the rotating-speaker simulation between fast and slow modes with a single press.

The other physical performance feature is a bank of four real-time faders located on the front panel above the bottom octave. Each fader can be routed to any internal modulation destination or MIDI controller message. For example, the faders can be used to control filter cutoff, attack time, decay time (which produces an effect similar to the mute slider on a Clavinet), pitch, and the balance of various components within complex sounds. As with the Thumby button, the faders are put to good use in the presets that ship with the unit, adding lots of extra character and dimension to the instrument's playability.

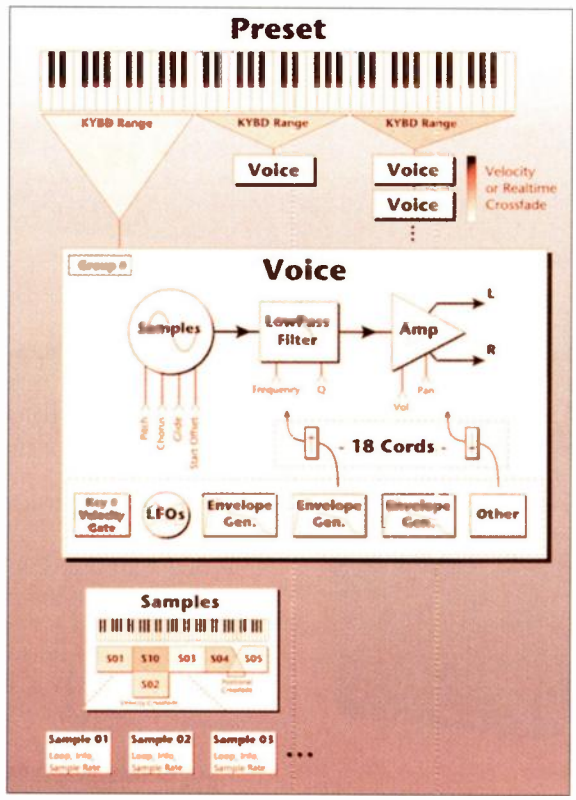


FIG. 1: The E4K's voice architecture follows the traditional synthesizer signal flow, but its matrix-modulation system offers many more modulators than are shown here. You can layer samples, split them across the keyboard, and even crossfade between zones. (Courtesy E-mu Systems)

Although there's plenty of control over internal splits and layers, the keyboard can't be zoned to transmit on more than one MIDI channel. There is also no patch mapping for external instruments. Another minor design gripe is related to performance ergonomics: the ten numeric keys are positioned in a straight line rather than the more familiar (and ergonomic) telephone-style keypad.

EFFECTS

E-mu has incorporated the optional effects board

"ENCORE'S TRANSCRIPTION IS THE BEST IN THE BUSINESS!"

—Julian Bratolyubov, music supervisor for MCA/Universal.

INTRODUCING ENCORE® 4.1 FOR MACINTOSH® AND WINDOWS™

"Our five man team transcribes the scores for weekly television shows and big budget movies for MCA/Universal & other major studios."

"We are able to do more work with our small team than music preparation offices twice our size because we use Encore."

"Encore's transcription algorithms are the best in the business. Our work must be perfect to meet the expectations of the composers who trust us with their compositions, that is why we use Encore. One day the whole world will open their eyes and use Encore."

Encore 4.1 is the official program of Music Copyist at **Universal Pictures/MCA®** & **Paramount Pictures®**. This year you've heard the results of Encore on the Oscar®-nominated soundtracks The Shawshank Redemption®, Unstrung Heroes®, Apollo 13® and Little Women, along with the scores for Phenomenon®, Dragonheart®, Diabolique®, Up Close and Personal®, Mars Attacks® and Daylight® among many others

Encore 4.1 transcribes faster, more elegantly and more accurately then any competitor. It provides superior guitar tablature editing and the shortest learning curve in the business.

Don't take our word for it download a free demonstration copy of Encore today from the **Passport MusicSite™** on the World Wide Web

http://www.passportdesigns.com

Photo courtesy of Joanne Cortes

PASSPORT ENCORE™ 4 FOUR

Passport Designs, Inc.
Tel. (415) 349-6224
Fax. (415) 349-8008

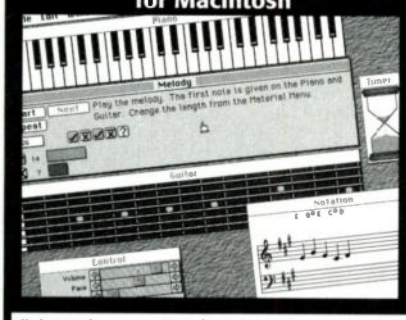
Passport Email
info@passportdesigns.com
passport@aol.com

PASSPORT

all trademarks and registered trademarks are property of their respective holders

circle #563 on reader service card

Beat the challenge!
Listen™
Interactive Ear Training
for Macintosh



"Listen is a music educator's dream and a Mac musician's salvation."
- Electronic Musician

Listen provides a wide range of matching and multiple-choice exercises for the beginning to pro musician. The ideal aid for music lessons, Listen features Mac or MIDI instruments, and melodic and harmonic exercises: Melody, Growing Melody, Intervals, Triads, 7th, 9th, 11th, 13th Chords, Interval Naming, Inversion Naming, Chord Naming, Tuning, and more for only $99. Call for brochure or lab-pack info for schools. New Version 2.3.1 supports Sound Manager, MIDI Manager, and Power Macintosh.

imaja
(800) 294-6252
Fax: (510) 559-9571
E-mail: software@imaja.com
Web: http://www.imaja.com/imaja/
PO Box 6386 Albany, CA 94706

circle #539 on reader service card

circle #568 on reader service card

COMPACT DISC • CASSETTE
& RECORD MANUFACTURING

YEAH! WE DO DIGITAL MASTERING!
YEAH! WE ACCEPT ART ON DISC!
YEAH! WE DO CD-ROM!
YEAH! WE'VE DONE THE BEATLES!
YOU YEAH! SHOULD CALL US NOW!

1.800.859.8401

For Your Free Catalog

qca

Serving the Music Industry for Over 45 Years.

2832 Spring Grove Ave., Cincinnati, OH 45225
Tel: 513.681.8400 • Fax: 513.681.3777

from the EIV and e6400 into the stock E4K. The board employs two 24-bit, stereo effects processors. Processor A is dedicated to 44 reverb and delay effects, and processor B provides 32 chorus, flange, and distortion effects. Actually, these numbers are a bit exaggerated; they include simple variations in parameter settings within categories such as chorus and flange.

Speaking of parameters, processor A provides control over decay time and high-frequency damping, and processor B offers feedback amount, LFO rate, and delay time. This is enough for the basics, but it's not exactly ambitious considering the attention to detail in the sound engine. Another disappointment is the lack of integration into the rest of the instrument. You can't control any effects parameters from the faders, envelopes, or any other modulation source, which is a real shame. However, you can program the effects via SysEx.

The processors can be applied to sounds in three different ways. First, they can be programmed as part of each preset. Second, you can tell the presets to use the master effects setting. Third, when operating the unit multitimbrally, you can route all sounds through the master effects or through the preset's effects on a specified MIDI channel.

You can also send the output of processor B into processor A for serial rather than parallel operation. This can make a dramatic difference in the resulting ambience. Sending a chorused string sound into a healthy reverb goes a lot further toward creating an orchestral wall of strings than parallel processing allows.

Each effects screen lets you program how much of the signal on the main bus and three submix buses is sent to the associated processor. (Actually, the maximum setting is 50 percent wet, which is a drawback when you want *total* distortion for a Marshall-esque lead.) Unfortunately, the effects processors only output to the main stereo bus. This means you can't use the processors separately on two different sounds in multitimbral operation and extract isolated, processed outputs. Earlier versions of the operating system did not let you simply turn off the effects, but the current version does offer this capability, which comes in handy when you go into a studio that has snazzy outboard effects.

SEQUENCER

The E4K includes a paltry onboard sequencer that doesn't have enough features to qualify it as a workstation. E-mu says its *raison d'être* is to import Standard MIDI Files for live performance.

E-mu E4K Specifications

Polyphonic Voices	64 (expandable to 128)
Effects Processors	2 (24-bit, stereo)
Number (Type) of Effects	Processor A: 44 (reverb, delay); Processor B: 32 (chorus, flanger, distortion)
RAM	4 MB (expandable to 128 MB)
Output Sample Rate	44.1 kHz, 48 kHz
Analog Inputs	2 balanced ¼"
Main Audio Outputs	2 balanced ¼"
Submix Audio Outputs	6 unbalanced ¼" TRS (send/return to main outs)
Digital I/O	S/PDIF and AES/EBU (switchable) on RCA jacks
Keyboard	76-key semiweighted with Velocity and Channel Pressure
Internal Hard Drive	540 MB
External SCSI	50-pin Centronics connector
S/N Ratio	>90 dB
Frequency Response	20 Hz–20 kHz (+2/-1 dB)
THD + Noise	<0.02% (1 kHz sine wave, A-weighted)
ASCII Keyboard	PC-AT style
Weight	35 lbs.
Dimensions	13.5" (W) x 4.1" (H) x 49.2" (L)

Were You Waiting For The Ultimate Grand Piano Sound In A Digital Keyboard?

"The PRO2 Digital Piano by Generalmusic has, by far, the most realistic grand piano sound and feel I've ever experienced in any digital keyboard - and I've tried them all! From now on, this is an essential part of my kit and I will use it in all performances."

Keith Emerson (Emerson, Lake and Palmer)

Critics and world class musicians agree; with groundbreaking 128 note polyphony, Physical Modeling technology, great piano action keyboard and all at a price that seems difficult to believe, the new Generalmusic PRO2 is the absolute pinnacle of achievement in digital piano technology. In fact, Generalmusic is the first ever company to marry complex sample analysis with physical modeling to accurately reproduce the unique experience of playing a fine concert grand. We started by painstakingly creating a composite sample which represents "the ultimate grand piano". This composite is based on careful analysis of Steinway, Bosendorfer, Yamaha and Fazioli concert grands with the most outstanding characteristics from each being implemented in the final sample. Of course we didn't just stop there - a great sample does not make a great piano sound!

To replicate the complex acoustic environment of a piano soundboard we use no fewer than three (3) patented physical modeling technologies. The first calculates the harmonic contribution of any other undamped strings to the final sound of the notes being played. The second model analyzes the exact position of the continuous damper pedal and calculates the correct static and harmonic results from the notes played. Finally, whenever a key is released, instead of using an envelope to simply fade out the sample over time, an accurate model of the damper returning to the string is generated and authentic harmonic trails are heard unique to each and every note.

In plain English, the result is sheer perfection. The PRO2 is the only digital piano on the market which sounds its best with the reverb turned off allowing the natural ambiance of the soundboard to provide a characteristic warmth never before heard on a digital instrument. With up to 47 additional sounds of outstanding quality and with a price starting at below $2000 (PRO1), it's no wonder these instruments are sending shock waves throughout the music industry. Check one out at a dealer near you today and find out what all the fuss is about. **If you've been waiting for the ultimate grand piano sound in a digital keyboard....the wait is finally over.**

Generalmusic Corporation
1164 Tower Lane, Bensenville, IL 60106

1-800-323-0280
www.generalmusic.com

GENERALMUSIC

circle #536 on reader service card

Beyond that, its recording capabilities fall in the category of musical scratchpad. It offers sixteen tracks and a 20,000-note capacity in a 4 MB machine.

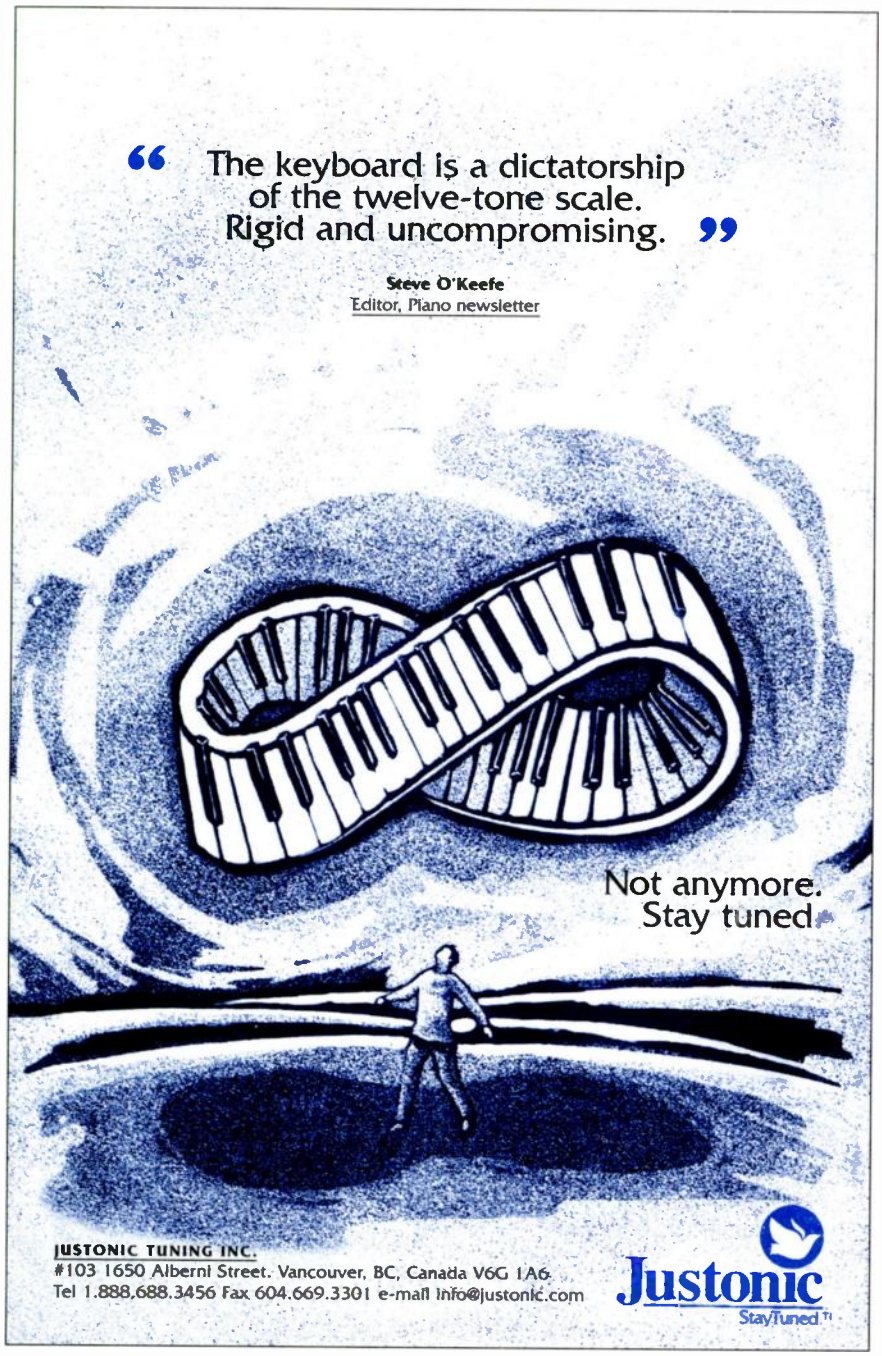
Each track can be toggled between Play, Record, Mute, and Solo modes, but there's no editing to speak of beyond copying entire sequences. You can't copy tracks, transpose, or quantize. If you make a mistake, you simply record over it. I suppose this is acceptable in a scratchpad, but here's the clincher: there's no metronome! Hello? You can set meter and tempo and monitor the song position in measures/beats on a hierarchically buried screen, but a visual display does not eliminate the need for an aural tempo guide. (You can slave the sequencer to an external clock, so you could get a click from a drum machine, but this makes it more complicated than it should be.)

The sequencer can import Standard MIDI Files (type 0 or 1) via DOS disks as long as they adhere to the DOS filenaming convention. Sequences can also be exported as Standard MIDI Files to a floppy disk, but that doesn't seem helpful if the timing doesn't map to anything useful! (Can you say "click track"?) You can also save sequences as EIV banks to transfer between machines and combine sequences from various sessions.

A Jukebox mode can be used to string up to eight sequences together for consecutive playback, but the queue always loops back to the first sequence. This is the closest thing you get to Song mode sequencing, in which different sections of a song are strung together. Unfortunately, the average intro-verse-chorus-verse-chorus-bridge-verse-chorus-chorus type of song has more than eight sections. The seamless playback of consecutive sections also makes the sequencer a poor candidate for playing backing tracks in a live-gig environment unless you program silence at the beginning and/or end of each section.

A set of dedicated transport controls appears front and center on the unit. These controls can also be used with external MMC devices. Unfortunately, they don't send Start and related messages to control generic sequencers that don't support MMC. The sequencer can be set to start recording when the transport is engaged or when the first note is played. Playback can be set to play once or loop after the last event. (The latter option actually causes it to loop from the point where the Stop key is pressed.)

Basic multitimbral recording is accomplished by going to the Multimode



circle #541 on reader service card

Product Summary

PRODUCT:
E4K keyboard sampler
PRICE:
$3,995
MANUFACTURER:
E-mu Systems, Inc.
tel. (408) 438-1921
fax (408) 438-8612
e-mail webmaster@emu.com
Web www.emu.com
CIRCLE #437 ON READER SERVICE CARD

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

screen, assigning Presets to each of the channels, selecting the channel you want to record, hitting the SetKybd soft key to tell the keyboard to transmit on that channel, and engaging the transport controls to record. You'll have to go back and forth between the Multimode screen and Sequencer screen to erase a bogus take, and you must go two levels deeper into the Sequencer screens to display song position. (You can get around this by assigning the latter screen to one of the three assignable keys.)

OPERATING SYSTEM

E-mu recently released version 2.5 of their EOS operating system, so let's look at the major changes since version 1.1f, which was discussed in the EIV review. The operating system resides in flash RAM, so upgrading is as simple as inserting the floppy disk and hitting a few keys.

One of the problems with samplers is the less-than-instant gratification inherent in browsing the disk, telling the unit to load a sound or bank, and waiting a while before knowing if you picked the right stuff. E-mu's SoundSprint feature takes some of the pain out of this process. (You can also audition raw samples directly from any connected hard disk or CD-ROM without loading them into memory.)

▼

One of the first things you notice is the classy aesthetics.

When you select a Preset to audition with SoundSprint, it is automatically loaded into one of the RAM locations 990 to 999. (Linked Presets are not loaded, which you can work around by subsuming associated links into a single Preset.) Once these locations are full, selecting another Preset to audition replaces the Preset that has been in this memory area the longest; in other words, the Autoload feature of SoundSprint operates on a first in, first out basis.

Loading the average stock preset with SoundSprint takes about three seconds, and the procedure avoids the normal loading routine. However, recalling any preset in memory is not instantaneous; it takes about one second. This is not quick enough for tight midsong program changes in a live gig, but the speed advantage of SoundSprint is welcome in the studio.

The other big improvement in EOS 2.5 is its System Exclusive implementation, the lack of which caused some concern in my review of the EIV. Virtually every function is now addressable via SysEx, finally allowing the use of editor/librarian software. (E-mu says that a complete ed/lib package will have been introduced by the time you read this.) Multiple units can now be addressed, thanks to the addition of a programmable device ID.

There's a long list of EOS changes of lesser significance. SCSI functions now have their own menu, and the SCSI driver has been rewritten for faster, better communication with storage devices and other devices, such as computers. Support for SMDI has also been added. Roland samples can now

The Paradigm is Shifting

Introducing
Pitch Palette™
Real-time just intonation, user scales,
& international scales for your PC.

FEATURES

◊ Menu of international and historical harmonic scales ◊ Unlimited user created scales ◊ Easily compare just intonation to tempered intonation ◊ Real-time modulation of key, or tonal center within a key ◊ Automatic or manual selection of tonal center ◊ Editable chord detector ◊ Read MIDI sequences and add tuning parameter changes ◊ **Free upgrade to version 2.0**

Only $199

To order Pitch Palette™ call toll free:
1-888-688-3456
Visa, MC, AmEx

Justonic Tuning Inc
Fax: 604-669-3301
103 - 1650 Alberni St. Vancouver, BC V6G 1A6
info@justonic.com or www.justonic.com
For use with a 486 PC with Windows 3.1
or better and a microtunable synthesizer or
sound card. (MAC version available soon)

Justonic
StayTuned.™

circle #542 on reader service card

be loaded in addition to samples in Akai format, opening up another sound library. Four new morphing filters, five new distortion filters, and two new time-compression algorithms have been added, too. A tempo-fit calculator and microcalculator (for use with the sample-rate converter) are also included.

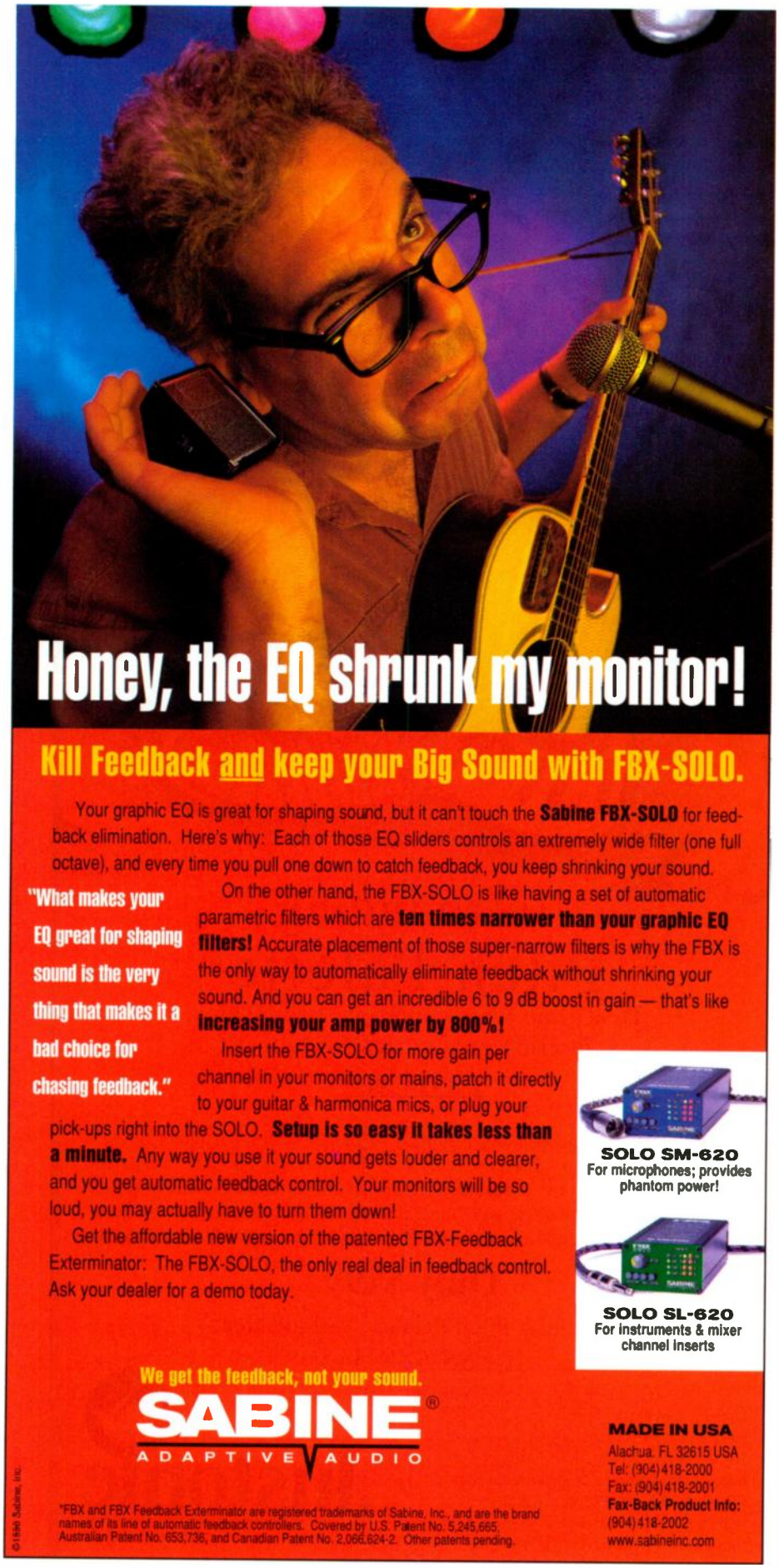
CONCLUSIONS

E-mu's optional combination of 128-voice polyphony and 128 MB of RAM is the best game in town if you like to arpeggiate piano samples with the sustain pedal down or put the metaphor of the all-in-one electronic orchestra to the ultimate test. The sound quality, available sound library, and integrated performance features are as good as it gets (except for the effects). The SoundSprint feature makes life in the fast lane easier, at least for sounds of modest size, and the matrix modulation provides powerful synthesis options.

On the downside, I noticed a significant amount of noise when changing presets or effects, which I don't recall from the EIV. (E-mu speculates that I'm hearing the effects processor changing algorithms.) In addition, the effects are surprisingly limited in the number and control of their parameters, especially for such a professional unit. An incomplete MIDI implementation makes the instrument less than an ideal controller in live situations, and it's pricey and sluggish as main performance axes go.

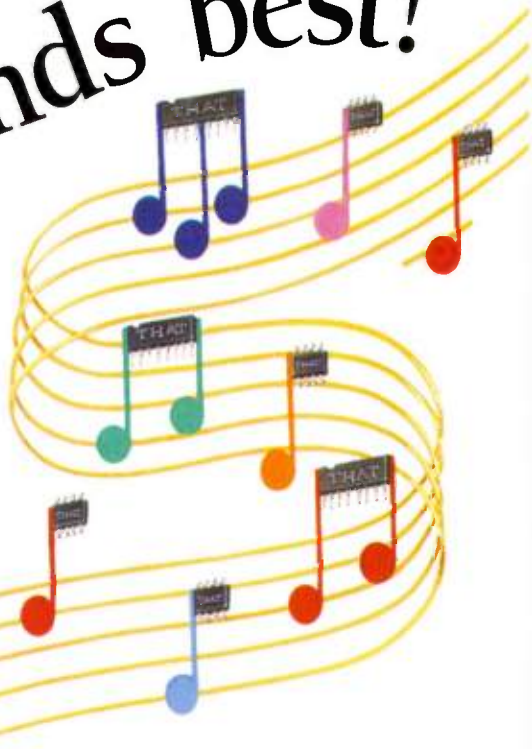
As for studio work, the sequencer is so abysmal that the unit is disqualified as a workstation. This means the E4K is best suited for studio/composition use with an external sequencer. Although the keyboard feels great, players who need a keyboard sampler might not be prepared to cough up this kind of money. Those who need this level of polyphony and memory expandability are most likely to have enough keyboards in their lives already and lust only after new modules. As a result, E-mu's own rack-mount EIV and E4X represent some of the E4K's biggest competition.

Musician-artist-multimedia producer **Jeff Burger** *lives in Sedona, Arizona, and is fond of reminding anyone who will listen that creativity is infinitely more important than technology.*



circle #574 on reader service card

THAT'S when *it* sounds best!



Cool or hot, blues or not – you make the music. And THAT Corporation makes the ICs that put you in control of dynamic range and level. When THAT ICs are in play, you get your best sound, because they respond to your every musical demand.

Listen carefully. Do the VCAs in your audio gear add unwanted distortion... or noise... or produce nasty thumps when you change gain? Some others do. But THAT VCAs consistently deliver clean, rich, pure sound. They don't add or subtract from your music, except where *you* want.

From mixers to compressors, to de-essers and other dynamic processors, you'll find THAT VCAs inside the world's most renowned audio gear. So, whether you need to ride gain, squeeze a sax, or control sibilance, insist on THAT ICs in your next audio processor.

With THAT ICs, you'll get all the music and every ounce of emotion that flows out of you.

THAT's the inside story. Ask your dealer to demo audio gear with THAT ICs inside.

THAT Corporation

734 Forest Street Marlborough, Massachusetts 01752 USA
Phone (508) 229-2500 • Fax (508) 229-2590 • http://thatcorp.com

THAT Corporation products are distributed throughout the world.

circle #592 on reader service card

Macromedia Deck II 2.5.2 (Mac)

By Jim Pierson-Perry

The latest and greatest from the original digital multitrack program.

I wonder if OSC realized how hot hard-disk recording would become when it released *Deck*, the first program for multitrack digital audio recording, back in 1990? The program's software emulation of an analog multitrack deck provided a friendly and familiar entry for musicians into computer-based audio recording. The upgrade to *Deck II* in 1993 (reviewed in the March 1994 **EM**) retained the tape-deck analogy and added support for Macintosh internal audio and QuickTime. Going to native Power Mac code in 1995 with version 2.2 bulked its capability up to 24 tracks of real-time playback.

In late 1995, OSC was acquired by multimedia giant Macromedia. *Deck II* 2.5, the first release since the acquisition, provides several cool new features, such as real-time digital effects, the ability to import audio CD tracks, and support for Adobe Premiere-format DSP plug-ins.

UP AND RUNNING

Deck II runs with any NuBus or PCI Power Mac with System 7.5.1 or later. Older 680X0 models running under System 7.1 or later are supported back to the IIx. Macs that are incapable of Sound Manager–based, 16-bit audio require a Digidesign audio card. The Digidesign Audiomedia III and Korg SoundLink 1212 I/O cards are not supported, but support for them is expected in early 1997. Technically, the PowerBook 520, 540, and 5300 are supported, but *Deck II* doesn't run well on these machines, and I don't recommend using them.

I tested *Deck II* over several months using both a Mac IIci with an Audiomedia II card and a Power Computing 150 MHz PowerCenter Mac clone. I used Systems 7.5.3 and 7.5.5 with OMS 2.2 and QuickTime 2.1 and 2.5. Both computers worked flawlessly, though obviously they had markedly different performance.

In general, you can expect to get four playback tracks on a 680X0 Mac, up to eight tracks on a Quadra 840AV, and from eight to thirty-two tracks using a Power Mac (depending on the CPU, clock speed, available RAM, and hard-drive throughput). A good practice is to specify only as many playback tracks as your project really needs in order to reduce *Deck II*'s processing overhead and improve its reliability.

The review of Macromedia's *SoundEdit 16* (in the August 1996 **EM**) included a sidebar on problems with real-time multitrack audio playback on Apple's Power Mac 7200 and 7500. These problems also plague *Deck II*. It is wise to install 512 KB or more Level 2 cache, but that will not solve the problems. The best solution: don't use a 7200 or 7500 for multitrack audio. Offline editing should work fine.

Regardless of your CPU, you will usually get the best results using a dedicated hard drive for audio and a separate drive for your System and program files. Those creating audio for QuickTime movies can improve playback quality by using another hard drive for the video files. In addition, Iomega Jaz removable drives work well with *Deck II* and can easily support twelve to sixteen playback tracks with mild editing.

Even hard-disk formatting software is reported to affect performance. Macromedia recommends CharisMac Engineering's *Anubis;* I used CharisMac's *APS Power Tools* and had no problems. The manual contains a list of known extension conflicts, to which Adobe Type Manager should be added.

Thankfully, copy protection has been dropped. I greatly appreciate this convenience and trust, having lost software installations with other programs due to hard-drive failures.

DOCUMENTATION & SUPPORT

The manual provides detailed instructions and helpful screen shots for most operations, with an appendix on digital audio basics. *Deck II* offers many key commands and shortcuts that can really speed up your work, but unfortunately, the manual doesn't offer a complete list of them. A laminated card would be great. Although earlier copies of *Deck* did not include a tutorial, the new CD-ROM version comes with a useful demo and 13-page tutorial, including sample audio files.

Macromedia maintains an active Web site containing product information, demos, and answers to common questions. Two minor maintenance updates have been released for *Deck II*, and an updater for the latest version (2.5.3) can be downloaded from the Web site.

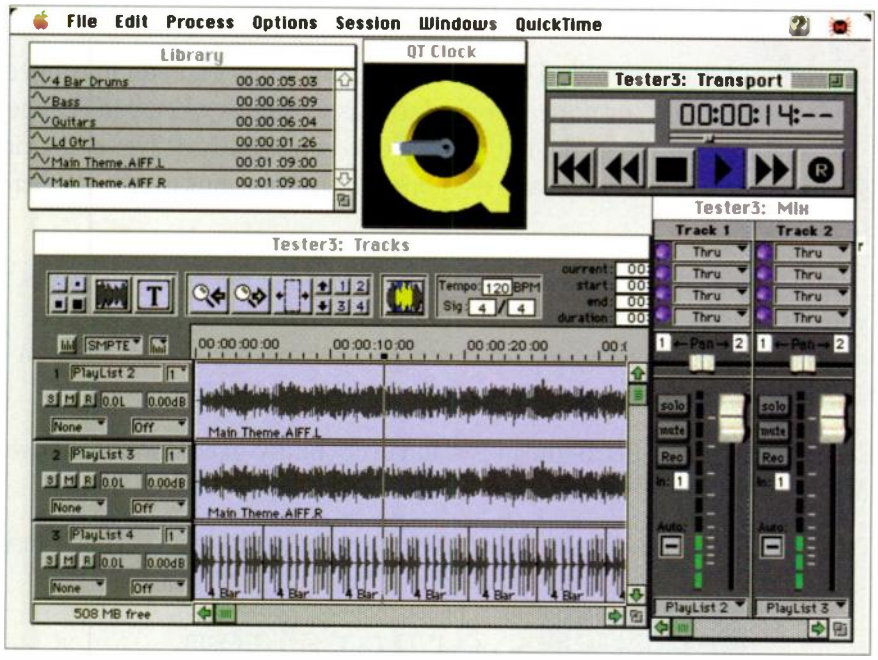


FIG. 1: Overview of the main working windows in *Deck II*. Clockwise from the upper left corner: Library, QuickTime, Transport, Mixer, and Tracks. All are linked so that changes in one are immediately reflected in the others.

MIDI by Mail

1•800•638•4280

Music By Mail At The Nation's Lowest Prices!

Guitar Center

VISIT ANY OF OUR 29 LOCATIONS NATIONWIDE TO DEMO THE LATEST IN MUSIC SOFTWARE. OR, FOR YOUR CONVENIENCE, ORDER BY PHONE. EITHER WAY YOU'LL GET PROFESSIONAL SERVICE AND THE LOWEST PRICES ANYWHERE...GUARANTEED.

- Hundreds Of Music Software Titles In Stock!
- Buying Power Of The Largest Music Retailer In The Country!
- Friendly Knowledgeable Staff!
- MIDI Peripherals & Multimedia Components!
- Lowest Prices Guaranteed!

SAVINGS UP TO **85% OFF!**

SOFTWARE

MIDI PERIPHERALS

MULTIMEDIA COMPONENTS

CD ROMS And Much More!

CALL NOW FOR YOUR FREE CATALOG

AND GET A FREE Steinberg CD-ROM!

"Factory Authorized Sale Prices"

"Factory Authorized Sale Prices"

"Factory Authorized Sale Prices"

The Ultimate Musician's Website

Visit The Most Comprehensive Music Related Site On The Web!

Artists

Prizes

Info

http://www.musician.com

circle #537 on reader service card

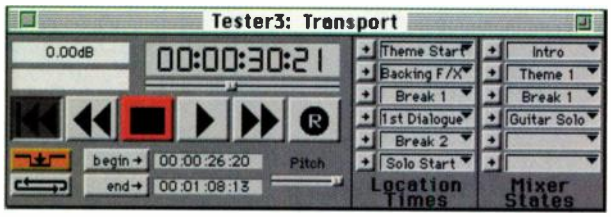


FIG. 2: Up close with the Transport window. The two sets of registers on the right hold predefined location times (markers) and mixer snapshots, which can be recalled with a mouse click. Controls at the bottom left provide automated punch in/out or looping over a defined time interval. The upper left numeric field shows the value of the current pan or volume fader as you move it.

You can get additional help and info from the Deck Users mailing list; send e-mail to deckusers-request@lists.best.com with "subscribe deckusers" in the body. A big tip o' the hat to Hank Hansen, Macromedia's *Deck II* guru and "Dear Abby" of the mail list. His responsiveness and tech-support smarts should be a model for other companies.

THE VIRTUAL MULTITRACK

The current version of *Deck II* retains the basic user interface of previous versions but with several embellishments. Most work is done in the Mixer, Transport, Tracks, and Library windows (see **Fig. 1**). Other windows provide specialized functions such as display of QuickTime video, Standard MIDI File playback, and real-time control of the effects parameters. The amount of display information in a typical session can quickly fill even a 17-inch monitor. Fortunately, the Transport window can be closed, and its functions can be operated through keyboard commands or even mapped to a MIDI Control Change message.

The Mixer and Transport windows convincingly mimic the operation of a multitrack cassette ministudio. Arm a track for recording, adjust the monitor level, and then click on the Record and Play buttons to start recording. When you're finished, click the Stop button, rewind, and play it back. Use the track controls to adjust volume and pan position, just as you would in a regular cassette ministudio, and sweeten in real time with a taste of in-line equalization, delay, or chorusing. You can record more tracks, punch in to fix a bad take, and mute or solo.

The Tracks window, however, offers capabilities far beyond what a cassette ministudio could provide. Audio files are displayed as waveforms against a timeline. Using a virtual razor, you can cut files into Regions that can be edited and reassembled. You can move audio Regions within or across tracks, toss away bad takes, and splice Regions together with crossfades, freely experimenting without ever losing a note or compromising audio quality.

In addition to the normal Play Tracks, you can create virtual Work Tracks—up to 999 tracks per session—for alternate versions or intermediate bounces. *Deck II* maintains a list of your Regions, original recorded tracks, and imported sound files in a Library window for storage and easy reference. Just click on a Library selection and drag it into position on a track to build your desired mix.

Any given project can involve a number of different files and file types: raw digital audio, QuickTime video, MIDI files, and so on. *Deck II* handles all of the storage and bookkeeping behind the scenes. The main project document is the Session file, which acts as a dispatcher, calling each data file at the right time and routing it to the designated outputs. *Deck II* allows you to add, delete, and compact audio files, and version 2.5.3 even allows you to defragment them.

AUDIO RECORDING

You can record as many tracks simultaneously as your hardware supports. (According to Macromedia, you will get up to twelve tracks with the Korg SoundLink 1212 I/O card, though that product was not shipping yet as of press time.) Recording is done in 16-bit resolution at 48, 44.1, 24, or 22 kHz. An available disk-space indicator is in the lower left corner of the Tracks window; it's an important feature, but its location makes it easy to overlook.

Deck II cannot adjust input-signal levels on a Power Mac, apparently due to a hardware bug that affects the computer's onboard preamp, so you must carefully set your levels at the source. In addition, limitations in Apple's Sound Manager force you to monitor all incoming audio at full volume during recording, with no control of pan. However, existing Play Tracks respond normally to all Mixer controls (including pan) while you are recording new tracks. Sound cards bypass this problem altogether.

VU meters for each channel provide visual feedback on recording and playback levels. A red light comes on if your levels cause clipping, and it stays on

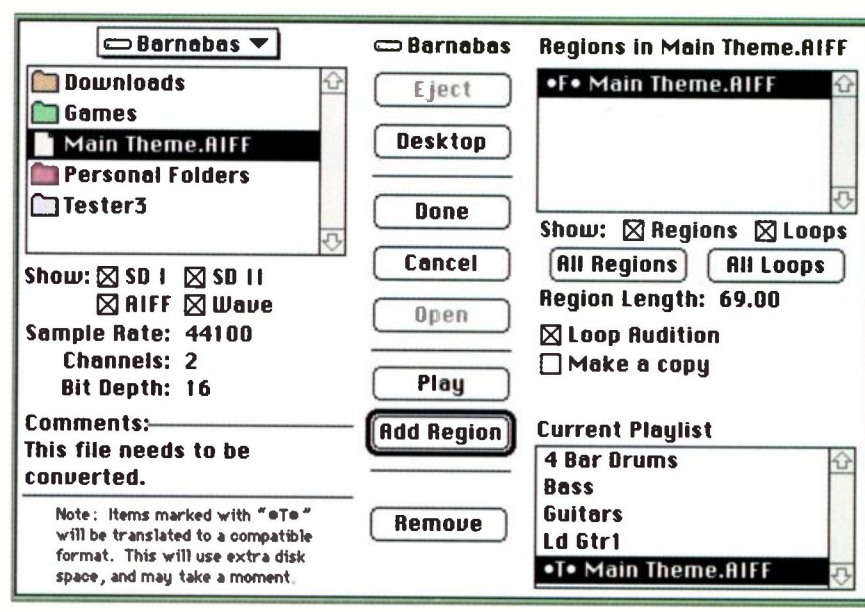


FIG. 3: The Add Audio dialog box facilitates batch loading of preexisting sound files in various formats. Entire sound files or predefined Regions from them can be selected, auditioned, and loaded in one step. Sample-rate and bit-depth conversions are done automatically, if required, to match the current session setup.

An Inside Tip from a Professional.

"After comparing the CAD E 100 to the mics I have been using on kick drum... it outperforms them all."

Randy Siegmeister,
Production Manager - Touring and Special Events for Maryland Sound

When it comes to choosing microphones, Randy Siegmeister relies on *years* of touring experience as house engineer for top performers like Mariah Carey, Daryl Hall & John Oates, Roberta Flack, Juice Newton, and Anita Baker.

His choice of the CAD E 100 Servo-Condenser, super cardioid microphone on kick drum has yielded phenomenal results... just one of the many applications the E 100 handles, delivering superior performance.

With extraordinary extended low-end response, extremely stable ballistic capability and wide bandwidth, the E 100 provides a detailed and transparent audio image of the sound source, well beyond any other microphone at its price point. Whether you're in a studio or on stage, the E 100 will produce exceptional reproduction of vocals, acoustics, amp stacks and of course... *percussion*.

CAD

Professional Microphones

CAD microphones - found in studios and on stage with major tours in venues worldwide. 1-800-762-9266. e-mail cti_audio@msn.com

circle #512 on reader service card

until you reset it to ensure you know there was a problem. Levels displayed by the VU meter while recording are slightly inflated over the actual levels when using a Power Mac audio input. This is another Sound Manager problem, and its effects vary among Power Mac models. The meters are accurate when recording through a sound card, though.

The problematic Power Mac 7200 and 7500 present a special challenge with multitrack recording, as newly recorded tracks are offset 20 to 40 ms behind existing tracks. The only workaround is to manually move the newly recorded track slightly ahead on the timeline to restore sync. This apparently is due to peculiarities with these computers and is not cured with a Level 2 cache. The problem only affects recording while playing back earlier tracks; spotting Regions or importing sound files are done correctly. No other models have displayed this problem; my IIci and Power Center 150 performed flawlessly.

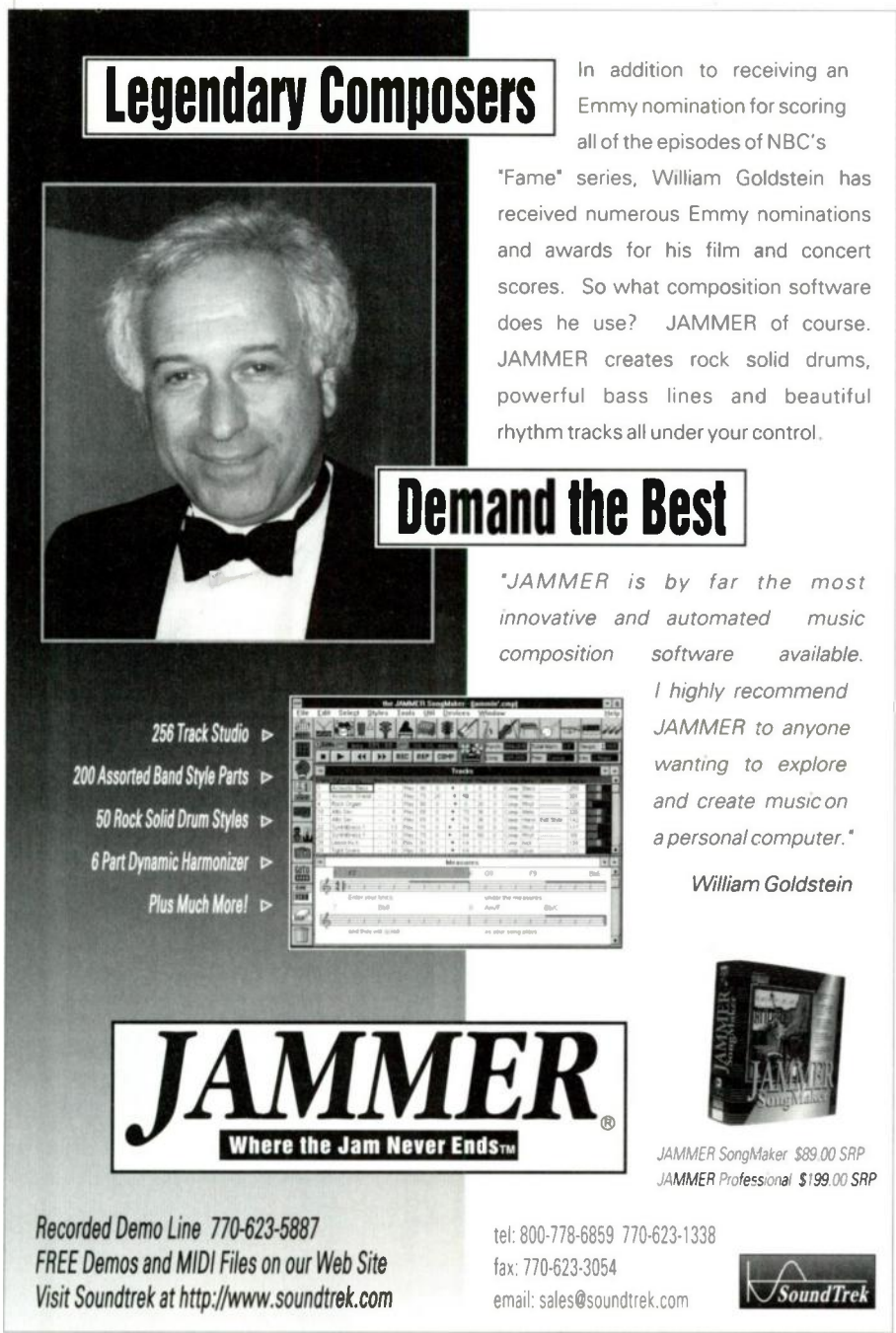
You can record multiple takes of an entire track or use the automated punch in/out to redo a selected Region. New takes are appended sequentially to the end of the parent audio file. Though they appear onscreen in place of the original data, nothing has actually been lost; the original data is just covered up. You can always restore the original or any retake. A loop function in the Transport window (see **Fig. 2**) allows you to rehearse with pre-recorded tracks. Looping is for playback only; *Deck II* doesn't support cycled recording. There's also a pitch-adjust slider to slow down playback speed, which is useful for rehearsing and homing in on areas to edit.

In the Transport window, you can recall predefined mixer snapshots and timeline markers. Snapshots hold volume and pan settings for all Play Tracks, but unfortunately, not mute/solo status. Nameable markers reference specific points on the timeline and can be added offline or dropped in during playback. You can define as many snapshots and markers as desired; up to six of each can be loaded into the Transport window at a time for instant access.

In addition to recording audio, you can audition and import multiple sound files from different locations in a single operation. *Deck II* recognizes Sound Designer I and II, AIFF, SND, WAV, and QuickTime file formats. The import dialog box (see **Fig. 3**) provides for bit-resolution and sample-rate conversion so you can match imported files to the current session. A separate Import command digitally transfers entire tracks or snippets from audio CDs using Apple-compatible, 2× or better CD-ROM players.

Deck II only deals with mono audio files, which is a common limitation for budget digital-audio software. Imported stereo files are split automatically into mono files for the left and right channels. I hope that Macromedia will make *Deck II* stereo aware in a future update.

Although only one session file can be open at a time, you can import other session files to use their audio files, Playlists, and automation profiles (more on this later). Any such imported data must first be added manually to the Library with the Update From Session command. This technique seems counterintuitive because the Library should automatically update when new source files or Regions are



circle #579 on reader service card

brought into the session. This same flaw exists with newly recorded tracks or created Regions.

ON THE RIGHT TRACK

The Tracks window (see **Fig. 4**) serves as a pasteboard for assembling audio files and Regions into the final multitrack mix. Tracks run horizontally against the timeline, with Play Tracks stacked vertically above Work Tracks. Time can be expressed as samples:seconds:frames or as bars and beats. Beat units are relative to the tempo and time signature, which cannot be changed during a session unless you run *Deck II* in tandem with JS Technologies' *Metro* sequencer. (A direct descendant of Dr. T's *Beyond* sequencer, *Metro* was originally distributed by OSC. It was reviewed in a sidebar to **EM**'s March 1994 review of *Deck* 2.0.) The track order can be changed at any time by loading a different playlist or by dragging tracks up and down.

You can watch the tracks scroll on playback, but scrolling was jerky even with my 150 MHz Power Mac. In addition, the cursor stays at the far left of the display. I'd prefer that it sit midscreen so I could see both sides of waveforms as they go past the cursor.

Customization controls let you select from one of four fixed track sizes, zoom in/out on the timeline scale, and expand/shrink the waveform scale. These parameters apply globally to all tracks; I'd rather control size at the individual track level. Up to four Views (comprising the timeline position and current zoom setting) can be stored for instant recall. These would be more useful if a View also saved the current track size and waveform scale. That way you could quickly flip between close precision work on a single waveform and an overview of many tracks for large-scale arranging.

There are two editing modes in the Tracks window: Range and Object. Although there is some overlap, Range mode is used to work at the waveform level to create Regions and build fades or crossfades between Regions. Object mode is used for dragging Regions within and between tracks to build the overall mix and spot audio.

Regions are the basic building blocks in *Deck II* and are easy to create. In Range mode, the mouse-based audio scrub is used to locate start and stop points. Range selections can be made within a single track or across multiple, contiguous tracks. You can audition the selection by itself or in context with all active tracks to fine-tune the start and end points. The Slice command turns the Range selection into a Region with an editable default name. Selections across multiple tracks are split automatically into multiple single-track Regions.

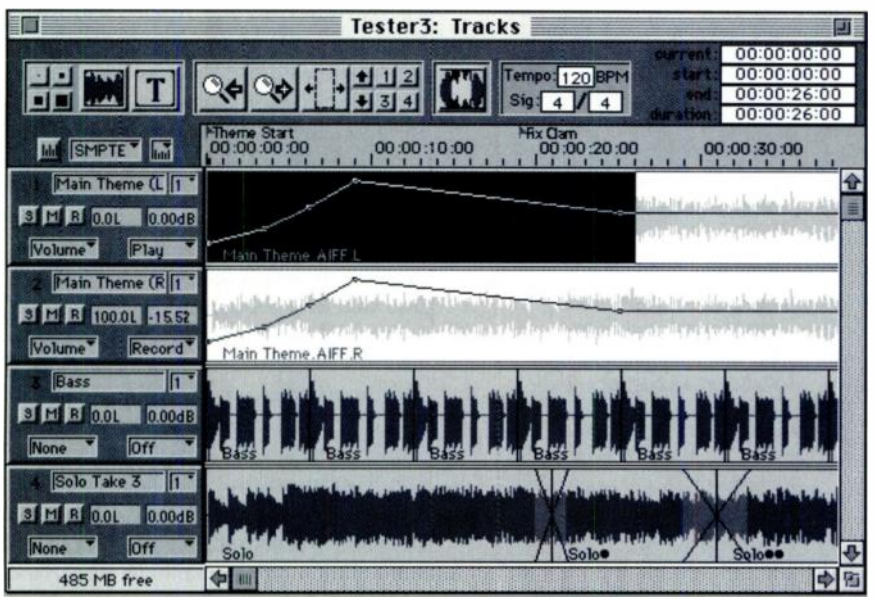


FIG. 4: The Tracks window is *Deck II*'s workhorse for editing and building up the overall session mix. Each track has a control area to the left and a display area to the right, which can be set to show the current audio waveforms, pan, or volume automation Profiles against the timeline. Crisscross shapes in the lower track represent crossfades between Regions.

Record Deals.

Publishing Deals.

Film/TV Music Deals.

Foreign Deals.

We're Not Kidding...

But you won't know that unless you call this toll-free number and request our FREE information kit.

1-800-458-2111

TAXI

The Leader in Independent A&R

circle #589 on reader service card

No. You're not seeing double.

Yes! 4-channels of pure digital audio.

4 Tracks
32-bit PCI
92dB
SMPTE
MIDI
Digital I/O
Digital Mixer
Balanced I/O

*It's the hottest digital audio card available. StudioCard™ from Antex. With 4 discrete channels of studio-quality digital audio, and production oriented features, it's the only digital audio card designed specifically for musicians, multimedia producers and post-production professionals. That's because it delivers the features and performance demanded by those who want the very best. Features like 4 balanced I/Os, digital I/O and MIDI/SMPTE synchronization capabilities. The card delivers studio quality sound, too. StudioCard is expandable and flexible. You can use multiple StudioCards in one PC giving you up to 16 discrete channels. Top that off with a programmable 40Mhz DSP and real-time digital mixing, StudioCard is a complete 4-track digital audio production studio that plugs into your PC. It comes with drivers for Windows 95 and NT and is compatible with most Windows-based MIDI and digital audio editing packages. So don't limit your creativity and capabilities with a mediocre two-channel sound card. Get StudioCard today. Call **800-432-8592** to order or for a dealer in your area.*

ANTEX digital AUDIO

• *Complete specifications via the Internet: www.antex.com • e-mail: antexsales@aol.com*
• *Phone: 800-432-8592 or 310-532-3092 • Fax 310-532-8509* ©1996 Antex Electronics Corp.

circle #506 on reader service card

• DECK II

I was pleased to see Library-management options that allow you to sort entries by their size or name and find all occurrences of a Region throughout the session. Unfortunately, the latter process was not entirely reliable; sometimes it failed to find all valid matches.

The standard Cut, Copy, Paste, Paste Multiple, and Delete editing commands work with both Range selections and Regions. *Deck II*'s four Clipboard memories can hold either audio or automation data; the latter is handy for holding common automation profiles that you plan to use throughout a session. Option-dragging pulls a copy of a Range or Region to a new location, leaving the original untouched. Command-dragging moves the original material and butt-splices it to the preceding Region in the destination track. Additional key commands move Regions or Range selections between tracks or along the timeline. These movements can be done freely or constrained to snap into the timeline grid.

Regions are aligned with respect to their beginning and end points. I'd like to be able to force alignment to an internal cue point, as you can with Digidesign's *Session*, to simplify locking musical accents on the grid. This would be easier in some cases than fiddling with the Region start time.

The Tracks window highlights a major difference between *Deck II* and its closest competitor, Digidesign's *Session* 2.0 (reviewed in the April 1996 **EM**). Tracks are 3-D in *Session*, so that you can move multiple Regions on top of each other or overlap them. Only visible parts of the Regions play, but the underlying Regions remain intact. In contrast, *Deck II* tracks are strictly 2-D. If you move a Region over a second Region and later move the first Region away again, you'll see a hole in the Region that had been covered. The audio data is not lost, however; it is just split into two Regions. You'll need to resize them manually to restore the original form. I greatly prefer *Session*'s approach, which promotes experimentation without wasting time cleaning up "holes" in tracks.

Fades and crossfades are made in Range Edit mode by making a Range selection and then applying one of *Deck II*'s seven preset curve shapes. You cannot edit the curve shapes, but you can set the prefade and postfade times independently. All fades are nondestructive;

JUST ONE LOOK TELLS YOU IT'S RADICALLY DIFFERENT.

NO FAN. NO NOISE. 2,500 WATTS.

The Crown K2. Revolutionary technology that delivers more power and sound while using less energy than any amplifier on the planet. And all in a durable, maintenance-free package that's just two rack spaces high.

Simply put, this new amp delivers more bang for your buck.

Using new, Patent-Pending Balanced Current Amplifier (BCA™) circuitry, the K2 gives you massive amounts of real-world power while generating virtually no component-degrading heat. In fact, it's so thermally efficient, it produces just one-tenth the heat of conventional amplifiers and is over three times more thermally efficient than anything else on the market.

Because the K2 is so energy efficient—more than twice that of conventional switching amps—it requires less power to deliver 1,250 watts per channel into 2 ohms. (And that's a solid 2 ohm rating!) This means that not only can more K2's be plugged into a single AC circuit, but there are also significant energy savings.

Best of all, our K2 gives you all the superior sound that Crown is known for— tight, chest-slamming low end, crystal-clear highs and a well-defined midrange.

In stock and shipping now, the new K2 is available for a Manufacturer's Suggested Retail Price of just $1795!

K2. Revolutionary design and performance. Only from Crown.

Toll-Free: 800-342-6939
Fast Facts Fax: 800-294-4094

crown
Guaranteed Excellence

www.crownintl.com

circle #519 on reader service card

if you don't like the results, delete the fade and try again. If you use the same fade shape for most of your work, make it the default to save time. The default fade is applied with a single command and avoids the Setup dialog box.

EFFECTS

Deck II offers several approaches to audio processing. These include destructive edits; in-line, real-time effects; support for Adobe Premiere-format plug-ins; and links to external audio-editing programs.

The destructive edits process an existing audio file or Region and cannot be previewed or undone, so it's best to work with a copy of your original file. Options include Normalize, Invert, Reverse, and Duplicate, and processing can be performed on one or more Regions at a time. *Deck II* normally keeps only a single copy of source audio files; multiple uses throughout a session refer back to the original file. The Duplicate command makes an independent copy of a Region that can be altered without affecting the rest of the session.

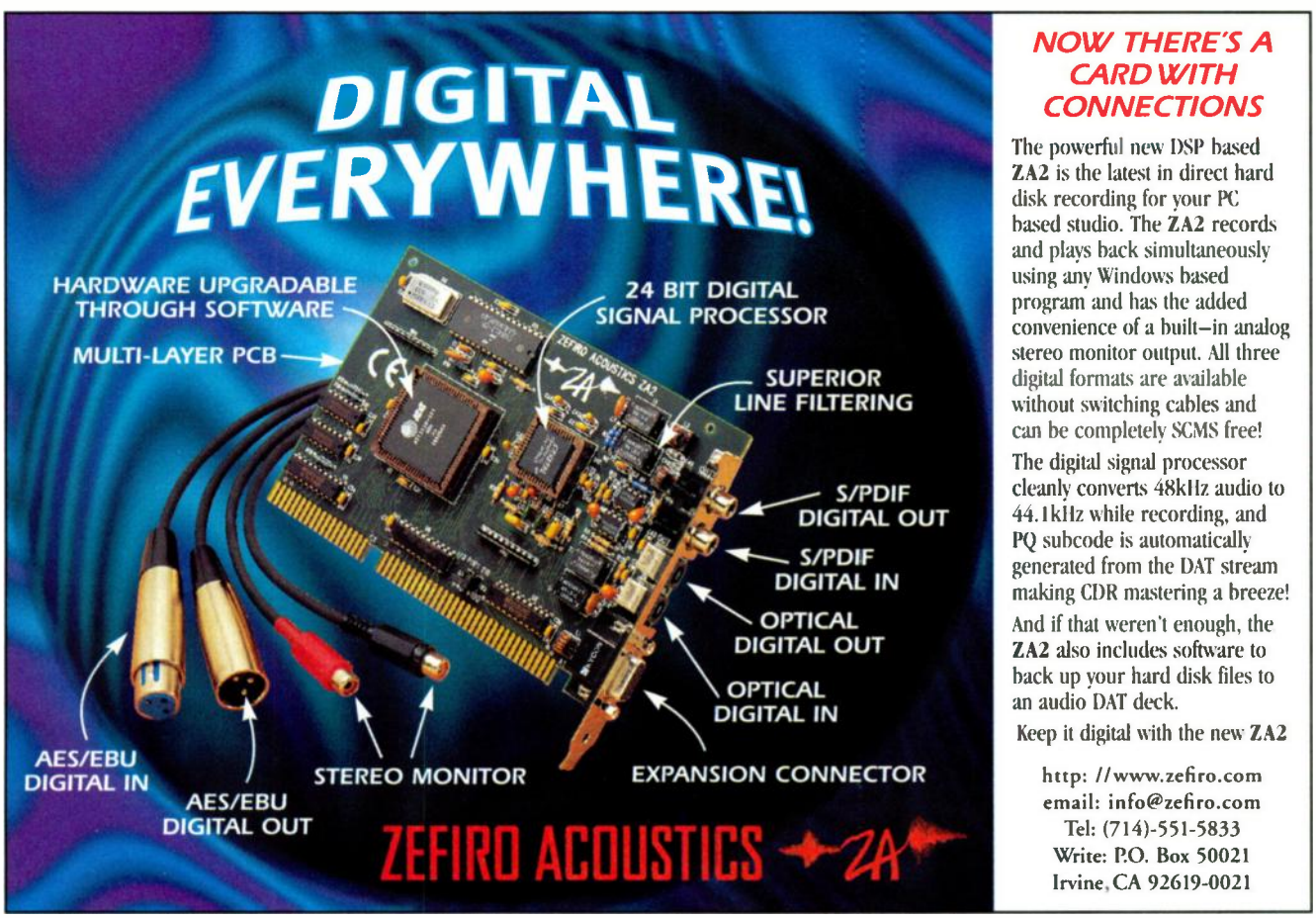
For more extensive destructive processing, you can launch an external sound editor from within *Deck II* (assuming you have sufficient RAM to run both programs together). Compatible editors include Macromedia's *SoundEdit 16*, Digidesign's *Sound Designer II*, and BIAS' *Peak*. Currently, only *Sound Designer II* automatically recognizes Regions when launched from within *Deck*.

One of *Deck II*'s strongest features is its proprietary, real-time effects-processing plug-in architecture. These effects are only available when using a Power Mac. Depending on your CPU's processing capability, you can use up to four mono effects per track to add gain, delay, EQ, and chorusing. The manual also describes a reverb module; however, it apparently did not perform up to Macromedia's expectations and was not released.

Effects modules can be added, removed, or changed at any time by clicking on the Effect Selector Boxes for a track in the Mixer window (see **Fig. 5**). There's even a handy Bypass button for each individual module. Modules are controlled by a set of sliders that can only be viewed and edited in the Effects window. Adding a new effects module to a track automatically adds the associated sliders in the Effects window. The sliders operate smoothly and introduce no audio glitches, even when multiple tracks are playing. You can even use multiple, independent instances of the same module; for example, you could have four delays chained together on a single track, each with different parameter settings.

The number and type of parameters depends on the effect, but in general they are few. The gain processor allows ±18 dB boost/cut. The delay allows up to 500 ms of delay time with control of feedback, cutoff, and wet/dry mix on a percentage basis. Theoretically, the maximum delay time can be governed by an Effects Preferences setting, but it never worked for me. When I entered a value and saved the Preferences, there was no change in maximum delay time, and reopening the Preferences dialog box showed the value had been reset to zero. (According to Macromedia, this bug has now been squashed.)

Chorus is similar to delay, with speed



circle #506 on reader service card

automatic or graphic

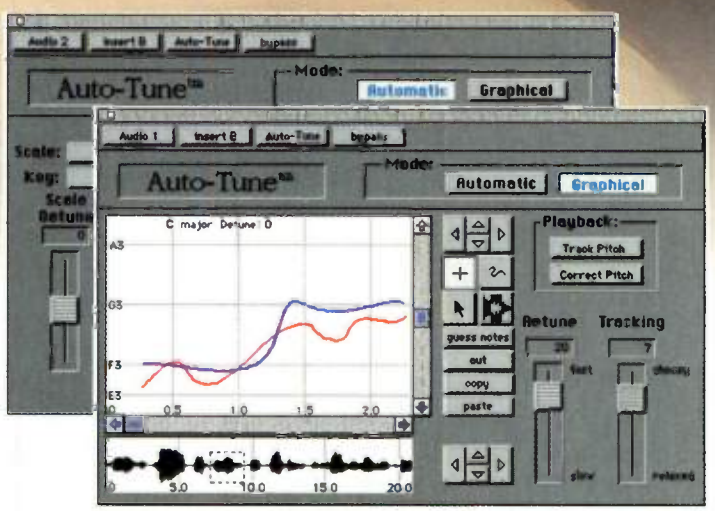
instant intonation correction

AUTO-TUNE™, a plug-in for TDM, corrects intonation problems of vocals and other solo recordings in real time.

The "Automatic Mode" instantaneously detects the pitch of the input, identifies the closest pitch in a user specified scale and corrects the input pitch to match the scale pitch.

The "Graphical Mode" displays the detected pitch and allows you to draw in the desired pitch on graph. This mode gives complete control over adding or repairing scooping pitches and large vibratos.

The quality of the output is spectacular: Even audiophiles cannot tell a sound has been processed, except that it is perfectly in-tune.



AUTO-TUNE™

INTONATION CORRECTION PLUG-IN

Auto-Tune™ is currently available as a TDM plug-in and will be available soon for VST and other platforms.

much MORE than a pitch shifter

ANTARES™
Creating the Future of Music Technology

Contact RiCharde & Company
1-800-446-2356

circle #505 on reader service card

and depth substituting for feedback and cutoff. The shelf EQs let you select the frequency (0 to 22 kHz) and gain; the parametric EQ adds adjustable Q. A separate 7-band EQ allows gain adjust at 60, 150, 400, 1,000, 2,400, 6,000, and 15,000 Hz.

The effects sound fairly good, but they could be easier to use. The only way to see a control-slider value is through a single display field in the Transport window. As a result, you must keep the Transport window open, and you can only view one slider at a time. This is annoying when trying to apply similar values across multiple tracks. I'd prefer that all slider values be shown directly in the Effects window, and I want to simply Control-click and type in a value.

Unfortunately, *Deck II* doesn't let you program automated changes to effects settings for playback or mixdown. You can manually change the parameters during playback by using the mouse or by mapping *Deck II*'s faders to MIDI Control Changes and recording them in a sequencer. But that won't work when mixing tracks to disk.

Deck II also supports Adobe Premiere-format DSP plug-ins for destructively processing mono audio files. Two companies have released compatible plug-ins: InVision Interactive and Waves. The Waves and InVision plug-ins give you access to most common effects with the notable exception of quality reverb. *SoundEdit 16* and InVision's *CyberSound FX* plug-ins include hobbyist-quality reverb modules, but these are not good enough for pro applications. In addition, these plug-ins ignore crossfades and may cause you to lose automation data from the source tracks, so be sure to do your effects processing first. The Waves plug-ins, on the other hand, are pro-quality products.

Macromedia bundles *SoundEdit 16* and *Deck II* as a package for $499, not much more than *Deck II* alone. A cool bonus from this is a new *SoundEdit 16* plug-in (free from Macromedia's Web site) that creates Shockwave real-time streaming audio files. You can record and mix in *Deck II*, send the master tracks into *SoundEdit 16*, and then export them as Shockwave audio files to publish your music on the Web.

AUTOMATION AND MIXDOWN

Deck II provides pan and volume faders for each track. The program's response to fader moves is nice and smooth, which is not surprising given the faders' 24-bit resolution. The screen faders move during playback to follow the changes.

You can make pan and volume changes manually with the mouse or automate the changes within the program or via MIDI Control Changes. Multiple faders can be mapped to the same MIDI controller, but relative offsets between tracks are lost: move the controller, and all associated faders go to the same new value. Although appropriate in some cases, I'd like to have an option for the external controller to add an offset value to existing fader settings while preserving relative track balances.

Pan and volume data can be recorded in real time through the Mixer window, but it's a bit daunting to build an entire mix using the mouse. Unless you map the faders to a MIDI control device (e.g., JL.Cooper's FaderMaster or Peavey's PC 1600), you will probably have an easier time creating automation

circle #566 on reader service card

Two New Reasons to Score Your Gear from the Best Discount Catalog in the Biz

1 **Our New Best Price Guarantee allows you to buy with confidence.**

If you find a lower published price, call us. We'll match any price in print before or after the sale.

MUSICIAN'S FRIEND BEST PRICE Guarantee

2 **With Musician's Friend New Easy Payment Plan You Can Stretch Your Music Dollars!**

No hassles. No applications. **No additional finance charges.** All you need is a Visa, Mastercard or Discover card and you can take up to 6 months to pay!

MUSICIAN'S FRIEND EASY PAYMENT PLAN Play While You Pay!

VISA MasterCard DISCOVER

Your Favorite Brands — Always in Stock!

Roland ALESIS DigiTech Gibson TASCAM FOSTEX MACKIE SKB KORG ZOOM lexicon

MUSICIAN'S Friend

I'd like to join hundreds of thousands of satisfied musicians in receiving the #1 music catalog, absolutely free! Call 1-800-776-5173, or mail this coupon to Musician's Friend P.O. Box 4520 Dept. 079 • Medford, OR 97501.

NAME _____

ADDRESS _____

CITY _____ STATE ___ ZIP _____

MAIN INSTRUMENT PLAYED _____

CALL 7 DAYS 1-800 776-5173

NOW YOU CAN GET THE BEST FOR LESS ONLINE: HTTP://WWW.MUSICIANSFRIEND.COM

ESP CUSTOM GUITARS WASHBURN ARTIST BOSS

circle #557 on reader service card

ADVERTISER INDEX

Advertiser	Reader Service #	Page
Advanced Audio Electronics	501	148
Akai	502	95
Alesis	503	30-31
Altech	504	140
AnTares	505	135
Antex Electronics	506	132
Aphex Systems	507	14-15
Applied Research & Technology (A.R.T.)	508	103
Audix	509	117
AVI	510	161
AVM Technologies	511	40
CAD	512	129
Cakewalk Music Software	513	79
Cakewalk Music Software #2	514	81
Cakewalk Music Software #3	515	83
Caruso Music	516	151
Computers & Music	517	90
Creamware/Mediamagix	518	91
Crown	519	133
dbx Professional Products	520	87
Digidesign	•	51
Digital Piano Buyer's Guide	•	97
DigiTech	521	39
Disc Makers	522	100
Discount Distributors	523	159
Ebtech	524	158
Electro-Voice (EV)	525	55
Emagic	526	10-11
E-mu Systems	527	89
Ensoniq (MR Series)	528	9
Ensoniq (DP/Pro)	529	41
Europadisk	530	80
Event Electronics (20/20bas)	531	45
Event Electronics (RØDE NT2)	532	113
FATAR/Music Industries	533	92
Focusrite	534	64
Full Compass	535	57
General Music	536	121
Guitar Center	537	127
Hohner Midia	538	151
Imaja	539	120
Innovative Quality Systems	540	114
JBL Professional	•	25
Justonic Tuning	541	122
Justonic Tuning #2	542	123
Kawai	543	35
Keyfax Software	544	144
Korg	545	16-17
Kurzweil Music Systems	546	IBC
Leigh's Computers	547	144
Lucid Technology/Symetrix	548	74
Mackie Designs (HR824)	549	2-3
Mackie Designs (CR1604-VLZ)	550	63
Mark of the Unicorn	551	BC
MiBAC Music Software	552	148
Microboards of America	553	82
MIDIMAN	554	115
Mission Recording & Audio	555	155
Musician's Discount Warehouse	556	150
Musician's Friend	557	137
Musicware	558	153
Musitek	559	145
Neumann/USA	560	36-37
Nikon	561	29
NRI/McGraw Hill	•	67
Opcode	562	75
Passport	563	119
Peavey	564	58
PG Music	565	84-85
Presonus Audio Electronics	566	136
ProSound & Stage Lighting	567	62
QCA	568	120
QSC Audio Products	569	27
Rhythm City	570	153
Rich Music	571	146
Roland (JP-8000)	572	4-5
Roland (GR-30)	573	73
Sabine	574	124
Sam Ash Music Stores	•	140
Shure Brothers	575	61
Sonic Foundry	576	71
Sony	•	111
Sound Factory	577	146
Sound Quest	578	143
Soundtrek	579	130
Speir Music	580	147
Spirit	581	59
Starr Labs	582	118
Steinberg North America	583	21
Sweetwater Sound	584	13
Sweetwater Sound #2	585	66
TASCAM (DA-38)	586	49
TASCAM (Dual Cassette Decks)	587	105
TASCAM (M1600)	588	107
Taxi	589	131
TDK	590	93
TerraTec USA	591	141
THAT	592	125
Thoroughbred Music	593	158
Tune 1000	594	106
Voyetra	595	112
Waves	596	65
West L.A. Music	597	106
Whirlwind	598	46
Whisper Room	599	150
Wildcat Canyon Software	600	147
World Records Group	601	155
Yamaha (MD4)	602	23
Yamaha (MX12/4)	603	53
Yamaha (REV500)	604	109
Zefiro Acoustics	605	134

RATE THE ARTICLES IN THIS ISSUE!

March 1997

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. "High-Tech Tutors," p. 32	701	702	703	704
B. "Cover Story: The Fab Five," p. 42	705	706	707	708
C. "Creative Space: Barnstorming," p. 68	709	710	711	712
D. "Master Class: A Place for Everything," p. 76	713	714	715	716
E. "Recording Musician: Optimum Gain Structure," p. 86	717	718	719	720
F. "Working Musician: Success by Association," p. 108	721	722	723	724

profiles in the Tracks window. This approach lets you create smooth profiles by entering breakpoints with the mouse. Editing the Profiles is equally easy: you drag breakpoints about and eliminate them or add new ones. There's even a command to thin excess automation points, which is useful for cleaning up "overcontrolled" faders while recording in real time.

Automation editing is hampered by *Deck II*'s inability to show volume and pan Profiles together for a track: you can only view one or the other (see track 2 in **Fig. 4**). This is a significant limitation. In addition, the screen display doesn't autoscroll if you hit the left or right boundary while moving a breakpoint. This annoying behavior goes counter to Macintosh software conventions.

Linear segments join one breakpoint to another. This technique is standard for such software, but I would like a tool for drawing smooth Profile curves instead of building them one small arc at a time.

The usual Mac editing commands can be used to cut, copy, and paste Profiles within and between t racks. This helps overcome *Deck II*'s monaural orientation because you can build up a Profile for one track and then copy and paste it to another track. I'd like to see Macromedia add a Profile Invert command to create mirror pan profiles for stereo channels.

Additional editing tools raise or lower a Profile or move it ahead or back along the timeline. The tools work by adding or subtracting offsets, but there are no provisions for scaling a Profile in amplitude or time. Be careful—inexplicably, these operations cannot be undone.

Automation data associated with a track is independent of audio data. If you cut or copy the audio data to another track, the automation Profiles normally do not tag along. Similarly, the automation data can be moved without affecting audio data. Fortunately, *Deck II* includes an option that links the two so you can move a Region with its pan and volume Profiles. This is a big improvement over *Session*, where you must re-create your automation settings if you move Regions.

You also can store a snapshot of current pan and volume settings for any or all of the track faders as a Mixer State. These Mixer States are readily recalled on the fly from the Transport window (see **Fig. 2**) and can be recorded as part of the mix. (It would be nice to be able to change Mixer States by MIDI Program Changes.) *Deck II* can be made to transition smoothly between designated Mixer States over a user-defined time interval. Macromedia suggests saving at least your starting pan and level settings as a Mixer State; otherwise, they may not be reliably restored every time you open the session file. I never experienced this problem, but other users have.

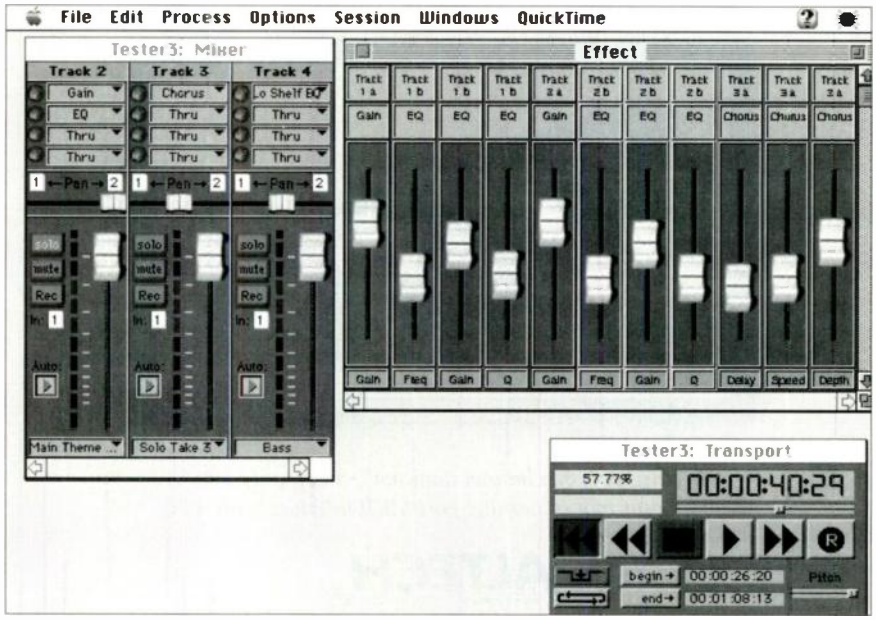


FIG. 5: The Effects window (right) works smoothly with the Mixer window to set up and control real-time audio processing. Up to four effects modules per track can be specified in the Mixer window, with individual bypass buttons. Activating an effects module adds a set of control sliders to the Effects window.

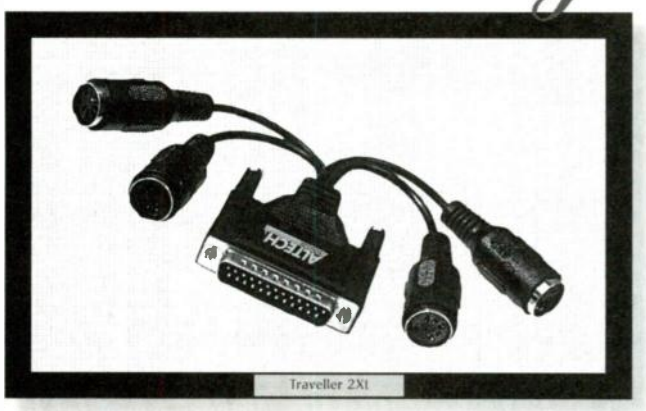
Bouncing tracks is a snap: select the range along any of the Play tracks, and then use the Bounce to Mono or the Bounce to Stereo command. All unmuted Play Tracks over the selected range are mixed down, along with active effects and automation. Then select the destination track (or tracks from the stereo Clipboard), and paste in the new bounce. Source files are left untouched and can be deleted or moved to Work Tracks to free up more space. Even better, turning on the Virtual Mix option extends the Bounce command to include all unmuted Work Tracks. Theoretically, this lets you create mixes with hundreds of tracks, and it is a major advance over *Session*, which can only bounce Play Tracks. It's fast, clean, and causes no signal degradation—love that digital technology!

Final mixdown works similarly, including the Virtual Mix feature. Instead of creating a new Clipboard file to paste into a track, however, you create an output audio file with the format, sample rate, bit depth (your choice of four conversion algorithms), and number of channels (mono, interleaved stereo, or split stereo files). Output formats include Sound Designer II, AIFF, Apple Sound Resource (SND), WAV, and QuickTime. If you save in WAV format, *Deck II* mistakenly uses "WAVE" as the file type rather than the correct ".WAV." This causes problems if you try to import the file into other programs, so be sure to correct the file type with *ResEdit*, *File Typer*, or a similar Mac file utility.

MOVIES, MIDI, AND SYNC

Deck II has all the necessary hooks to work with QuickTime movies. You can extract audio from QuickTime files, export audio in QuickTime format, or go all the way and master audio tracks with existing QuickTime video. One of the coolest features is the Chase Positioning option. With this option on and an audio Region selected, scrubbing in the QuickTime video window pulls the Region along the timeline. When you get to the desired video frame, release the mouse, and the Region stops in place. Spotting doesn't get easier.

MIDIdock Gallery



self-powered • 32 channel dual port • msrp only $99.95
high performance parallel port MIDI interface with MTC

ALTECH systems

www.altechsystems.com
for other fine PC and Macintosh™ Interfaces
888.LUV.MIDI / 818.709.4261 / Fax 818.709.4039
20621 Plummer Street Chatsworth, CA 91311

Altech Systems, MIDIdock and MIDIface are Trademarks of Sentech Electronics, Inc.
All Other Trademarks are the Property of Their Respective Holders.

circle #504 on reader service card

THE NEWEST SAM ASH SUPERSTORE LOCATION!
KING OF PRUSSIA, PA
139 E. DeKalb Pike • PHONE: (610) 265-6444 • FAX: (610) 265-6488

THE WORLD'S FAVORITE MUSIC STORE!

GUITARS & BASSES
DIGITAL HOME PIANOS
RECORDING EQUIPMENT
PRO SOUND SYSTEMS
DJ EQUIPMENT
SHEET MUSIC & BOOKS

Sam Ash GUARANTEED LOWEST PRICE
We will not be undersold by any music retailer, music store or mail order catalog.*

*If within 30 days of your purchase, you find the same item advertised in a local or national paper by an authorized dealer at a lower price, we will refund the difference. Demo models, factory seconds, discontinued merchandise and floor samples not included. Advertised items must be factory sealed new product.

DRUMS & PERCUSSION
ELECTRONIC KEYBOARDS
STAGE & CLUB LIGHTING
COMPUTERS & SOFTWARE
BRASS & WOODWINDS
STRING INSTRUMENTS

The Sam Ash® Credit Card
Quick Approvals • Convenient
Apply for yours today!

Sam Ash® MUSIC STORES
FAMOUS FOR DISCOUNTS SINCE 1924

Call Toll-Free!
1-800-4 SAM ASH
(1-800-472-6274)

VISA MasterCard DISCOVER NOVUS

Paramus, NJ (201) 843-0119
Edison, NJ (908) 572-5595
Cherry Hill, NJ (609) 667-6696
New Haven, CT (203) 389-0500
Margate, FL (954) 975-3390
Miami Lakes, FL (305) 628-3510
New York, NY (212) 719-2299
Brooklyn, NY (718) 951-3888
Forest Hills, NY (718) 793-7903
White Plains, NY (914) 949-8448
Carle Place, NY (516) 333-8700
Huntington Sta, NY (516) 421-9333
King of Prussia (610) 265-6444

Can't Get Through? Write: Sam Ash Music, Department X, P.O. Box 9047, Hicksville NY 11802

• DECK II

Exporting a QuickTime movie with audio is as easy as mixdown. Standard options are to select the audio format (8- or 16-bit, mono or stereo) and sample rate. Any sample rate can be used—an improvement over earlier versions, which supported only a few preset choices. If you are working with a preview instead of the final version, you can save disk space and time by having *Deck II* include pointers within the movie that point to audio files in the session. Otherwise, *Deck II* includes the actual audio tracks and produces a flattened QuickTime movie suitable for viewing on Macintosh and, optionally, Windows systems.

Deck II can run in tandem with an external MIDI sequencer through OMS via the IAC driver, Apple's MIDI Manager, or *Deck*'s own proprietary synchronization scheme. The simplest and perhaps most accurate approach is to use the proprietary synchronization, which is only supported by JS Technologies' *Metro* sequencer. *Metro* and *Deck II* share a common timing reference that allows for substantially better synchronization and that supports both trigger and continuous sync. Additionally, *Deck II* follows tempo changes from *Metro*. (For more

Product Summary

PRODUCT:
Deck II 2.5.2 multitrack recording software
PRICE:
$399
SYSTEM REQUIREMENTS:
Mac IIx or better with System 7.1 or later or Power Mac with System 7.5.1 or later; 16-bit audio card or 16-bit internal audio using Sound Manager; 8 MB of RAM; hard drive
MANUFACTURER:
Macromedia
tel. (415) 252-2000
fax (415) 626-0554
e-mail macropr@macromedia.com
Web www.macromedia.com
CIRCLE #438 ON READER SERVICE CARD

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

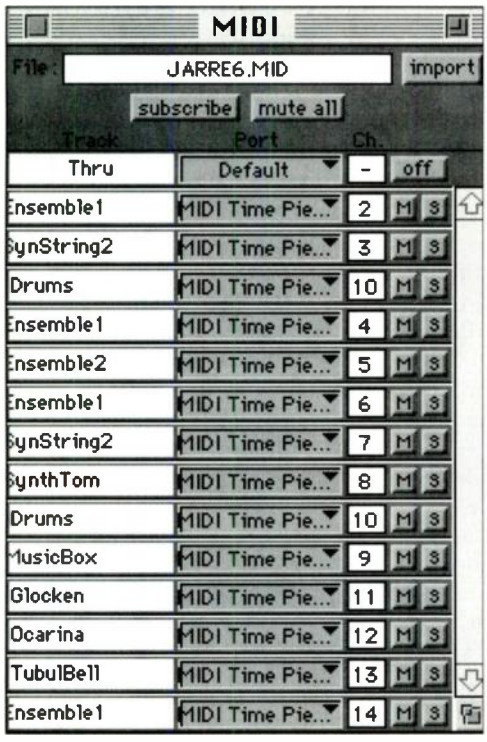


FIG. 6: You can import and play back a Standard MIDI File along with the digital audio. This dialog box lets you change the name (but not program), MIDI output port, MIDI channel, and mute/solo status for each individual track in the MIDI file.

information, you should check out the *Metro* Web site at www.smartcom.com/metro/metro.html.)

There's also a simpler alternative. *Deck II* can import a Standard MIDI File and play it back with the audio session. A MIDI window displays attributes for each track in the file (see **Fig. 6**); allows you to change the MIDI output device, channel, and mute/solo status; and supports a MIDI Thru channel. Surprisingly, there is no support for Program Changes. I had no problems using this method to play MIDI files along with my audio tracks using external synthesizers or the QuickTime Musical Instruments synthesizer. Tempo changes are recognized, and timelines displayed in bar:beat units update properly; the displayed tempo value, however, is not updated—go figure. Watch out for processor overload if you try to play more than four to six audio tracks with a busy MIDI sequence.

Deck II responds to incoming SMPTE via MIDI Time Code, allowing it to slave to an external video or audio deck. All common frame rates are supported, and you can assign an offset start time. A Capture button grabs and displays the current SMPTE time code. This is particularly useful with VITC, where you can get an exact frame time even while the video deck is stopped. Alternatively, *Deck II* can act as the master clock and send MTC.

FINAL THOUGHTS

I'm impressed with *Deck II*'s features and performance. The program also proved very robust over several months of testing with my IIci and Power Mac systems—no small feat given its processing and SCSI transfer demands.

Deck II's capabilities extend well beyond simple multitrack recording. You can readily create digital stereo masters to make your own CDs, make multiple remixes of a starting session, score multimedia presentations, handle video soundtrack post-production, sync audio tracks to MIDI files, and a whole lot more.

Compared with Digidesign's *Session*, its closest competitor, *Deck II* comes out way ahead in my book. *Session*'s advantages include its ability to group faders and view pan and volume automation Profiles together, more intuitive handling of Regions in a track (stacking), better scrolling in the track window, and overall better design aesthetics.

In turn, *Deck II* fulfills so many of the criticisms and suggested updates I had in my review of *Session* 2.0 that I'm tempted to call it *Session* 3.0. Standout features include the real-time effects, mixer snapshots, Work Tracks and virtual mixes that go way beyond the hardware playback limit, automation that moves with audio edits, and audio scrubbing.

Is *Deck II* for you? That depends on your needs. If you're primarily involved with sequencing and just want to add some audio tracks, I'd say stick with a digital audio version of a professional sequencer. If you come down more on the audio production side, you can't go wrong with *Deck II*.

Jim Pierson-Perry *survived a bicycle accident, a car crash, a hard-drive suicide, kamikaze cats, electrical brownouts, and a near fatal case of gas to complete this review. His next of kin can hardly wait for* Deck III.

Join our World of Sound and Vision!

Sound System MAESTRO 32/96

TerraTec's high-end soundcard, honoured with more than 15 awards in PC magazines, has been improved with the latest technology and extended with a lot of new functions. The well established 4 MB GM/GS wavetable has been integrated onto the soundcard, a second MPU-401 interface was added and an additional Waveblaster™ compatible connector now allows the simultaneous utilization of two synthezisers on up to 32 MIDI channels (with an optional TerraTec Wave System or external MIDI equipment). Of course this so id music machine provides the greatest comfort in installation and handling with Plug and Play and complete software setup of all functions. An extended input circuit supports 2 external Line-In's an one Microphone-In. The extremely noiseless design enables simultaneous record and playback up to 48 kHz with 16 Bit stereo in professional quality. Hereby the ATAPI-IDE interface supports the high-speed data transfer of the latest CD-ROM drive. If a PC based HIFI center, a professional musician's tool or a Multimedia sound machine is wanted, the Maestro 32/96 is a must for the enthusiastic user!

Technical specifications:

Compatible to:
- Roland Sound Canvas SC-55 MK II (soundcompatible)
- Roland SCC1 / RAP-10 / SCD-15 (soundcompatible)
- General MIDI
- Roland MT32 (via PatchMapping)
- General Synthesizer Standard (GS)
- Roland MPU-401 (UART mode)
- Soundblaster™
- Soundblaster™ Pro
- Adlib™
- MPC level II
- Microsoft Sound System™ 2.0

Wavetable:
- 32 MBit (4MB) Rom
- GM/GS Wavetable with 32 voices and Multieffectprocessor
- 393 Sounds, 8 Drumkits (incl. 1 SFX-Kit)
- 8 Reverb- and 8 Chorus-types
- Soundcompatible to Roland Sound Canvas SC-55 MK II / SCC-1, General MIDI, General Synthesizer Standard (GS).
- Latest DCC DAC technology
- Roland MT 32 (via PatchMapping

Audio features:
- 8/16-Bit audio Stereo/Mono for record and playback up to 48 kHz samplefrequency
- High-quality CODEC with simultaneous Full Duplex record and playback
- 4 bit hardware compression ADPCM
- 16 bit Hardware realtime compression and expansion with m-Law, A-_aw CCITT Standard
- Record and playback from all audio sources

FM-Synthesizer
- 40P+ technology
- 20 voices, Stereo

Stereo Digital / Analog Mixer:
- Mix of several audio sources: CD, Synthesizer, Stereo DAC and 2 line-In.

Midi Interface:
- 2 Roland MPU-401 MIDI interfaces (UART mode)
- Standard Soundblaster™ MIDI interface
- 64-Byte FIFO
- Duplex MIDI interface for simultaneous record and playback on up to 32 MIDI-channels

Game Port for two joysticks

CD-ROM interface for:
- Enhanced-IDE ROM drives

Waveblaster comp.connector:
- Compatible to all TerraTec Wavesystems
- Compatible to the most common wavetable upgrades from other manufacturers

Amplifier:
- Stereo amplifier with 4 Watts per channel

Contents: Soundcard, Audio cable, Microphone, MIDI Kit, Hardware manual, MIDI- and Wavetable-manual, Installation disks, Register form.

Bundlesoftware:
- Steinberg 'Cubasis Audio Light',upgradeble - 32 MIDI-tracks, score-editing and 2 stereo digital audio tracks
- Various 16/32 Bit Utilities

TERRATEC PROMEDIA

TerraTec USA
27132-B Paseo Espada, Suite 1205
San Juan Capistrano, CA 92675

Tel. (714) 249-4333 Fax: (714) 846-5821
E-mail: TerraTec@Pacbell.net

circle #591 on reader service card

Sound Factory Groove Construction Kit

By Christopher Patton

This sample CD puts your tracks on a sound foundation.

Rarely does a sample CD get top marks in every category, but Sound Factory's *Groove Construction Kit* knocked me out. This collection contains 60 minutes (537 MB) of superior drum and percussion loops. Recorded by Conrad Hunter and Merril Bradshaw at White Room Studio in Charlotte, North Carolina, it is available as an audio CD, an Akai S1000–format CD-ROM, and as Sound Designer II files on a hybrid PC/Mac CD-ROM.

Excellent performances by Charlotte-area session drummers Rick Murray and Donnie Marshall make this an outstanding disc. The grooves are solid and "in the pocket" in every category, which means that every track is usable.

I auditioned the *Groove Construction Kit* audio CD and Mac/PC CD-ROM using *Cakewalk Pro Audio,* Digidesign *Sound Designer II,* and a variety of Ensoniq samplers. I had no problem sampling the Red Book CD audio files or importing the CD-ROM's SD II files.

IN THE GROOVE

The *Groove Construction Kit* is divided into ten sections: Basic Beats, Blues, Country, Funk, Slow Funk, Latin, Odd Times, Rap and Dance, Reggae, and Rock/Grunge. All of the styles are well executed.

In addition to full-kit loops, some sections contain loops of conga, timbale, bongos, shakers, tambourines, claves, guiro, cowbells, or triangles, depending on what's appropriate for the style. The collection includes drum fills, but oddly, they're only present in the Country, Funk, and Rock/Grunge sections.

Enclosed with the audio CD is a clear, detailed manual that includes a track index along with the start time of each loop in each track. A description of the loop and tempo in bpm is also provided.

In addition to the great performances, I really appreciated the variations within the tracks. For example, Track 29 features three versions of a loop called "Barry White Funk" (Sho' Ya Right!). The first variation provides a full kit with snare downbeat, variation 2 contains a full kit with sidestick downbeat, and variation 3 uses a full kit with snare and ride cymbal. Other tracks have variations of loops without kicks, snares, hi-hats, and so on. This provides flexibility for creating your own unique grooves by mixing and matching several loops.

The Groove Construction Kit **provides a solid battery of well-recorded drum loops.**

HAPPENING SOUND

The feature that really separates this sample CD from the many others on the market is the sound quality. The drum kits and percussion were recorded in stereo using high-quality mics. Toms, cymbals, and percussion are panned nicely across the stereo spectrum. The instruments were also recorded relatively dry (using room ambience), leaving room for the user to add reverb and other effects to taste. The sounds were recorded direct to DAT and transferred digitally to a Mac using Digidesign *Sound Designer II* audio-editing software.

All of this results in the best-sounding drum and percussion loops I've heard to date. If you're looking to get your musical house in order, I strongly recommend the *Groove Construction Kit.*

Christopher Patton *is president of Ars Nova Productions, a production company that offers artist management, publicity, and recording services in the San Francisco Bay Area.* *Thanks to Peter Stanley at Apogee Studio in San Jose, California.*

Product Summary

PRODUCT:
Groove Construction Kit
sample CD
PRICE:
Audio CD $99.95
Akai S1000 CD-ROM $179.95
Sound Designer II CD-ROM $179.95
MANUFACTURER:
The Sound Factory
tel. (888) 598-4322
fax (704) 598 0627
e-mail 102014.2520@compuserve.com
Web www.thesoundfactory.com
CIRCLE #439 ON READER SERVICE CARD

EM METERS	RATING PRODUCTS FROM 1 TO 5
QUALITY OF SOUNDS	● ● ● ● ●
DOCUMENTATION	● ● ● ● ●
VALUE	● ● ● ● ●

Roland PMA-5

By Bob LoSasso

Put a MIDI studio in your palm— or your pocket.

I knew that Roland's PMA-5 was something out of the ordinary when I heard that its model designation actually means something. PMA stands for Personal Music Assistant, and the moniker fits. The palm-sized but not petite box resembles the Apple Newton, complete with a touch-screen interface that occupies most of the front surface. Inside, Roland has stuffed a sound module, 8-track sequencer with built-in accompaniment patterns, and intelligent arranger that conforms the patterns to your chord progression.

The PMA-5 communicates with the outside world via MIDI In and Out jacks, an ⅛-inch stereo audio output (which accommodates line-level inputs as well as headphones), and an 8-pin DIN serial port that allows direct connection to a Mac or PC via an optional cable. The remaining controls include a volume knob, power switch, and sequencer Start/Stop jack for an optional footswitch. (The footswitch connector is an ⅛-inch minijack, so you'll need an adapter in most cases.)

Powered by six AA batteries or an optional AC adapter, the PMA-5 can handle quite a few musical chores. For example, it can be a portable songwriting tool/MIDI studio that lets you jot down musical ideas or create full-length compositions and arrangements. It can also serve as a tireless backup band, and it provides a multitimbral MIDI sound module for your desktop or laptop computer. The sound quality is so good you can even use it on gigs.

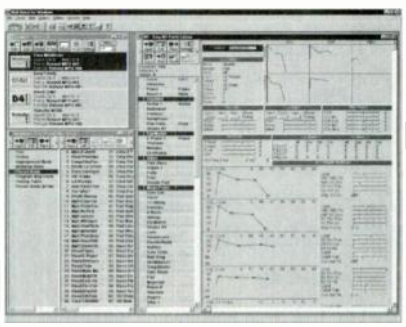
SOUND OFF

The PMA-5's sound module includes 306 different instrumental sounds. The unit is 16-part multitimbral and 28-voice polyphonic. Because it conforms to the General MIDI (GM) standard, the instrumental sounds cover a broad orchestral and pop spectrum, and Roland's GS extensions add some much needed depth (e.g., GM gives you two synth basses whereas GS offers fourteen). Unless you're into something way off the beaten path (Tibetan clog music, perhaps), you shouldn't have any trouble finding usable sounds.

According to Roland, some of the sounds are new, but most of them come from their high-end synthesizers. The sound quality bears this out: there

The PMA-5 puts a complete MIDI studio in the palm of your hand. You can use it to jot down musical ideas and create complete arrangements. It can also act as a backup band or GM sound module.

MIDI QUEST V6.0
for Windows 95 / 3.1



The ONLY Editor/Librarian software with

✔Native 32-bit Windows 95 version
✔Full Windows 95 compliance
✔Support for: long file and directory names, popup tooltips, mini-icons, Win 95 look & feel, and more
✔Both 32&16-bit versions included
✔User-definable Floating Editors
✔New support for over 60 Devices from Roland, Alesis, and others
✔Over 50 new features for v6.0
✔CD ROM version
✔Over 50 MB of Patches (CDROM)
✔'Video' tutorials (CDROM)
✔Over 275 supported instruments
✔See our web site for a complete list

Sound Quest Inc.
1140 Liberty Dr.
Victoria, BC, V9C 4G7, Canada
US Info/Sales: (800) 667-3998
Sales: (250) 478-4337
Tech Support: (250) 478-9935
Fax: (250) 478-5838
EMail: sales@squest.com
New! WebSite: http://www.squest.com New!

V6.0

circle #578 on reader service card

LEIGH'S Computer
Midi Mail Order Software

129 W. Eagle Rd.
Havertown, Pa. 19083
(USA) 800-321-6434 (CAN)
(610-658-2323) FAX- 610-896-4414
Internet : leighs@ix.netcom.com
On Line Secure Shopping via WEB
WEb Page: http://www.leighs.com

We stock the following: Cakewalk, Cubase, Sound Forge, Opcode.ANTEX Midi Time Piece AV, Voyetra, Hohner Performer, Encore, Midi Man ,Wave Lab, Samplitude, Fast Edit, Gadget Labs-Finale, Band in a Box, ADB-Audiomedia - Jammer & many more !! CALL US !!

Musicator CAKEWALK

CD Rom Recorders and software to master are our specialty!!

We sell hard disk recording CARDS.
Digital Audio CardD +
DIGITAL ONLY CARD (SPDIF) Sound Forge AdB
Samplitude

Call for free Midi Multimedia catalog!

We ship worldwide !!
FAX : 610-896-4414

circle #547 on reader service card

circle #544 on reader service card

Top artists have access to the top players with the best licks and the best feel...
Now, so do you!

TWIDDLY.BITS

"The ultimate MIDI accessory"

Cut & paste parts played on alternate MIDI controllers by super sidemen such as Bill Bruford (King Crimson, Yes), Steve Hackett (Genesis), Dale Davies (Paul Young), Milton MacDonald (M People, ABWH), Gavin Harrison (Level 42, Incognito), Shane Meehan (Beats International), Hugo Degenhardt (Honeycrack), Mike Stevens (Take That!), John "Rabbit" Bundrick (The Who), Scott Joss (Dwight Yoakam), Jonn Savannah (Tina Turner...)

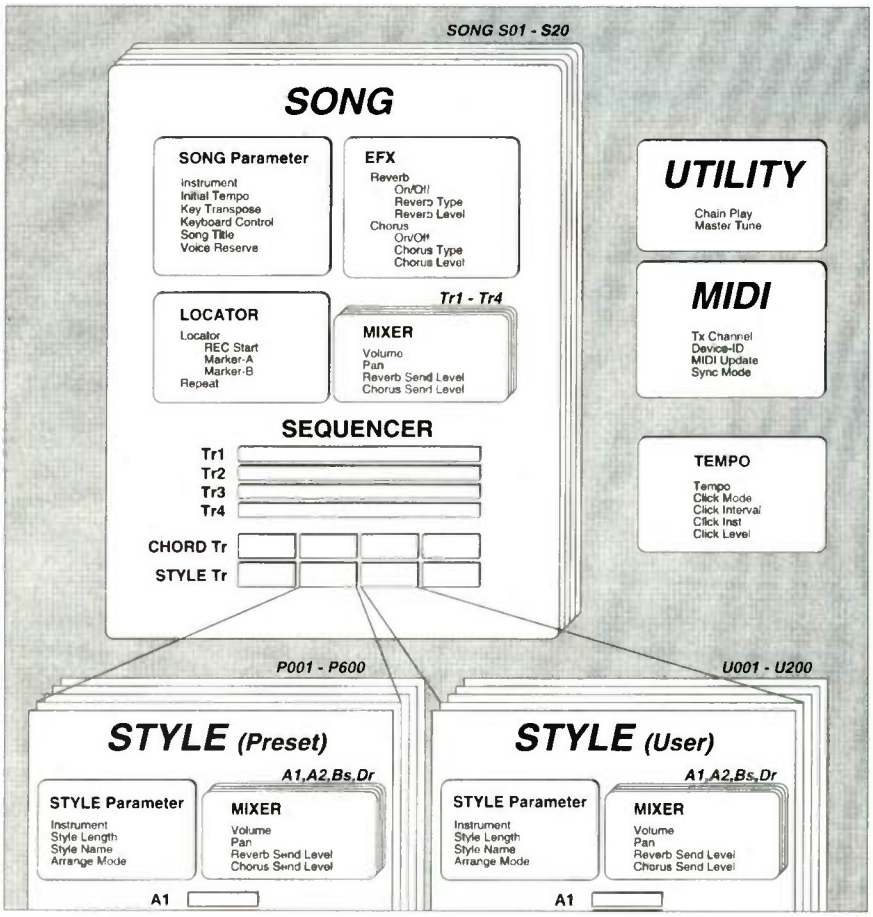
SMF format. On PC/Mac/Atari disk. Copyright free.
12-page manual included. Price $34.95

• Vol One General Instruments • Vol Two Gate Effects • • Vol Three Acoustic & Electric Guitar • • Vol Four Drums & Percussion • Vol Five Country • • Vol Six The Funk • Vol Seven Programmer's ToolKit • • Twiddly.Beats Brazilian Rhythms • • Master Series John Rabbit Bundrick Classic Rock & Country Piano •

If you're thinking "Hey that sounds like a good idea..." You're right. It is. So pick up a volume or two today!

twiddly-bits

KEYFAX Software Direct 1-800-752-2780.
Tel: 408-688-4505 Fax: 1-408-689-0102.
PO Box 958, Aptos, CA 95001-0958.
Website http://www.usgmedia.com/keyfax.
email: 102045,3065@compuserve.com.
UK: PO Box 4408 Henley-on-Thames, Oxon, RG9 1FS.
01734-471382.



The PMA-5's parameters are well organized. Up to twenty songs can be held in memory, each with up to four linear tracks and four pattern tracks. (Courtesy Roland Corporation U.S.)

are no grungy or tinny sounds here except where appropriate. If you're looking for realism, the brass and reed timbres fare better than some of the strings. I was impressed by the clarity of the acoustic guitars and the punch of some of the organs. In addition, there are a few synth pads that made me stand up and take notice. Retro fans will appreciate the TB-303 and SH-101 basses.

In the percussion section, there are more than 150 kicks, snares, toms, cymbals, snaps, scratches, and assorted sound effects and ethnic noise makers. These sounds are organized into sixteen drum kits that will please the cool-jazz brush devotee, the hip-hop fanatic, and everyone in between, including Latin lovers.

Complementing these sounds are Roland's two standard effects: reverb (three rooms, two halls, one plate, two delays) and chorus (four chorus, one feedback, one flanger, two delays). You can't assign separate effects to each multitimbral part, but you can adjust the effects-send level for each part. Overall, the effects are good. Of course, they're not in Lexicon's league, but they certainly add to the sound rather than detract from it.

TAP AND DRAG

The designers of the unit's custom LCD touchscreen display did an excellent job assembling a combination of icons and pages that provide easy access to the features. In the center of the display is a 25-note minikeyboard with permanent icons directly above it for controlling sustain, octave shift (all 128 MIDI notes are accessible), and Velocity values.

Above these are icons for selecting sequencer tracks and the four major operating modes: Song, Style, Utility, and MIDI. Below the keyboard is a 2-line by 32-character, alphanumeric readout that displays various messages. Beneath this readout are icons for such things as the sequencer's transport controls and Value Up/Down buttons.

The PMA-5 is controlled by touching the icons in the display. The primary

data-entry tool is a small silver pen with a rubber tip that nestles into a convenient slot on the right side of the unit. It is sometimes possible to use your fingers, but avoid using fingernails, which can damage the panel's surface.

To enter notes in real time, you simply tap away on the minikeyboard like an excited woodpecker. If you want to add Modulation or Pitch Bend to a note, drag up or down on the panel after you've touched the note. (A separate setting determines which message is applied during this movement.)

Changing other parameters, such as the selected instrument, is just as easy: press the desired icon and drag up or down. The faster you drag, the faster the parameter changes. You can also increment parameter values by first tapping the appropriate icon (which starts flashing) and then tapping the plus or minus arrow in the lower right corner of the display.

One of the coolest aspects of this design is that some icons, such as navigating arrows and note and chord symbols, only appear when needed. For example, you can delete something only when the Del icon appears. It's a beautiful thing. The menus are so intuitive that I seldom scratched my head wondering where to go next. If you do get lost, a few taps on the Exit icon takes you right back to a main menu.

My only gripe with the display is its limited visibility. Because it's not backlit, viewing the display in low-light situations is iffy. There is no contrast control, and the image tends to wash out if you shine a flashlight on it. In normal light, the problem is the display's narrow viewing angle. You must tilt the PMA-5 just right to get the information to stand out; at some angles, it disappears entirely. When I first started using the machine, I made dozens of mistakes because I misread the display.

SEQUENCER

The PMA-5's sequencer reminds me of a certain breath mint because it's two sequencers in one: a linear sequencer and a pattern sequencer. There are four linear tracks and four pattern tracks, each of which can be soloed and muted. The internal memory can hold up to 21,000 notes distributed among up to twenty songs, each of which can be up to 999 measures long. You can also name each song, which is cool. Data can be entered in step time from the onscreen keyboard or real time from the onscreen keyboard or an external MIDI controller.

After selecting an instrument for a track, you can record over any data in the selected track in real time or merge the new data with anything that was previously entered. You can also loop one, two, four, or eight measures during real-time recording. A rehearsal feature lets you practice before you go for a take.

However, don't expect to enter all your linear inspirations in real time. For one thing, "playing" the onscreen keyboard is not the same as playing a real keyboard; it's a bit cumbersome to tap strings of short notes at a fast tempo. In addition, you might have to slow the tempo down to correctly register multiple taps on the same note. With practice, though, I was able to get the *William Tell Overture* (aka the *Lone Ranger* theme) going at a decent clip.

The display is not sensitive to Velocity; you set the Velocity of notes entered from the onscreen keyboard with a control that lets you specify one of eight preset Velocity values. Unfortunately, the Velocity values of incoming notes from an external controller are quantized to one of these eight preset values, as well, which is a real drag. In addition, you can only enter single notes in real time, not chords, and if your melody's span is greater than the onscreen keyboard's, you must hit the Octave icon. Nevertheless, I found myself using real-time entry more often than not to get my initial ideas into the machine.

A Locate function lets you jump to the point at which the last recording began, which makes it easy to check your last take. In addition, you can set two Markers to which you can jump with the Locate function. This handy feature speeds things up considerably.

For passages that are impractical to enter in real time, step-time entry provides an effective alternative. Each measure is divided into steps that correspond to sixteenth notes or eighth-note triplets; this is called the Grid. To enter notes in step time, you must first enter Step Standby mode and specify various parameters, such as the time signature for the current measure, the Grid resolution, and what type of events to display. Then you enter Step Write mode, which displays a palette of note durations (quarter note, eighth

MIDISCAN® FOR WINDOWS

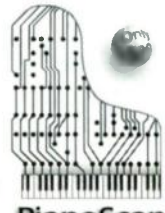
reads music, plays back and transposes MIDI files all inside one easy-to-use package. Scan and Play with 90-98% accuracy!

VERSION 2.5 SCAN & PLAY

MIDISCAN is compatible with all TWAIN scanners and MIDI software. With v2.5, you can save your music as either MIDI files or choose the revolutionary NIFF notation file format, soon to be supported by Encore®, Cakewalk® and most other music programs. *$299.*

Includes Cakewalk home studio FREE!

New! Introducing PianoScan, the affordable way to scan sheet music into your computer. Identical to MIDISCAN, PianoScan is designed for piano, solo and duet scores (with up to 2 staves / system instead of 16). Use the built-in image editor to remove vocal lines from piano/vocal sheet music and you've got instant karaoke arrangements. Upgradeable. *$99.*



PianoScan.

Call for free demo Sept. & Aug. Download Demo
CServe: GO MIDISCAN > Sect. 17 library
INTERNET: www.musitek.com/musitek

Call about our low-cost scanner bundles starting at just $229!

800-676-8055

MUSITEK
MUSIC RECOGNITION TECHNOLOGIES

410 Bryant Cir. Ste. K, Ojai, CA 93023
TEL: 805-646-8051 / FAX: 805-646-8099

circle #559 on reader service card

KEYBOARDS
BEFORE YOU JUMP...
CALL US LAST!

• SYNTHESIZERS
• DIGITAL PIANOS
• RECORDING GEAR
• PRO AUDIO
• SAMPLERS
• AMPLIFIERS
• MIXERS / EFFECTS
• SOFTWARE
All Major Brands!
RICH music
1-800-795-8493
CALL OUR SALES STAFF OF MIDI EXPERTS
RICH MUSIC • 1007 AVENUE C • DENTON, TX 76201 • FAX (817) 898-8659
Store Hours: Mon.-Fri. 10-6:30, Sat. 11-5 http://www.richmusic.com
WE ACCEPT VISA • MASTERCARD • DISCOVER • AMERICAN EXPRESS
circle #571 on reader service card

circle #577 on reader service card
Don't be left behind
THE SONG CONSTRUCTION KIT
Create and edit studio quality songs as easy as cut and paste word processing. By using Sound Factory pre-recorded Song Blocks (.Wav files include drums, percussion, electric guitars, acoustic guitars, bass guitars, pianos, keyboards, synthesizers, and voices), Sound Forge XP™, and a Windows compatible sound card create a virtual digital audio recording studio on your PC.

• Record Music Demos
• Business Presentations
• Virtual Jam Sessions
• Video/Movie Soundtracks
• Voice-overs
• Music for Games
ONLY $69.95
INCLUDES:
2 Sound Factory CD-ROMs with over 1.2 Gig of .Wav Song Building Blocks Recorded Live using Real Musicians
THE GROOVE CONSTRUCTION KIT
Over 300 Drum and Percussion Loops in many different styles. All drum loops are grouped by style and tempo and include phrase variations for quick development of complete songs. The Sound Designer II version is ideal for Mac/PC Workstation drag and drop song construction.

"A great tool for creating professional live rhythm tracks!"
Audio CD $99.95
Prelooped Sound Designer II files on Mac/PC hybrid CD-ROM $179.95
"Power Hits will quickly make itself indispensable in a lot of project studios."
- Jim Aikin, Keyboard Magazine March '96 - Five Star Review

POWER HITS drum samples allow you to produce dynamic drum tracks that exhibit a realistic human feel with extraordinary sound quality. The drum samples include several stickings of each drum at various dynamic levels for programming sampler velocity crossfades.
Audio CD $79.95
MIDI Sequences (Type 1 MIDI Files) $24.95
To Order: toll free 1-888-598-4322
http://www.thesoundfactory.com
P.O. Box 562012 • Charlotte NC 28256-2012
THE SOUND FACTORY
Major Credit Cards Accepted

note, etc.). Select a track and touch the step at which you wish to enter a note. Next, touch the duration of the note you wish to enter, and then select the pitch of the note on the keyboard.

This might sound complicated, but it gets easier from here. For one thing, there are two step-advance modes. Manual mode lets you select any step at any time, and Auto mode automatically advances to the next available step based on the last selected duration. In Auto mode, all you have to do is select a duration and pitch for each note; if you want to enter a string of notes with the same duration, simply select the duration and touch the desired pitches on the keyboard. You must use Manual mode to enter several notes at the same step to form a chord. You can also tie notes and enter rests in Step Write mode.

During step-time entry, note durations are not assigned as expected. Based on the unit's resolution of 96 ppqn, selecting the half-note icon during step-entry should yield a duration of 192 ticks, and a quarter note should be 96 ticks. However, the half note is 158 ticks, and the quarter note is 76 ticks. All the other notes are similarly shortchanged. In order to get a true legato line, you have to edit the durations one note at a time, which is no fun. I wish Step Write mode had a parameter that let you specify a percentage of full duration for entered notes (e.g., a quarter note at 100 percent = 96 ticks, 80 percent = 77 ticks, and so on).

STYLES

The pattern tracks let you take advantage of the PMA-5's Styles, of which there are 100 preprogrammed examples onboard. These Styles play fully automated accompaniments of many different types, from heavy rock to electric pop, from west coast funk to Thelonius Monk, from Dixieland to big band. Although some Styles are immediately recognizable, others are intriguingly different, such as "Ragtime-Like Folk with Ac Guitar," "Technical Japanese Fusion," and "Light Fusion with Latin Feel," for example.

Each Style includes six patterns—an intro, two main grooves, two short fills, and an ending—each of which range from one to eight measures in length. You assemble an entire song by chaining these patterns together in a special Style track. The information for each instrumental part in the patterns is

stored in the four pattern tracks: drums, bass, accompaniment 1, and accompaniment 2. (The last two are intended for chordal instruments such as piano or guitar.)

Many of the Styles are quite good, but a few are not so great. In addition, using all four pattern tracks can make the background so busy that you can't get your melodies in edgewise. I often muted the two accompaniment tracks and used only the drums and bass as a starting point. But most of the Styles are worth more than a few listens. You can learn a lot from their stylistic detail, and you can jam with them until the cows come home.

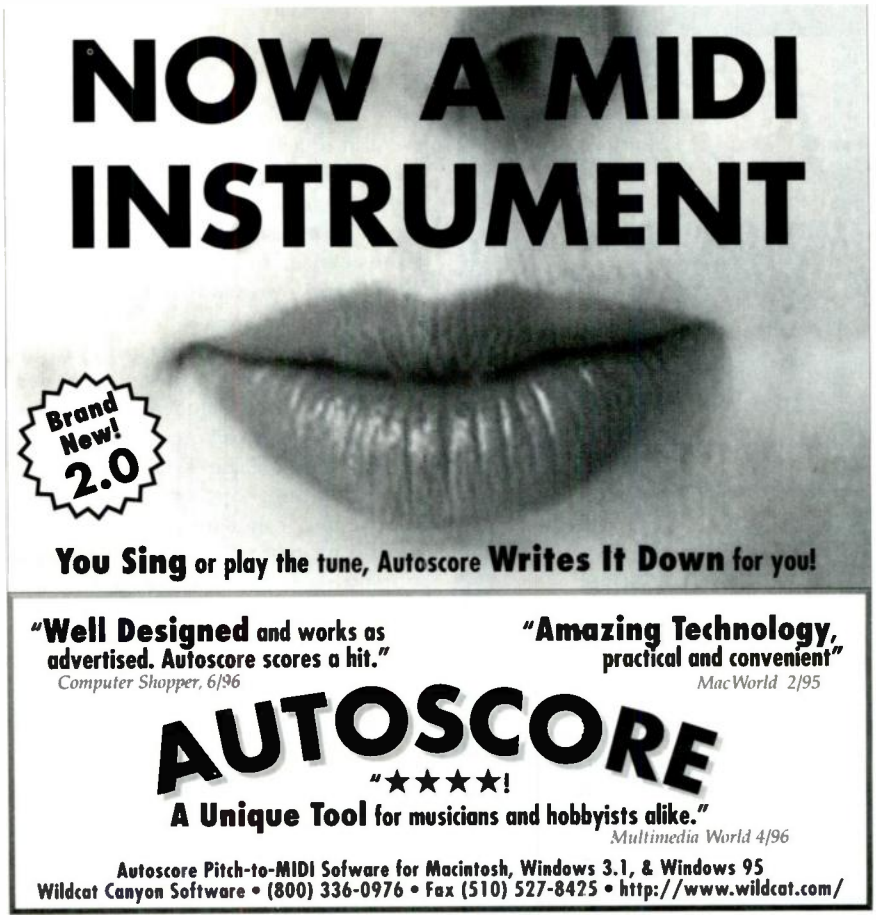
In addition to chaining patterns together, you must also specify a chord progression in the special Chord track. This is accomplished in Chord Entry mode, in which you specify the root, chord type (26 to choose from), inversion (seven for each chord type), and alternate bass note. You can also tell the PMA-5 to play the chord ahead of the beat for a syncopated feel. Unfortunately, you can't enter chords in real time from an external keyboard; the PMA-5 is not a real-time arranger like the RA-95. You must input the chords in advance using the touchscreen.

If the 100 Styles built into the PMA-5 aren't to your liking, you can create up to 200 of your own Styles from scratch or using the preprogrammed Styles as a starting point. Of course, you can bypass the pattern tracks in favor of the four linear tracks, one of which can be a drum track, or you can combine both types of tracks.

One interesting feature of the PMA-5 is the Ad Lib bar, which is located directly beneath the transport-control section of the screen. As a song plays back, you can drag along the Ad Lib bar, which plays a scale that fits with each chord in the Chord track. You can also drag upward from the bar to engage Modulation or Pitch Bend, and you can record the Ad Lib notes into the sequence. In addition, you can select a separate sound for the Ad Lib bar. I fooled with this for a while, but ultimately I think it's kind of hokey. Nonmusicians might dig it, though.

EDITING

Editing the data in a track is performed in two different screens. The pitch, duration, and Velocity of each note is edited in the Step Write screen, and the



circle #600 on reader service card

circle #580 on reader service card

SPEIR MUSIC COMPANY

SPEIR MUSIC CO.

800•219•3281

510 S. Garland Ave. Garland, TX 75040

GUARANTEED BEST PRICES!

New/Used • M-F 9-7, Sat. 9-6

All Major Credit Cards

Customer Service 214-494-1601

ADVANCED AUDIO

Recorders
Speakers
Amps
Lighting

Consoles
Samplers
Keyboards
Microphones
Signal Processors
Sound Reinforcement

ALL MAJOR LINES
NO MAJOR ATTITUDE
"The nice guys in pro audio"

800-831-5111

VISA MasterCard DISCOVER AMERICAN EXPRESS

circle #501 on reader service card

circle #552 on reader service card

MUSIC LESSONS
gets an A-plus
Macworld Magazine

1994-1995
TECHNOLOGY & LEARNING
SOFTWARE AWARD
OF EXCELLENCE

Improve your musical skills
with this award winning software.
Ages 8 to Adult.

MUSIC LESSONS
New Mac Version 3.0 $149
IBM/Windows Version 1.2 $119
MiBAC JAZZ - Mac $125
JAZZ/BIAB Crossgrade $59 Call for details
FREE Demo Disk online, $5 by mail.

MiBAC Music Software
info@mibac.com
http://www.mibac.com
800 645-3945

Event Edit screen is used to shift an event in time, insert an event, and copy and erase the events within a specified range of grid steps (which cannot exceed one measure in length). Inserted events can include Program Changes, Pitch Bend, various Control Changes, and tempo changes.

In addition, you can perform various editing operations on songs and Styles. These operations include copying, erasing, transposing, and quantizing a specified range of measures; combining two tracks into one; copying an entire song or Style to another song or Style; clearing a song or Style; and converting a song into a Style or vice versa. You can also delete a specified range of measures from a song and insert blank measures into a song. A mixing function lets you adjust volume, pan, and effects-send levels for each track in a song.

MIDI AND MANUALS

The MIDI implementation is pretty straightforward. The PMA-5 transmits what it's playing to the MIDI Out jack so you can capture it in an external sequencer. (You assign the transmit channel for each track.) It recognizes MIDI Clock, Start/Stop/Continue, Song Position Pointer, and Song Select messages from an external source, and it can bulk dump and load its song and Style data as SysEx files.

According to Roland, software for converting Standard MIDI Files to and from the PMA-5's internal format will be available for Windows and Macintosh by the time you read this. The package, which sells for $49.95, includes the software, driver, 50 new Styles, and the appropriate cable for the PMA-5's computer port.

As mentioned earlier, you can use the PMA-5 as a MIDI sound module. In Normal mode (which uses the sequencer), MIDI messages coming in on any channel are routed to the currently selected track. In GM/GS mode (which disables the sequencer), messages on each channel are applied to the corresponding Part, of which there are sixteen. A sound is assigned to each Part, which also includes parameters for volume, pan, reverb and chorus send levels, transposition, MIDI channel, and mute status.

There are two manuals: a Quick Start guide and an owner's manual. Both are much better than many Roland manuals, although they still have many typos and poor English. A plastic-coated pocket guide fits into the leather cover and lists the instruments, drum-kit note assignments, and preset Styles.

WRAP-UP

The PMA-5 is a convenient, portable idea machine that lets you document your musical inspirations wherever you happen to be. The quality of the sounds and Styles is generally excellent, and the user interface is well conceived and implemented, with the exception of the touchscreen's limited visibility. The PMA-5 is also a fine switch hitter: it performs well as a backup band and GM/GS sound module, which adds value to the package.

Of course, I have a few complaints. For one thing, it's a bit awkward to enter fast melodies with the onscreen keyboard, but this gets easier with practice. Of more concern is the fact that the Velocities of notes entered in real time from an external controller are "quantized" to one of eight preset values. Why can't the actual Velocity values simply be retained? Another problem is the shortened durations of step-entered notes, which makes it all but impossible to step enter legato lines.

Despite these problems, I like this device a lot. Except for guys like Mozart, who did most of his work in his head, I can't think of any musician who couldn't use a tool like the PMA-5.

Product Summary

PRODUCT:
PMA-5 Personal Music Assistant
PRICE:
$595
MANUFACTURER:
Roland Corporation U.S.
tel. (213) 685-5141
fax (213) 722-0911
Web www.rolandus.com
CIRCLE #440 ON READER SERVICE CARD

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

Bob LoSasso *works with computers by day and plays with them at night. He thanks Roseann, Brian, and Jennifer for letting him do so.*

Yamaha CS1x

By Jim Pierson-Perry

Twist and shout with this knob-laden digital synthesizer.

Mix one part analog-style real-time control with one part digital-synth stability and programmability. Flavor with a bouquet of standard sample-playback instrument sounds, and add an extra helping of spicy analog emulations. The result is Yamaha's new 16-part multitimbral, 32-voice polyphonic CS1x entry-level synthesizer.

The CS1x catches the eye with its sleek design, profusion of knobs and buttons, and standout blue case. Its weight—only twelve pounds—ensures easy portability. As we'll see, this synth has some peculiarities, but overall it's an interesting addition to Yamaha's product line.

FACE FRONT

The front-panel controls include the pitch bend and mod wheels, master volume knob, and a modest, backlit LCD. There is no contrast control for the LCD, which is a problem: although visibility is fine from a seated position, the display is very difficult to read when you stand up to play.

Eight buttons near the LCD control the arpeggiator and Octave Shift features, navigate multitimbral Parts and Voices (programs), and choose between the preset and user banks. Six Sound Control knobs (see the section "Gnarly Knobs") provide real-time access to the synthesis parameters. A pair of Scene buttons store and recall two snapshots of the Sound Control knob settings and let you morph between the two Scenes in real time.

A 6-position rotary knob and ten buttons combine to provide fast, 2-step access for parameter editing. Rounding out the front panel are a numeric keypad for direct entry of parameter values or Voice selection and four buttons that control the synth operating mode (discussed later).

The 61-note, unweighted keyboard action is fair but not great; it seemed flaccid when I played runs. In addition, the keyboard sends Velocity but not Aftertouch, a limitation that is common in low-budget keyboard synths. For these reasons, I would not choose the CS1x as a controller. But for those who already have a MIDI controller the inability to send Aftertouch is no big deal because the CS1x's synth engine can respond to Channel or Poly Aftertouch messages. As for the action, well, there's only so much you can expect for under $800.

UP AND RUNNING

The unit's rear panel sports unbalanced ¼-inch jacks for the L/R audio outs; a ¼-inch, TRS headphone jack; the power switch; a connector for a wall-wart power supply; and MIDI In, Out, and Thru ports. There's no strain relief for the power cord, and you could be in trouble if you accidentally pull the plug because settings in Multi mode (multitimbral operation) are not preserved when the power is off. A stereo ⅛-inch minijack lets you mix an external audio signal with the CS1x's sounds. There's no input-level control or provision to process external audio through the CS1x effects, as there is in Yamaha's more expensive MU80.

Also on the rear panel are jacks that accommodate two optional continuous foot controllers and one optional Yamaha-type (normally open) footswitch. These controllers can be independently reassigned to send a selectable MIDI Control Change message that affects both the internal sounds and external devices.

A built-in serial interface lets you connect the CS1x directly to a Mac or Windows PC. The appropriate cable is not supplied with the synth, but it is readily available at computer stores or via mail order. The interface worked fine with my Mac using software configured for the 1 MHz port rate. Windows users should contact Yamaha to obtain MIDI driver software before using the interface, which is an unnecessary hassle; the drivers should be bundled with the synth. Fortunately, the drivers can be downloaded from the XG section of Yamaha Japan's Web site (www.yamaha.co.jp) under "Tools."

Unfortunately, the manual doesn't explain how the MIDI ports operate when the computer interface is active. For example, if you want to send messages from a computer to the CS1x serial interface and on to a daisy-chained, external MIDI device, you will discover that the messages are sent from the CS1x MIDI Out port rather than the Thru port. When the serial interface is active, the MIDI ports become part of the computer interface rather than acting as normal synth MIDI ports.

Yamaha's CS1x keyboard synth offers real-time parameter control via front-panel knobs. It incorporates the synthesis engine from the company's popular MU50 synth module and includes a special bank filled with fat, analog-like sounds.

Do it on the Web!

On the web or on the phone, our name says it all

MUSICIAN'S DISCOUNT WAREHOUSE™
1-800-395-2489
OR
http://www.musiciansdiscount.com

circle #556 on reader service card

circle #599 on reader service card

WhisperRoom INC.
Sound Isolation Enclosures

Sound Isolation Rooms
Vocal Booths
Amplifier Isolation Enclosures
Practice Rooms
Tel: 423-585-5827 Fax: 423-585-5831
116 S. Sugar Hollow Rd.
Morristown, TN 37813 USA

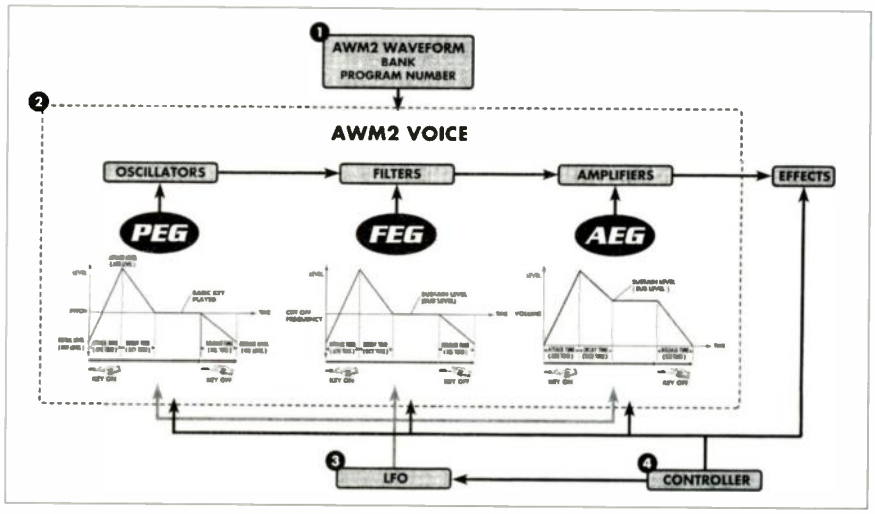


FIG 1: The CS1x uses Yamaha's AWM2 sample-based synthesis architecture. Envelope generators are supplied for the oscillator (pitch EG), filter, and amplifier. (Courtesy Yamaha Corporation of America)

The documentation is aimed at getting novice users up and running quickly using the CS1x as a lead synthesizer. The manual is satisfactory for this purpose, but its treatment of other topics is too cursory. An advanced user's guide, the *Blue Book*, is available from Yamaha dealers and comes with two useful disks of sample sequences and SysEx commands. But to really get your CS1x chops up, you should get a copy of Yamaha's *Blue Is Beautiful* promotional CD-ROM (see sidebar, "Blue Is Beautiful"). It's chock full of new demo sequences, extra Performance banks, programming info, an advanced user's guide, and it even includes a Performance-mode editor program for the Macintosh.

VOICE ARCHITECTURE

Based on Yamaha's XG superset of General MIDI, the CS1x sound engine is a descendant of the MU50 tone generator. However, it has been updated with new features that emphasize real-time performance and include new sounds with an attitude.

The CS1x offers two primary playing modes: Performance and Multi. Two other modes, Utility and Store, let you set system-level parameters and save your edits, respectively.

Multi mode turns the CS1x into a multitimbral synth, in which each of the sixteen Parts plays on its own MIDI channel. This mode is normally used when sequencing. Performance mode is designed for real-time playing, and the CS1x really shines in this regard. Up to four Parts, which are called Layers in this mode, can be used to create splits and/or layers.

Regardless of the mode you're in, the basic sound generation is the same (see **Fig. 1**). A ROM waveform is selected for each Part or Layer and modified by subtractive synthesis. A digital oscillator, lowpass filter, and amplifier constitute a Voice (Yamaha-speak for a program or patch). Each of the components within a Voice is controlled by a dedicated, 4-stage envelope and can be modulated by real-time MIDI controllers and one LFO per Part. Voices for all active Parts enter the onboard effects processor and are summed on the stereo bus before being routed to the audio outputs.

The Octave Shift button transposes notes played from the keyboard by up to ±3 octaves, one octave per button-push, in real time. It operates in both Performance and Multi mode, affecting both the internal voices and MIDI output. This setting is not stored as a Performance parameter and can only be established from the front panel. Octave Shift affects all Layers equally, remaining in effect through program changes and power on/off.

The CS1x can pan dynamically, moving sounds within the stereo field in real time in response to MIDI Pan messages. This is much better than the pan implementation of most GM synths, in which pan can be set to a fixed position or a random setting. However, I miss the Scaling mode from Yamaha's earlier GM modules, which mapped

pan position to note numbers. This feature worked nicely with piano, string, and choir sounds. Although the manual claims that this effect is present in some of the CS1x Voices, I could not find it.

SOUND PALETTE

The synth's sample ROM contains 4 MB of standard XG sounds from the MU50 (480 Voices and eleven drum sets) plus 0.5 MB of so-called Material Voices (930 Voices). These Material Voices, mostly created for the CS1x, were designed for use in Performance mode and are especially rich in analog leads, pads, and sweeps. There is no way to expand the sample ROM (i.e., there is no card slot or expansion board).

The XG Voices are organized into 44 banks of 128. These banks can be selected by name from the front panel or via MIDI Bank Select messages from an external synth or sequencer. Virtually all XG banks include the bank 0 (GM) sounds with a few variations. A hidden bank of Material Voices can only be reached using the Bank Select command. It holds additional sounds (Voices 74 to 128) that are used in the demo sequences.

The accompanying Data List book contains a much needed listing of Voices by bank, the matching Bank Select numbers, and the drum-set maps. XG bank listings include the number of Elements for each Voice, but the term Element is never explained. It comes from older Yamaha tone generators and is equivalent to a single oscillator. Using a voice with two Elements cuts the available polyphony in half. No such information is given for the Material Voices; presumably they use one Element each.

MULTI MODE

In Multi mode, the CS1x becomes a 16-part multitimbral tone generator for sequencing. Unfortunately, most of the power of this mode is not available from the front panel and can only be reached through SysEx or Control Change messages.

By default, Parts play on consecutively numbered MIDI channels, but you can set them to receive on any channel. You can specify the Voice, volume, pan, effects sends, filter cutoff and resonance, and whether the Part is polyphonic or monophonic. That's it.

24 BIT AUDIO EDITING WITH ALL WINDOWS™95 PCs !!!!!!!! Do it now!

NEW: samplitude Master

Hard disk recording in real 24 bit audio resolution.

Hard disk record/playback/edit with 24bit audio resolution - Powerful denoiser and declipper - Real-time EQ & Dynamics - PQ-Editing - Direct CD to harddrive copy - Non-destructive editing - Freehand volume and panoramic curves - Real-time fades & cross-fades - Autoscroll while playing - Real-time scrubbing/varip tch - Real-time resampling from 48 to 41,1 kHz - Converting 16 to 24 bit - ...

SEE US AT NAMM BOOTH #3602

Samplitude Master The new member of the Samplitude family	$ 595.00 SRP
Samplitude Studio 16 Track hard disk recording	$ 399.00 SRP
Samplitude Pro 8 Track hard disk recording	$ 199.00 SRP
Samplitude Multimedia 4 Track hard disk recording	$ 69.00 SRP

DARC II The ultimate 24bit hard disk recording and mastering package for Windows™ 95.

Just plug in the included 24bit digital interface card and record audio direct to hard disk. Edit your tracks with the included SAMLITUDE MASTER software.

DARC II The mastering package $ 1899 SRP

RED ROASTER

The Windows™ CD Mastering tool

RED ROASTER	$695.00 SRP
RED ROASTER 24 Bit	$944.00 SRP

HOHNER MIDIA
P.O Box 5497, Santa Rosa, CA 95402
Tel: 707-578-2023, Fax: 707-578-2025
CompuServe: 100772,1052
Web: http://www.hohnermidia.com

Canada: Kaysound
1-800-343-0353

CompuServe: GO SEKD
Web: http://www.sekd.com

To find out more call your local dealer or contact **HOHNER** MIDIA at **1-800-330-7753**

circle #538 on reader service card

circle #516 on reader service card

PROJECT STUDIO EXPERTS

WORLDWIDE DELIVERY

THE LARGEST SELECTION OF THE BEST PRODUCTS IN THE BUSINESS

• DIGITAL & ANALOG MULTITRACKS & CONSOLES •

• EFFECTS, MONITORS, MICS & PRE-AMPS •

• KEYBOARDS, GUITARS & ELECTRONIC PERCUSSION •

FREE EXPERT ADVICE

CALL NOW 860-442-9600
YOU CAN BE PRE-APPROVED FOR CREDIT ACCOUNT!

DISCOVER VISA Caruso Music AMERICAN EXPRESS

CARUSO MUSIC

94 State Street • New London, CT 06320 USA • Fax: 860-442-0463 • E-mail: sales@caruso.net • http://www.caruso.net

Sounds are not cut off when you change a Voice in Multi mode; held notes continue to play using the original Voice while newly triggered notes use the new sound.

Those willing to venture into SysEx programming can tap into far more features. The standard XG synthesis parameters are available, including note and Velocity ranges; MIDI channel assignment; portamento; sensitivity of the pitch, filter, amp, and LFO to Channel and Poly Aftertouch; alternate scale tunings; and the ability to modify individual sounds in a drum set. Bank Select messages provide access to the Material banks. Fortunately, the documentation goes into considerable detail about accessing these parameters with a sequencer. (Another excellent resource is "Multitimbral Muse," Clark Salisbury's XG programming tutorial in the November 1996 **EM**.)

Amazingly, the Multi settings are kept in volatile memory. Every time you power up or push the button to enter Performance mode, even if accidentally, all Multi settings are reset to the defaults—*ouch!* There is no provision to save the settings from the synth's front panel. Your only option is—you guessed it—to use a SysEx command to request a Bulk Dump of the settings and save them as a sequencer file.

The CS1x also offers TG300B mode, an alternative Multi mode that corresponds to the Roland GS superset of General MIDI. This mode, which is included to provide compatibility with existing GS-based MIDI files, can only be activated through a GS Mode On SysEx message. It provides 579 Voices in 24 banks and ten drum sets. Most Voices are taken from the XG banks, but some are TG300B-specific, and all of these sounds can be accessed within normal XG Multi mode via the Bank Select command.

BLUE IS BEAUTIFUL

Plead with your dealer or write to Yamaha, but do whatever you can to get a copy of Yamaha's *Blue Is Beautiful* promotional CD-ROM for the CS1x synthesizer. It includes new demo sequences, new Performance banks, demo sequencer programs, and extra documentation.

The complete *Blue Book* advanced user's guide is here, including both text files and example MIDI files. The *Blue Book* provides considerably more information than the regular manual, particularly regarding Multi mode and accessing hidden synthesis parameters. There are even audio versions of twelve demo sequences, which can be played on a regular CD player. Some of these contents may eventually show up on Yamaha's Web site, but this is currently the only source for them.

The demo sequencers on the disc are Steinberg's *Cubase VST* (Mac) and *Cubase Score* (Windows) and Emagic's *Micro Logic* (Mac and Windows). *Cubase VST* requires a Power Mac and is not compatible with Mac OS 7.5.5, but it works with Mac OS 7.5.3. Several Mixer maps for *Cubase VST* are included that let you operate the CS1x controls from within the sequencer. Although these maps are fairly crude, they are usable and serve as guides for writing your own Mixer maps. A smaller set of maps and an Environment file are included for *Micro Logic* users. A copy of *MIDI Typer* is also included for Mac users. This handy little shareware program provides a way to convert Standard MIDI Files from PC to Mac format. (For more on *MIDI Typer*, see "Cool Tools" in the October 1996 **EM**.)

A welcome surprise was the *CSed* program, an editor/librarian for CS1x Performances. It is only available for the Macintosh, and Yamaha's representative indicated that there are no firm plans to port it to Windows. *CSed* allows you to edit all Performance parameters and transfer banks between the Mac and the CS1x. It makes good use of graphics and is easy to use (see **Fig. A**).

Unfortunately, *CSed* version 1.0 has problems transferring banks from the CS1x to the Mac, and I was unable to get this feature to work. Transfers from the Mac to the synth worked flawlessly, however. I was pleased to see that all XG and Material Voices are identified by name in the editor. It's likely that commercial universal editor/librarian programs will eventually support the CS1x, but *CSed* gets Mac users going now.

By the way, another good CS1x resource is the unofficial CS1x Web page, which is run by Grant Davies at www.cybercom.nl/~buma/index.html.

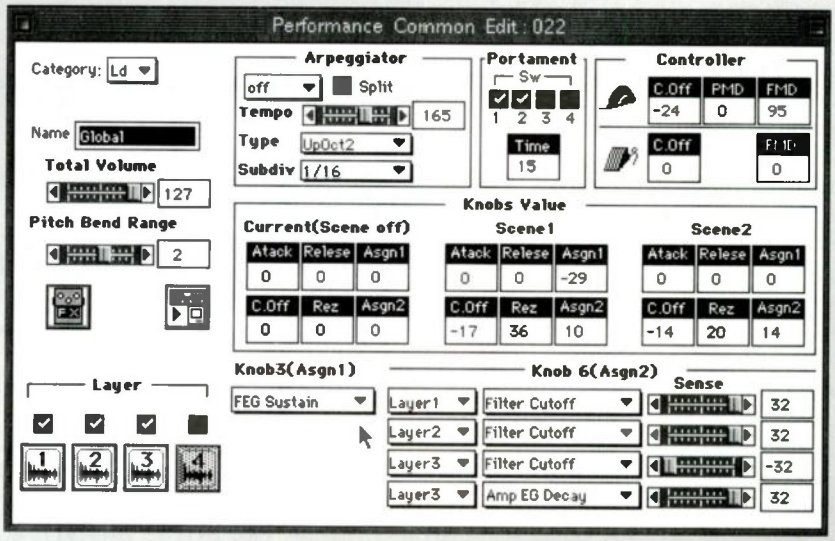


FIG. A: Yamaha's freeware *CSed* for the Mac provides access to all CS1x Performance parameters and lets you transfer banks between computer and synth. In this window, you can edit the common parameters across all Layers in a Performance.

PERFORMANCES

Performance mode is the CS1x's forte. With up to four Layers of dynamically changing timbres, you can handle everything from backing parts to solo leads without a problem. The four Layers in a Performance are the equivalent of Parts 1 to 4 in Multi mode except that they all play on the same MIDI channel, and you have immediate access to all of the synthesis parameters. One thing to be wary of, however, is that held notes cut off if you change Performances. (Sometimes you just can't win.)

You get one bank of factory Performances in ROM and one bank of RAM-based user Performances. Performance parameters are grouped into six menus: two menus are common to all Layers, and four are Layer-specific. Common parameters include the effects selections, arpeggiator operation (discussed later), overall level, mod wheel and foot-controller influence on the pitch and filter, portamento, and Pitch Bend range.

Portamento can be switched on or off for each Layer, but all Layers use a common portamento time. I would rather have a separate glide time for each Layer to allow cool, sweeping chord changes. It's also interesting that some synthesis parameters (such as response to Aftertouch and scale tunings) are available via SysEx in Multi mode but not in Performance mode.

The Layer-specific parameters are typical of sample-playback synths, with settings for Voice, envelope shapes, note transposition and detuning, filter cutoff and resonance, LFO control, pan, and effect sends. Voices can be chosen from any XG or Material bank via the front panel. Selections from the TG300B or "hidden" Material banks must be done by means of Bank Select messages.

Each Layer has its own LFO and low-pass filter. You can also restrict Layers so they play only over a defined keyboard range and/or Velocity range, which is useful for creating splits and Velocity-switched accents and timbral changes.

The Assign 1 and 2 Sound Control knobs can be used for real-time control of Performance parameters. Assign 1 operates at the overall Performance level and can be mapped to one of 29 destinations, including arpeggiator tempo, effect sends, pitch, envelope

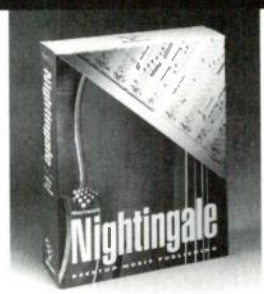
The Best In Notation!

Musicware

Nightingale 3.0

...striking the balance between extensive features and ease of use.

Electronic Musician February '97



ELECTRONIC MUSICIAN 1997 EDITORS' CHOICE

Musicware® Nightingale™ is a lightning fast, personal music publisher designed to let you notate and print your own scores with ease. Nightingale has an arsenal of powerful, intuitive notation tools, but its simple approach lets you begin with only a basic knowledge of music. Whatever your skill, now you can easily put your creativity onto paper at the moment of inspiration – and publish it on the internet!

- **Internet Ready** Includes NoteView 2.2 Internet Publishing Utility
- **Imports Finale® ENIGMA™ Files** Edit, save, print and publish on paper and online
- **Supports OMS®**
- **Real-Time Recording and Over Dubbing**
- **Scanning Capability** Note Scan is the only notation scanning software for the Macintosh®

Product names used are trademarks of their respect ve owners

Call **1-800-997-4266** for the dealer nearest you.
www.halcyon.com/musicware/

circle #558 on reader service card

circle #570 on reader service card

MUSICIANS • BANDS • STUDIOS • CHURCH • HOME • SCHOOL

Keyboard Specialists

NOBODY BEATS OUR PRICES!

All Major Brands • Beginner to Professional • New or Used • All Major Credit Cards
E-Z Terms • Financing Available • Professional Advice • Speedy Shipping

Special pricing for packaged systems!

SAMPLERS
SOFTWARE
DIGITAL PIANOS
SYNTHESIZERS
DRUM MACHINES
MIXERS/AMPLIFIERS
RECORDING EQUIP.

RHYTHM CITY

1485 N.E. Expressway • Atlanta, GA 30329
e-mail: rhycity@aol.com • web: www.rhythmcity.com
Tel: 404-320-SALE • Fax: 404-633-2522

attack/decay times, and LFO speed. Some choices include effects parameters that are otherwise accessible only through SysEx, such as routing chorus to reverb.

Assign 2 is even more powerful. It can be mapped to a different destination (out of 29 choices) for each Layer, with independent scaling factors for each. This is way cool; turning one knob can simultaneously change the direction and value of a parameter across all Layers or change different parameters for each Layer. With one knob, for example, you could change the pan position of each Layer by a different amount in either direction. The Preset bank contains more extensive examples; for instance, "RytField" maps the Assign 2 knob to the filter-envelope decay time for Layer 1, pitch for Layer 2, LFO speed for Layer 3, and LFO filter-mod depth for Layer 4.

In addition to 4-Layer Performances, the CS1x can play twelve Parts, which operate just as they do in Multi mode. This can only be done with an external MIDI source because there is no way to set up or access these Parts from the front panel. Nonetheless, it's great for the one-person band armed with a portable computer, hardware sequencer, or MIDI-file player. You can sequence your backing tracks and play the lead part live.

Unlike Multi settings, new or modified Performances can be saved to the User bank with the Store button, so they are protected at power-down and when changing modes. You also can offload one or all Performances in the User bank with a SysEx bulk dump. There are no card slots, so this is the only way to save and load new Performance banks.

GNARLY KNOBS

Creating and editing sounds on the CS1x is a breeze, which will be welcome news for beginners. Forget about fumbling through nested, cryptic menu hierarchies on the LCD. Simply turn the rotary knob to select from one of six sets of menus and then push the designated button to change a parameter value. The synth automatically changes from Play to Edit status and makes your changes. That's just two operations for any edit!

Menu parameters are arranged logically in groups of ten and are printed on the case above the appropriate parameter button. For faster editing, one of the Sound Control knobs doubles as a data-entry wheel, or you can use the numeric keypad. Holding down the Shift button applies the edited value to all Layers or Parts, which is a handy shortcut. Alternatively, you can stay in a given parameter-edit page and step through all Parts and Layers, making changes as needed. Kudos to Yamaha for a consistent and readily accessible user interface.

The six Sound Control knobs provide immediate, interactive control of sounds. Although real-time control knobs are not new in digital synthesizers, their availability and implementation are novel at this price point. Four knobs are "hard-wired" (permanently mapped) to control amplitude-envelope attack and release time, filter cutoff, and resonance for the current Layer (Performance mode) or Part (Multi mode). I have already discussed the other two knobs (see the "Performances" section), which are assignable to Performance parameters and have no immediate effect in Multi mode.

When you select a new Voice, the knob positions are ignored, and all parameters take on their programmed values. Turning a knob adds or subtracts an offset to the programmed value. The knobs affect all Performance Layers equally; there's no way to exempt some Layers from the change.

Each knob can be assigned to send a MIDI Control Change message, which is useful for controlling external MIDI devices while playing the CS1x. Unfortunately, the four knobs that have premapped functions (i.e., amplitude-envelope attack, release, filter cutoff, and resonance) retain these properties for the internal voices while executing the new controller assignments. If you assign knob 4 (resonance) to pan, turning it fully clockwise moves the stereo position to the far right and maxes out filter resonance for the current Performance. Fortunately, only the assigned MIDI Control Change is sent externally. This setup hamstrings the knobs' utility. You can't just control a slave tone module with these knobs because moving the knobs affects the CS1x, too.

Parameter changes with the knobs are not reflected on the LCD. I would like to see this changed in an operating system upgrade. A workaround is to use a sequencer to monitor the CS1x MIDI Out while editing and note the controller values when you get a sound you like.

MAKING THE SCENE

The CS1x has two Scene buttons that let you store and recall the current values of all Sound Control knobs. An LED lights to show that a Scene is active. Even better, activating both Scenes together lets you morph between the settings by moving the mod wheel or foot controller. Very cool! Be careful, however: turning a Scene on sends a SysEx message followed by a Control Change message (CC 1 or CC 16, depending on your setup) with a value of 0 (Scene 1 on) or 127 (Scene 2 on). This could cause a rude surprise with external MIDI modules. The Scene Off

CS1x Specifications

Keyboard	61-key unweighted
Sends Key Velocity/Aftertouch	yes/no
Polyphonic Voices	32
Multitimbral Parts	16
Preset/User Performances	128/128
Normal Voices (XG/TG300B)	480/579
Drum Kits (XG/TG300B)	11/10
Effects Algorithms	11 Reverb, 11 Chorus, 43 Variation
Arpeggiator Algorithms	30
Main L/R Outputs	unbalanced ¼-inch
Headphone Output	TRS ¼-inch
Controller Jacks	2 continuous (CV), 1 footswitch
Dimensions	38⅜" x 11¼" x 4 1/16"
Weight	12 lb., 9 oz.

message is SysEx only, so it has no effect on external devices.

When one or both Scenes are active, the permanently premapped knob functions for the internal Voices are inactive. Knobs assigned to send MIDI Control Changes remain active both for internal voices and external MIDI control. This partially gets around the limitations of the premapped knob functions. If you plan to rely on custom-assigned MIDI Control Changes, be sure to save your Performance as a Scene without moving the knobs from their default positions. This trick works for all MIDI controller messages except those sent by the permanently premapped knobs; it isn't possible to assign a knob to the same MIDI control function as its premapped assignment and have it remain active when a Scene is on.

Each Performance saves the Scene settings as part of its parameter set. This gives you three sounds—the basic Performance, Scene 1, and Scene 2—in one memory location. The status of the two Scene buttons is not saved and does not change when you select a new Performance; the buttons return to their last settings on power up.

GETTING UP, GOING DOWN

Yamaha included a cool arpeggiator on the CS1x to further enhance Performance mode. Although you can't change or create new arpeggiator patterns, you can use any of the 30 preset patterns (called Algorithms). These include simple chord patterns over one or more octaves, techno dance patterns, and even chord runs and phrases incorporating filter and pan sweeps. Pretty impressive for an entry-level keyboard!

You'll need a little time to familiarize yourself with the patterns because they are not well documented. Unfortunately, they only play the internal voices and are not output via MIDI. I'd like to capture them in a sequencer for analysis or enhancement.

The arpeggiator has three controls—Algorithm, Tempo, and Subdivide—and three modes of operation: Normal, Hold, and Split. All of these parameters can be changed while playing. As mentioned earlier, Algorithms are preset patterns. Supported tempos range from 40 to 240 bpm using the internal clock, but you can also sync the arpeggiator to MIDI Clock. The Subdivide parameter sets the rhythmic beat unit and can range from 1/32 to 3/8, including some triplets.

In Normal mode, the arpeggiator plays the selected pattern using all the notes held down on the synth's keyboard. Change the notes, and the sequence changes to match. The Hold button keeps the sequence repeating, which frees up your hands. Unfortunately, the only way to stop the Hold function is by turning off the arpeggiator. I'd rather be able to press the Hold button again and return to Normal mode without stopping.

Split mode activates the arpeggiator only for the lower octaves of the keyboard, leaving the upper area for soloing. Although you cannot change the split point, you can use multiple Layers and note transposition to create a treble arpeggio on the lower half of the keyboard and bass-line soloing on the upper half. You can even use Hold and Split mode together. Split mode is the only instance in which the CS1x's newcomer-friendly user interface stumbles. It uses a special activation step, whereas all other operations are clearly labeled on the front panel.

ONBOARD EFFECTS

The effects processor is similar to that found in the MU50. It provides global reverb and chorus (eleven algorithms of each). A Variation effect (43 algorithms) can be applied globally or to a single Part/Layer. From the front panel, you can only select the reverb and chorus algorithm and set the effect-send levels for each Part/Layer. The only way to modify the parameters for these two effects or change the internal send levels between effects is via SysEx.

Fortunately, at least in Performance mode, the Variation effect can be modified readily. Its list of available effects includes all the global choruses and most of the global reverbs. Other possibilities are delay (up to 715 ms), phaser, distortion, rotary speaker, autopan, autowah, and two types of EQ. A 2-band stereo EQ has a low shelving band that ranges from 50 Hz to 2 kHz and a high shelf that goes from 500 Hz to 16 kHz with ±12 dB boost/cut. The 3-band mono EQ has the same shelving bands and adds a 500 Hz to 10 kHz, fully parametric midrange band.

Most Variation effects have eight or more editable parameters. All can be

AdB * DAL * Metalithic * Zefiro
Hard Disk Recording Interested?
It's our Mission!
PC MAC
Great Deals! Great Service!
Now CD Burners!
See our WWW catalog
www.missionrec.com/em
Mission
Recording and Audio
Sales 800.801.0153
770.599.0681
Fax 770-599-6469
sales@missionrec.com
Audix * Behringer * Lexicon * Symetrix * Aphex * Digitech * Furman
Cakewalk * Sonic Foundry * Digidesign * Waves * Power Technology * AB
Opcode * Emagic * Steinberg * Motu
circle #555 on reader service card

circle #601 on reader service card
WE WROTE THE BOOK
CUSTOM CD's & CASSETTES
1-800-463-9493
24 Hours
WORLD RECORDS GROUP BUYER'S GUIDE
Manufacturing • Packaging • Mastering • Compact Discs • Cassettes
Hassle Free Money Back Guarantee
MAJOR RELEASE QUALITY SINCE 1969
WORLD
Priority Service
E Mail wrcusa @ aol.com
The Complete Guide to Manufacturing Packaging Mastering Compact Discs Cassettes.

edited in real time while the synth is playing. You can even create special effects such as sweeping the LFO speed with the Tremolo algorithm. This approach doesn't always work, though, as some changes cause zipper noise.

In Performance mode, you can control one parameter for each of the Variation algorithms in real time via the Assign 1 Sound Control knob or a foot controller. This controller is permanently premapped for each algorithm, typically to the wet/dry balance. Only the EQ lacks real-time control parameters. You can specify which Layers are sent to the Variation effect and the overall wet/dry level, but unfortunately, you can't set send levels for each Layer.

In Multi mode, the Variation algorithm is applied as an insert effect for a single Part. To apply the effect globally or alter the default parameter values, you must use System Exclusive. This is incredibly restrictive, especially for sequencing newcomers. However, it is consistent with other constraints in Multi mode.

Each of the three effects modules can be turned off independently, which is useful for isolating and programming each effect. Unfortunately, the CS1x lacks a global effects bypass. I often flip between wet and dry states when creating sounds, and I would appreciate the ability to press one button to bypass all three effects.

Overall, the CS1x effects are comparable to the better General MIDI tone modules I've auditioned. I did not detect any loss of audio quality from their use. The reverb and chorus algorithms are reasonably differentiated and sound good. The effects architecture allows flexible series and parallel routings, but you may need to use System Exclusive messages to create the desired setup.

EVALUATING THE SOUNDS

So much for theory; how does the CS1x sound? For routine multitrack sequencing, the XG banks are on par with most good General MIDI synths I've heard. Although not as convincing as Yamaha's MU80, which has twice the sample ROM, the sounds hold their own when matched up against an Alesis QS6 or Roland XP-10.

▼

Activating both Scenes together lets you morph between the settings.

As with other Yamaha GM tone generators I've auditioned, the individual GM Voices are a bit too bright for my taste when used as solo instruments. This is particularly noticeable with the choirs, saxes, acoustic pianos, and some electric pianos. In ensemble, however, the sounds blend nicely.

Except for a terrible bagpipe patch, there were no big losers in the unit. The strings, guitars, basses, and brass are among the better instruments. The synthesizer leads and pads are a cut above many comparable synths, delivering richer sounds and timbral dynamics. The drums are good and punchy, with clean cymbal fades. I played a variety of MIDI files in different styles and was pleased with the results. The availability of variant Voices in the XG banks allows you to double up tracks with different versions of the same instrument. This helps create a more realistic sound.

The Material bank sounds are aimed at techno/dance grooves. Dance masters will find lots here to keep the floor hopping. Yamaha's goal was to bring back the glory and sass of analog synths, and they have succeeded fairly well. These two banks are full of sweeping pads, fat leads, and frantic stabs; there are precious few conventional instrument timbres here. Many presets make good use of the arpeggiator, knobs, and Scene morphing. Fortunately, the manual includes a breakdown of the preset and user bank Performance settings so you won't miss any sonic options.

One annoyance is that the volume levels are not matched consistently for all Performances. Calling up some heavy hitters such as "Scary" or "Fuzzline" can blast your ears unexpectedly.

Overall, there are a lot of good sounds here. Although not in the Nord Lead's league—remember, the Material banks are based on just 0.5 MB of sample ROM—the arpeggiator and real-time controls add a lot of life and make the sounds more effective than I expected. The sonic bang for the buck is impressive.

The audio quality is good through either headphones or the audio outputs. The sounds are clear, both with and without effects processing. Although I've seen some user comments about background noise, I experienced no such problems.

WRAP UP

The CS1x compares well with other synths in its price range. Most of my criticisms relate to design issues rather than performance problems. Some of these—e.g., the lack of RAM card storage for user Performances—cease to be problems if the CS1x is used with a computer. You'll have to learn to live with such downers as the extensive dependence on SysEx for accessing some features and the way the hard-wired knobs always control the internal sounds while sending out MIDI Control Changes.

I'm pleased with the Yamaha CS1x synthesizer and recommend it as an entry-level keyboard. Its front-panel features make it one of the easiest synths to get up and running I have ever tested. Although it is a bit overhyped as being "analog-like," there's no denying the effectiveness of its real-time controls for livening up a sound and promoting player interaction. The factory Voices are good, and although the selection of parameters is pretty limited, it's simple to create new sounds. When you add the arpeggiator, Octave Shift, and real-time parameter control, you get the potential for a great lead synthesizer.●

Product Summary

PRODUCT:
CS1x synthesizer
PRICE:
$799.95
MANUFACTURER:
Yamaha Corporation of America, Inc.
tel. (714) 522-9011
fax (714) 739-2680
e-mail info@yamaha.com
Web www.yamaha.com
CIRCLE #441 ON READER SERVICE CARD

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

Front Room Productions Producer Series, Vol. 1

By Jeff Obee

High-quality vintage-synth samples for the K2000.

A drift in sleep, I'm having a strange dream: a TV is glowing blue in a dark room, and a commercial is on the screen. Spinal Tap's Nigel Tufnel is standing next to a computer, pointing at the CD-ROM drive, and saying in his inimitable English accent, "This one goes at 11× speed..."

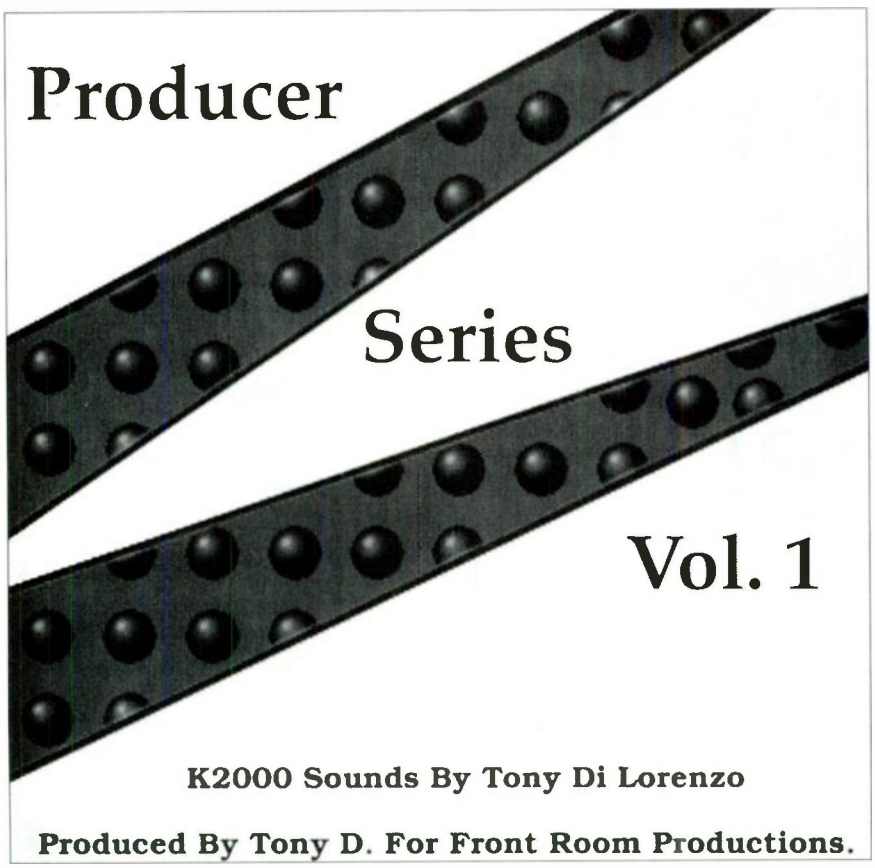
CD-ROM drives have become a standard tool for electronic musicians. So while some folks are loading Cyan's *Myst* (or Palladium Interactive's *Pyst*), those of us who make music are loading in sample libraries ranging from conventional instrument collections to bizarre industrial loops. One entry into the fray that leans towards the former style is Front Room Productions' *Producer Series*, vol. 1, for the Kurzweil K2000.

A DRAUGHT OF VINTAGE

This collection consists of 110 samples (over 500 MB) from vintage synths, including the PPG Wave 2.3; Sequential Prophet VS; Roland MKS-80, MKS-30, and MKS-20; and Yamaha CS80, DX5, and TX216/TX416 racks. According to Tony DiLorenzo, sound developer at Front Room, the idea behind this CD was to give people who don't have access to these older instruments a way to get their hands on some classic sounds.

All samples are 16-bit, 44.1 kHz and span a 76-note range. Some of the samples are from factory patches that originally came with the synths, some are edited versions, and others are original programs.

The title of this CD-ROM is appropriate: it's a fairly proletarian collection of sounds well suited for the gigging keyboard player and for day-to-day production use in recording sessions and songwriting, although there are some more eclectic offerings. Each sound bank contains a basic program and anywhere from three to twenty-three variations thereof. For the most part, the sounds can be classified into standard categories: basses, electric pianos, clavinets, organs, brass, strings, pads, and solo voices. There are no drum or percussion samples on this disc, and a single sound is assigned across the entire keyboard.



Front Room Productions' *Producer Series*, vol. 1, supplies Kurzweil K2000/K2500 users with a solid selection of vintage synth sounds on CD-ROM.

GRADE A AUDIO

The quality of the samples on this disc is excellent. I scoped it out on a Kurzweil K2000RS with 10 MB RAM, using an Oberheim Matrix-12 as a 5-octave master keyboard. You will need 10 MB of sample RAM to accommodate the largest samples; although a portion of the samples were done in mono, the majority of them are big, beefy stereo samples, and they use a good deal of memory.

I went through every sample with the proverbial fine-toothed comb, checking their quality across the keyboard. Virtually every sound passed the test. I rarely detected transitions between multisamples. With a few minor exceptions, all the samples were noticeably free of aliasing or noise. The looping was also done to perfection. DiLorenzo is to be commended for his attention to sonic detail. The two years of energy he spent compiling and programming these samples were well spent; I was impressed.

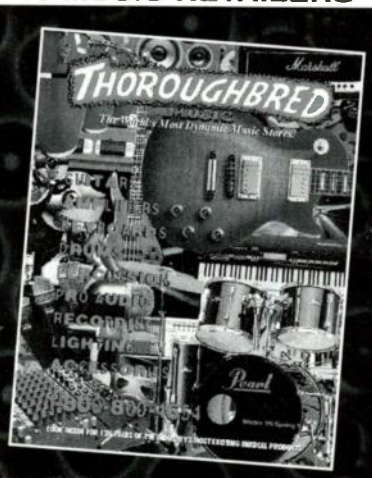
All samples were created on the K2000, and every parameter is mapped for optimum usage on this deep machine. The samples were recorded dry through a mixer, and they are indeed high-end reproductions of vintage synthesizer sounds. The K2000 has a tendency to make any sample sound better than the original, and this effect is obvious here. They have a lot of presence and clarity and stand out well in a piece. DiLorenzo told me he optimized the samples using the K2000's Truncate and Normalize DSP functions.

WHAT'S IN A NAME

Unfortunately, the source synth for each sound isn't mentioned in the documentation. You only get a list of patch names in alphabetical order, the corresponding file sizes, and the number of programs. This is a disappointment. When I buy a CD-ROM of vintage

ONE OF THE NATION'S TOP 10 MUSIC RETAILERS

Get Our New Free Catalog



128 pages of the newest and most exciting musical instruments & pro audio equipment

THOROUGHBRED MUSIC
The World's Most Dynamic Music Stores!

Call 1(800)800-4654

Call us toll-free from outside Florida. Inside Florida & outside U.S. call (813) 889-3874

CALL US TODAY AND WE'LL RUSH OUR CATALOG TO YOU!

Send all correspondence to 5511 Pioneer Park Blvd. • Tampa, FL 33634

TAMPA • CLEARWATER • SARASOTA • BRADENTON • ORLANDO

VISIT OUR WEBSITE AT http://www.tbred-music.com/network

circle #593 on reader service card

circle #524 on reader service card

AC Hum

Gone!

The Hum Eliminator™ from Ebtech stops the 60Hz buzz that's caused by groundloops, quick and easy. Just plug it into the signal lines between offending pieces of equipment and you're done.

And since it's not a filter or gate, it won't change your sound.

- Works with balanced or unbalanced signals at either end.
- Breaks groundloops safely while leaving all equipment grounds intact.
- Also available in Line Level Shifter™ version for converting back and forth between -10dBV and +4dBu.
- Two channels for $74.95 retail. Eight channels for $284.95 retail.

EBTECH
the experts in great sound

Call now for a dealer near you. tel. (619)271-9001, fax(619)271-9079

synths, I want to know which sound came from which synth—not only for practical purposes, but also because it enhances my overall experience of the product.

In addition, I took issue with a sample called "StrGlass," which comprises two samples already on the disc, "Str2" and "Glasspno," each on a separate layer. I could have put these together myself. I was also at odds with "Brz-Bell," a combination of a good bell and a good brass sound; I would have liked to get separate samples and been able to decide whether or not to combine them. I like bells and use analog brass sounds occasionally, but they don't work well together.

Some of the source patch names didn't make sense to me. One called "Clanky" didn't sound remotely metallic; it was more a sawtooth-based comping thing. The same holds true for "Clnkbraz." One called "Anastr2" was merely a sawtooth wave. No string patch here. If the idea was to have a solo violin voice, then it missed the mark, although it still functions as a basic fat sawtooth to build on.

A MINOR QUIBBLE

DiLorenzo made the decision to keep the source sample dry in all program variations in order to retain the character of the source synth. I agree with this approach where the main sample is concerned, but I would have liked to have seen some more adventurous "aural prestidigitation" done on the ensuing variations in a bank. The first variation or two in each bank generally

Product Summary

PRODUCT:
Producer Series, vol. 1, sample CD-ROM
PRICE:
$199.95
MANUFACTURER:
Front Room Productions
tel. (718) 449-2129
e-mail thefront@interport.net
Web www.interport.net/~thefront/index.html
CIRCLE #442 ON READER SERVICE CARD

EM METERS	RATING PRODUCTS FROM 1 TO 5
QUALITY OF SOUNDS	● ● ● ● ◖
DOCUMENTATION	● ● ●
VALUE	● ● ● ●

uses the K2000's effects processor to add chorus slap or reverb, or the layer is duplicated and panned or detuned for a chorusing effect. Subsequent variations are from the "add a waveform" school of programming, i.e., taking the source sample and adding a single-cycle waveform from the onboard ROM, shaping it a bit, and calling the result a program.

I know it's a subjective call, but I'm not a big fan of this style of programming. Perhaps that's because I'm a synthesist and not a keyboard player per se. Most of these programs are aimed at keyboardists and work well for comping, and I grok the pragmatic sensibility behind that. After all, these are sounds programmed by a working keyboard player. For what it's worth, good use is made of this technique: the additional waveform (vocal, EP, wood bar, etc.) is matched and blended in well with the root sound and is usually run through the DSP algorithms and filtered.

For example, a sawtooth wave might be added to enhance the main sample and the filter modulation can be programmed to be brighter and more resonant at higher Velocities. This adds some meat and texture to the sound, and good use is made of Velocity in all the programs. The panning, when used, is also effective.

Nonetheless, this method is subtle, and I was left wanting to hear some broader strokes painted with the original sample run through the effects and filtered in unusual ways and with the envelopes expanded on more. Anyone with a rudimentary knowledge of the Kurzweil can duplicate a layer and detune it; I would have preferred some more advanced, expansive approaches. The K2000 and these vintage synth sounds lend themselves to experimentation.

AND SOME PRAISE

One of the big strengths of the K2000-series synths is their ability to function as both a sampler and a synthesizer, freeing the more adventurous user from the standard onboard waveforms and making any sample fair game for the synth engine. When the source sample is of reasonable quality (or not-so-reasonable, depending on your taste and purpose), you can have a gas creating new programs based on that sample. I found this CD-ROM to be an excellent source of programming material; almost every sample had potential to be expanded upon.

I was inspired to program some sounds of my own, and I found these samples to be outstanding templates on which to build more elaborate textures. One of my favorites was "Forte," a fat, analog sawtooth patch that lent itself to a broad, sweeping pad that would work well in a cinematic context. Another fave was "Powerpad." Although it's not my idea of a pad, this sound had a nice, digital, triangle-wave base with shimmering, distorted, metallic overtones. When I ran it through a notch filter and played with it, I came up with some intriguing variations.

▼

The synth basses have a lot of punch and kicked the groove nicely.

A couple of samples, "Savy" and "Str2," sounded as if they were from the Roland Super Jupiter: rich analog pads that stood well on their own but also had lots of potential to be expanded upon. The brass patches had all the wonderful analog thickness we like to hear in sounds of that ilk.

I particularly liked the PPG and Prophet VS patches; that early wavetable-synth sound has a lot of appeal for me. I really enjoyed "Newkey," a bright, "Pat O'Hearn-ish" sound with chorused guitar flavors. In that same vein, "Digikey" is also an excellent sound, both on its own and as a launching pad for other variations.

The synth basses have a lot of punch and kicked the groove nicely when I used them in a sequence. If you're doing techno/house/dance music, you'll want to have a good supply of fat analog basses in your library, and there are a slew of good ones here. There are also a lot of sounds that are just right for rhythmic comping. The Clavinet-oriented stuff was crisp, clear, and funky. The electric pianos were very good, too; there are none of the typical DX7 "DynoRhodes" sounds, just an assortment of eminently usable patches.

CONCLUSIONS

I would have done some things differently, but I understand the philosophy behind this effort: give K2000 users a palette of classic synths at an affordable price. The audio quality is top-notch, and you get true-to-life vintage synth samples, mostly in stereo. The documentation could have been more comprehensive: including the source synth with each sample would have been a nice touch, and some categorizing of the sounds would have been helpful.

If you're a working player who wants to acquire some vintage keyboard patches, a producer looking to broaden your library, or a serious synthesist looking for source material to expand on, I recommend this disc. Of course, you should always listen closely before laying down your hard earned cash, but at this price, the *Producer Series*, vol. 1, is a quality addition to anyone's CD-ROM library.

Jeff Obee *is a bassist-synthesist who plays in bands with cool names like Haunted By Waters and Sculpting the Muse.*

circle #523 on reader service card

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

Audix PH-15vs

By Rob Shrock

A big sound comes from these small, active monitors.

Powered close-field monitors eliminate many problems. Because the amplifier and speaker are optimally matched by the manufacturer, self-powered monitors are not (if properly designed) subject to the arbitrary coloration caused by underpowered or poor-quality amplification. Also, because the internal amps are specially tailored to the optimum power requirements of the transducers, speaker overload is much less likely to occur. And, of course, using a close-field design helps minimize the sonic improprieties of your room.

Active close-field monitors should prove especially attractive to engineers who tote their own monitors from studio to studio for the sake of consistency and familiarity. No longer at the mercy of power-amp variables, they can rest doubly assured of sonic consistency from one environment to the next. Setup, too, is usually easy and quick, and most powered monitors are no more of a hassle to travel with than a couple of small racks of outboard gear.

As more engineers and studio owners choose powered monitors over passive models, manufacturers are tooling up to meet the demand. Audix Corporation has designed a versatile line of monitors that covers a broad range of musical applications. Dubbed the Powerhouse Series, the line offers five models that cover everything from small multimedia workstations to multitrack recording and mixing.

POWERHOUSE

All models in the Powerhouse Series operate in a master/slave configuration and feature internal amplification, a passive crossover, and video shielding in a 2-way, front-vented cabinet. The master unit contains the amplifier. Its back panel sports a master-volume knob, balanced RCA jacks for L/R inputs, a 3-prong power connector, and a ¼-inch jack that links the master to the slave cabinet via a 6-foot cable. The back plate of the master unit also serves as the heat sink. Speaker size, frequency response, sensitivity, power output, dimensions, and weight are all dependent upon the specific model. I tested a pair of the PH-15vs monitors, the second-largest model in the series.

Audix suggests the PH-15vs monitors as ideal for all applications, including home-studio recording, computer workstations, keyboard rigs, multitrack recording, multimedia production, and post-production editing. I used the PH-15vs for recording and mixing and as keyboard monitors during recording.

FIRST ENCOUNTER

Initially I was a little skeptical about what 45 watts of amplification could provide in the way of clean volume. But after an effortless setup, I listened to some familiar CDs and was impressed by how loud these speakers could get before they started to break up. Audix has done a nice job of creating a tight-sounding cabinet with good sonic projection. The PH-15vs won't deafen you by any means, but it's very capable of filling a room with lots of sound, and it provided plenty of level for my working style. My first impression was that its response may be a bit deficient in the midrange, but overall the sound was solid and pleasing.

The PH-15vs has a shutoff device that powers down the amp if it doesn't see signal for five minutes. Once it gets input signal again, it automatically fires up with only a trace of input transient lost to the quick ramp-up. A brief, low-level hash sound lasts about half a second. The auto-shutoff feature cannot be defeated. It probably prolongs speaker life by allowing the amplifier to cool off periodically, thus reducing the heat level of the cabinet, but the heat output of the PH-15vs monitors seems minimal anyway.

Although I suspect that substantial equalization curves are being employed between the amplifier and cabinets, there is a well-rounded tone in the PH-15vs's low end that doesn't start to get mushy until you really push the volume. The monitors are rated down to 50 Hz, but they seem to start rolling off around 80 Hz. However, they still deliver readily discernible lows down to 60 Hz. (A supplemental powered subwoofer would complement the Powerhouse Series nicely!)

The top end is relatively smooth, and the dispersion of high frequencies covers a broad area for such a small speaker system. The sweet spot is very wide, which means it isn't necessary to glue yourself in one spot to hear everything evenly—an important quality if you work with a sprawling setup that requires moving around a lot. Imaging is also very good for monitors this size. My main worry, again, was about the oh-so-crucial midrange.

FAMILIAR TERRAIN

I encountered the first real problem while recording female vocals. Because the session was for my own song demos, I had the luxury of auditioning various microphones, EQ settings, and compressors. But I wasn't convinced that the PH-15vs was giving me a true representation of the vocals, so I A/B'd it against my other monitors, including a pair of Audix HRM-1s (an older, discontinued model).

The nagging suspicion of a carved-out midrange proved to be true. The HRM-1, which has a very solid upper midrange similar to that of the Yamaha NS-10, sounded like a frequency-content opposite of the PH-15vs. For example, a vocal sound that was good on the PH-15vs sounded overly honky and

One of five models in Audix's new Powerhouse Series, the PH-15vs active monitors offer a broad sweet spot and a big, tight sound, but their midrange response is subpar.

PH-15vs Specifications

Frequency Response	50 Hz–20 kHz (±6 dB)
Sensitivity	86 dB
Amplifier Output	45W RMS per channel/65W peak
Woofer	5.25", long-throw
Tweeter	0.75", ferrofluid polycarbonate dome
Crossover	passive, 2.2 kHz
Input Connectors	balanced RCA
Dimensions	6" (W) x 9" (H) x 9" (D)
Weight	10 lbs. ea.

bright on the HRM-1, whereas a good vocal sound on the HRM-1 was veiled and ghostlike on the PH-15vs and threatened to disappear into an accompanying full-range track. As we were cutting vocals to a rough track of piano, bass, and drums only, I was not confident that the vocal sound I was getting on the PH-15vs would stand up to a later onslaught of synth, string, and guitar overdubs.

However, when I added overdubs to the same tune at a later date, the PH-15vs sounded great and was fun to use. I think the aesthetically pleasing sonic signature of the PH-15vs lends itself to MIDI sequencing or multimedia uses because the speaker doesn't wear your ears out over extended periods of time. However, I don't think the PH-15vs monitors are critically accurate enough for serious tracking or mixing.

I did a rough mix of the same song using only the PH-15vs. The mix was good enough for a demo, but it didn't blow me away. Listening to the mix on other systems, I could hear inconsistencies in the midrange. Not surprisingly, the contrast was most evident as I compared the mix on the two pairs of Audix monitors. (On the HRM-1, the mix was too midrange heavy.)

Of course, all monitors have a sonic signature, and time must be spent getting used to their sound. I would have no problem using the PH-15vs as a second monitoring system while tracking or mixing on the road once I became more familiar with its characteristics.

Product Summary

PRODUCT:
PH-15vs powered close-field monitors
PRICE:
$479/pair
MANUFACTURER:
Audix Corporation
tel. (503) 682-6933
fax (503) 682-7114
e-mail audix@apc.net
Web www.audixusa.com
CIRCLE #443 ON READER SERVICE CARD

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

TRAVEL LOG

I took the PH-15vs monitors along for a rhythm-section date and set them up with my keyboard rig in the main recording room. The producer and I had to spend some time programming sounds before the rest of the musicians arrived, so I ran a feed from the headphone output of my Mackie CR-1604 to the powered speakers. This gave us a convenient way to hear the sounds as I programmed. It also freed us from the oppression of relying on the engineer to feed us a mix through headphones. The engineer liked the arrangement, as it granted him extra setup time, and the producer appreciated the convenience of having keyboard monitors in the room. He also expressed how much he liked the sound of the PH-15vs. "That's a big sound for such little speakers," he said.

Having the monitors in the room proved useful to the rhythm section, as well, because it allowed us to start playing as a group while the engineer was still getting his sounds together. Having never worked with this producer before, I was thankful that I had a good-sounding set of powered speakers to take along on the session. Who knows? It might encourage him to call me for other sessions down the road.

MISSION ACCOMPLISHED

Audix's PH-15vs monitors definitely fill a niche in the powered-speaker market. Their performance is superior to the average multimedia speaker for home computers and is also perfectly suited to the demands of MIDI rigs, background-music systems, portable recording and/or editing setups, and the hotel rooms that traveling musicians must frequently convert into instant studios.

Although not quite as capable as powered monitors from Genelec or Event, the PH-15vs is priced much lower than models from those manufacturers. And because the price includes amplification, these monitors should prove a good choice for the home-studio owner seeking to save money. My main criticism is about the carved-out midrange. Aside from that, the PH-15vs is a good-sounding, versatile, convenient monitor system that is ideal for musicians on the go.

Composer-producer **Rob Shrock** *is the keyboardist-arranger for Dionne Warwick and Burt Bacharach.*

circle #510 on reader service card

ARE YOU FRUSTRATED WITH MANUALS?

Learn *fast and easy* with video training!

SOFTWARE VIDEO TRAINING

Cakewalk	Finale
Band-In-A-Box	Encore
Master Tracks Pro	MusicTime
Performer	MIDI
Cubase	Digital Audio
Sequencing Drums	...and more!

HARDWARE VIDEO TRAINING

Korg M1	Roland JV-90
Korg X3	Roland G-800
Korg X5	Yamaha QY20
Korg Prophecy	Home Recording
Korg Trinity	...and more!

Ask about our Internet & Win 95 videos!
Call today for FREE catalog!
AVI Advanced Video Instruction 1-800-650-2427
Tel 210-828-9282 Fax 210-828-9585

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.**

ACOUSTIC CONSULTING

Acoustic Foam, Diffusors & More!

STUDIOFOAM™ SOUND ABSORBENT WEDGES

Good gear in a bad room sounds no better than bad gear. We can smooth out your room's response, improve your imaging, enlarge your sweet spot & control the reflections that're messing with your sound, no matter whether you work in your garage or a big commercial studio. Whatever your budget or sound problem, *we can help.* Plus, we've just introduced two proprietary diffusors that outperform ones costing hundreds more & at prices you will simply not believe! Wall mount 'em or drop 'em into your suspended ceiling. Easy & cheap to ship, easy to paint, easy to mount, **incredibly affordable & extremely effective** (at any price). For once, diffusion is within the reach of EVERY budget. Call us & we'll fax you the test data on our new world-class T'Fusor™ & MiniFusor™. While you're at it, ask for your own copy of our free new expanded sample & info kit! *Other new goodies:* **Active & Passive Studio Monitors, Mic Windscreens, Headphone Ear Cushions, U-Boat™ Floor Floaters, LENRD™ Bass Traps, NS10M Tweeter Protectors, Rack Hardware, Etc.**

Users: AT&T • NASA • Sony • NBC Sports • Shure • ABC Radio Network • NPR • Ford • ShowCo • Kodak • Warner Bros. • 20th Cent. Fox • Universal Studios • Maury Povich Show • Ensoniq • Community • Hitachi • Gen'l Dynamics • Toshiba • Dennis DeYoung (Styx) • Baldwin • SkidRow • Editel • Paramount • Mike Wanchic (J. Mellencamp) • Rockwell • US Gov't • Opryland • Carvin • WhisperRoom • Pat Duke (Voice of McDonalds & Miller Brewing) • Martin Marietta • Manley Labs • Rainbow America (Disney, Microsoft) • D. Ervasti (Voice of NFL on Fox) • Plus People Who Do Work For ABC News & Sports, NBC News, ESPN, Late Show With D. Letterman, Cell. One, Texas Instr., Stevie Nicks, The Outfield, Kurzweil, Turner Broadcasting, WalMart, NFL on Fox, Coke, Taco Bell, Levis, Mattel, Apple Records, Fox TV, 7UP, etc.)

Auralex, formerly USAFoam • 11571 E. 126th, Fishers IN 46038
Free Tech Support & Advice 317-842-2600 • Fax 317-842-2760

MasterCard VISA DISCOVER AMERICAN EXPRESS

1-800-95-WEDGE

HARD TO FIND MEMORY
for your **AKAI SAMPLERS**
Best prices for **SIMMS**
for AKAI, Ensoniq, E-mu, Kurzweil, Roland, memory for E-IIXP, XS & Jamman, **Zipr Snake Studio Pro Series Cables,** Hard Drives, CD Recorders, Pro Audio Equip.
(800) 979-9066
Mountain International, 501 4th St. SE, Bandon-by-the-Sea, OR 97411 USA, Tel. (541) 347-4450 Fax (541) 347-4163

Sound thinking
Digital Audio: It's What We Do!
digidesign ALESIS
...and more
new! website
541-386-2682
www.soundthinking.com

SINGERS! REMOVE VOCALS
Unlimited Backgrounds™
From Standard Tapes, Records, & CDs with the **Thompson Vocal Eliminator™**
Visit our Internet Site at http://www.ltsound.com
LT Sound, Dept EM-1
7988 LT Parkway
Lithonia, GA 30058
24 Hour Demo/Info Line (770)482-2485 - Ext 16
Best Vocal Eliminator™, Key Changer, Voice Enhancer!

Midi Lighting Dimmer
- 6 Channels of Dimming
- Responds to Notes and Controllers
- Only $399.00 US List Price !

Ask about our Midi products to control Valves, Relays, Servo's, Analog Keyboards & more!!

MEDIA Mation
Show Control & Multi Media Systems
Visa, MC, Discover & AmEx
Phone: (310) 320-0696 Fax: 320-0699

Modular Analog *Lives!*

Evos Research
Voice (603) 878-0702 FAX (603) 878-3997

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

PROFESSIONAL CONSOLE HOUSINGS FOR
YAMAHA 02R
and **MACKIE 8•BUS** mixers

prices from $699.95 to $3,669.95
FREE COLOR BROCHURE 800-427-5698
Outside U.S. 573-346-8549, Fax 573-348-2769
ACI • Rt 3, Box 4374-A • Osage Beach, MO 65065
www.argosyconsole.com
ARGOSY

How BIG is Yours?
HARD DRIVES
Digital Audio Specialists!
CD RECORDERS
MEMORY CHIPS
SOUND CARDS
MIDI SOFTWARE
BIG DISC
(954) 749-0555
http://www.bigdisc.com

EMPLOYMENT OFFERED

SINGERS, ENTERTAINERS, DJS
Be Discovered: Make $1,500 weekly singing, performing at shows locally. Free Report: Pro-Singers Soundtraxs, Attn: Max, Box 1106, Bridgeview, IL 60455.

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

EQUIPMENT FOR SALE

DIGITAL RECORDING STUDIO
16-track digital and analog studio mastering/demos. MIDI capabilities. (304) 697-7959. Cassette and CD duplication; graphic design.
Web site http://members.aol.com/digitalrs. E-mail digitalrs@aol.com.

OMNIRAX
STUDIO FURNITURE for the discriminating musician

800-332-3393
P.O.BOX 1792 SAUSALITO, CA 94966

MIDI MACHINE CONTROL FOR MACHINES WITHOUT MIDI ?
Yes! Control your VCR, CD Player, DAT machine and more with the amazing new ***Infra* MIDI Equator™** from **Epigraf**. Now musicians, performance artists, studios, theatres and others on the cutting edge of multimedia, stage and recording can bridge the separate worlds of MIDI and IR remote control.
ORDER YOURS NOW only $245 U.S.
800 - EPIGRAF • 374-4723 WEB http://www.epigraf.com E-MAIL epigraf@epigraf.com

CLASSIFIEDS

Every major brand of everything. Millions of dollars of musical gear in stock. **ALTO MUSIC**. Guitars, recording, keyboards, amplifiers, drums, pro sound, new & used. One of the largest selections in the country. We ship everywhere!
(914) 692-6922 • 680 Rt. 211
East Middletown, NY 10940
Ask for Uncle Freddy—He loves ya!

Analog Modular Systems, Inc. We buy, sell, and trade all analog synths—especially **Moog, ARP, Buchla, Serge, Roland, Mellotron,** etc. Best price paid!!! Tel. USA: (213) 850-5216; fax USA: (213) 850-1059. Visit our virtual store, http://www.analogsynths.com.

MIDI KITS: Patch Bay, Relay Driver, Custom Instrument, Chord Player, Seq. Remote, Randomizer, 20 more. MIDI Project book, DIY newsletter. For catalog: (800) 546-5461. PAVO, 95 Yesler Way, Seattle, WA 98104; e-mail miditools@aol.com.

NEW, USED, DEMO EQUIPMENT
BEST SELECTION OF DIGITAL/ANALOG RECORDERS, CONSOLES, DAWS, OUTBOARD GEAR
Otari C1 4032, Yamaha 02R, API 1200 rack system, Dynaudio Monitors, Alesis ADAT, TASCAM DA-88, Sony PCM800, Otari Radar 24TK, Pro Tools III, All Digidesign Plug-Ins, Mackie 8•Bus, Apogee AD1000, Lexicon PCM 80/90, TC Electronic M5000, CD Recorders, API, GML, ADL, Summit, Focusrite, Demeter, Lucas, TL Audio, Neumann, AKG, Microtech, Rode, B&K, Genelec, Dynaudio.
Studio and System Design, Financing, Factory Service/ Installation, Experienced and Knowledgeable Sales Staff.
EAR PROFESSIONAL AUDIO
(602) 267-0600
http://www.ear.net

MICRO ROOM
Silent Speaker System
Record guitar, bass, or ANY amplified inst. thru your amplifier SILENTLY. MICRO ROOM's isolated sound chamber contains: Shure SM57, speaker, and Auralex acoustic treatment. Like adding another room to your studio. Contact: Folded Space Technologies (770) 427-8288; fspace@mindspring.com.

WORLD'S SMALLEST EQUIP. DLR. GET ON THE MAILING LIST NOW! R-8, $375; Quadra-Verb, $275; D-50, $600; S900, $650; M1R, $700; TSR-8, $1,500. Mics, Mixers & Processors aplenty. Call for today's availabilities. TELESIS (714) 998-3001.

Guitar/Equipment Shows & Musician Swapmeets in the Northeast. Buy, Sell, or Trade. Next show: April 13, Central New Jersey. Check out: http //www.guitarshow.com. (908) 359-0124. Tristate Music Fairs, PO Box 296, Flagtown, NJ 08821.

FACTORY DIRECT PC MIDI
Sound Card MIDI Cable $19.99
Serial MIDI Interface $69.99
Parallel MIDI Interface $79.99
Prices shown for basic models less ship/hndlg. & Texas sales tax.
The External MIDI I/F Leader since 1988
Key Electronics Direct
Web: www.keyelec.com
Email: info@keyelec.com
1-800-KED-MIDI (533-6434)
817-738-9991 Fax 817-738-9993

Looking for new/used recording, keyboard, or outboard equipment? We've got **tons** of super clean **used** as well as **new** products from **TASCAM, Alesis, Kurzweil, Roland, Mackie, Genelec, Lexicon, Fostex, Yamaha, Korg,** and hundreds more. **Discount pricing** and **Worldwide Delivery!** 66 years in business. Trade-ins welcome. Visit our new **22,500 sq. ft.** location. Call, write, or fax us today for price quotes and details. Also find us on the Internet at **sales@caruso.net**. Start saving money today! Call **Caruso Music**, 94 State St., New London, CT 06320 USA. **(860) 442-9600**/fax: (860) 442-0463.

Down Town Sound
Looking for the newest equipment for your recording studio? We carry Soundcraft, Panasonic, JBL Pro, Ramsa, TC Electronic, Shure, Audio-Technica, Hafler, dbx, Lexicon, Rane, KRK, Mackie, Beyerdynamic, Fishman, AKG, Fostex, and many more top brands. Call or fax us for price quotes and information.
Down Town Sound
290 West Water Street
Toms River, NJ 08753
(800) 836-5555/Fax (908) 349-0475

CASIO CLOSEOUT!
Digital MIDI Horn
$149.95
VZ-10M Synth Module
Priced with
2 FREE ROM Cards at
$299.95
(414) 784-9001

EQUIPMENT WANTED

We want your used keyboard, recording, and audio equipment We'll **airmail** you **$$$** or take your stuff in trade toward over **350 brands** of new and used products **Come in or do it all through the mail**. 66 years in business. **Worldwide delivery**. Visit our new **22,500 sq. ft.** location. **Call**, write, or fax us today for price quotes and details. Also, find us on the Internet at **sales@caruso.net**. Start saving money today. Call **Caruso Music**, 94 State St., New London, CT 06320 USA. **(860) 442-9600**/fax: (860) 442-0463.

INSTRUCTION

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.

BOOKS, TAPES, VIDEOS

GET OUR FREE CATALOG FEATURING RESOURCES ON
- **MIDI**
- **INSTRUMENT-SPECIFIC GUIDES**
- **SYNTHESIS & SAMPLING**
- **RECORDING**
- **DRUM MACHINE PATTERNS**
- **COMPOSITION**
- **MUSIC BUSINESS**
- **A&R LISTS AND MORE**

ALL TITLES REVIEWED AND GUARANTEED
MIX
BOOKSHELF
c/o Whitehurst and Clark, Inc.
100 Newfield Avenue, Edison,
New Jersey 08837-3817
fax (908) 225-1562
phone (800) 233-9604

Recording Engineer
No experience required!
On-the-job-training in local major Recording Studios
Part-time, nights, weekends – Free video and brochure tell how
1-800/295-4433 Ask about our Record Label!
http://www.sna.com/musicbiz

BE A RECORDING ENGINEER
★ TRAIN AT HOME ★
Easy Home-Study practical training in Multi-track Recording. Join our successful working graduates or build your own studio. Career Guidance. Diploma. Accredited.
FREE INFORMATION:
Audio Institute of America
2258-A Union St. Suite F, San Francisco, CA 94123

LEARN THE ART OF RECORDING
Learn the practical skills needed to start a career as a engineer, producer or studio musician. •300 hours •Six studios/latest equipment •Small classes •Job placement assistance •Financial aid •On-campus housing
Call 800-848-9900 or 614-663-2544
The Recording Workshop
455-L Massieville Rd, Chillicothe, Oh 45601

PARTS & ACCESSORIES

SOUND LOGIC
Keyboard Upgrades & Accessories
Hard to find RAM MEMORY
Roland Sampler MONITORS
TYPHOON OS for TX16W
Pentium MIDI Systems
CD Recorder Systems
SCSI Drives & I/Fs
Memory(RAM/ROM)
MIDI Peripherals
Keyboards & Upgrades
Music & MIDI Software
Samples & Sounds
Generalmusic • Fostex
Spectral • Fatar • DAL
INFO: 619-484-9817
FAX: 619-484-9857
ORDERS: 800-753-6558
Email: sndlogic@connectnet.com
Web Site: http://www.ramona.com

EM CLASSIFIEDS
(800) 544-5530

CLASSIFIEDS

PUBLICATIONS & BOOKS

FREE Indie Music Report!
"39 Low-Cost Ways to Promote Your Band, Record Label, or New Release." Dozens of proven, high-impact music marketing tips. Call (800) 527-ROCK or e-mail bob101ways@aol.com.

e-mail your EM classified ad
boycemr@cardinal.com

DIGITAL FORCE®
MASTERING
REPLICATION
PERSONAL EXPERT SERVICE
212 333-5953
digital force@morebbs.com
TOTAL CD, CD-ROM & CASSETTE PRODUCTION
330 WEST 58th ST
NY, NY 10019
The Power of Excellence SM
GRAPHIC DESIGN
PRINTING
COMPLETE PACKAGING
POSTERS

SONGWRITERS! Have you been searching for these career items?
Contracts
Copyrights
Books
Directories
Promo Photos
Dupes & Tapes
Printing Supplies
Labels, J-Cards
Studio Supplies
Shrink Wrap Equipment
Free Catalog! (407) 321-3702
http://spotnet.com/SPIN
SONGWRITER PRODUCTS IDEAS & NECESSITIES
SPIN Box 952063, #5
Lake Mary, FL 32795-2063

FREE!
Guide To Master Tape Preparation
Brand New Edition!
Find out how to prepare your audio master for error-free manufacturing. A must for recording artists and studio engineers.
Call today for your FREE copy:
1-800-468-9353
24 HOURS TOLL FREE
Outside USA call 609-663-9030 • FAX 609-661-3458
http://www.discmakers.com
DISC MAKERS

Create Sound
LOW Prices!
FREE Brochure!
MAJOR Label Quality!
FRIENDLY Customer Service!
Compact Disc & Audio Cassette Production
(802)453-3334 FAX (802)453-3343

RECORDING SERVICES AND REPAIRS

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.

Your music on CD
Cassettes & Vinyl
CDs from 1 to a million
Low prices • fast, friendly service
Everything incl. • no hidden charges
Mastering • Sound Enhancement
847-945-6160
Big Dreams Studio

SOUTHERN RECORDING & SOUND
Bulk Cassette Tapes
DAT, ADAT, D-88 Tapes
Recording Supplies & Accessories
** NO MINIMUM ORDER **
Call for Free Catalog
1-800-450-8273

X TRAX
DIGITAL MASTERING
INTENSE GRAPHICS
ONE OFF CD'S
CD REPLICATION
CASSETTE DUPLICATION
VIDEO DUPLICATION
1000 CD'S AS LOW AS $999
Free Full Color Catalog • Toll Free 1.888.88XTRAX
OUTSIDE THE USA (713) 237-8636

EUROPADISK
specializes in full service compact disc replication. Everything is done in-house, on-site for guaranteed quality and cost efficiency. Major credit cards accepted. For a free catalog or estimate, call:
800-455-8555, ext.48
CD-Audio Vinyl Cassette CD ROM
COMPLETE SERVICES:
REPLICATING • DUPLICATING • PRESSING MASTERING • GRAPHICS • FULFILLMENT
REPLICATION WITH SERVICE THAT CAN'T BE REPLICATED
EUROPADISK, LTD.
Discs With No Risks.
75 Varick Street, New York, NY 10013. (212)-226-4401, ext.48 FAX (212) 966-0456

MANUFACTURERS OF CDs and CASSETTES
CD REPLICATION -
CASSETTE DUPLICATION -
DIGITAL MASTERING -
GRAPHIC DESIGN -
PRINTING - PACKAGES -
ONE OFF CDs
Ask about our FREE WEB PAGE offer
HTTP://WWW.PB.NET/~CCMUSIC
800-289-9155
OUTSIDE U.S. 516-244-0800
C&C MUSIC

CLASSIFIEDS

TUBE BAR STUDIOS
$1.79 Cassette Copies includes High-Bias Chrome Tape, Laser Labels, Norelco Boxes, and duplication. No Job too Small. Also CD Packages and Recording Supplies. (718) 768-4723.

CD Audio Transfers
Put your cassette or DAT on CD. Best prices! Single copy or small amounts. Laser quality. Send stamp for mailing information to: CD Audio Transfers, c/o Don Lamb, PO Box 119, Springville, UT 84663.

REAL-TIME DUPLICATION BLOWOUT SALE!
300 Chrome (up to 45 min.), Full-color insert, imprint, shrink, boxes **$599.99!** + ship. We'll beat any price!
Accurate Audio Labs, Inc.
(800) 801-7664

CD & TAPE MANUFACTURING
500 Full Color CDs plus 500 Chrome Cassettes
FOR ONLY $2,597
Includes design!
COMPLETE COMBINATION PACKAGE
FOR FREE CATALOG CALL:
Hummingbird RECORDINGS
1-800-933-9722

INDEPENDENT RELEASE SPECIAL – MAJOR LABEL QUALITY
Our CD and cassette packages are the most complete, superior quality, retail-ready packages available. Just send us your master, photos, and liner notes. We do the rest!
1,000 CDs Complete Package $2,447
(Add 500 cassettes for only $922.00 more)
- 4-Panel Folder, 4-Color (4/1)
- 4-Color Tray Card (4/0)
- 3-Color CD Disc Printing
- From Your DAT, 1630, or CDR
- Color Separations, Typesetting, and Graphic Design Included!

For The Most Complete CD and Cassette Packages Available, Call 1-800-637-9493 Musicraft

Custom CDs
Full-Service AMW CDs FAST
1000 CDs-Packages from $1750
MASTERING ON SONIC SOLUTIONS
NoNoise™ • CUSTOM GRAPHICS
Call NOW for A Personal Estimate
MasterWrks@aol.com Memphis
(901) 821-9099

25 CDs for only $349!
Includes jewel case and free direct printing on disc! Call for details.
Compact Discs • Real Time Cassettes
Digital Mastering
(800) 249-1110
National Multimedia Services

a+r Est. 1967
Record & Tape Mfg., Inc.
902 N. Industrial Blvd.
Dallas, TX 75207
214-741-2027
1-800-527-3472
CD's Starting at $900.00
VISA/MC ACCEPTED
MAJOR LABEL QUALITY & SERVICE
★ VINYL PRESSING
SPECIAL RADIO & PROMO PACKAGES
★ COMPACT DISCS
★ CASSETTES
No Hidden Costs!

DUPLICATION
•COMPACT DISCS
Direct from Digital •CASSETTES
•VIDEOS
1000 CD Pkg. $1399
We Do It All ~ Your One Stop Shop
1-800-365-TAPE(8273)
~ 100% Guaranteed ~
11 Years Serving The World
EASTCO PRO Audio/Video Corporation
FREE COLOR CATALOG
www.eastcopro.com

HEALEYdisc Manufacturing
INCREDIBLE CD & CASSETTE PACKAGES!
Complete Full Color CD Packages:
500 CDs $1163.
1000 CDs $1663.
CD Package includes: color 4 pc. panel + tray insert, color traycard, 2 color on CD printing, pre-master & glass mastering, jewel box, shrinkwrap, insertion of graphics. Does not include film or typesetting.
Complete Full Color Cassette Package:
500 Cass. $611.
Package includes: 10-60 min. high bias tape, 1 panel J-card, digital running master, on cassette printing, set-up, Norelco box, shrinkwrap, insertion of graphics. Does not include film or typesetting.
Professional Mastering Available at Affordable Rates!
American Clients: No Tax... No Duty... No Problem!
Combination Packages and CD ROM Available!
TOLL FREE 1-800-835-1362

RECORDS, TAPES & CDS

1-800-TAPE WORLD or 1-800 245-6000
We'll beat any price! 5.95 SHIPPING • FREE CAT.

SONY		MAXELL		TDK		FUJI	
DAT-120	5.99	XL11-90	1.59	DAT-120	6.49	S-VHS-T120	6.49
DAT-124 PRO	8.99	XL11S-90	1.99	SA-90	1.49	8MM-120	3.49
T-120V	1.69	ST-120	6.99	SAX-90	1.99	HI 8 120	5.99
L-750HG	4.49	DAT-124 PRO	7.99	T 120 EHG	2.49	DCC-90	6.99
MDW-74	6.49	T120HGX	2.49	CDR-74	5.99	DR-I-90	.69
TDKDVC60	11.99	UR-90	.79	UD35-90	8.99	JVCST120	5.99

TAPE WORLD 220 SPRING ST., BUTLER, PA 16003. FAX: 800-322-8273
OVER 500 DIFFERENT SAME DAY SHIPPING. M-F 8-5

Your #1 Choice
Factory Direct Prices!
CD REPLICATION
CASSETTE DUPLICATION
MASTERING
GRAPHIC DESIGN & PRINTING
500 COMPACT DISCS $1295
FREE CD PROOF!
Includes glass master, 2 page book and tray card in full color, 2 color CD imprint, assembled and wrapped
1000 CDs $1795
MARTIN AUDIO DUPLICATION
1-800-553-8906
1-206-285-2642
1219 Westlake Ave. N. Suite 218-A, Seattle WA 98109
All prices based on production ready DAT and plate ready film. Freight charges are additional.

EARTH DISC
CD PRICES THAT ARE DOWN TO EARTH
CD's ($1070/500 or $1635/1000)
& Cassettes ($555/500 or $745/1000)
1-800-876-5950
VISA and AmEX accepted

Complete CD packages!
WAVE

	CD's	Cassettes
300	$975	$396
500	$1075	$506
1,000	$1637	$752

1-800-928-3310
World Audio Video Enterprises
Retail ready including full color inserts. Bar-codes, CD-Rom, CD-R, Mastering, Design and Film services available.

HIGHEST QUALITY
BEST SERVICE
LOWEST PRICES
BayWind productions
100% Satisfaction Guaranteed
CDs & CASSETTE DUPLICATION
• Major Label Quality • High Quality Duplication •
• State-of-the-art Graphics Design •
• Complete Retail Ready Packages •
• Any Size Order • Fast Turnaround •
• Call for your customized quote & monthly specials •
TOLL FREE 1-888-229-9463

CLASSIFIEDS

RECORDS, TAPES & CDS

CD-AUDIO REPLICATION
The best disc is an APD disc
1-800-APD-DISC (273-3472)
FAX: (315) 768-8942
AMERICAN PRO DIGITAL
WEB Site:
http://www.apd-disc.com
E-Mail:
apdinc@northnet.org

"OUR 29TH YEAR OF FAST GUARANTEED SERVICE"
FREE CATALOG
4212 14TH AVENUE - BROOKLYN, NY 11219
ANDOL AUDIO PRODUCTS INC.
CUSTOM LENGTHS FROM 1-126 MINUTES
CD-RS, HI-8, MINI DISKS, S-VHS MASTERING TAPE
A-DAT, R-DAT, BULK VHS PLASTIC REELS, BOXES
NORELCO, SOFT POLY BOXES
VIDEO BOXES & SLEEVES
SINGLE & DOUBLE CD BOX
DCC, MOD, DD52 AND MORE

LENGTH · TYPE	C-10	C-20	C-30	C-40	C-50	C-60	C-70	C-80	C-90	100 PIECE MINIMUM
TDK SA	.25	.30	.35	.39	.44	.49	.53	.58	.63	
MAXELL XLII	.27	.32	.38	.44	.47	.52	.67	.70	.76	
BASF CHROME SUPER	.30	.38	.47	.56	.65	.69	.80	.87	.89	

3M TDK BASF AMPEX maxell
IN HOUSE DIRECT ON CASSETTE PRINTING
• CUSTOM PRINTED LABELS & J-CARDS •
IN NYC 718-435-7322 • 800-221-6578 • 24 HOUR FAX 718-853-2589
FREE LABELS WITH EVERY CASSETTE ORDER
ROUND EDGE OR STANDARD NORELCO BOXES $.012 EACH

CD'S FAST
*300 CD Special: $849
*500 CD Special: $999
*with client provided CD-R label film & inserts.
Digital Mastering, CD-Rom & Graphic Design Available
new
Silicon Graphics Digital Printing
Full color inserts from $275
10 Free Posters w/complete package
Call (800) DIGIDOC
DIGIDOC PRODUCTIONS

TAKE DAT! CALL NOW!

AMPEX		APOGEE		HHB		MAXELL		TDK	
467 DAT16	$4.19	AD19	$6.10	DAT-15	$5.35	DATA CERTIFIED		DAR16	$4.65
467 DAT34	5.09	AD34	7.05	DAT-35	6.30	R19DA	$4.75	DAR60	5.60
467 DAT48	5.72	AD64	7.85	DAT-50	7.45	R34DA	4.92	DAR90	6.29
467 DAT64	6.51	AD94	9.30	DAT-65	8.40	R49DA	5.23	DAR120	6.65
467 DAT94	7.82	AD124	10.55	DAT-95	9.60	R64DA	5.56		
467 DAT124	8.75			DAT-125	10.50	R94DA	6.25		
						R124DA	7.14		

WE WILL MATCH ANY ADVERTISED OR CATALOG PRICE!
MAXELL COMPUTER GRADE
HS4/60 METER (120MM) $5.79
HS4/90 METER (180MM) 6.77
TDK COMPUTER GRADE
DC4/60 METER (120MM) $5.39
DC4/90 METER (180MM) 5.60
MINIMUM ORDER: 10 DAT TAPES
(Mixed Orders Okay. Shipping Charges Extra)
CALL FOR FREE FULL LINE A/V CATALOG
FREE NOW! Coffee Mug with Purchase!
(While Supplies Last)
NOW! RECORDING SYSTEMS, INC.
32 WEST 39TH STREET, 9TH FLOOR, NEW YORK, NY 10018
Telephone: 212-768-7800 • 800-859-3579 • Fax 212-768-9740
http://www.tapes.com e-mail:cc001499@interramp.com
MASTER DISTRIBUTORS of:
AMPEX • BASF • DIC • FUJI • MAXELL • MOTHER'S® SYSTEMS • SONY • TDK • TELEX
AND MUCH, MUCH, MORE . . .
We Accept VISA - MasterCard - American Express or UPS COD Cash Only • Corporate Clients Welcome

Castle Technology, Inc.
Cassette Duplication
"REAL TIME"
C-10...$.90 C-20..$1.05 C-30...$1.15
price includes chrome tape and box
Single CDs Starting at $10
(800) 636-4432 or fax (615) 399-8855

Prestigious Displays

Stock and Custom Display Frames
F.T.I.
PO Box 5873, Endicott, NY 13763
Visa 800-636-6377 M/C
. . . because music is a work of art

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

WE DO IT ALL! CDs, CASSETTES and VINYL!
QUALITY PRICED RIGHT!!
ONE-STOP PRODUCTION
• HIGHEST QUALITY MUSIC CDs, TAPE, VINYL
• 5 COLOR CD, J-CARD & INSERT PRINTING
• JEWEL BOX with FOIL STAMPING
1-800-257-0887
GZA • 221 HUDSON BAY • FOSTER CITY, CA

500 CDs w/ 2PG COLOR BOOKLET OR 1000 CDs W/ JEWEL CASE, INSERT YOUR BOOKLET AND SHRINKWRAP $999
800-401-8273
BALLISTIC COMMUNICATION

KLARITY CASSETTE & CD
500 Retail-Ready Premium Cassettes only $1.26 each
add another 500 at just 60¢ each!

Klarity Quality Packages Include:
✓Free Macintosh® Graphic Design
✓State-of-the-Art Duplication
✓Fast Turnaround
✓Superior Quality Raw Materials
✓Terrific Price
✓Satisfaction Guarantee
Call Today For Our Free Samplerlogue®!
1.800.458.6405
CDs & Cassettes in quantities from 100 - 100,000
P.O Box 160
Maple Street
N. Vassalboro, ME 04962

Good Vibrations—RJR Digital
OUR CD PRICES INCLUDE ABSOLUTELY EVERYTHING
• SONIC SYSTEM MASTERING
• COMPLETE TYPESETTING AND CUSTOM DESIGN
• FILM SEPARATIONS AND COLOR MATCH PRINT PROOFS
• INCREDIBLE QUALITY PRINTING
• REPLICATION, FABRICATION, OVERWRAP
1000 CDs - $2275 retail ready!
http://www.diabloweb.com/goodvibrations
1-800-828-6537 · 619-267-0307 · FAX 619-267-1339

YOUR AD COULD BE HERE
(800) 544-5530

CLASSIFIEDS

CD & CASSETTE MANUFACTURING

FEATURING THE SOUTHWEST'S FIRST & ONLY DIGITAL BIN CASSETTE SYSTEM & LARGEST REAL TIME CASSETTE FACILITY!

PRINTING • GRAPHIC DESIGN • BLANK CASSETTES • MASTERING & EDITING • ONE-OFF CD-RS

PACKAGES AVAILABLE! CALL FOR FREE CATALOG!

CRYSTAL CLEAR SOUND/TAPEMASTERS

1.800.880.0073

EM CLASSIFIED DEADLINES

June issue—April 1st, 1997

July issue—May 1st, 1997

MEDIAWORKS INTERNATIONAL INC

Nashville, TN

1,000 CDs from $1300

Call (615) 327-9114

CD, Cassette, Video, & Vinyl Disc Manufacturing.
Graphic Design, Printing, and Packaging.
Best Quality • Fast Turnaround Time

Design, Print and Apply CD Labels for $79.95

That's NEATO!

ORDER NOW! FREE 100 LABELS

NEATO™ CD LABELER KIT

1 Create your own artwork *On Your Computer* with easy-to-use NEATO Templates.

2 Print on *Any Laser Printer* using NEATO pressure sensitive die-cut labels.

3 Using the NEATO Label Device, apply labels... *PERFECTLY EVERY TIME!*

KIT INCLUDES:
- Label Design Templates (PC & Mac)
- The Amazing Neato Labeler
- Complete Instruction Guide

800-984-9800

NEATO • 250 Dodge Ave. • East Haven, CT 06512
203-466-5170 • Fax 203-466-5178
In Europe: +44 (0)990 561571
See us at: http://www.neato.com

MASTERING • MANUFACTURING • PRINTING

DIGI-ROM

CD-AUDIO • CD-ROM

REAL TIME & HIGH SPEED AUDIO CASSETTES

COMPLETE PACKAGES • CD-ROM STRIKE-OFFS • GRAPHIC DESIGN STUDIO
CD-ROM PRODUCTION & ARCHIVING • *1 TO 200 DISCS DUPLICATED OVERNIGHT*

(800) 815-3444
(212) 730-2111
www.digirom.com

130 West 42nd Street • New York, NY 10036

CD labeling?...PressIT™!

We guarantee:
- *No fingers sticking to labels*
- *No label alignment problems*
- *Won't damage CDs*

COMPARE US TO THE COMPETITION!

Patent Pending

» **PressIT™ the quickest, easiest and most accurate way to create, print and centre labels on CDs using laser and inkjet printers**

MONEY BACK GUARANTEE

» **Kit Includes;**
- PC label design software plus templates for PC and Mac
- One hundred white, 118mm diameter CD labels (two per A4 or 8 1/2 x 11 sheet) for laser and inkjet printers
- The original, one piece, PressIT™ CD label applicator

Additional labels available in: white, gold, silver, red, yellow, blue, crystal clear for inkjet printers and crystal clear for laser printers.

ROCKY MOUNTAIN TRADERS LTD

$79.95 (Plus $8 S&H)

North America: **800 549 0411**
16 Helaine Court, Orangeburg, NY 10962
tel: 914 359 0689 fax: 914 359 0396

DO YOU NEED BLANK TAPE?

AMPEX maxell FUJI 3M TDK

- DAT Tape!
- ADAT Tape!
- DA-88 Tape!
- Analog Tape!

PROTAPE NORTHWEST

(800) 331-6107
(206) 441-8273
e-mail: ptnw@seanet.com
2412 2nd Ave.,Seattle,WA 98121

DRT Mastering

You *will* have the big, high-impact major-label sound that sells discs... or the work is free! Custom signal chains. First class results. Outrageous replication prices. Free brochure.

800-884-2576 www.drtmastering.com/biz/drt

Serving You THE WAREHOUSE Since 1975
Studio Sales & Service$

Cassette, CD, CDR duplication

RtAR · DATs · ADATs · HI8 · VHS · CDs

Blank Cassettes, any length

Warehouse prices

800-483-TAPE · fax: 904-398-9683

Visa · MasterCard · Discover

internet:warehouse@jax.jaxnet.com

2071-20em Emerson St., Jacksonville, FL 32207 · 904-399-0424

1,000 CD'S $1,200!

PROPHET DISC MFG

Includes jewel box, 2 color CD imprint & shrink wrap

1-800-491-8141

MAJOR LABEL QUALITY

CD & CASS DUPLICATION • MASTERING

500 FULL COLOR CDs $1550

INCLUDES - GRAPHIC DESIGN, LAYOUT, FILM, JEWEL CASE & SHRINK WRAP

www.sellersound.com

SELLER SOUND STUDIOS
810-264-7500

CLASSIFIEDS

SOFTWARE & PATCHES

ROCK, STANDARDS & BLUES SEQUENCES BY PETER SOLLEY. Producer for Motorhead, Nugent, Romantics, etc. Keyboardist for Clapton, Whitesnake, and many others. **We are the best.** Call (954) 570-9787 or fax (954) 570-9788 for free 15-minute demo and song list. Visa/MC accepted.

ENSONIQ OWNERS: Convert Sequences to/from **Standard MIDI Files** on IBM/PCs. Each package TS-10/12, ASR-10, EPS/EPS-16, VFX-SD/SD-1, SQ-80, SQ-1/2, KS-32, or KT-76 costs $54.95. Convert SD-1 to TS-10 w/our SD1TS10 Conversion for $54.95. **Call for Alesis, Kawai, Korg, PianoDisc, Yamaha, Roland.** Visa/MC/Amex. **Giebler Enterprises**, 26 Crestview Drive, Phoenixville, PA 19460. **(610) 933-0332**; fax: (610) 933-0395.

COMPUTER MUSIC SOFTWARE
Hottest MIDI software, Digital Audio, Sequencing, Notation, Music education, Sound cards, Multimedia, CD Titles. Low prices, widest choice.
AIMS Systems **(800) 697-2467**
PO Box 612336, San Jose, CA 95161

Studio Software for Windows 3.x or higher
Studio Desktop, Info System for studios. Track clients, musicians, tapes, sessions, sales, expenses & more $60 direct. CAL Tutor 2.1—for Cakewalk users. Teaches Cakewalk Application Language. $25 direct. Clockwork Music: http://ourworld.compuserve.com/homepages/clockworkmusic. Check/MO to Clockwork Music, PO Box 4881, Boulder, CO 80306.

KID NEPRO
KID NEPRO IS THE PATCH KING !
SINCE '84 MORE QUALITY SOUNDS, FOR MORE INSTRUMENTS THAN ANYONE IN THE ENTIRE UNIVERSE!

KORG• 01W X3/X3R 03RW ALL WAVESTATIONS T-SERIES M1 M1R M3R DS8 707 EX/DW8000 EX-POLY 800 POLY 800-2
ROLAND• JV80 JV880 JD800 XP50 JD800 JV1080 U20 MOST D SERIES U220 MKS70 MKS80 MKS50 JX8P JX3P JX10 JUNO-1/JUNO-2 JUNO-106 JUNO-60 JUPITER-8 JUPITER-8
YAMAHA• MOST SY, TG, DX/TX V50 AND FB01
CASIO• MOST CZ & VZ SERIES FZ1 FZ10M FZ20M
OBERHEIM• MATRIX-6 6R 1000 XPANDER OB8 DPX1
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 MOST PROTEUS SERIES SP1200
AKAI• S900 S950 S1000 S1100 S2800 S3000 S3200 S01 MPC 60 MPC3000
KURZWEIL• K2000 K2000S K2500

The Patch King is now on the Internet! Check out our Web Site at: http://www.kidnepro.com Featuring FREE PATCHES & Lot's of goodies!!
SEND $3.00 FOR CATALOG Via SNAIL mail
KID NEPRO PRODUCTIONS • PO BOX 360101 (DEPT E) BROOKLYN, NY 11236
(718) 642-7802 • Fax:(718) 642-8385
E-MAIL KID NEPRO @ AOL.com
•••• AMEX • DISCOVER • VISA • MC ••••

Acoustic Essentials
Vol.1- Drums,Bass,Ac. Gtr Strums/Notes
Vol.2- 6 &12 Str Ac. Gtr Strums/Notes/Fx
ROLAND AKAI/Emu/ASR Kurzweil
CD ROMS $299 each or $399 for both.
Audio CD only $79 for both volumes
No Loops! Multi-velocity up/down strokes

NORD LEAD Vol.1
100 Patches for the K2000/2500 made from Clavia Nord Lead wave forms combined with the Kurzweil's V.A.S.T. technology--$34.95

Essential Grooves
Live drum performances on 3.5" disk. 50 plus 8 bar musical phrases per disk 80 plus drum fills. Compatible with virtually all sequencers $69.95 each.
Funk Grooves-R&B/Shuffles-Session V.1/2
(Performed by top LA session drummers)

Essential Sounds 800-915-0001 (Inter.)818-865-3184 Http://members.aol.com/esounds/ (VISA*MC*AMEX)

BAND-IN-A-BOX IMPROVEMENT PRODUCTS: rated "A good buy" by *Electronic Musician* magazine! Power-User Styles, Fake Disks, and More! Tune 1,000 brand GenMIDI **SEQUENCE**, too! **FREE** info! Send legible address today: Norton Music & Fun, Box 13149, Ft. Pierce, FL 34979. Voicemail, fax (561) 467-2420; http://members.aol.com/NortonMIDI.

The Hunt Is Over...
...for friendly, expert advice on everything you need to make your computer musical!
call today for a FREE Catalog
Midi Software
Hard Disk Recording
Notation Programs
Interfaces/Soundcards
SOUND CHASER *Music Software*
800-549-4371
FAX (707) 826-2994
2530 Davis Way • Arcata, CA 95521
http://www.soundchaser.com/sndchsr

SOFTWARE BLOWOUT!
Cakewalk Pro Audio, $249.95! Finale Academic, $199.95! Huge Discounts on thousands of sequences. Latest software, hardware, samples, books, videos, CDs. Visa/MC. **(800) 787-6434.** FREE catalog on the Web at http://www.midi-classics.com! Dept. E, **MIDI Classics,** Box 311, Wea:ogue, CT 06089.

PROFESSIONAL MIDI SEQUENCES
Try our MIDI files & compare the quality! Specialists in custom-made sequences. You can have any song exactly how you need it. Free catalog & demo.
RAINBOW MIDI SEQUENCES
TEL. (718) 726-2000
email: rainbowmid@aol.com
http://users.aol.com/rainbowmid

MIDI SEQUENCES
WHEN QUALITY COUNTS
ONLY ***TRAN TRACKS*** WILL DO
World's leader in quality & service
In business over 10 years
All styles of music
Rhythm and Groove disks
GS/GM compatible
Email service

Call for FREE demo & catalog
1-800-473-0797
Canada call 1-800-488-6248
Email trantracks@crystal.palace.net
TRAN TRACKS MIDI SEQUENCES
350 Fifth Ave. #3304
NYC NY 10118
voice 201-383-6691
fax 201-383-0797

Music for Multimedia

Are you a software developer creating MIDI soundtracks for games or presentations?

Take your music to a higher level using GS Format (supported by the industry standard Roland). Apply for a free copy of the GS Format Developers Kit (a $345 value) by mailing or faxing a request letter to:

GS Developers Kit
c/o Edirol Corporation
808 Harrison Ave.
P.O. Box 4919
Blaine, WA 98231-4919
fax (360) 332-4405

Sounds for every ENSONIQ keyboard!
FREE CATALOG
SYNTAUR PRODUCTIONS
(800) 334-1288 (713) 682-1960
http://www.fatsnake.com/syntaur

CLASSIFIEDS

Midisong Jam Sequences—Featuring real session drummers with drum pads and killer keyboardists! Includes instructional book with guitar tab. **Blues Jams Vol. 1 & 2, 15** R&B-style grooves per **Vol. Jazz Jams Vol. 1, 15** classical jazz-style grooves. Standard MIDI or GM disk—$21+$2 S&H. Cassette—$11+$2 S&H. Outside U.S. add $1. Midisong, PO Box 71231, Marietta, GA 30007; www.midisong.com for samples.

Announcing 5 new Pro sample disks for SY99! Killer samples of Mini-Moog, LinnDrum, Rap Drums, Grand Piano & Matrix-1000. Each disk also features 16 Pro Patches. Order all 5 disks for **$98**. Also, 960 SY99 Pro Patches available for $200. (Foreign orders add $10.) "Pro Patches since 1985." **VISA/MasterCard accepted!! PATCHMAN MUSIC,** 1600 Saint Charles Ave., Lakewood, OH 44107. (216) 221-8282. **E-mail:** matteblack@aol.com; **Web site:** http://members.aol.com/Patchman1/

RAP & DANCE SAMPLES FOR ANY SAMPLER
ROLAND AKAI ENSONIQ EMU
Free Catalog & Disk
800 301-MIDI 6434
www.midimark.com

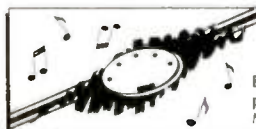
MIDITRON—The easy way to preview sequences from the leading vendors, artists, and composers. New releases, original compositions & special promotions. **MIDITRON** 24-hour line: (614) 888-0802. Info: Data Assist, Inc., 651 Lakeview Plaza, Suite G, Columbus, OH 43085. Phone: (614) 888-8088.

COUNTRY SEQUENCES
We do country best CUZ country's all we do! **C.J. MIDI PRODUCTIONS**, 24 Hinkleyville Rd., Spencerport, NY 14559.
Ph/Fax (716) 352-5493
e-mail cjmidi@frontiernet.net

COMPUTER MUSIC PRODUCTS for IBM/PC musicians. Great prices & selection of popular MIDI software/hardware. Call for FREE catalog. **(941) 746-6809**. Beginners welcome!

FAX YOUR EM CLASSIFIED AD
(510) 653-8171

Give Your Act A Good Kick In The Gas...!
Imagine what it would be like jamming with some of the best known musicians in the world. With Midi Hits, you just step in and play along.
Over 5,000 Premium Backing Tracks Available
Pop, Country, Classic Rock, Top 40, Big Bands, Standards, Jazz, Gospel, Show Tunes, Ethnic, etc.
Free Catalog
Now In our 6th Year
midi hits
3 Shratton Ave.
San Carlos, CA 94070
1-(800) 593-1228
Fax (415) 637-9776
e-mail: **midihits@pacbell.net**



MIDI Sequences for Today's Music™
Explode polyphony with this monster library of drum patterns & groove templates. High energy tracks for PC, Macintosh, Atari & dedicated sequencing environments.
Techno • House • Rave • Industrial • Pop • Top-40 • Hip-Hop • Rap
Alternative • Funk • R & B • Jazz • Rock • Country • Ballads • Reggae

Vol. I-Dance Beats™ Beats, Fills & Break Beats	Vol. V-Pop Piano™ Upbeat Melodies & Phrases
Vol. II-Dance Beats™ Fat Drum Pattern Layers	Vol. VI-Pop Piano™ Popular Chord Progressions
Vol. III-Groove Master™ Penetrating Bass Lines	Vol. VII-Cultural Collection™ Ethnic Drums
Vol. IV-Groove Master™ 16-Beat Bass Grooves	Vol. VIII-The Arpeggiator™ Arpeggios & Delays

Only $39.95 (ea.) CC/COD welcome. Phone/fax/write for more info & package prices:
Big City Productions
PO Box 263 • Houston, TX. 77347 Ph: (281) 852-0444 Fax: (281) 456-8273

EM CLASSIFIEDS WORK FOR YOU

Text rate:	**$9 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. $63 MINIMUM CHARGE for each ad placed.**
Enhancements:	$10 black border, $15 for a gray screened background, $25 for a reverse. $25 for Post Office box service. Charges are based on a per-insertion basis.
Display rate:	$110 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:	$35 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-Trubitt, 6400 Hollis St., #12, Emeryville, CA 94608 tel. **(800) 544-5530** or (510) 653-3307, fax (510) 653-8171, e-mail boycemr@cardinal.com
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 (PLEASE CHECK ONE)

- ☐ ACOUSTIC CONSULTING
- ☐ EMPLOYMENT
- ☐ EQUIPMENT FOR SALE
- ☐ EQUIPMENT INSURANCE
- ☐ INSTRUCTION & SCHOOL
- ☐ PARTS & ACCESSORIES
- ☐ PUBLICATIONS
- ☐ RECORDING SERVICES & REPAIRS
- ☐ RECORDS, TAPES & CDS
- ☐ SOFTWARE & PATCHES
- ☐ WANTED TO BUY
- ☐ MISCELLANEOUS

ATTACH YOUR CLASSIFIED 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 ($110 per inch)	$_____
_____	Lines @ $9 (seven-line minimum)	$_____
_____	Bold @ $0.50 additional	$_____
_____	Border @ $10	$_____
_____	Reverse @ $25	$_____
_____	Screen @ $15	$_____
_____	Blind PO box @ $25	$_____
_____	Special Saver rate =	$ 35

TOTAL PAYMENT INCLUDED $ _____
☐ Visa ☐ MC ☐ AmEx ☐ Discover
☐ Check/Money Order # _____
Card # _____ Exp. _____

TECH PAGE

The Need for Speed

ADSL technology leaves ISDN and T1 in the dust.

By Scott Wilkinson

Net-savvy electronic musicians have a need, a need for speed. Distributing music and other media on the Internet holds great promise for independent artists, but they all face the same problem: audio and video download at a snail's pace, making it difficult for consumers to get excited about the content.

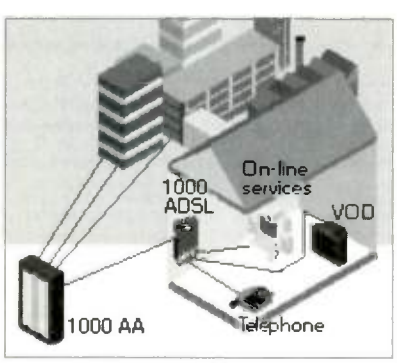
This bottleneck could soon be eliminated if Alcatel Telecom (e-mail michael_newsom@aud.alcatel.com; Web www.alcatel.com/broadband) has its way. This company is developing a new modem technology that leaves ISDN and T1 lines in the dust. Not only that, it does so on standard, twisted-pair phone lines.

Alcatel's approach is based on Asymmetric Digital Subscriber Line (ADSL) technology. This technology can coexist with "plain old telephone service" (POTS) on the same cable, which means that no new infrastructure is required to increase the speed of phone-line data transfers. ADSL can support upstream (from client) data rates of 64 to 640 kbps and downstream (to client) rates from 500 kbps to 8 Mbps. This is ideal for client-server applications, such as the World Wide Web and video on demand, in which users (clients) typically receive much more data than they send. By contrast, ISDN operates at a maximum of 128 kbps, T1 operates at 1.5 Mbps, and both of these approaches require special, expensive lines.

Alcatel's ADSL solution combines two technologies: Asynchronous Transfer Mode (ATM) and Discrete Multi-Tone (DMT) modulation. ATM is a technology selected by the CCITT international standards organization (now called the ITU-T) to implement a broadband ISDN network. Its most significant advantage is the ability to provide various services, such as voice, data, audio, and video, on a single network. It also guarantees bandwidth availability and high efficiency.

DMT simultaneously uses multiple carrier frequencies to transport a data signal, and a variable number of bits are modulated onto each carrier. This design offers several advantages over other modulation schemes, including optimum use of line capacity, adjustable bit rate, and high immunity to interference and noise.

Together, these technologies provide flexibility and automatic configuration for each specific situation (quality of twisted pair, noise/interference levels, client's maximum bit rate, etc.). In addition, various services that have different bandwidth and traffic characteristics (e.g., streaming MPEG video and bursty TCP/IP service) can be effectively combined on a single medium.



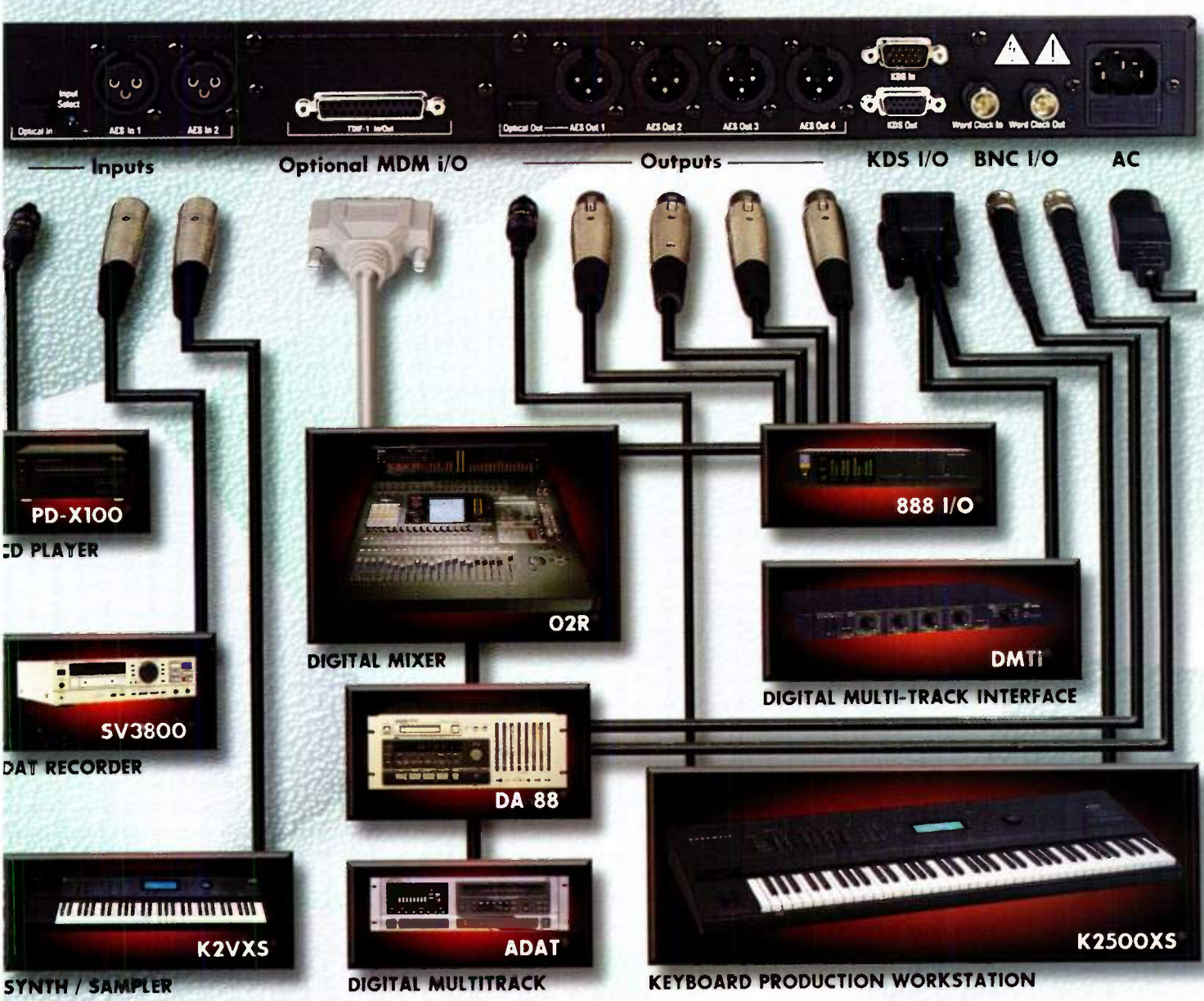
The Alcatel ADSL system includes an Access Adaptor at the phone company and a Network Terminator in the home, which can accommodate Internet data, video on demand, and normal telephone service simultaneously.

At the service provider's end, an Access Adaptor interfaces with the backbone network. This device includes a card cage that holds several ADSL cards and connects them to an ATM bus, which operates at 155 Mbps. Each card accommodates four ADSL lines to individual clients, which lets the service provider add lines as necessary. Several major phone companies, including Ameritech, BellSouth, Pacific Bell, and SBC Communications, have agreed to offer this technology to their subscribers.

At the client's end, a Network Terminator connects to a computer using Ethernet (10 Mbps) or ATM (25 Mbps), which may require a plug-in board for the computer. At both ends, an ADSL modem modulates and demodulates the digital data.

The most important aspect of Alcatel's ADSL system is that it uses existing phone lines; we don't have to wait for fiber-optic cable or "cable modems" for high-speed Internet access. This technology could give musicians a much-needed boost onto the Information Superhighway, allowing them to distribute audio and video without the delays inherent in current transfer schemes. We are approaching a brave new world, and companies like Alcatel are taking us there at warp speed.

Connect to the Future.



The DMTi is a 1U rack module designed to be used as a stand alone digital signal format convertor, digital patchbay, as well as for use interfacing Kurzweil's K2500 series production stations to popular MDM formats such as TDIF, and ADAT formats found on MDM's produced by Sony, Tascam, Alesis, Fostex and others. The DMTi allows communication between Alesis Adat or Tascam DA-88 with their respective proprietary 8 channel digital formats and AES-EBU or SPDIF digital formats.

The DMTi was also designed to interface with Kurzweil's proprietary 8 channel digital protocol KDS-Kurzweil Digital Stream (offered as an upgradeable option for the K2500 series). The DMTi can perform sample rate conversion (in real time) on up to 4 stereo pairs of incoming digital data while acting as the master or slave clock; the DMTi can transmit 44.1K or 48K clock and can transmit or receive BNC word clock.

This device is well suited for use with popular digital mixers such as Yamaha's O2R, or Korg's Soundlink, or as a translation device from MDM to Digidesign's ProTools systems. The DMTi allows many different digital input formats to be user routed to a variety of digital output formats **and** sample rate converted. The Alesis and Tascam option cards are needed for conversion to and from these popular MDM formats. The DMTi can be seen and demonstrated at your local Kurzweil dealer.

DIGITAL MULTITRACK INTERFACE

DMTi

KURZWEIL

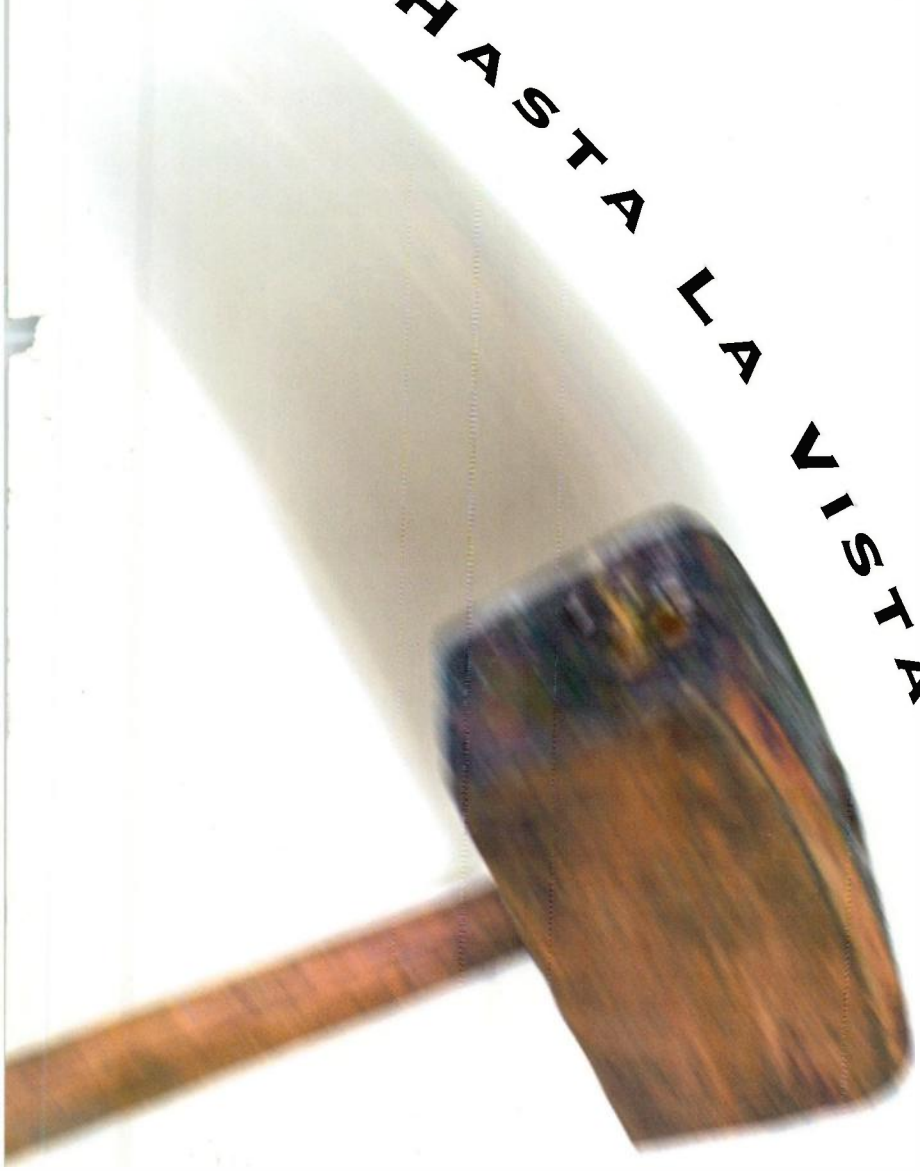
Music Systems

THE BEST KEEPS GETTING BETTER

KURZWEIL / Young Chang America, Inc.
13336 Alondra Blvd. Cerritos, CA 90703
phone 310-926-3200 fax 310-404-0748
www.youngchang.com/kurzweil

circle #546 on reader service card

HASTA LA VISTA BABY!



Get FreeStyle Version 2.0 and say good-bye to robotic metronome clicks that choke the feel of your music before it even gets recorded. Because with FreeStyle's innovative new SenseTempo™ feature, you can record into your computer as freely as you like, and FreeStyle will detect the tempo on the fly. The result? Instant, readable music notation and easy, musical editing with measures and beats. And with a host of new advanced features such as SMPTE sync, smart note spellings, and meter/tempo/key changes, FreeStyle 2.0 gives you all of the sequencing power you need — in what Keyboard Magazine calls "the first program we've seen that deserves to have the title of 'intuitive' bestowed upon it." So go ahead and let loose. With FreeStyle 2.0, you call the shots.

New version!

FreeStyle™ 2.0

circle #551 on reader service card

Mark of the Unicorn, Inc. • 1280 Massachusetts Ave. Cambridge, MA 02138 • VOX: 617-576-2760 • FAX: 617-576-3609 • WEB: www.motu.com • AOL: keyword MOTU • Compuserve: go motusupport