

# Electronic Musician

U. S. - \$3.95 / Canada \$4.95  
August 1992

## COMMAND CENTERS

EM GUIDE TO COMPACT MIXERS

**Performance Anxiety**

*Avoiding Onstage  
Nightmares*

**Conquering  
Notation Software**

*A Master Class*

U.S. POSTAGE  
PSN 751-071-00  
07120 47104  
\*\*\*\*\*ALL FOR STATE  
548 SIA  
1992 AUG 10  
1992 AUG 10



# UNVEILING



- ◆ 7 Programmable "soft" keys with virtually endless combinations of MIDI control
- ◆ Full MIDI automation (V4 plus!) of channel, monitor and effects send and return mutes
- ◆ All Mutes use FET Silent switching
- ◆ 16 x 8 x 2 or 24 x 8 x 2 formats
- ◆ 8 channel expander option, Up to 32 channels, 72 line inputs all with dedicated eq and mute
- ◆ Channel direct-to-tape switches allowing up to 32 tracks to be recorded simultaneously.
- ◆ Separate EQ for channel and monitor paths with EQ on switch
- ◆ 6 aux buses (via MULTI AUX system) providing effects and cue sends for both channel and monitor signal paths
- ◆ 4 stereo effects returns with EQ, Programmable mutes, cue sends, and routing to all outputs

## GS3 SERIES

To preview the incredible new Allen & Heath GS3 series studio console technology, visit your local Allen & Heath dealer, or call or write us for more information

Allen & Heath  
5639 South Riley Lane  
Salt Lake City UT  
84107  
(801) 268-8400  
Ask for Marty





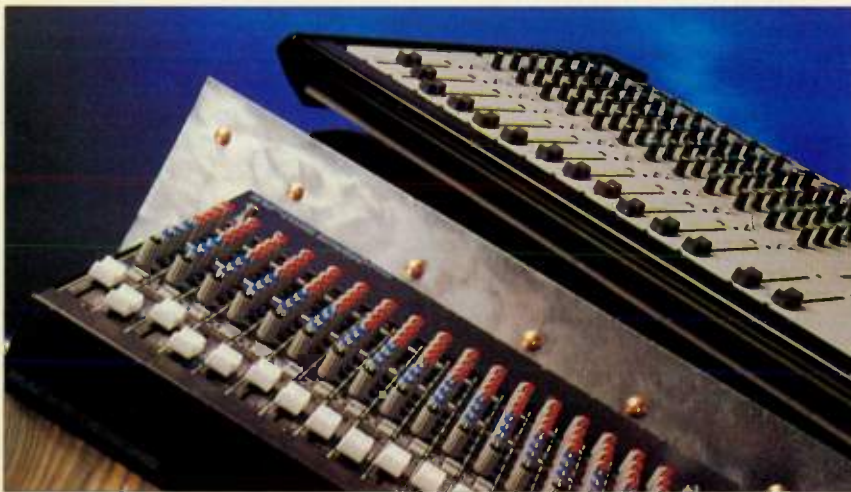
# C O N T E N T S

## FEATURES

- 24 COMPUTING THE SCORE**  
Turn your notation software into a music-publishing powerhouse.  
*By Steve Peha*
- 36 COVER STORY: COMMAND CENTERS**  
The EM guide to compact mixers.  
*By Larry "the O" Oppenheimer*
- 54 TRAGIC PERFORMANCES**  
Professional musicians discuss coping with onstage chaos.  
*By Michael Molenda*

## COLUMNS

- 62 RECORDING MUSICIAN: LOCATION RECORDING**  
Learn how to capture great live sound.  
*By Neal Brighton*
- 68 WORKING MUSICIAN: LET'S MAKE A DEAL**  
Mediating costly legal disputes is easier than you think.  
*By Marcia J. Pear*
- 74 FROM THE TOP: COMPUTERS IN THE STUDIO**  
You and your computer can make beautiful music together.  
*By Scott Wilkinson*
- 82 COMPUTER MUSICIAN: REMOTE COLLABORATION**  
Distance is no barrier for musical partnerships.  
*By David (Rudy) Trubitt*
- 88 SERVICE CLINIC: QUESTIONS & ANSWERS**  
The professor discusses soldering tools, 'scopes, and K2000 amnesia.  
*By Alan Gary Campbell*



PAGE 36

## Electronic Musician

AUGUST 1992 VOL. 8, NO. 8 - AN ACT III PUBLICATION



PAGE 24

## REVIEWS

- E-MU PROTEUS/3 WORLD**  
*By Scott Wilkinson*..... 92
- TURTLE BEACH MULTISOUND (PC)**  
*By David Miles Huber*..... 95
- ROLAND R-70 DRUM MACHINE**  
*By Al Eaton*..... 100
- PASSPORT ENCORE FOR WINDOWS (PC)**  
*By Dennis Miller*..... 105
- GULBRANSEN KS20 MIDI RETROFIT FOR PIANO**  
*By Mike Krewitzky*..... 111
- AUDIO-TECHNICA AT4033 MIC**  
*By Michael Molenda*..... 115

## DEPARTMENTS

- THE FRONT PAGE..... 6
- LETTERS..... 11
- WHAT'S NEW..... 17
- THE TECHNOLOGY PAGE..... 50
- AD INDEX..... 98
- CLASSIFIEDS..... 117
- THE BACK PAGE..... 122

Cover: Photo by Joshua Ets-Hokin.

August 1992 Electronic Musician 5



## Get Small

Break through creative ruts by downsizing your system.

It's late. You're in the throes of a creative flourish, composing and arranging one of your best efforts yet. Your well-stocked personal MIDI studio isn't impeding your efforts; you've made sure of that. Over the years, you've dutifully bought everything you need and painstakingly arranged it into a workable system.

You're at no loss for timbral variety; with a keyboard, two synth modules, and a sampler, you can make more noises than most people hear in a lifetime. Yet, when it comes time to arrange your new piece, you can't figure out what sounds to use. There are too many choices.

After a minute or two, you remember something stored as a SysEx file on your computer's hard disk that might do the trick. You boot your editor/librarian, search for the right bank of patches, load the sound, dump it to the synth in question, and...nothing happens. After a frustrating, time-consuming round of troubleshooting, you discover that you forgot to compensate for patches recently programmed into your MIDI patch bay. Once you adjust the appropriate parameters, everything gets where it needs to be. But now it's 45 minutes later, and you've lost momentum. Time for bed.

Administering massive patch files and other all-too-familiar scenarios put a serious dent into electronic music-making, often leading high-tech musicians to wonder if all the hassles are worth it.

If you ever reach this point (and who hasn't?), try something radical: Get rid of most of your gear. Not permanently, of course, but as an experiment, force yourself to work within some narrowly defined limits (like a single keyboard and sequencer) and see what happens.

The irony of today's advanced product development is that we now can get more done with less equipment. I know this sounds heretical, but let's be honest: A 24-voice, 16-part multitimbral keyboard with built-in effects, in conjunction with a MIDI sequencer program and a one-in, one-out MIDI interface, provides a helluva lot of musical capability. No, it's not enough for sophisticated applications, but if you can't make music with a no-frills setup, there's something wrong.

You may find that these limitations yield pleasantly surprising results (and send some of your gear on a search for a permanent new home) by forcing you to concentrate on making music, rather than negotiating the pathways of a large system. Also, having to rely on fewer tools helps you learn more about specific instruments and programs. When you know there's only one manual you need to look through to find out how to do something, you'll be more inclined to actually crack it open.

Even if you've assembled a trouble-free mega-system, you may want to work out a basic subset for composing. Put together a single bank of essential sounds for each instrument and stick with them. Discipline yourself to avoid tweaking programs and sequences until the structural elements are fully composed using the basic system. The options presented by modern gear make it easy to get mired down in time-consuming detail work and lose sight of the bigger picture: the composition itself.

There are no simple solutions for enhancing creativity and improving musical output. But if you find yourself getting lost in the techno-twilight zone, you may want to try a simple reduction plan. Get small.



APRIL THOMPSON

# Electronic Musician

**Publisher** Peter Hirschfeld

**Editor** Bob O'Donnell

**Managing Editor** Steve Oppenheimer

**Associate Editor** Michael Molenda

**Technical Editor** Scott Wilkinson

**Assistant Editor** Anne-Marie Praetzel

**Editorial Assistant** Mary Cosola

**Editorial Interns** Andrew Jewett,

Christine Pare

**Contributing Editors** Alan Gary Campbell,

Gary Hall, George Petersen

**Art Director** Andrew Faulkner

**Assistant Art Director** Linda Birch

**Art Assistant** Val Martino

**Informational Graphics** Chuck Dahmer

**Director of Advertising** Carrie Anderson

**Eastern Advertising Manager**

Valerie Pippin

**Western Advertising Manager**

Dennis Gray

**Marketing Manager** Elise Malmberg

**Marketing Associate** Stephanie Sedin

**Sales Assistants** Christine Cali, Tina Spinelli

**Classifieds Manager** Robin Boyce

**Classifieds Assistants** Jill Stauffer,

Elizabeth Hildreth

**Director of Operations and**

**Manufacturing** Anne Letsch

**Production Manager** Ellen Richman

**Advertising Traffic Manager**

Donna Price

**Production Assistant** Christopher Ferrell

**Event Coordinator** Jane Byer

**Circulation Manager** Steve Willard

**Circulation Associate** Karen Stackpole

**Controller** David Rothenberg

**Assistant Controller** Ronald LeRouzig

**Accounting** Lea Lewis, Therese Wellington,

Christina Purdy, Bettye Gardner

**Receptionist** Kim Rabideau

### ACT III PUBLISHING

**Group Publisher** Hillel Resner

**Director of Corporate Development**

David Schwartz

**National Editorial, Advertising,**

**and Business Offices**

6400 Hollis Street #12

Emeryville, CA 94608

tel. (510) 653-3307

fax (510) 653-5142

**Southern California Advertising Office**

tel. (818) 709-4662

fax (818) 709-6773

**East Coast Advertising Office**

tel. (212) 315-1800

fax (212) 315-1848

**Subscription Services Office**

(Address changes and customer-service inquiries)

PO Box 41094

Nashville, TN 37204

tel. (800) 888-5139

or (615) 377-3322

Electronic Musician (ISSN: 0884-4720) is published monthly by ACT III Publishing, 6400 Hollis St. #12, Emeryville, CA 94608. ©1992 by ACT III Publishing, Inc. This is Volume 8, Number 8, August 1992. One year (12 issues) subscription is \$24; outside the U.S. is \$44. Second Class postage paid at Oakland, CA, and additional mailing offices. All rights reserved. This publication may not be reproduced or quoted in whole or in part by any means, printed or electronic, without the written permission of the publishers. POSTMASTER: Send address changes to Electronic Musician, PO Box 41255, Nashville, TN 37204. Editeur Responsable (Belgique): Christian Desmet, Vuurgatstraat 92, 3090 Overijse, Belgique.

Classified  
Audit

An ACT III PUBLICATION  
Also publishers of *Mix* magazine.



Bob O'Donnell





# EVOLUTION



In the beginning there was the 01/W. Now this award-winning keyboard has evolved into a full line of extraordinary music workstations.

**01/W** The 0 that started it all. 32 voices, 200 programs, 200 combinations. And you can access up to 800 of the best sounds on the planet using Korg's SRC-512 RAM



card! Wave Shaping (Korg's exclusive process for modifying waveforms) yields super-realistic acoustic instrument sounds and original sounds nothing else can. A 7,000 note, 16-track sequencer adds more versatility.

**01/WFD** The "pumped up" 01/W. All of the incredible sounds and power of the 01/W. Plus a built-in



disk drive that lets you store programs, combinations, sequences and sysex data. Flex your creativity with an expanded 48,000 note, 16-track sequencer. Like the 01/W, it includes two Stereo Dynamic Digital Multi-Effect Processors with 47 effects and real-time control.

**01/W Pro** The Pro starts with all of the sounds and music-making power of the 01/WFD. Add an extended 76-note keyboard and an expanded 10 Meg PCM memory featuring 256 multi-sounds and 129 drum and percussion sounds. A 48,000 note, 16-track sequencer includes advanced editing functions. Import and export sequences in the Standard MIDI File format.



And, like the 01/WFD, it can even be used as a MIDI data filer.

**01/W ProX** The most evolved 01/W. Features an 88-note weighted action keyboard that makes the ProX an ideal Master MIDI Controller. And you get the full complement of the 01/W Pro's sounds, sequencing power and storage capability.



**01R/W** A perfect MIDI module. All the sounds and features that

have made the 01/W the leader in music workstations. Plus a 7,000 note, 16-track sequencer with sophisticated editing control. Receives on 16 independent MIDI channels. MIDI overflow. Four polyphonic outputs. The ultimate open-ended system in a compact two rack space.



**03R/W** The affordable and compact MIDI module for fast, easy access to many of the great 01/W sounds. 32 voices, 128 General MIDI ROM programs, plus 100 user-programmable Programs and Combinations. Program and PCM card slots that use 2 Meg PCM cards. Compatible with Korg's RE-1 Remote Editor.



Receives on 16 individual MIDI channels. A comprehensive, open-ended system in one rack space.

Go to your Korg dealer and audition the 0 Series. See how much music workstations have evolved. And while you're at it, discover the growing library of Korg 0 Series sound cards.

## KORG® 01/W SERIES

For more information, write to: Korg U.S.A., 89 Frost St., Westbury, NY 11590 ©1992 Korg U.S.A.



# FEEL THE SUPER POWER OF MASTER TRACKS PRO & ENCORE

CRITICS RAVE ABOUT MUSIC SOFTWARE'S  
MOST PRODUCTIVE PAIR!

Record it Fast...

...and Score it Beautifully.

"These folks are the best at making complex tasks easy to perform."  
— Keyboard Magazine

The award winning *Master Tracks Pro* is the fastest-to-learn and easiest-to-use sequencer in existence for both Windows and the Macintosh. Its clear, direct interface lets you keep your mind on the music, not the software.

*Encore* is the most intuitive music scoring program available. It's the easiest way to create, edit and print professional-quality musical scores. *Encore*—for Windows and the Mac—records what you play on a synthesizer, imports music directly from a sequence or MIDI file, or lets you click notes in with the mouse.

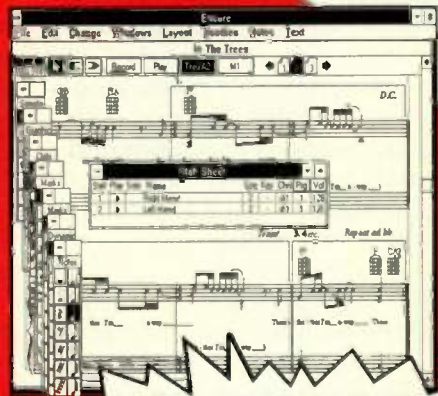
**MASTER TRACKS PRO AND ENCORE** balance powerful features with clean and functional operation. Separately or as a pair, they give you **POWER YOU CAN USE.**

"Encore has a wonderful interface and intuitive features...it emerges as the all around choice. Encore handles the widest variety of projects with ease."  
— MacUser Magazine

An *Encore* score is completely interactive. Grab and move notes, staves, symbols and other elements to edit the score any way you want. You can even play back an *Encore* score on MIDI instruments or sound cards.

#### *Encore's* notation tools include:

- **Transposable Guitar Chord Symbols** - Place guitar fret and standard chord symbols anywhere.
- **Encore 2.5 for the PC is now for Windows!** Combine easy, accurate scoring with the powerful Windows environment.
- **Every Object Mouse-Movable** - No menus or dialog boxes needed—just click and drag almost anything.
- **Auto Beaming** - Step-entered and guessed notes now automatically beamed.
- **Auto Spacing** - *Encore* automatically spaces notes for easy reading.
- **Extract Multiple Parts** - Create parts for any number of instruments.



Now for Windows!

All products and brands are trademarks and registered trademarks of their respective holders.

# DYNAMIC



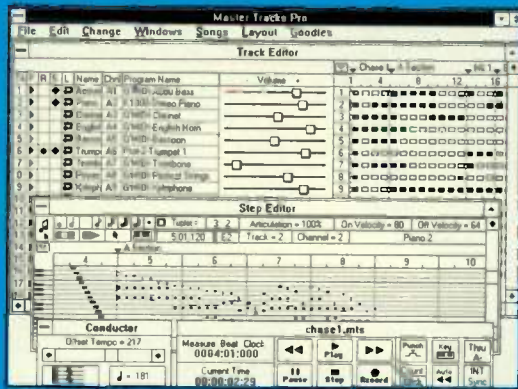
# MASTER TRACKS PRO 4 Blasts Thru Your Windows!



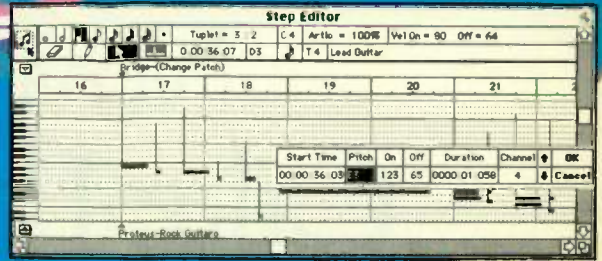
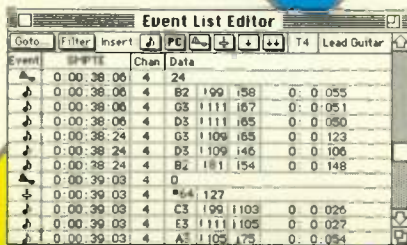
"...the most intuitive sequencer for serious musicians and amateurs alike... easy control over nearly every aspect of your sequence." -PC Magazine

Master Tracks Pro 4's wealth of features include:

- **64 Tracks** - Record each part of your song on an independent, synchronized and easily editable track.
- **Song Playlist** - Load an entire set's worth of songs and play them back in the order you choose.



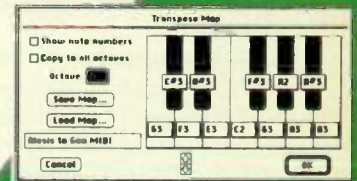
- **Graphically Edit MIDI Controller Data** - Modify controllers by drawing a line with the mouse.
  - **Fit Time** - Automatically adjust a song's tempo to fit a specified duration.
  - **SMPTÉ Sync** - Synchronize your music to film, video or tape.
  - **Change Filter** - The most common-sense way to edit specific parameters with perfect accuracy.
  - **Event List Editing** - Accurately edit note, controller and time data from an alphanumeric list.
- ...and much more!



# MASTER TRACKS PRO 5 for the Macintosh...

...combines powerful new features, integrated seamlessly into Pro's prize-winning interface.

- **Recordable Faders** - Create an Automated mixdown.
- **Draw Velocity Curves** - Draw the shape of velocity.
- **Graphic Note Velocity** - A draggable stem on each note lets you see and edit its velocity.
- **Master Fader** - Assign any number of tracks to a single recordable group fader.
- **Transpose Map** - Fast and easy drum and note mapping.
- **SMPTÉ Event List** - Type in SMPTÉ times to create an accurate cue sheet for film scoring.
- **MIDI Interface Support** - Supports up to two MOTU MIDI Time Pieces™ or the Opcode Studio 5™.
- **And There's Much More**, including: Ghost Notes in controller windows, punch in while playing and Multi-Channel Tracks.



CALL (415) 726-0280 TODAY for a dealer near you! Demo disks available.



# DUO!

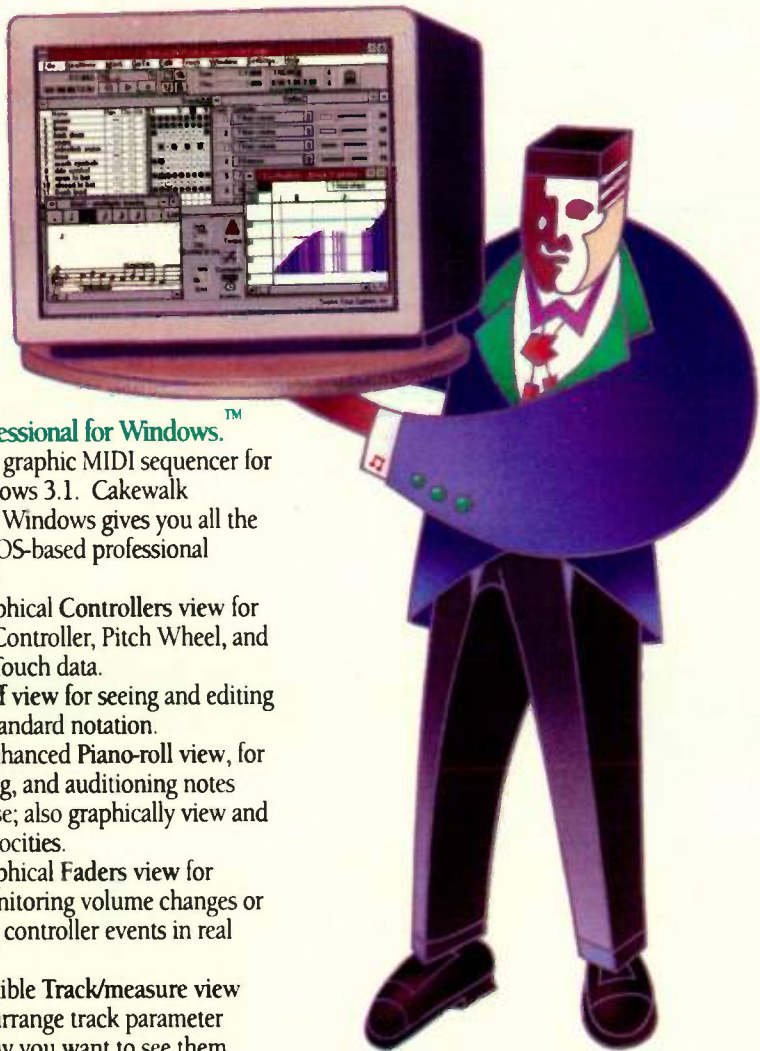
Available at music & computer stores WORLDWIDE!  
Contact Passport for YOUR LOCAL DEALER OR INTERNATIONAL DISTRIBUTOR.

## PASSPORT

100 Stone Pine Road • Half Moon Bay, CA 94019  
Phone: (415) 726-0280 • Fax: (415) 726-2251



# Now Serving Cake For Windows.



## Introducing— Cakewalk Professional for Windows.™

The 256-track graphic MIDI sequencer for Microsoft Windows 3.1. Cakewalk Professional for Windows gives you all the power of our DOS-based professional sequencer, plus:

- ☰ A graphical Controllers view for drawing MIDI Controller, Pitch Wheel, and Channel After-Touch data.
- ☰ A Staff view for seeing and editing your notes in standard notation.
- ☰ An enhanced Piano-roll view, for inserting, editing, and auditioning notes with your mouse; also graphically view and change note velocities.
- ☰ A graphical Faders view for mixing and monitoring volume changes or any other MIDI controller events in real time.
- ☰ A flexible Track/measure view that lets you rearrange track parameter columns the way you want to see them (with new Pan and Volume parameters). Plus "drag and drop" editing to move or copy selected measures to new times and tracks.
- ☰ A graphical Tempo Map for drawing tempo changes, and a new Meter/Key-signature Map.
- ☰ A 256-bank System Exclusive Librarian, for storing and sending up to 1 megabyte of synthesizer data per bank.
- ☰ Support for the Windows 3.1 Multimedia Extensions: MIDI Mapper, for patch, key, and channel mapping; MCI (Media Control Interface) commands, for controlling other multimedia devices during playback; and Wave events for embedding digital audio .WAV files in your sequence.

☰ You'll find other new features, plus everything you expect from Cakewalk Professional for DOS: An Event list view, an Event Filter for conditional edits, variable timebases up to 480 PPQ, the built-in CAL programming language for custom sequence editing (free CAL routines available), fractional tempos, quantization by percent strength, sync to all popular SMPTE/MTC formats, support for multiple MIDI interfaces, and so much other good stuff we can't begin to fit it all here.

## You Don't Do Windows?

If you're not yet running Windows on your PC, we still have a full menu of updated DOS-based music software, like the best-selling Cakewalk 4.0 (\$150) and Cakewalk Professional 4.0 (\$249) MIDI sequencers. There's also Cakewalk LIVE! 4.0 (\$49) for automated playback of up to 128 song files (both Cakewalk and Standard MIDI files), as well as a complete collection of load-and-play song files and drum patterns. We also carry a full line of MIDI interfaces. Call today to receive our MIDI product catalog!

## We Deliver.

To order Cakewalk Professional for Windows, or for more information, call:

**800-234-1171 or 617-273-4437.**

# Cakewalk

---

## PROFESSIONAL

---

f o r W i n d o w s

System Requirements: IBM PC with 10 MHz 80286 or higher, 2 MB of RAM, hard drive, mouse; Microsoft Windows 3.1. Supports any combination of up to 16 MIDI devices with Multimedia Extensions drivers (including Roland MPU-401 compatibles and Music Quest MQX interfaces).

Cakewalk, Cakewalk LIVE!, Cakewalk Professional, and Cakewalk Professional for Windows are trademarks of Twelve Tone Systems, Inc. Other product names mentioned are owned by their respective manufacturers.



S Y S T E M S

P.O. Box 760 Watertown, MA 02272





## DIGITAL DEBATE

**"D**igital Fluency" ("Recording Musician," June 1992) makes the following statement regarding digital recording: "Reducing overall signal level to avoid clipping does not compromise sonic quality..."

I'd expect you to know that every 6 dB drop in input level reduces resolution by one bit. To prevent a peak higher than 3 to 6 dB below digital overload (which, as you state, is nasty), the nominal average level should be no higher than 20 to 24 dB below overload.

This translates into a resolution of 12 bits. On low-level information such as ambience and reverberation tails, the resolution becomes eight bits or lower. It does not take golden ears to hear the increase of digital grunge and loss of quality at lower levels. At a low enough level, digital "gates" off, hence the often-heard comment about the "sterile, dry" sound of digital.

These phenomena are well-known amongst professionals. In order to minimize them, many professionals use a compressor/limiter in front of the A-to-D converters.

**Marvin Caesar**  
President  
Aphex Systems  
Sun Valley, CA

Author David Miles Huber responds: *I agree that signal levels should be kept as high as possible, within reason. These levels also depend upon the type of signal that's being recorded. If instruments are heavy in*

*high-level, transient peaks, you should keep the overall signal lower than if the levels stayed within a relatively small range (such as a heavily compressed signal).*

*Your comment about using a compressor/limiter to limit the dynamic range makes sense for certain types of sampling, but certainly shouldn't be followed as a hard-and-fast rule when recording digitally. As always, it's up to us to balance digital's good points with the bad.*

## POP PHILOSOPHY

I enjoyed Michael Molenda's article "The Architecture of Pop" (May 1992). In its clearest, articulate form, Molenda's theme rings to my discontent about the present, decrepit state of pop music and successfully spurs me to dissect the author's typical and dangerous perspective on music.

I fear this group of bigwig producers and its subjective interpretation of how a pop song should be: a pre-packaged formula that must dazzle in the first twenty seconds or suffer the garbage-can fate. It's a sad truth that "sales figures and chart position are the sole measures of a successful pop record." But this state of affairs largely was created by the same producers who use it as a crutch in the massive task that faces them—choosing the good from thousands of bad. The generic producer asks exactly Molenda's question: "Why are masses of people seduced by a specific popular work?" The answer is that the mass media markets anything into a seductive form and pumps it down the public's throat. Producers and music publishers serve as the crucial link between artists and listeners. And when they assume listeners can't appreciate much beyond New Kids on the Block, they treat us as such. Ever hear of self-fulfilling prophecy?

A little patience might be in line when reviewing demo tapes. Great art does not always jump out at you; it should take some work/participation on the listener's part. Impossible to dedicate such attention to so many candidates? Producers who have managed

such miracles as successfully promoting Nirvana have the power to take more time with new priorities and direction.

**Jason Schmidt**  
New York, NY

Jason—I always try to educate musicians on the realities of the music business. In the fifteen years I've worked in the industry, things haven't changed much: A pop song is more about marketing than music. I didn't make the rules, but if I want to sell a song, I (usually) try to follow them. However, I never use the rules as a crutch, just a guideline.

*The media has never been 100 percent successful at "pumping [pop acts] down the public's throats." For every New Kids on the Block, there are a dozen well-promoted acts that fail. And, thankfully, there are people closer to the street than some pop producers wish to tread. Occasionally these street cats discover a Nirvana. But the single that broke the Nirvana record, "Smells Like Teen Spirit," is a classic pop track dressed up with rude guitars. I never considered the song cutting-edge or even alternative. Hey, I would have signed Nirvana in a flash (and I'm an old fogey). Unfortunately, they didn't think to send me their tape.—Michael M.*

## ARTIST'S VISION

I believe in artistic license, but maybe you should tell Brian Cronin the next time he illustrates a cover (April 1992) that keyboards alternate between sets of two and three black keys. It's no big deal. Keep up the good work!

**Gerald Hill**  
Santa Barbara, CA

Art director Andrew Faulkner responds: *Many of the artists used in EM are chosen for what they can bring to a subject with their artistic interpretation. Unlike photography, illustration allows us to view reality from a different perspective. Brian Cronin's rendering of a keyboard may seem naive at first glance, but if you note how he uses switches and buttons as decoration throughout the piece, it becomes obvious how deliberate his choices were.*

DAVE EMBER



# JUMP START YOUR MUSIC CAREER. GO TO GROVE.

If you're serious about a career in music, do yourself a favor and check out Grove.

Grove is not your average music school. It's the breeding ground for some of the finest musicians around. People dedicated to becoming a force within the industry. But foremost, toward the culmination of a dream — spending their life making music and making money doing it.

Grove offers 10 one-year programs and over 200 additional evening and weekend workshops, all taught by some of the top professional musicians in the business today. The skills you develop and the insight you acquire are guaranteed to open your eyes, ears, and mind... assuming you have the heart.

Classes begin 4 times a year. That's 4 opportunities in the next 12 months to get your career in gear. So don't blow it. Go to Grove.

For a free catalog simply call (818) 904-9400, ext. G1 or send back the coupon below.

*Grove*  
SCHOOL OF MUSIC



## ● LETTERS

### ONE HAPPY ROBOT

**M**y feeling about the negative rap MIDI gets ("The MIDI Trap," February 1992) is that it's sour grapes from the non-MIDI arena. The article's opening story concerning a veteran film composer's attitude toward MIDI probably stems from the fact that he has lost a lot of gigs to MIDI-equipped facilities. Sour grapes! A lot of people comment about the "robot sound" of some MIDI music. As far as I can tell, that "robot sound" accounts for some of the most successful and creative rap, dance, industrial, and alternative music.

MIDI musicians also are criticized for not knowing music theory. Joe Jackson once called us "push-button idiots." I think the real "theory" here is that these guys slaved for years with music theory and practice, starved for their art, and then bitterly watched some "non-musician" make a million with one of those "robot tunes."

Before MIDI, I had all these tunes in my head and that's where they stayed. MIDI changed that by allowing me to share my musical thoughts with everyone else. I love MIDI. I'm sick of MIDI people allowing themselves to be intimidated by a bunch of sour grapes. Go ahead, MIDI guys and gals, don't be afraid. Quantize. Robotize. Completely dehumanize. If you like it, then go ahead and do it some more!

Before there was written music, there was music. And people liked it just as they now like a lot of the stuff that you seem to love to hate. I believe it was Benny Goodman who said, "If it sounds good, it is good."

**Phil Radelat**  
North Bergen, NJ

### VIDEO QUERY

I am a videographer. I'm familiar with the conventional techniques of editing and sound mixing but computer enhancement is where I start getting lost. I am interested in recording live audio and video for use on a Macintosh so that the sound may be altered while still being synched. What do you recommend I use?

**Gregory Treadway**  
Atlanta, GA

*Greg—I believe what you're asking for is two separate hard-disk recording products, one video and one audio. The video portion*

Mail Coupon To: GROVE School Of Music, 14539 Sylvan Street, Van Nuys, CA 91411

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (required to process your request) \_\_\_\_\_

I would like to know more about the following programs:

- |                                     |   |  |
|-------------------------------------|---|--|
| <input type="checkbox"/> Guitar     | <input type="checkbox"/> Recording/Engineering          | <input type="checkbox"/> General Musicianship          |
| <input type="checkbox"/> Bass       | <input type="checkbox"/> Songwriting                    |  |
| <input type="checkbox"/> Keyboard   | <input type="checkbox"/> Instrumental Major             | <input type="checkbox"/> Enclosed is a check for \$15. |
| <input type="checkbox"/> Percussion | <input type="checkbox"/> Acoustic Composing & Arranging | Please send me a copy of your Video Tour.              |
| <input type="checkbox"/> Vocal      | <input type="checkbox"/> Film/TV Composing              | EM8/92   |



**FREE**  
Passport's  
Trax™ Sequencing  
Software for PC or Mac  
with purchase of any MPS  
(for a limited time only)

# More is a "Plus."

It's that simple. The E-mu Proteus Master Performance System Plus has more of what you want.

## More E-mu Sounds.

The MPS Plus comes standard with 8MB of CD-quality sounds. It starts with the same 4MB of samples that made the MPS famous—sounds like grand pianos, screaming electric guitars, punchy brass and much more. The Plus adds an additional 4MB of orchestral sounds including solo strings, woodwinds, classical brass and orchestral percussion—the power and grandeur of a full symphony orchestra at your fingertips. Combined with our studio-quality digital effects you've got access to more incredible sounds that will let you express your personal style of music.

## More Features.

Add features like 32 voice polyphony, 16-MIDI channel multi-timbral operation, 4 polyphonic outputs and the ability to access 500 onboard presets. Add powerful performance and MIDI control capabilities like Quick Keys and Performance Maps—all with the industry's clearest, most straightforward user interface—and you've got the perfect instrument to use for live performance, sequencing, or as the heart of an extensive MIDI-based music system.

## More Value.

Why settle for less? You won't find a better value anywhere. More superb E-mu sounds. More easy-to-use features. More reason to visit your nearest E-mu dealer for a demo of the MPS Plus.



# The New MPS Plus

E-mu Systems is a proud sponsor of WOMAD, the World of Music Arts and Dance.

Made in the USA

E-mu Systems, Inc.

P.O. Box 660015, Scotts Valley, California 95067-0015

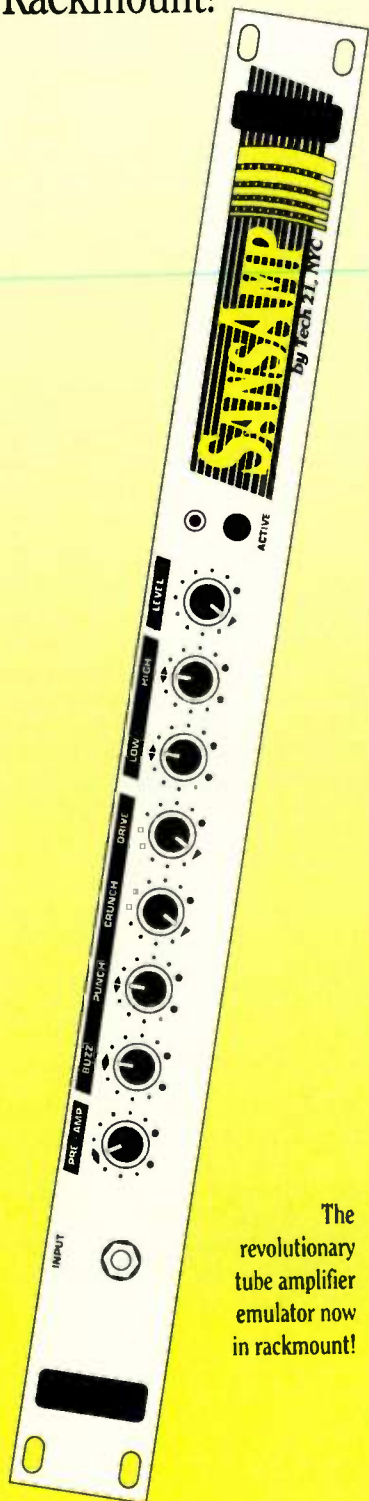
U.K. E-mu Systems, Ltd., Suite 6, Adam Ferguson House,

Eskmills Industrial Park, Musselburgh, EH21 7PQ

All trademarks are property of their respective companies.



# Tech 21 presents SansAmp Rackmount!



The  
revolutionary  
tube amplifier  
emulator now  
in rackmount!

Designed and  
manufactured in  
the U. S. A. by

## Tech 21

1600 Broadway, NY, NY 10019  
(212) 315-1116 / Fax: (212) 315-0825

## ● LETTERS

could be handled by SuperMac's Video Spigot, RasterOps' VideoTime, or an equivalent video digitizing board. The audio could be recorded via a Digidesign Audio-media II card (or a MacRecorder if you only want 8-bit audio). RasterOps also offers the MediaTime board, which combines a video digitizer and 16-bit Audiomedia hardware onto a single NuBus card. Whether you recorded your material with this board or two separate products, however, you would still end up with separate files that you would have to synchronize in a QuickTime editing program like Adobe Premiere or Macromind Director 3.1. Once recorded, you could edit the sound files offline with Passport's Alchemy, or Digidesign's Sound Designer II. If you want to process it in real time, you could run the audio outputs of the hard disk through any available signal processor. Note that you will need a gigantic hard disk to work with digitized video and audio files.—Bob O'D.

## DETAILS, DETAILS

**W**ow! I always thought electronic signals being sent through wire, or optical signals in optical fibre, traveled at nearly the speed of light, barring resistance and/or reflectance. Wouldn't James Clerk Maxwell and Albert Einstein, (not to mention Steven W. Hawking) be surprised to find out that they actually travel an order of magnitude slower than that!

In the July 1991 issue, Gary Hall writes in "The Technology Page" that light would travel only about five inches in four nanoseconds. Now a nanosecond generally is accepted as being one thousand millionth of a second. (I put it in these terms in order to be clear. In the USA, a billion is a thousand million, or 10 to the ninth power, whereas in the UK and some other European countries, it is a million million, or ten to the 12th power.) Given this, light will travel about 47 (not five) inches in four nanoseconds. The calculation is relatively simple: 186,000 (the speed of light in miles per second) times 5,280 (feet in a mile), times 12 (inches in a foot), all divided by 1,000,000,000. times four (the number of nanoseconds). Even if Mr. Hall has chosen the British system, the answer is still wrong. It is disturbing that Mr. Hall can't do simple arithmetic, but it is even more disturbing that your editors didn't catch the error. Perhaps this is because EM is either poorly-

written or poorly-edited, or both. And if there are objections to my hyphenation, it would be better-suited to address those objections to the editor who used "better-suited" instead of the more correct "better suited" in "What's New" (see page 122) in the April 1992 issue.

In this vein, I wish your writers and editors would learn to use English properly, and in particular, cease the practice of verbing nouns. I refer you again to page 122 of the April issue. Ignoring the split infinitive in the first sentence, I submit that programmers program and editors edit, but authors write—they do not author, nor do they use "authoring tools." Ughh!

**Bruce Nolen**  
Palo Alto, CA

Gary Hall responds: *This is great. Now I finally can prove someone reads this column. Seriously, thanks for the correction on my butterfingered calculation. I hope there weren't any accidents on the freeway as a result of trying to use this information.*

*Bruce—One of the joys of working with the English language is that it always changes, enough that Webster's New World Dictionary is frequently updated to reflect modern usage. Webster's has accepted such nouns-turned-verbs as "to author" for many years. This is particularly true now that "authoring tools" have become an entire product category in the world of multimedia software. Magazines provide an especially playful and creative medium for the language. If you prefer dated, limited usage of our language, I suggest you stick to legal documents. Also, according to The Chicago Manual of Style, "better-suited" is hyphenated when used after the verb "to be," or before a noun—Anne-Marie P.*

## ERROR LOG

**June 1992**, "What's New," p. 20: The correct address for KAT is 300 Burnett Rd., Chicopee, MA 01020; tel. (413) 594-7466.

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

*Corrections to articles are listed at the end of "Letters." We compile these published corrections annually; to receive a copy, send an SASE to "Error Log Listing" at the above address.*



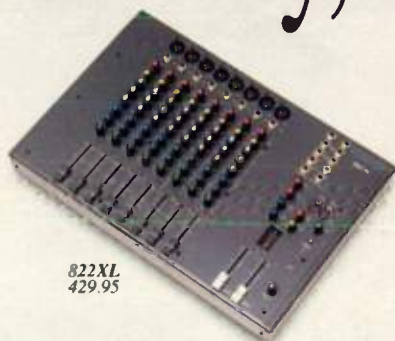


# The other guys missed the bus. Actually, 2 of them.

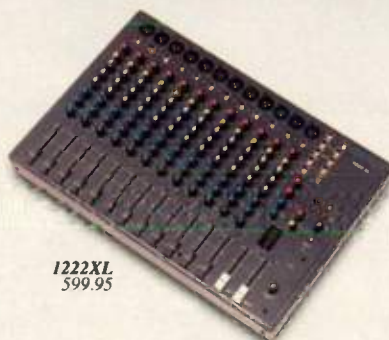
Why settle for a simple 16 channel stereo mixer, when you can have the 1642 4 bus mixer for \$1099.

Or if 8 or 12 channels are enough, you'll find most of the same features on the 822 and 1222 stereo mixers, starting as low as \$429.

With four similar discrete outputs (Sub1, Sub 2, Left and Right), the 1642 may be used as a 16x4 for recording, or, by assigning the subs to the L/R outputs, as a 16x2x2 for sound reinforcement. Each channel of the 1642 has a 3-band EQ



822XL  
429.95



1222XL  
599.95

Also available as 822XL and 1222XL table top versions at the same prices.

with Adaptive-Q circuits for a contoured response that adds clarity to the highs and warmth without "boomy-ness" to the lows.

The 822 and 1222 models are offered in two versions, designated XL (table top) or RM (for rack mounting). Each comes with phantom power, 3 bands of EQ, 1 monitor and 2 effects sends,

and monitor & headphone outputs. We're so confident that you'll love our new mixers that we'll back them with a two year warranty. So if you want some great mixers with low

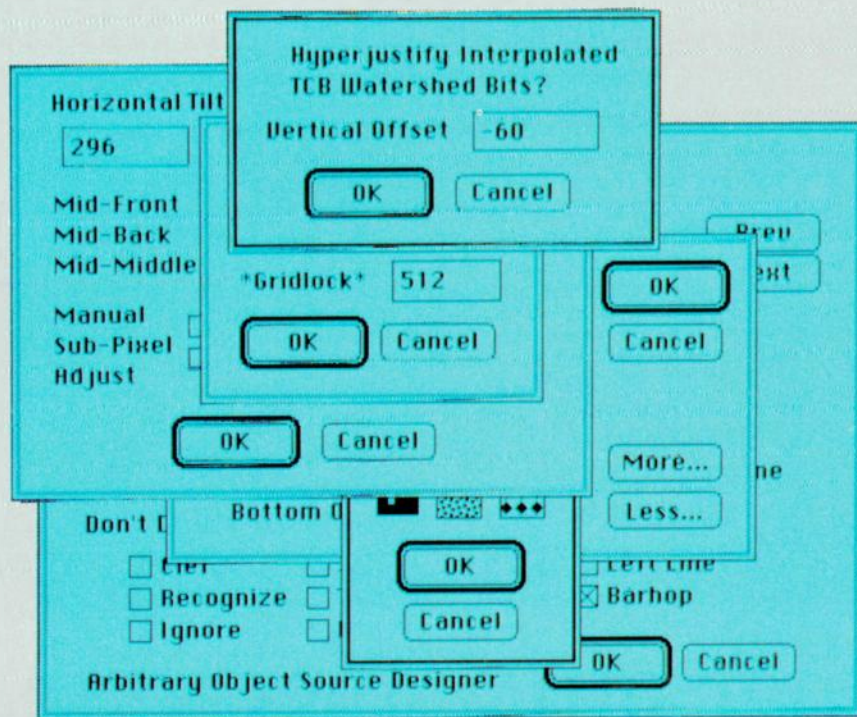
fares, don't miss the bus. Check out the 1642 and the rest of the DOD lineup at your favorite Dealer now.

## DOD

A Harman International Company

©1992 DOD Electronics Corp.  
5639 South Riley Lane, Salt Lake City, Utah 84107  
(801) 268-8400.





# Ok! Ok! Cancel!

Until now, producing music notation on a computer meant choosing between two evils. Simple programs with limited capabilities or complicated programs designed for computer masochists, not composers.

Composer's MOSAIC™ reclaims the elegant artistry of traditional notation while retaining the flexibility of advanced computer publishing. Without an endless sea of dialog boxes or arcane tools.



Just click-and-drag to position notes, stems, beams and articulations. They always retain their musical meaning. View and edit a voice as an individual part, condensed score and full score—all at the same time. Modify margins, staff layout, text and footers directly on the page.

Enter lyrics wordprocessor-style and then auto-flow them below any voice. Slurs and ties re-shape with a click of the mouse. Unlimited undo and redo lets you experiment without losing your ideas.

MOSAIC has both real and step-time MIDI input and playback and supports the MIDI Time Piece™. Advanced features include complex meters, cross-staff beaming, unlimited multiple voices on a single staff, automatic meter and key change warnings, nested triplets and tuplets, and more.

From complete symphonies to pop lead sheets, Composer's MOSAIC offers you the freedom to produce your manuscripts quickly and elegantly.



**Mark of the Unicorn**



## New Products

Our summer selection includes a multi-effects processor and several dynamics processors, a hard-disk recorder, multi-port MIDI interfaces, and sequencers for the NeXT and PC.

### EFFECTS PROCESSORS

In addition to classic Eventide pitch shifting, Eventide's **H3500 Dynamic Ultra-Harmonizer** (\$3,495) offers sampling, delay (up to 22 seconds), flanging, chorusing, reverb, and sound effects. Pitch can be shifted one octave up and two octaves down. The H3500's eighteen algorithms include two new ones, Mod Factory 1 and 2, that provide dynamic effects modules such as compression, ducked delays (the delayed signal is heard during pauses between program material), bpm-calibrated delays and loops, and level- and envelope-sensitive choruses and reverbs. The software modules can be patched together in any combination. The product is available with either 11.8 or 47.5 seconds of stereo, 16-bit, 44.1 kHz sampling. Sample memory, which can hold two separate samples, can be accessed via delay-loop presets in Mod Factory mode. The H3500 comes with Eventide's sampling software, which offers effects such as pitch shifting without changing playback length and time compression/expansion without pitch transposition. Parameters can be controlled via front-panel "soft key" buttons, a 10-key data-entry pad, and an alpha wheel. The manufacturer claims a frequency response of 5 Hz to 20 kHz ( $\pm 1$  dB,  $\pm 0.5$  dB typical) and .01% THD (.007% typical) at 1 kHz. The Mod Factory (\$250) and sampling components (\$995 for 23.71 seconds and \$1,995 for 95 seconds) of the 3500 can be added to existing H3000s.

**Eventide**  
One Alsan Way  
Little Ferry, NJ 07643  
tel. (201) 641-1200

### DIGITAL AUDIO

Following up on its Audiomedia entry-level hard-disk recording system, Digidesign is shipping **Audiomedia II**



Eventide H3500 Dynamic Ultra-Harmonizer

(\$1,295), a 2-track system that consists of a NuBus card and the company's well-known *Sound Designer II* audio editing software. The hardware features a 33 MHz, Motorola 56001 DSP chip; S/PDIF digital I/O; stereo analog I/O on RCA jacks; and 16-bit converters that sample at 44.1 kHz. The software includes non-destructive playlist editing, SMPTE sync, real-time digital EQ, and pitch shifting with time-correction. Audiomedia II will eventually support four tracks (mixed down to two outputs) in Digidesign's *DECK* digital audio recording software and Opcode's *Studio Vision* integrated sequencing/digital recording programs. It will support two tracks in Mark of the Unicorn's *Digital Performer* and Steinberg's *Cubase Audio* (when available). Existing Audiomedia owners will be offered a software upgrade to *Sound Designer II* for \$149.

**Digidesign**  
1360 Willow Rd., #101  
Menlo Park, CA 94025  
tel. (415) 688-0600

### MIDI INTERFACES

Mark of the Unicorn is shipping the **MIDI Time Piece II** (\$595), an enhanced, 1U rack-mount MIDI interface/patch bay/processor for the Macintosh. The MTP II offers 8 x 8 MIDI matrix merging and routing with independent In and Out ports (for 128 MIDI channels). It can rechannelize on input and output and mute MIDI

data on any cable. The device reads and writes SMPTE time code, supports SMPTE jam sync and freewheeling, and converts SMPTE to MTC and Direct Time Lock. Unlike the earlier MIDI Time Piece, the MTP II has a 16 x 2 backlit LCD display, a hardware panic button, an internal power supply, four programmable data and control knobs, click-to-MIDI, and onboard memory for 128 patches, which respond to Program Change messages. It can accept a bulk dump from an original MTP, so your old MTP setups can be used with the new machine. Two footpedal inputs admit continuous or momentary pedals.

**Mark of the Unicorn**  
222 Third St.  
Cambridge, MA 02142  
tel. (617) 576-2760

MIDIMAN is shipping the **MM-401** (\$99.95), an MPU-401-compatible MIDI interface for PC-compatibles. The interface comes bundled with software, including a generic SysEx archiver, a MIDI viewer/channelizer, and an MPU-401 diagnostic program. The company also introduced the **MacMan** (\$99.95), a miniscule 1-in, 3-out Macintosh interface with MIDI receive/transmit indicator LEDs. A Serial Thru switch bypasses the MIDI circuit, routing the data to a printer or modem. Finally, MIDIMAN is offering **Mac Syncman** (\$324.95), a 2-in, 6-out Mac interface and sync box with SMPTE



## ● WHAT'S NEW

reader/writer and regenerator that operates even when the Mac is turned off. The interface can be configured as a 1-in, 6-out interface, or a dual 1-in, 3-out box, and includes dual Serial Thru switches and MIDI receive/transmit indicator LEDs. The synchronizer supports SMPTE/MTC, Direct Time Lock, and Smart Song Pointer.

### MIDIMAN

30 N. Raymond Ave.  
Suite 505  
Pasadena, CA 91103  
tel. (818) 449-8838

Passport Designs released two 1-in, 3-out MIDI interfaces for PC-compatible and Macintosh computers. The MPU-401-compatible PC interface (\$129) is a half-slot card. The Mac interface (\$89), which replaces the company's earlier model, features flashing MIDI receive/transmit indicator LEDs.

Passport Designs  
100 Stone Pine Rd.  
Half Moon Bay, CA 94019  
tel. (415) 726-0280

## SOFTWARE

Pinnacle Research is shipping *Presto* (\$295; introductory price \$149), a graphical sequencer for the NeXT computer. The program integrates sequencing functions with the computer's DSP capabilities (using the *NeXT Music Kit*) to let you synthesize sounds and modify them while sequencing "on the fly." *Presto* includes a library of editable sounds, including piano, electric bass, strings, voice, woodwinds, and percussion. The user interface includes drag-and-drop measure editing and graphic and event-list note and MIDI-controller editing. Transforms include Quantize, Randomize ("humanize"), Transpose, Velocity Adjust, and Time Shift. All editing functions except part-deletion operate in real time. The program lets you simultaneously edit multiple files and reads and writes Standard MIDI File, NeXT Score, and Playscore formats. *Presto* transmits MIDI Clock for synchronizing external devices. The initial release is beta version 0.9b, but users will receive a free upgrade to version 1.0 (expected in late 1992). The company also offers a line of NeXT MIDI interfaces.

Pinnacle Research  
4725 E. Sunrise Dr., #435  
Tucson, AZ 85718  
tel. (602) 529-1135

MIDIconcepts announced *EZ MIDI Pro* (\$149), a 128-track sequencer for IBM PC-compatibles (80286 or better). The program features pulldown menus, mouse support, SMPTE/MTC sync, a SMPTE hit-point calculator, up to 768 ppqn resolution, and Standard MIDI File support. Four assignable virtual faders provide real-time MIDI Continuous Control, and you can edit pitches and controllers on the same screen. *EZ MIDI Pro* can address up to four MIDI Ins and eight MIDI Outs (depending on the interface), supports MPU-401-compatible interfaces and SoundBlaster Pro, and uses EMS and extended memory. The list of editing functions includes Bounce, Extract, Fill, Filter, Offset, Quantize, Retrograde, Scale, and more.

MIDIconcepts  
2253 Chesterton St.  
Simi Valley, CA 93063  
tel. (805) 582-1591

## DYNAMICS PROCESORS

Drawmer replaced the DL241 Auto-Comp compressor with the **DL251 Spectral Compressor** (\$1,200). The DL251 is a dual-channel, full-band compressor with a sidechain input. The new Spectral Enhancement circuit boosts the highs without increasing output level, emulating the function of a 2-band compressor. The device has switchable hard-knee/soft-knee compression with a threshold offset to minimize level changes when switching between the two. The peak limiter has been refined to handle low frequencies and high-level signals better than the DL241. A Stereo Link feature lets you switch between averaging (for most music applications) and peak-hold compression (for post-production and effects). Inputs and outputs are electronically balanced, with XLR connectors, and the unit is switchable between -10 dBV and +4 dBm levels. Drawmer also showed the DS404 Quad Gate (\$1,149), a 4-channel, frequency-sensitive gate, and the DS201B (\$849), a dual-channel, frequency-sensitive gate.

QMI (distributor)  
15 Strathmore Rd.  
Natick, MA 01760  
tel. (508) 650-9444

The **Afterburner** (\$599), from ARX Systems, is a 1U rack-mount, single-/dual-channel compressor/limiter. In Dual Channel mode, it acts as two independent devices, with variable threshold, ratio, and output gain. Its variable Enhance function boosts certain frequencies to compensate for the loss of highs and lows during compression. In Alternative mode, the Afterburner acts as a single-channel, 2-band comp/limiter with separate dynamic control of highs and lows. The unit has a hardwire bypass, a passive RFI filter on the input, and a sidechain insert point. Inputs and outputs are balanced XLR and TRS jacks. ARX also offers the DL-1 single-channel direct box (\$125), which can switch automatically between 9V batteries, phantom power, or an external DC supply. The direct box has a continuously variable gain trimpot ( $\infty$  to +15 dB), battery-check switch with LED, audio ground-lift switch, and phantom power LED.

ARX Systems  
PO Box 842  
Silverado, CA 92676-0842  
tel. (714) 649-2346

## PREAMPS

The Soldano/Caswell **X99** (\$2,600) is a MIDI-controlled, all-tube preamp that provides parameter control via motorized potentiometers. The 2U rack-mount device offers real-time MIDI Continuous Control of preamp gain, bass, mids, treble, and output-level pots and has a separate Bright switch. The X99 has three gain modes: Clean, Crunch, and Overdrive. Settings can be saved in 128 user program locations. The signal path uses five 12AX7/7025 tubes.

Soldano Custom  
Amplification  
7625 Hayvenhurst Ave., #29  
Van Nuys, CA 91406  
tel. (818) 780-0690



Drawmer DL251 Spectral Compressor



# Just *feel* the Color in these Black and Whites

As a pianist, do you find that today's synthesizer workstations have the right sounds and features but just don't feel right? Then check out the new *KS-32 Weighted Action MIDI Studio* from ENSONIQ. With a 76-key weighted action keyboard (*with pressure sensitivity*), the *KS-32* gives you the dynamic response of sitting at your favorite piano, with all the benefits of an integrated MIDI workstation. ■ With 32 note polyphony you can play the *KS-32* like a real piano, without worrying about running out of notes. The 180 internal sounds cover a variety of piano, electric piano and organ styles, as well as orchestral, solo wind and pop sounds. And 20 dedicated drum kits, with support for both the ENSONIQ *and* General MIDI drum maps, give you more drums than any other comparably priced keyboard available today. ■ If you use other MIDI gear, you'll appreciate the *KS-32's* MIDI controller features. Press one button to take the current sound you're playing and combine it with control of up to 16 internal or external sounds, with instant key splits and layers. And when you get an idea for a song, you have an onboard 16 track sequencer with a whole host of recording and editing features. ■ But in the end it's the **feel** of the *KS-32* that will win you over. Finally, you can play from a whisper to a roar based on your touch, not your amplifier! So if the feel of your keyboard is important to you, call **1-800-553-5151** to find the Authorized ENSONIQ Dealer nearest you. Then go try the *KS-32 Weighted Action MIDI Studio* for yourself, and see if we didn't get the feeling right.



## KS-32

Weighted Action MIDI Studio

Please send me more information on the *KS-32* and all the other products ENSONIQ has to offer.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Mail to: ENSONIQ, Department E-30  
155 Great Valley Parkway, Malvern, PA 19355

**ensoniq**

THE TECHNOLOGY THAT PERFORMS



# SWEETWATER SOUND

Specialists in  
MIDI systems and home  
recording.

## E-mu Systems

Proteus/1, 2, & 3 World  
PROformance/1 piano module  
EMAX II, EIII & EIIIx 16-bit  
samplers, PROcussion module  
PROteus/MPS keyboard

## TASCAM

DAT machines, Mixing consoles,  
Mastering decks  
Multi-track tape recorders

## KORG

01/WFD, 01/RW, 01/WPro,  
01/WProX, 03RW, 01RW, M1, M1REX,  
M3R, Wavestation EX, WSAD

## Roland

Synthesizers, tone modules,  
modules, drum machines,  
MIDI controllers, mixers & samplers

## KURZWEIL *Music Systems*

FREE Sweetwater newsletters  
New Sales • Support • Modifications • Service • Upgrades

Mark of the Unicorn • Opcode • AKAI • Digidesign •  
Ramsa Passport • TOA • AKG • Panasonic • Digitech •  
InVision Nakamichi • JBL Studio Monitors • Fostex  
Recording • Lexicon Coda • Carver • JL Cooper • QSC •  
Mackie Designs • Rane Soundcraft • TAC/Amek • BBE •  
Crown • Anatek • Furman Oberheim • Juice Goose •  
Tannoy speakers • KAT • Stewart • 3M tape • Tech 21 •  
Macintosh & IBM MIDI software & interfaces!

Other major brands too!  
Huge in-store inventory!

Our exclusive guarantee is...  
if you don't like it...  
we'll take it back... with no hassles!

CONFUSED? Call us for  
friendly **FREE** advice!



We ship UPS & Federal Express or...  
You can receive it TODAY if  
we ship by major airline!

NO SALES TAX (except IN)  
VISA • MasterCard • AMEX  
COD • Trades

**SWEETWATER SOUND, INC.**  
5335 BASS ROAD • FORT WAYNE, IN 46808  
**(219) 432-8176**  
FAX (219) 432-1758

### ● WHAT'S NEW

BBE introduced its 1U rack-mount **381 Guitar Preamp**, **383 Bass Preamp**, and **386 Acoustic Guitar Preamp** (\$299 each), which use BBE's Process sonic enhancement. Rather than add harmonics (as with most "enhancers" or "exciters"), the BBE Process compensates for phase and amplitude distortion by phase-correcting the high frequencies and delaying the lows by approximately 2.5 ms. The 381 offers switchable clean and distortion channels with separate volume pots and master left and right volume pots. The clean channel has three bands of EQ, while the distortion channel has 4-band active EQ and a Drive control. Independent stereo "recording" outputs with filtering are supplied for speaker simulation. The 383 offers 6-band EQ (at 60, 125, 250, 600, 1,800, and 3,600 Hz) and has a compressor with In/Out and Threshold switches. A Punch switch adds adds low- and high-frequency enhancement, and an internal crossover has frequency and balance controls for bi-amping through the high- and low-frequency outputs. An effects loop and XLR and 1/4-inch outputs (with XLR ground-lift switch) complete the package. The 386 provides quasi-parametric EQ (level and frequency controls), a notch filter, and an input gain control, and has an extremely high input impedance for piezo pickups.

#### BBE

5500 Bolsa Ave., Suite 245  
Huntington Beach, CA  
92649  
tel. (714) 897-6766

Pendulum Audio is offering the **HZ-10SE Preamp System** for acoustic instruments (\$650 with single-pickup preamp module, \$720 with dual-pickup module). The system includes a single-rackspace main preamp unit and a preamp module. The rack-mount device offers four bands of fully parametric EQ, two effects loops, a mute/effects foot-switch, and unbalanced and TRS balanced stereo outputs. The phantom-powered preamp module, which is designed for piezos, magnetic pickups, mini-mics, and dual-pickup systems, is available in several versions. One version

of the module can be implanted in the instrument, two (floor and belt-clip modules) use a standard 1/4-inch instrument cable, and one plugs directly into the instrument's 1/4-inch end-pin jack. The module connects to the main preamp with an 18-foot cable (included) that can be extended through a snake or mic cable.

#### Pendulum Audio

PO Box 339  
Gillette, NJ 07933  
tel. (908) 665-9333

### MISCELLANEOUS MIDI

German company FriendChip (distributed in the U.S. by Euro-Stuff) unveiled the **DC K..AT** desktop controller (\$599). Designed to control any Mac, ST, or PC sequencer or hard-disk recording program, the unit offers a scrub wheel and 21 different buttons for operating up to 35 software functions. The company is also shipping the **Mac-K..AT** (\$199), an ADB-based Macintosh peripheral that offers seven switches and two Shift keys that control up to 21 software transport and edit functions.

#### Euro-Stuff

4455 Torrance Blvd.  
Suite 159  
Torrance, CA 90509  
tel. (800) 726-6491  
or (310) 542-6490

### ELECTRONIC PERCUSSION

ddrum introduced the **ddrumAT** (brain \$4,995; 5-trigger set \$5,350; set with pads \$6,650), an electronic triggering system for acoustic drums that



ddrumTrigger



# THE RIGHT PLACE TO START

START HERE.

LEARN FAST.

FINISH STRONG.

FEEL GOOD.

**MusicProse.**

*It's everything you need.*

For Macintosh (Systems 6 and 7).

And NOW for Windows (3.0 and 3.1).

From the makers of Finale.

**Just \$249.**

**CALL TODAY.**

**(800) 843-2066**

EXT. 804

Ask about MusicProse-to-Finale upgrades!



**CODA MUSIC  
SOFTWARE**

© 1992, Coda Music Software. All rights reserved. Finale is a registered trademark and MusicProse is a trademark of Coda Music Software. Suggested retail price subject to change without notice. Coda Music Software, 1401 E. 79th Street, Minneapolis, MN 55425  
Phone: (612) 854-1288 Fax: (612) 854-4631



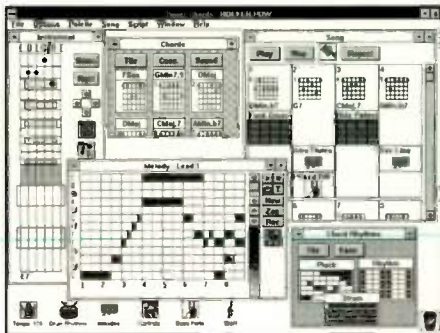
Guitarists, Keyboard Players, Electronic Musicians...

# Plug in your **POWER CHORDS™**

**Power Chords** is a new, fun to use, fully graphic song writing program for Windows.

- create chords on an on-screen guitar (or other stringed instrument) or have 'Chord Request' create them for you
- use the graphic rhythm editor to quickly create strumming/plucking patterns, drum parts, melodies and bass parts
- create songs by visually arranging objects representing the various parts
- record in from MIDI instruments or import and export standard MIDI files
- supports General MIDI and Roland GS standards - select instruments by name
- compatible with any sound card or MIDI interface supported by Windows
- create great music on-screen - no input instruments required

Power Chords requires an IBM or compatible computer running Windows 3.1 (or 3.0 with the multimedia extensions) and can use any sound card or MIDI interface supported by Windows.



**Power Chords** is only **\$84.95** available from:



**Howling Dog Systems**

Box 80405, Burnaby, BC, Canada  
V5H 3X6  
(604) 436-0420  
CIS: 70044,2736

Dealer enquiries welcome.



## ● WHAT'S NEW

consists of ddrumTriggers and the ddrumAT module. The triggers are available in three different models for tom, snare (with separate rim sensor), and kick drum. Instead of requiring adhesives, the triggers clamp onto standard drum rims, and the sensor softly presses against the drum head. The triggers are not affected by different drum tunings, and you don't have to dampen the drum heads. A metal casing protects the trigger from being damaged by accidental hits. The trigger output uses an XLR connector. The ddrumAT module provides a selection of sampled acoustic drum sounds. MIDI functions include Program Change, Note Assign, Gate Time (between Note On and Note Off), and Local On/Off.

**ddrum**

**PO Box 166**

**25 Lindeman Dr.**

**Trumbull, CT 06611**

**tel. (203) 374-0020**

Drum Workshop's **Acoustic Drum Triggering System** (\$365/4-trigger system; components available separately) uses internally mounted, AT Series, active triggers that track at the impact point without deadening the drum or affecting tuning. Because the triggers are internally mounted, they cannot be damaged by stick strikes. A multi-channel mini cable connects to an external trigger/DC power unit. The trigger/power unit routes up to four trigger signals via 1/4-inch jacks.

**Drum Workshop**

**26907 Lavery Ct.**

**Unit 16**

**Newbury Park, CA 91320**

**tel. (805) 499-6863**

## LINE TRANSFORMERS

The Rane **FLT22 Line Transformer** (\$159) converts two line-level signals to isolated, balanced outputs using a pair of low-distortion, wide-bandwidth, nickel-core audio transformers. All inputs and outputs are via terminal strip. The FLT22 is a module for the Flex Series HR-format chassis and can be expanded to four channels with an Option 44 card (\$89). It can be mounted horizontally or vertically, or can stand alone.

**Rane Corp.**

**10802 47th Ave. West**

**Mukilteo, WA 98275-5098**

**tel. (206) 355-6000**

**PC Music Software**

# GOLD STANDARD

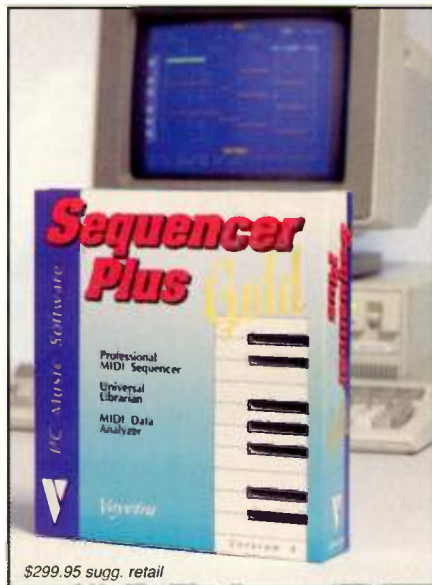
Struggling with multiple programs can turn state-of-the-art into a state of confusion.

Besides integrating the industry's most reliable

**Sequencer** with a **Universal Librarian** and **Network Organizer**, Sp Gold's **MIDI Data Analyzer** lets you view, control and analyze MIDI Network activity.

If you'd rather juggle tunes instead of software, why compromise?

Go for the Gold Standard.



\$299.95 sugg. retail

# Voyetra

333 Fifth Avenue • Pelham • NY • 10803 • (914) 738-4500 • Fax: (914) 738-6946

Call for Free Catalog: 1-800-233-9377



// ...sets the  
standard by  
which other  
synthesizers  
will be  
judged... //

*Craig Anderton,  
Sound on Sound*

**"This instrument is definitely going to have the competition scrambling to catch up."**

*Jim Aikin, Keyboard*

**"...logical and intuitive...a real powerhouse for the 90's."**

*George Petersen, MIX*

**"VAST™ offers one of the few really innovative approaches to electronic sound manipulation to appear in recent years."**

*Scott Wilkinson,  
Electronic Musician*

*There's never been a better time to trade up. Play the K2000 today at your authorized Kurzweil dealer.*



**KURZWEIL**

Kurzweil is a registered trademark of Kurzweil Music Systems, Inc. © 1992 Young Chang America, Inc.

©1992 Young Chang America, Inc., 13336 Alondra Blvd., Cerritos, CA 90701, 310/926-3200. VAST is a registered trademark of YCA.



# COMPUTING THE SCORE

Every year or two, a ground-breaking notation package is introduced amid claims that it is faster, easier to use, and more powerful than any previously released program. And while those claims often are true (better packages *are* coming out all the time), a single notation program has yet to emerge that does for musicians what *Excel* has

done for businesspeople or what *PageMaker* has done for desktop publishers.

While we wait for the ultimate package to appear, there are many ways to improve the utility of available programs. Here are a few tips to help you get more out of your existing notation software.

## STARTING FROM SCRATCH

Many people find themselves writing for similar groups of instruments, so before you enter a single note, create templates for the ensembles with which



you frequently work. In addition to obvious things like clefs and instrument names, include place holders for titles, credits, copyright notices, and anything else you regularly use.

In a notation program, the order in which you do things makes a big difference. For example, don't bother tweaking

the page layout before you enter the lyrics; long words often require additional space between notes, which affects the layout of measures in a system. As a rule of thumb, enter notes first; go on to dynamic markings, articulation markings, and lyrics; and then take a shot at the layout.

This procedure works because many graphic objects must be positioned relative to other objects. If you move a note, any articulations, dynamics, slurs, or lyrics must move with it. Some programs are better at this than others. Most of them keep track of

BY STEVE PEHA



# The Perfect Match



## Finally, a wireless to match N/DYM® performance: the new Electro-Voice MS-2000AH wireless microphone system.

Our new N/DYM Series III microphones take neodymium dynamic technology to its highest level yet. In a rugged package, they combine condenser-like frequency response, low distortion and sizzling high output – all N/DYM hallmarks – with the lowest overall handling noise available.

In the MS-2000AH wireless system, advanced audio and RF circuitry brings out the true sound of the N/D757B microphone. Our exclusive DNX™ companding gives you a wide, noise-free dynamic range while eliminating compander “breathing.” And the dual-receiver true-diversity design switches automatically to the receiver with the strongest signal.

The MS-2000AH has more features to optimize and simplify setup than any competitive system. A continuously variable mic level on the transmitter and audio level metering on the receiver match the wireless to the voice of the performer. Output of the rack-mountable receiver is fully

adjustable and equipped with the connectors to match any mic or line input. RF signal and diversity channel meters aid antenna setup. The internal power supply eliminates bulky plug-in adaptors.

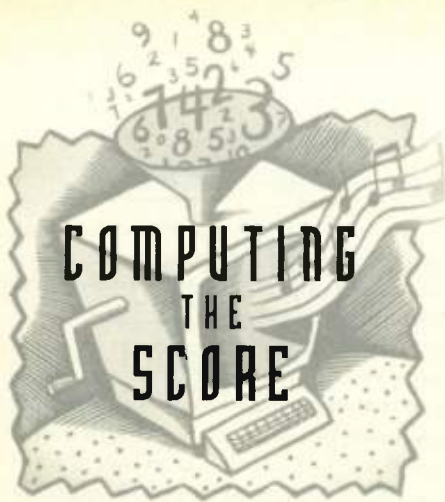
**Electro-Voice MS-2000A wireless systems\***: extraordinary values with all the features you want and the superb sound of N/DYM. Visit your EV dealer or call us at 800/234-6831 for more information on **The Perfect Match**.



\*Also available are MS-2000AB bodypack systems and the GT-1000 professional guitar transmitter.







for an entire track or song. Otherwise, play the notes in staccato passages with longer durations.

### CREATIVE QUANTIZING

Even if you don't read music, you probably understand rhythm better than your computer does. Using some creative quantizing, you can coax your notation software into producing the results you're looking for.

Let me use a personal example. A couple of years ago, I sat down to transcribe some very complicated jazz piano

performances. Using an appropriate quantization level, my notation software correctly transcribed the rhythms in about seven or eight out of every ten measures. Unfortunately, two or three out of every ten measures were hopelessly mangled. If I changed the quantization setting to more accurately match the music in these measures, the measures that previously had been transcribed correctly came out wrong.

Finally, it occurred to me that I could duplicate the track I was trying to transcribe. By quantizing one copy with one rhythmic value and the other copy with another value and importing both copies into my notation program, I could pull out the correct parts from each copy to create the best possible transcription.

Here's a highly simplified example of this technique:

The swing eight-note rhythms of jazz and some pop styles present a unique challenge. The goal is to take eighth notes that have been played with a triplet feel and notate them as though they were normal "straight" eighths.

Few notation programs are sophisticated enough to handle something like this automatically, but by combining track shifting with quantization in your sequencer, eighth notes can be notated correctly (see Fig. 1).

When people play eighth notes with swing, the second eighth note in each beat is played on the last third of the beat, as though it were an eighth-note triplet. Quantizing to eighth-note resolution straightens these eighths out by moving the second eighth note in each pair back to the middle of the beat. However, eighth-note quantization is quite coarse; large parts of your music might be ruined. In general, quantizing to sixteenth notes produces better overall results, but all the swung eighths end up as sixteenth notes on the last quarter of the beat.

To prevent this from happening, shift the entire track forward in time before you quantize so that quantizing to sixteenth-note resolution pulls the off-beat eighths to the middle of the beat and not to the last sixteenth note. If the off-beat eighth notes fall exactly on

## Hey Greg, what do you do with your 56K?

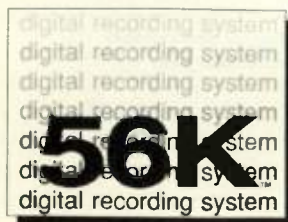
*Greg Edward is the president of Reflex Productions in Woodland Hills, CA. His production/engineering credits include: Corey Hart, Jefferson Airplane, Bob Seger, John Mellencamp, Stevie Nicks, R.E.M., The Beach Boys, Dillinger, and several Damn Yankees singles.*



"The 56K has become an indispensable tool for my every day routine. It's perfect for sequencing and editing albums that I produce for Virgin, Warner Brothers, Polygram, and BMG Records. The Playlist is great! I use it to sample and fly in sound effects, vocals, guitars, etc. The system is ideal for creating and editing effects and drum sounds for mixing. The 56K also helps me quickly rearrange the sequence of music on DAT tapes for CD preparation.

I've worked in many mastering houses which refuse to let desktop workstations in the door because of the colorization which they add to the sound. My 56K has changed a lot of those opinions because what you get out is exactly what you put into the system. I also like the fact that I could pick the A/D quality level I wanted.

In an industry where your work reflects the quality of your tools, the 56K is the most important sound tool I've added in years."



**A Professional System.  
A Reasonable Pricetag.  
Still \$1995.00.**



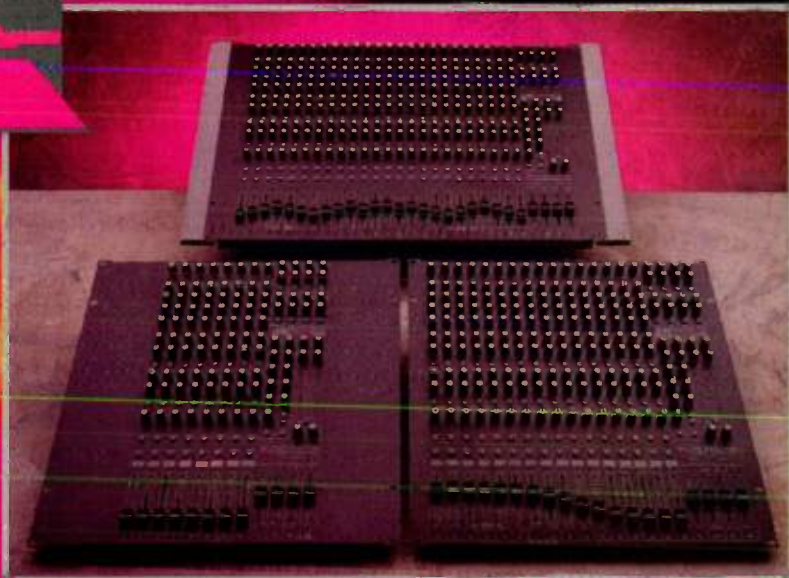
PO Box 5074, York, PA 17405 717 843 6916 Fax 717 854 8319



# A.R.T. SHATTERS THE PRICE OF PROFESSIONAL MIXING TECHNOLOGY!!!

## THE PHANTOM PROFESSIONAL SERIES CONSOLE

Every once in a while a product comes to market that offers a brilliancy in design that seems beyond human engineering. The Phantom Series consoles offer the performance and features of mixing boards costing thousands of dollars more. They are rugged enough to take the pounding of steady live use. They are also so transparent and utterly free of noise that they are the first choice for precision multitrack recording! From a four track home studio to 32 channel digital, the Phantom consoles offer a level of performance that is inspiring. A.R.T. has taken the fidelity of world class recording mixers and made the technology available in a professional console that is as silent as its' name implies. Production unit will vary slightly from photo.



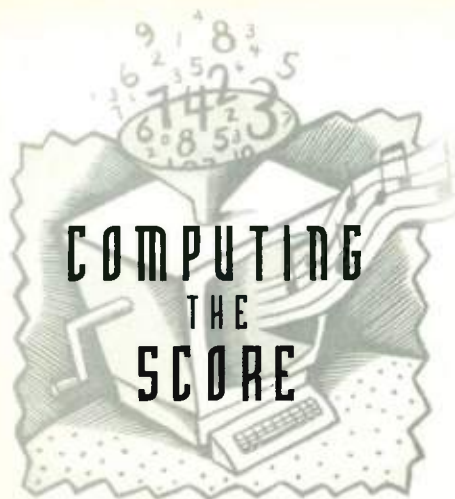
- 16/24/32 CHANNEL VERSIONS
- ULTRA LOW NOISE LINE AND XLR BALANCED MIC INPUTS
- 8 AUXES
- 8 DIRECT OUTPUTS
- 16 PATCH POINTS
- 4 SUBGROUPS
- OVER 20 MIX OUTPUTS
- COMPREHENSIVE 4-BAND EQUALIZATION
- PHANTOM POWER
- MAIN-SUB SELECTION SWITCHES
- 8 CHANNEL DEDICATED TAPE RETURN SECTION
- BOTH PRE AND POST-FADE MONITOR AND AUX SENDS
- CLIPPING INDICATOR LIGHTS EACH CHANNEL
- FULL CHANNEL SOLOING
- FULL CHANNEL MUTING
- LONG TRAVEL SHIELDED FADERS
- SWITCHABLE OUTPUT METERING
- SWITCHABLE MONITOR METERING
- ISOLATED 2 TRACK MONITOR TAPE RETURN
- SEPARATE STEREO CONTROL ROOM OUTPUT
- ASSIGNABLE TALKBACK-MAIN, MONITOR, AUX.
- INDEPENDANT SOLO LEVEL
- SEPARATE HIGH POWERED HEADPHONE OUTPUT
- RUGGED ALL STEEL HEAVY DUTY CHASSIS

- SI FEK, WOOD END PANELS (OPTIONAL)
- LINEAR CAPACITIVE ULTRA LOW NOISE CIRCUITRY
- HIGH-HEADROOM INPUT PROCESSING
- ADVANCED INPUT/OUTPUT COMPARATIVE DESIGN PROVIDES EXTREMELY WIDE DYNAMIC RANGE
- SEALED BODY LOW NOISE POTS
- 100% R.F. SHIELDING VIA METAL ENCLOSURE
- HEAVY DUTY HARDCONTACT SWITCHES THROUGHOUT
- COMPUTER CONTROLLED PRECISION SOLDERING
- PRECISION AUTOMATED ASSEMBLY INSURES CONSISTENCY
- MIL-SPEC GLASS EPOXY CIRCUIT BOARDS
- HIGH FIDELITY EQUALIZATION CIRCUITS
- NEW DESIGN AND ASSEMBLY TECHNIQUES PROVIDE THE TRANSPARENCY OF CONSOLES COSTING THOUSANDS OF DOLLARS MORE.
- AUTOMATED ASSEMBLY AND COMPUTERIZED TESTING MAKE THE PRICE UNBELIEVABLY LOW.

THE SOUND OF PERFECTION

APPLIED RESEARCH AND TECHNOLOGY 215 TREMONT ST. ROCHESTER N.Y. 14608 • 716-436-2720 • FAX 716-436-3942





## COMPUTING THE SCORE

the last eighth-note triplet (or 66 percent into the beat), move the track forward about four or five percent of one beat. That's about five clock ticks at 96 ppqn, or as many as 25 ticks at 480 ppqn. The more the music lays back (plays behind the beat), the more you'll need to shift the track to keep those off-beat eighth notes from becoming sixteenths.

### OTHER CHALLENGES

Keyboard parts pose a bigger challenge to notation software than single-line

instrumental parts. Even simple piano tracks often include multiple independent voices and other complexities that confuse the most savvy of notation programs.

The best thing to do is split the right and left hands onto separate tracks. If your sequencer has good graphic editing capabilities, this doesn't take long and saves you a lot of time in the long run. (If your music has hand crossovers, splitting hands won't work very well, but to be honest, crossovers are difficult to deal with anyway.) Once the hands are split, you may want to further separate any independent voices within the left- and right-hand parts. Transcribing multiple voices on one staff is almost impossible for a computer program to notate correctly.

No matter how incredible your notation program is or how much effort you expend editing a sequence prior to transcription, you'll probably never get exactly the kind of notation you want. There are two reasons for this problem. As we've seen, there is often a significant difference between the

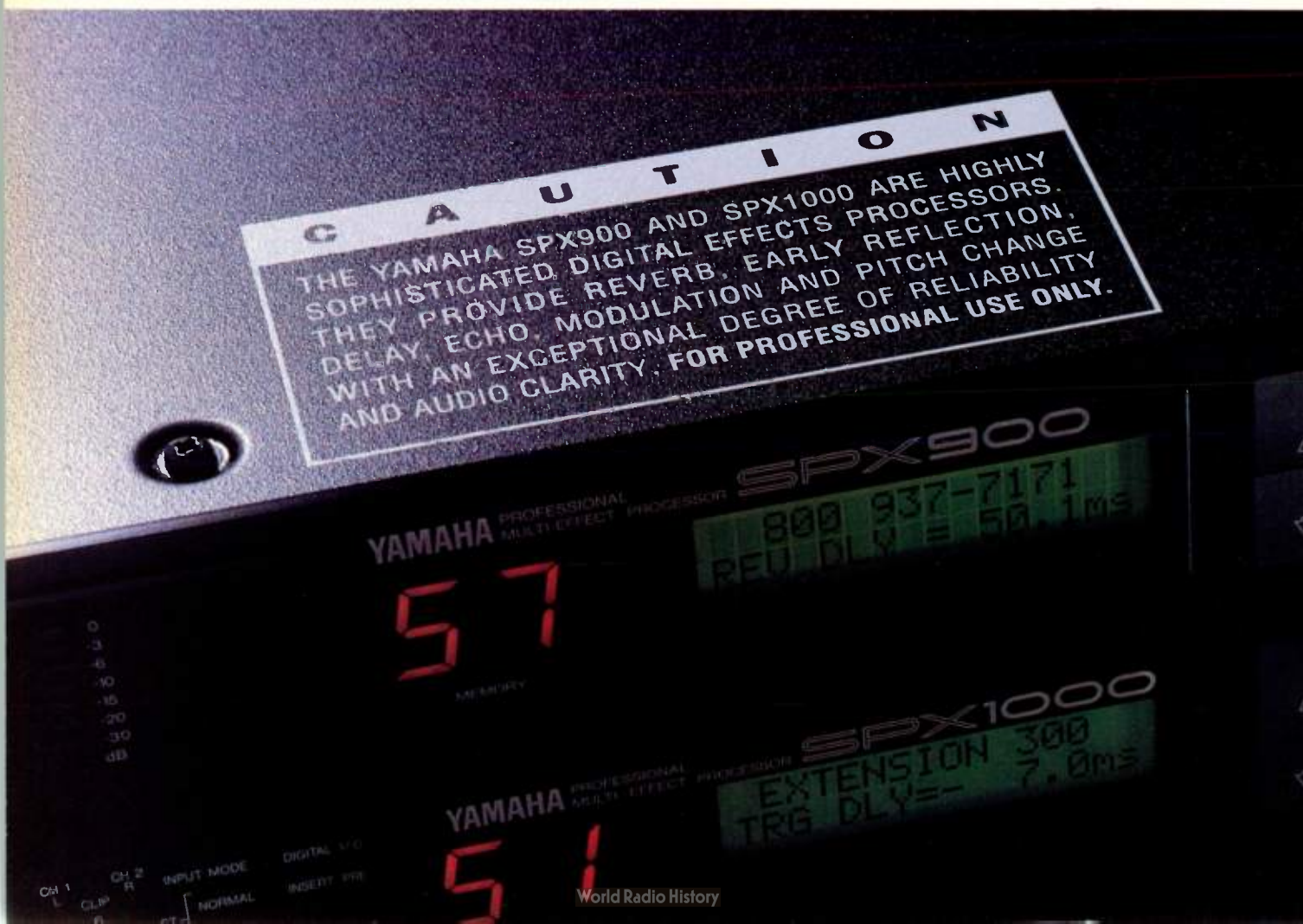
way something is played and the way it's notated. That difference has to do with style, and we can hardly expect today's personal computers to have a complete understanding of musical styles as they apply to transcription.

The second reason is that MIDI files don't contain information about important things like beaming, enharmonic accidentals, and articulations. So, even if the ultimate transcription program is introduced someday, you'll still have to correct a few sharps and flats, adjust the beaming, and put in your own articulation marks.

### GRAPHIC MUSIC

It isn't enough just to know how to get your music into a notation program. You also need to know how to get it out. Moving your score into a word-processing or DTP environment usually is a matter of deciding which graphics file format to use. Most notation programs save their files in three graphic formats: EPS, TIFF, and bitmap.

The EPS (Encapsulated PostScript) format generally produces the best





results. However, EPS files are large, slow to print, and must be printed on expensive laser printers to achieve the best results. You should use this format if you intend to print on a PostScript laser printer or high-resolution (1,200 to 2,400 dpi) PostScript imagesetter.

TIFF (Tag Image File Format) files also can be large and slow to print. Exporting TIFF files usually produces good results, although usually not as good as the EPS format. The primary advantage of TIFF files over EPS files is that they can be printed on less expensive non-PostScript printers without sacrificing quality.

The bitmap format is the simplest of all. It is low-resolution (generally 72 dpi), so the files are fairly small and easy to work with. Of course, the print quality is much lower than either TIFF or EPS. On the other hand, bitmap files can be imported or pasted into almost any word processor, graphics program, or DTP environment. If your notation program can't export graphics in any known format, you can produce a bitmap file by taking a screen

Here's "Row, Row, Row Your Boat" played in 4/4 with a swing feel as you ideally might like it to be notated. The problem, of course, is getting the swing 8th notes transcribed as straight 8ths and still get the triplets in the 3rd measure. Most programs can't do this automatically, so it's up to you to do a little quantizing beforehand.

Quantizing to 8th notes takes care of the swing 8ths. But the 3rd measure is ruined.

Quantizing to 8th note triplets fixes the third measure but does not straighten out the 8ths in measures 1, 2, and 4.

FIG. 1: By quantizing the same part two or more ways and then combining the results, you can usually get your sequences to notate properly.

shot of the score. This works fine for small examples, but it's impractical for exporting whole pages or entire scores.

#### LYRICS

Many notation programs allows you to

import text from a word processor. I highly recommend that you take this approach if possible. Typing and editing text is much easier in a good word processor than it is in most notation programs (and don't forget about the

© 1992 Yamaha Corporation of America, Professional Audio Products, P.O. Box 6600, Buena Park, California 90622-6600, (714) 622-9011.



CALL 1-800-937-7171, EXT. 300 FOR THE DEALER NEAREST YOU.



# LASTING POWER

In a field where products come and go as often as Madonna changes hairstyles, it's remarkable to find two keyboards that continue to perform as industry top sellers year after year. The Kawai K4 and K111 Digital Synthesizers.

Frankly, we aren't surprised. There are good reasons why the K4 and K111 have been so popular with musicians and why they continue to be. First of all, they offer the kinds of sounds most in demand. Both are highly flexible in sound programming, easily updatable with tons of new sound programs that show off that flexibility, and best of all, sensibly priced.

Just take a quick look at the specs: K111: 16 Voice Digital Synth, Multi-Timbral, Multi-Layering, 256 Waves, Digital FX, Velocity and Aftertouch, Retail Price \$895.00. K4: 16 Bit, 16 Voice Digital Synth, 256 DC and PCM Waves, Multi-Sampled, Multi-Timbral, Multi-Layering, Resonant Filter, Digital Drums, Digital FX, Velocity and Aftertouch, Release Velocity, Analog, Acoustic and Digital Sounds, Retail Price \$1445.00. Both units are also available in rack-mount form as the K4R and K111R.

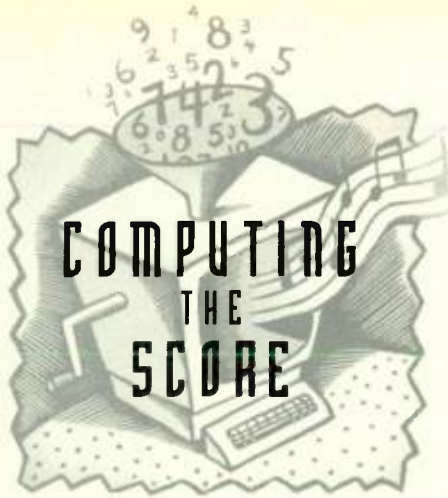
But great specs are only part of the answer. The bottom line on the continued success of the K4 and K111 is something thousands of musicians already know: **THEY PERFORM** — consistently, professionally and reliably. And while they don't try to be the flavor of the moment, they do provide an unbelievably rich arsenal of sounds to complement setups from the most miniscule to the most fully blown. Get some lasting power out of your keyboards — add a K4 or a K111 to your set up. Better yet, a K4 *and* a K111.

## KAWAI

Digital Magic.

Kawai Professional Products Group, 2055 E. University Drive, Compton, CA 90220, (213) 631-1771. Kawai Canada Music Ltd., 6401 Stawson Dr. Unit #1, Mississauga, Ont., Canada L5T1E8. Prices shown are suggested retail.





in the PC world, Intel's new line of affordable and speedy '486SX chips were designed from the ground up for easy upgrades.

#### A FINAL NOTE

It takes some ingenuity to get the most out of today's crop of music notation packages. But there is some good work being done by composers, arrangers, and publishers using off-the-shelf software. We're also starting to see software that can make rough transcrip-

tions of a live performance instantly in real time. It won't be long before computers have the horsepower and programs have the smarts to produce good-looking notation just about as fast as you can play it in from a keyboard.

*Steve Peha is the president of Music Technology Associates, a Boston-based group of music and computer professionals who provide product-development and consulting services to companies in the music technology industry.*

benefits of spell-checking).


Some notation programs attach lyrics to notes automatically by looking for spaces at the ends of words and in the middle. Unlike regular writing, lyrics need hyphens inserted in every word that contains more than one syllable. Some word processors do this automatically if you ask them to display all discretionary hyphens in your text. If you can export your lyrics with all the hyphens intact, you can save yourself some tedious retyping. Even if your word processor can't do this automatically, you're probably better off doing the hyphenation in a word processor because you can check your word breaks against the word processor's hyphenation dictionary.

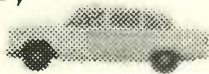
#### UPGRADING YOUR HARDWARE

It's easy to forget that notation programs are not really music programs at all. They're heavy-duty graphics and page-layout programs in disguise. Nobody would think of using *Illustrator* or *PageMaker* on a Mac Classic or a 16-MHz 80286 PC with 1 MB of RAM. Nevertheless, people run notation programs on machines like these all the time. While low-powered machines are just fine for sequencing, they aren't satisfactory at all for most notation-related tasks.

The best way to improve your productivity with notation software is to upgrade your computer hardware. RAM is the first place to start. (At less than \$40 per megabyte, it's also the cheapest improvement you can make.) If increasing your RAM still doesn't cut it, you may need to upgrade your microprocessor. For the Macintosh user, there are all sorts of accelerator boards starting at a few hundred dollars. While the idea of microprocessor upgrades is just beginning to catch on

## A&R People Won't Call You... But they do call us.

 So do producers, managers, publishers, film & TV companies, and lots of other people looking for new tunes and talent.

If you own a computer, our network will tell  you what they're looking for, no matter where you live.

You'll never feel stranded again.

# TAXI

The Computer Vehicle for the Music Industry  
Call 1-800-458-2111





## ***NORMAL BIAS***



## ***HIGH***

Maxell has a tape for those whose passion for music isn't normal or high, but intense.

The tape is XLII-S. The power behind it is Black Magnetite—a higher output magnetic material harnessed by Maxell engineers.

With 13% greater power than





## **BIAS**

the magnetic coating on any normal or high bias tape, Black Magnetite helps XLII-S deliver higher maximum output levels and a wider dynamic range.

This might explain why CD Review magazine called XLII-S “head, shoulders and torso above the rest”



## **BLACK MAGNETITE**

in their analysis of high bias cassettes.

“You’ll know you’re hearing something good,” said their reviewer, “when your heart leaps into your throat.”

That’s not normal. That’s not high. That’s Maxell XLII-S with Black Magnetite.



**TAKE YOUR MUSIC  
TO THE MAX.**



# Command

## THE EM GUIDE TO



By Larry "the O" Oppenheimer

Quite simply, the mixing console is the heart of an audio system. All the synthesizers, tape decks, and digital doo-dads in the world don't amount to more than a hill of silicon without some way to combine and route their outputs.

The importance of mixers is evident by the plethora of models offered by a host of manufacturers. The sheer abundance of mixing consoles is enough to turn purchase decisions into university-level research projects. At EM, we may be crazy, but we're nobody's fools; we've made no attempt to compile a comprehensive mixer guide of all sizes and types. In the interest of sanity, the scope of this survey is limited to models designed primarily as nerve centers for the home studio. The criteria are as follows: compact mixing consoles with faders, having up to 24 channels, and costing no more than \$6,000.

### CHART TALK

Our chart (pp. 40-45) offers a selection of parameters that we feel represent the most salient mixing-con-

sole features. This is not to say the details we don't mention are insignificant, but it's difficult to list every technical nuance in a general overview. The chart provides fundamental product information to get you started. Obviously, more thorough evaluations are recommended before you decide which mixer best fits your needs, working habits, and budget.

### CONFIGURATION

This column denotes the standard marketing niche of each console. The first number lists the total number of input channels the board offers, the second gives the number of subgroups, and third notes master outputs. For example, a designation of 16 × 8 × 2 describes a 16-channel board with eight subgroups and a stereo output bus.

Standard mono inputs are represented by a number only, while an "S" designation marks a stereo input. Thus, the entry 8/8S × 8 × 2 identifies a board with 24-channel input jacks, but only sixteen console "slices." (Pan controls on stereo



# Centers

## COMPACT MIXERS



JOSHUA ETS-HOKIN



● COMMAND CENTERS

input channels act as balance controls.) Some models, such as the Soundcraft Spirit Studio 16, allow simultaneous tape and source returns on the input modules. A 16-channel mixer with this feature would be designated 16 × 8 × 16 × 2.

**MIC INPUTS**

This category provides the number of balanced XLR microphone-level inputs. One current trend is to offer mic inputs only on some of the total channels, which is why the number of mic inputs does not always correspond to the number of channels.

It is wise to investigate a mic input's noise performance (especially in its area of maximum gain) and sound quality. Most boards with mic inputs also include a variable preamp trim pot.

**LINE INPUTS**

The number of channel inputs accepting line-level signals is listed under "Line Inputs/Type". This is assumed to be an unbalanced 1/4-inch phone jack, unless otherwise indicated. (Some



Carvin FX2444

models utilize RCA jacks.) Stereo lines that act as left/ right inputs feeding a single console slice are marked with an "S."

**INSERTS/DIRECT OUTS**

The "Inserts/Direct Outs" column gives

the number of input channels that accept some type of *insert loop patching*. Although not specified in the chart, some mixers use 1/4-inch TRS phone jacks for both sends and returns, while others utilize separate 1/4-inch TS jacks. The former arrangement requires special adapter cables; the latter takes up more panel space. Except on some high-end professional boards, insert loops are unbalanced.

Generally, boards with mono and stereo inputs offer insert patching only on the mono channels. Nominal levels at insert patches vary widely and are not always clearly documented. This information glitch is unfortunate because levels at insert patch points often are well below the nominal output level of the board, making it difficult to drive signal processors crippled with weak input gain.

*Direct outs* are useful in multitrack recording situations, as they can be employed as channel sends to outboard gear. These outputs usually are routed through unbalanced 1/4-inch jacks operating at levels similar to the insert points.

**EQUALIZATION**

Ah, equalization: the great unequalizer of mixing boards. Console EQ separates the champs from the chumps. Unfortunately, the limitations of language thwart attempts to describe the "sound" of a mixer's EQ, so we give a basic listing of the number of bands and type. Although this information

(continued on p. 44)

# UPWARD MOBILITY

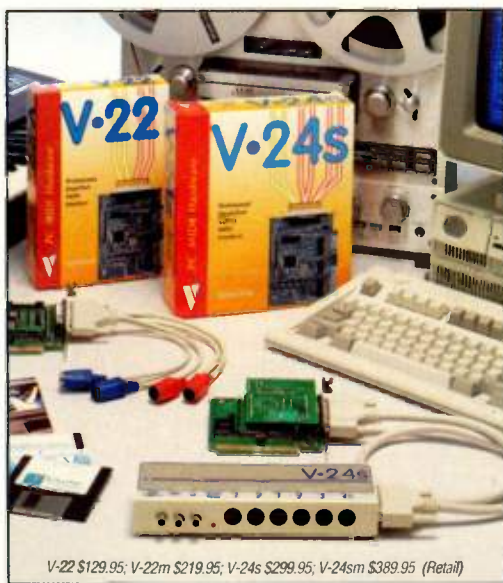
PC Music Tools

Start with our V-22 dual-port MIDI interface, and when you're ready, move up to a V-24s.

Four MIDI ports, 64 channels. SMPTE reader/generator. Audio click detector.

You can even add MPU-401 compatibility.

Upgradable. Affordable. A strategy that defines the future of PC MIDI interfaces.



V-22 \$129.95; V-22m \$219.95; V-24s \$299.95; V-24sm \$389.95 (Retail)

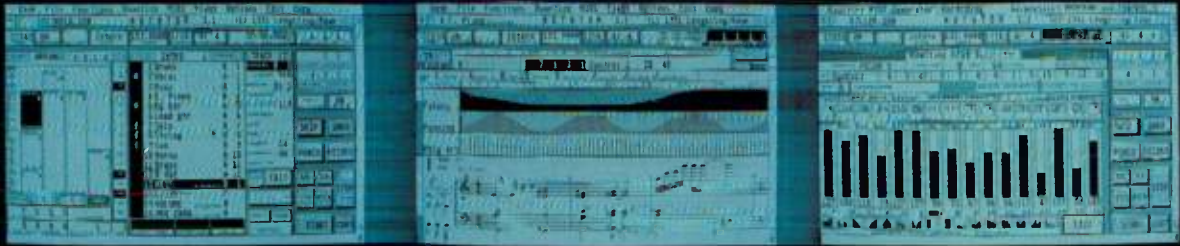
**Voyetra**

333 Fifth Avenue • Pelham • NY • 10803 • (914) 738-4500 • Fax: (914) 738-6946  
Call for Free Catalog: 1-800-233-9377





**PLAY IT.**



**PLAY WITH IT.**



**PRINT IT.**

## IT'S THAT SIMPLE.

NOTATOR SL for the Atari computer combines sequencing and music printing in one easy-to-use program. And it uses the language of music, not technology!

Play a part into NOTATOR and see it instantly on-screen as a staff of music. Then work with the notation to modify your performance. Highlight a section, drag it to transpose or slide it to change location. With NOTATOR, you perfect your composition by looking at *music*, not a laborious event-list!

NOTATOR has unique editing functions like *Adaptive Groove* quantization, so you can set a feel based on your playing

*A variety of optional hardware devices allow you to have up to 96 discrete MIDI channels, video synchronization, trigger-to-MIDI conversion and more!*



style, then adapt other parts to match that feel. The *Transform* controls allow you to take any note or controller and turn it into any other event. And the *Real Time MIDI Generator* gives you on-screen faders and switches to mix your music – and even edit other MIDI gear.

From a simple lead sheet to a complete film score, NOTATOR can handle your writing needs. Dynamic markings, lyrics, chord symbols, even guitar chord grids can be placed with pinpoint accuracy.

Split parts across two staves for easier reading, and handle tuplets and beaming with the skill of a professional music engraver – all without touching pencil to paper.

And there's no convert-

ing files between separate programs or different computers. NOTATOR SL for Atari computers – state-of-the-art sequencing and notation in one program. Call 1-800-553-5151 for an Authorized C-LAB dealer near you. Yes, it's that simple.

**Please send me information on NOTATOR SL and all the products C-LAB offers.**

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Mail to ENSONIQ, Department EC-102  
155 Great Valley Parkway, Malvern, PA 19355  
In Canada mail to: MUSICWARE, 641 Caledonia Rd.,  
M6E 4V8 Toronto Ontario Tel.: (416) 785-3311





# GUIDE TO COMPACT MIXERS

Manufacturer/ Model	Configuration	Mic Inputs (XLR)	Line Inputs/ Type	Inserts/ Direct Outs	Equalization (Bands/Type)
Alesis 1622	16x2x2	8	16/1/4"	16/8	2/high and low shelving
Allen & Heath GS3	16x8x2	16	16/1/4"	16/16	3/swept mid, low
Allen & Heath Scepter	12x2x1	12	12/1/4"	12/12	3/swept mid, switchable low
Biamp Cascade 12/342c	12x2x1	12	12/1/4"	12/0	3/fixed
Biamp Cascade 16/342c	16x2x1	16	16/1/4"	16/0	3/fixed
Biamp Integrity Tri-Power	12x2x1	12	12/1/4"	12/12	3/fixed and 9/graphic (2)
Biamp Maxxam 8+8	8Sx8Mx2	2	8S 8M/1/4"	8S-8M/0	n/a
Biamp Newport 16/344	16x4x2x1	16	16/1/4"-2S/RCA	16/0	3/fixed
Biamp Newport 24/344	24x4x2x1	24	24/1/4"-2S/RCA	24/0	3/fixed
Biamp Rackmax II/12	12x2x1	12	12/1/4"	12/0	3/fixed
Biamp Rackmax II/16	16x2x1	16	16/1/4"	16/0	3/fixed
Biamp Rackmax II/EX	16x2x1	16	16/1/4"	16/0	4/fixed
Boss BX-16	16x2	0	16/1/4"	0/0	2/fixed
Boss BX-8	8x2	0	8/1/4"	0/0	2/fixed
Boss BX-80	8x2	0	8/1/4"	0/0	2/fixed
Carvin FX1244	12x4x2x1	12	16/1/4"	16/16	4/fixed and 9/graphic (2)
Carvin FX1244D	12x4x2x1	12	16/1/4"	16/16	4/fixed and 9/graphic (2)
Carvin FX1644	16x4x2x1	16	20/1/4"	20/20	4/fixed and 9/graphic (2)
Carvin FX2444	24x4x2x1	24	28/1/4"	28/28	4/fixed and 9/graphic (2)
Carvin MX2488	24x8x8x2	24	36/1/4"	32/32	3/sweepable
Electro-Voice Interface 8P	8x4x2x1	8	8/1/4"	8/8	4/high-low shelving, swept mid
Electro-Voice BK-042	8x2x1	8	8/1/4"	8/0	3/high-low shelving, swept mid
Electro-Voice BK-1242	12x2x1	12	12/1/4"	12/0	3/high-low shelving, swept mid
Electro-Voice BK-1642	16x2x1	16	16/1/4"	16/0	3/high-low shelving, swept mid
Electro-Voice BK-2442	24x2x1	24	24/1/4"	24/0	3/high-low shelving, swept mid
Fostex 454	8x4x2	8	8/1/4"	8/8	3/fixed high, swept mid, low
Fostex 812	12x6x2 or 12x8	12	12/1/4"	12/12	3/fixed high, swept mid, low
Fostex 820	20x6x2 or 20x8	20	20/1/4"	20/20	3/fixed high, swept mid, low
Kawai MX-4S	4Sx2	0	8/1/4"	0/0	n/a
Kawai MX-8BR	8x2	0	8/1/4"	0/0	n/a
Kawai MX-8SR	8Sx2	0	16/1/4"	0/0	n/a
Kawai MX-16	16x2	0	16/1/4"	0/0	2/high low shelving
Mackie 16*8	16x8x2	16	32/1/4"	16/16	4/high-low shelving, swept mids
Mackie 24*8	24x8x2	24	48/1/4"	24/24	4/high-low shelving, swept mids
Mackie CR-1604	16x4x2	6	16/1/4"	8/8	3/fixed
Peavey SRC-1600	16x4x2	16	16/1/4"	16/0	3/shelving/sweepable
Peavey SRC 2400	24x4x2	24	24/1/4"	24/0	3/shelving/sweepable
Peavey MDIII-12	12x2x1	12	12/1/4"	12/0	3/shelving/sweepable
Peavey MDIII-16	16x2x1	16	16/1/4"	16/0	3/shelving/sweepable
Peavey Unity 1000 S.M.	18x2	12	18/1/4"	0/0	3/fixed
Peavey Unity 2000 S.M.	20x2	12	20/1/4"	0/0	3/fixed
Peavey Unity 1000-8	8x2	8	8/1/4"	0/0	3/fixed
Peavey Unity 1000-12	12x2	12	12/1/4"	0/0	3/fixed
Peavey Unity 2000-12	12x2	12	12/1/4"	0/0	3/fixed
Peavey Unity 2000-16	16x2	16	16/1/4"	0/0	3/fixed
Peavey AMR 1242	12x4x2	8	28/1/4"	12/4	3/swept mid
Peavey AMR 64	6x4x2	6	14/1/4"	6/0	3/swept mid
Roland M-120	12x2	0	12/1/4"	0/2	n/a
Roland M-12E	12x2	0	12/1/4"	4/2	2/fixed
Roland M-160 II	16x2	0	16/1/4"	0/2	n/a
Roland M-16E	16x2	8	16/1/4"	16/0	3/fixed
Roland M-240	24x2	0	24/1/4"	0/0	n/a
Roland M-240R	24x2	0	24/1/4"	0/2	n/a
Roland M-24E	24x2	12	24/1/4"	24/0	3/fixed
Ross Systems Minimix	16x2	16	16/1/4"	0/0	2/fixed
Ross Systems PC7250	7x1	7	7/1/4"	0/0	3/fixed
Ross Systems PC8400	8x2	8	8/1/4"	0/0	3/fixed
Ross Systems RCS 802	8x2	8	8/1/4"	8/0	3/fixed

KEY: A=automatable; F=onboard frequency oscillator; H=headphone out; MM=MIDI muting; MP=mic pads; P=powered; PP=phantom power; R=rack-mountable; S=switchable +4 dBm/-10 dBV; T=talkback



Aux Sends/ Aux Returns	Mute/Solo	Tape Returns	Meters (Number/Type)	Notes	Price
6/8	yes/PFL	2	2/PPM	H,R,S	\$899
4/4	yes/PFL	40	10/PPM	F,H,MM,PP,T	\$4,595
4/4	yes/PFL	14	2/PPM	MP,PP,R	\$2,700
4/1M-2S	no/PFL	1	2/PPM	A,H,PP	\$1,759
4/1M-2S	no/PFL	1	2/PPM	A,H,PP	\$2,099
3/2S	no/PFL	2	2/PPM	A,H,P,PP	\$2,499
4/4S	no/no	1	2/PPM	A,H,PP,R	\$1,332
4/4	no/PFL	2	6/PPM	A,H,PP	\$2,699
4/4	no/PFL	2	6/PPM	A,H,PP	\$3,383
4/1M-2S	no/PFL	2	2/PPM	A,H,PP,R	\$1,659
4/1M-2S	no/PFL	2	2/PPM	A,H,PP,R	\$1,999
6/1M-2S	yes/PFL	3	2/PPM	A,H,MP,PP,R	\$2,859
2/2	no/no	0	2/PPM	H	\$795
2/2	no/no	0	2/PPM	H	\$495
1/1	no/no	0	2/PPM	H	\$450
6/4	no/PFL	4	4/VU	H,MP,S,T	\$1,469
6/4	no/PFL	4	4/VU	H,MP,P,PP,S,T	\$1,679
6/4	no/PFL	4	4/VU	H,MP,PP,S,T	\$1,689
6/4	no/PFL	4	4/VU	H,MP,PP,S,T	\$2,289
4/2	yes/PFL	8	8/VU	H,MP,PP,S,T	\$3,679
6/8	yes/PFL	8	6/PPM	F,H,MP,PP,R,T	\$4,506
3/3	no/PFL	2	2/VU (peak LED)	H,PP,R	\$1,314
3/3	no/PFL	2	2/VU (peak LED)	H,PP	\$1,572
3/3	no/PFL	2	2/VU (peak LED)	H,PP	\$1,894
3/3	no/PFL	2	2/VU (peak LED)	H,PP	\$2,600
2/4	no/PFL	8	4/LED	H,PP	\$1,195
3/6	yes/SIP	12	8/LED	H,MM,PP	\$1,995
3/6	yes/SIP	20	8/LED	H,MM,PP	\$2,995
1S/2S	no/no	0	6/LED	H,MP	\$249
2/2S	no/no	0	2/PPM	H,MP,R	\$425
1M-1S/2S	no/no	0	2/PPM	H,MP,R	\$595
3/3S	no/no	0	2/PPM	H,MP,S	\$795
6/6	yes/SIP	16	10/PPM	A,H,PP,S,T	\$2,995
6/6	yes/SIP	24	10/PPM	A,H,PP,S,T	\$3,495
7/4	yes/SIP	0	2/LED	A,H,PP,R,S	\$1,099
6/8	no/PFL	4	4/PPM	H,PP	\$1,999
6/8	no/PFL	4	4/PPM	H,PP	\$2,599
6/4	no/PFL	4	2/PPM	H,PP	\$1,299
6/4	no/PFL	4	2/PPM	H,PP	\$1,549
2/1	yes/no	1	2/PPM	H	\$699
4/2	yes/no	1	4/PPM	H	\$799
2/1	no/no	1	2/PPM	H	\$449
2/1	no/no	1	2/PPM	H	\$599
4/2	no/no	1	4/PPM	H	\$699
4/2	no/no	1	4/PPM	H	\$899
2/2	yes/no	4	2/PPM	H	\$1,449
1/1	yes/no	4	2/PPM	H,R	\$599
2/2	no/no	0	2/PPM	H,R	\$595
2/2	no/no	0	2/PPM	H,R	\$985
4/4	no/no	0	2/PPM	H,R	\$1,195
4/4	yes/no	0	3/PPM	H,PP,R	\$2,295
4/4	no/no	0	2/PPM	H	\$1,495
4/6	yes/no	0	2/PPM	H,R	\$2,595
4/4	yes/no	0	3/PPM	H,PP	\$2,795
4/4S	yes/PFL	0	2/PPM	H,PP,R	\$995
1/1	no/no	1	2/LED	P	\$730
2/1	no/no	0	2/PPM	P	\$1,250
3/2S	no/PFL	0	2/PPM	H,PP,R,S	\$600



# GUIDE TO COMPACT MIXERS

Manufacturer/ Model	Configuration	Mic Inputs (XLR)	Line Inputs/ Type	Inserts/ Direct Outs	Equalization (Bands/Type)
Ross Systems RCS 1202	12x2	12	12/ 1/4"	12/0	3/fixed
Ross Systems RCS 1602	16x2	16	16/ 1/4"	16/0	3/fixed
Ross Systems RCS 2402	24x2	24	24/ 1/4"	24/0	3/fixed
Samick SM 820	8x2x2	8	8/ 1/4"	8/0	3/fixed
Samick SM 1200	12x2x2	12	12/ 1/4"	12/0	3/fixed
Samick SM 1600	16x2x2	16	16/ 1/4"	16/0	3/fixed
Samick SMP 900	8x2x2	8	8/ 1/4"	0/8	3/fixed and 5/graphic (2)
Samick System 84	8x4x2	8	8/ 1/4"	8/0	4/fixed
Samick System 124	12x4x2	12	12/ 1/4"	12/0	4/fixed
Samick System 164	16x4x2	16	16/ 1/4"	16/0	4/fixed
Samick System 244	24x4x2	24	24/ 1/4"	24/0	4/fixed
Soundcraft Delta SR-16	16x4x2	16	16/ 1/4"	16/16	3/1 fixed, 2 variable
Soundcraft Delta SR-8	8x4x2	8	8/ 1/4"	8/8	3/1 fixed, 2 variable
Soundcraft Spirit Live 8	8x3	8	8/ 1/4"	8/0	3/1 fixed, 2 variable
Soundcraft Spirit Live 16	16x3	16	16/ 1/4"	16/0	3/1 fixed, 2 variable
Soundcraft Spirit Live 24	24x3	24	24/ 1/4"	24/0	3/1 fixed, 2 variable
Soundcraft Spirit Monitor 16	16x8	16	16/ 1/4"	16/0	3/1 fixed, 2 variable
Soundcraft Spirit Monitor 24	24x8	24	24/ 1/4"	24/0	3/1 fixed, 2 variable
Soundcraft Spirit Studio 16	16x8x16x2	16	16/ 1/4"	16/16	4/2 fixed, 2 variable
Soundcraft Spirit Studio 24	24x8x24x2	24	24/ 1/4"	24/24	4/2 fixed, 2 variable
Soundtech PC830	8x2x1	8	8/ 1/4", 2/RCA	8/0	3/swept mid
Soundtech PC1250	12x2x1	12	12/ 1/4", 2/RCA	12/0	3/swept mid
Soundtech ST122	12x2x1	12	12/ 1/4", 2/RCA	12/0	3/swept mid
Soundtech ST162	16x2x1	16	16/ 1/4", 2/RCA	16/0	3/swept mid
Soundtracs Solo LIVE 16	16x4x2x1	16	16/ 1/4"	16/16	4/swept mids
Soundtracs Solo LIVE 24	24x4x2x1	24	24/ 1/4"	24/24	4/swept mids
Soundtracs Solo MIDI 16	16x8x16x2	16	16/ 1/4"	16/16	4/swept mids
Soundtracs Solo MIDI 24	24x8x24x2	24	24/ 1/4"	24/24	4/swept mids
Speck Electronics Model SSM	24x2	0	24/ 1/4"	24/24	3/sweepable
Studiomaster 82D	8x2	8	8/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster 122D	12x2	12	12/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster 162D	16x2	16	16/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster 82RB	8x2x1	8	8/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster 1642D	16x4x2x1	16	16/ 1/4", 2/RCA	16/0	3/fixed
Studiomaster SM 82RG	8x2	8	8/ 1/4", 2/RCA	8/0	3/swept mid
Studiomaster SM 122RG	12x2	12	12/ 1/4", 2/RCA	12/0	3/swept mid
Studiomaster SM 162G	16x2	16	16/ 1/4", 2/RCA	16/16	3/swept mid
Studiomaster SM 162G-24	24x2	24	24/ 1/4", 2/RCA	24/24	3/swept mid
Studiomaster 82PH	8x2	8	8/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster 122PH	12x2	12	12/ 1/4", 2/RCA	0/0	3/fixed
Studiomaster SH 1621	16x2x1	16	16/ 1/4", 2/RCA	16/16	4/swept mids
Studiomaster SH 1621-24	24x2x1	24	24/ 1/4", 2/RCA	24/24	4/swept mids
Studiomaster SH 1624	16x4x2x1	16	16/ 1/4", 2/RCA	16/16	4/swept mids
Studiomaster SH 1624-24	24x4x2x1	24	24/ 1/4", 2/RCA	24/24	4/swept mids
Studiomaster SH 1682	16x8x2x1	16	16/ 1/4", 2/RCA	16/16	4/swept mids
Studiomaster SH 1682-24	24x8x2x1	24	24/ 1/4", 2/RCA	24/24	4/swept mids
Studiomaster SM 168 Monitor	16x8	16	2/RCA	16/16	3/swept mid, low
Studiomaster SM 168-24 Monitor	24x8	24	2/RCA	24/24	3/swept mid, low
Studiomaster PL 162RG	12x4x2	12	20/ 1/4"	12/12	3/swept mid
Studiomaster PL 4G	16x4x8x2	16	24/ 1/4"	16/16	3/swept mid
Studiomaster PL 4G-24	24x4x8x2	24	32/ 1/4"	24/24	3/swept mid
Studiomaster PL 8G	16x8x16x2	16	32/ 1/4"	16/16	3/swept mid
Studiomaster PL 8G-24	24x8x16x2	24	40/ 1/4"	24/24	3/swept mid
Studiomaster MD 4G	16x4x8x2	16	27/ 1/4"	16/16	3/swept mid, low
Studiomaster MD 4G-24	24x4x8x2	24	32/ 1/4"	24/24	3/swept mid, low

KEY: A=automatable; F=onboard frequency oscillator; H=headphone out; MM=MIDI muting; MP=mic pads; P=powered; PP=phantom power; R=rack-mountable; S=switchable +4 dBm/-10 dBV; T=talkback



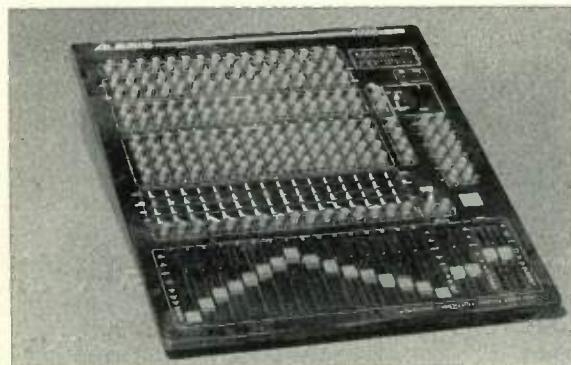
Aux Sends/ Aux Returns	Mute/Solo	Tape Returns	Meters (Number/Type)	Notes	Price
3/2S	no/PFL	0	2/PPM	H,PP,S	\$800
3/2S	no/PFL	0	2/PPM	H,PP,S	\$1,000
3/2S	no/PFL	0	2/PPM	H,PP,S	\$1,250
1/1	no/no	0	2/PPM	H,R	\$399
1/1	no/no	0	2/PPM	H	\$499
1/1	no/no	0	2/PPM	H	\$699
1/1	no/PFL	0	4/PPM	H,P	\$899
4/8	yes/PFL	8	6/PPM	F,H,R,MP,PP	\$1,299
4/8	yes/PFL	8	6/PPM	F,H,MP,PP	\$1,499
4/8	yes/PFL	8	6/PPM	F,H,MP,PP	\$1,949
4/8	yes/PFL	8	6/PPM	F,H,MP,PP	\$2,299
4/4S	yes/PFL	6	20/PPM	H,PP,S,T	\$4,650
4/4S	yes/PFL	6	20/PPM	H,PP,S,T	\$2,950
4/4S	yes/PFL	2	20/PPM	H,PP,R	\$1,295
4/4S	yes/PFL	2	20/PPM	H,PP,R	\$2,395
4/4S	yes/PFL	2	20/PPM	H,PP,R	\$3,495
0/0	yes/PFL	9	20/PPM	H,PP,T	\$4,250
0/0	yes/PFL	9	20/PPM	H,PP,T	\$5,650
6/4S	yes/PFL	10	20/PPM	H,PP,S,T	\$3,995
6/4S	yes/PFL	10	20/PPM	H,PP,S,T	\$5,650
3/2	no/no	2	2/PPM	H,MP,P,PP,R	\$1,499
3/2	no/no	2	2/PPM	H,MP,P,PP	\$1,999
3/2	no/no	2	2/PPM	H,MP,PP,R	\$1,099
3/2	no/no	2	2/PPM	H,MP,PP,R	\$1,299
6/4S	yes/PFL	2	6/PPM	H,PP,T	\$2,699
6/4S	yes/PFL	2	6/PPM	H,PP,T	\$3,599
6/4S	yes/PFL,SIP	16	10/PPM	A,F,H,MM,P,PP,S,T	\$4,299
6/4S	yes/PFL,SIP	24	10/PPM	A,F,H,MM,P,PP,S,T	\$5,999
8/8S	yes/SIP	0	2/PPM	H,R,S,T	\$4,975
2/2	no/no	2	2/PPM	H,PP,R	\$629
2/2	no/no	2	2/PPM	H,PP	\$839
2/2	no/no	2	2/PPM	H,PP	\$1,049
2/2	no/no	2	2/PPM	H,PP,R	\$679
4/6	no/PFL	2	2/PPM	H,PP	\$1,495
4/2	no/no	2	2/PPM	H,PP,R	\$765
4/4	no/no	2	2/PPM	H,PP,R	\$995
4/6	yes/PFL	2	2/PPM	H,PP	\$1,395
4/6	yes/PFL	2	2/PPM	H,PP	\$2,020
3/2	no/no	2	2/PPM	H,P,PP	\$1,495
3/2	no/no	2	2/PPM	H,P,PP	\$1,795
6/8	yes/PFL	2	3/PPM	H,MP,PP,T	\$2,495
6/8	yes/PFL	2	3/PPM	H,MP,PP,T	\$3,760
6/8	yes/PFL	2	7/PPM	H,MP,PP,T	\$3,425
6/8	yes/PFL	2	7/PPM	H,MP,PP,T	\$4,875
6/12	yes/PFL	2	11/PPM	H,MP,PP,T	\$4,050
6/12	yes/PFL	2	11/PPM	H,MP,PP,T	\$5,600
8/0	yes/PFL	2	8/PPM	H,PP,T	\$3,750
8/0	yes/PFL	2	8/PPM	H,PP,T	\$4,815
4/0	yes/PFL	0	2/PPM	H,PP,R	\$2,595
4/4	yes/PFL	8	6/PPM	F,H,MM,PP,S,T	\$2,595
4/4	yes/PFL	8	6/PPM	F,H,MM,PP,S,T	\$3,470
4/4	yes/PFL	16	10/PPM	F,H,MM,PP,S,T	\$3,695
4/4	yes/PFL	16	10/PPM	F,H,MM,PP,S,T	\$4,620
6/2	yes/PFL	8	6/PPM	F,H,MM,MP,PP,S,T	\$3,995
6/2	yes/PFL	8	6/PPM	F,H,MM,MP,PP,S,T	\$5,345



## GUIDE TO COMPACT MIXERS

Manufacturer/ Model	Configuration	Mic Inputs (XLR)	Line Inputs/ Type	Inserts/ Direct Outs	Equalization (Bands/Type)
Studiomaster MD 8G	16x8x16x2	16	32/ 1/4"	16/16	3/swept mid, low
Tascam M06	6x2	0	6/ 1/4", 6/RCA	0/0	2/fixed
Tascam M06ST	6x2	0	6/ 1/4", 12/RCA	0/0	2/fixed
Tascam M108	12x4	4	12/ 1/4"	4/4	2/fixed
Tascam M1016	8Mx4Sx2	8	16/ 1/4"	8/0	3/swept mid
Tascam M1024	16Mx4Sx2	8	24/ 1/4"	16/0	3/swept mid
Tascam M1508	8x4x8	8	8/ 1/4"	8/8	3/swept mid
Tascam M1516	16x4x16	16	16/ 1/4"	8/8	3/swept mid
Tascam M2516	16x8x2x16	16	16/ 1/4"	16/16	3/high shelving, swept mid
Tascam M2524	24x8x2	24	24/ 1/4"	24/24	3/high shelving, 2/swept
Tascam MM1	20x2	0	20/ 1/4"	0/16	2/fixed
Tascam MM100	16x2	0	16/ 1/4"	0/0	2/fixed
Tascam MM200	16x2	0	16/ 1/4"	0/0	2/fixed
Vestax RMC-88	8x8x2	4	8/ 1/4"	0/8	3/fixed
Yamaha EM2820	8x2	8	8/ 1/4"	0/0	3/fixed
Yamaha EMX2200	8x2	8	4/ 1/4"	4/0	3/fixed
Yamaha EMX2300	12x2	12	8/ 1/4"	4/0	3/fixed
Yamaha MC802	8x2	8	8/ 1/4"	8/0	3/swept mid
Yamaha MC1202	12x2	12	12/ 1/4"	12/0	3/swept mid
Yamaha MC1602	16x2	16	16/ 1/4"	16/0	3/swept mid
Yamaha MC1604II	16x4x2	16	16/ 1/4"	22/0	4/swept mids
Yamaha MC2404II	24x4x2	24	24/ 1/4"	30/0	4/swept mids
Yamaha MR842	8x4x2	8	8/ 1/4"	12/0	3/swept mid
Yamaha MR1242	12x4x2	12	12/ 1/4"	16/0	3/swept mid
Yamaha MR1642	16x4x2	16	16/ 1/4"	20/0	3/swept mid

KEY: A=automatable; F=onboard frequency oscillator; H=headphone out; MM=MIDI muting; MP=mic pads; P=powered; PP=phantom power; R=rack-mountable; S=switchable +4 dBm/-10 dBV; T=talkback



Alesis 1622

provides valuable insight into a mixer's sound-sculpting parameters, it can't label an EQ personality as "clean and sweet" or "harsh and edgy." The fact that perceived sonic quality is completely subjective further complicates critical appraisal.

It is extremely important to audition a mixer's EQ with your own ears. (It's astounding to me that some people actually buy consoles "sound unheard" through mail-order houses.) There are a number of ways of implementing equalization, and design decisions have

a profound impact on audio quality.

### AUX SENDS/RETURNS

*Aux sends* are defined as buses labeled aux send, effects send, monitor send, or fold-back. The majority of aux sends are 1/4-inch unbalanced phone jacks. Aux sends can be pre- or post-EQ and pre- or post-fader. Most sends

are mono. Many mixers allow user customization of the sends via internal jumpers. (Check your manual for specifics.)

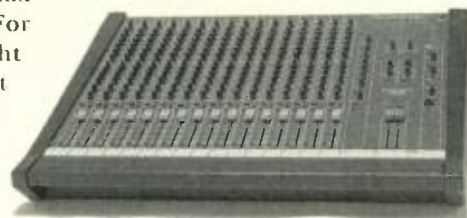
Some designs do not make all aux sends simultaneously available. For instance, some consoles offer eight sends, but only four can be used at one time. Switches allow selection of send one or five, two or six, three or seven, and four or eight.

*Aux returns* generally are unbalanced 1/4-inch phone jack inputs with level and pan controls (if mono).

Stereo aux returns, designated with an "S" in the chart, are hardwired left/right. Mono sends and returns on boards that also offer stereo returns are labeled with an "M".

### MUTE/SOLO

*Mutes* are channel on/off switches, generally located post-fader. The *Solo* function usually is destructive on a recording board (meaning that a soloed input replaces the master left/right mix in the monitors) and non-destructive on a sound reinforcement board (most commonly as a solo to headphones). Many boards within the chart's price range employ a pre-fade listen (PFL). Solo-in-place (SIP) is a high-end feature which maintains



Studiomaster SH1621



Aux Sends/ Aux Returns	Mute/Solo	Tape Returns	Meters (Number/Type)	Notes	Price
6/2	yes/PFL	16	10/PPM	F,H,MM,MP,PP,S,T	\$4,995
1/1	no/no	0	2/VU	H	\$389
1/1	no/no	0	2/VU	H	\$499
3/25	no/no	8	2/PPM	H	\$799
6/2M-4S	no/PFL	0	2/PPM	H,MP,PP	\$1,399
6/2M-4S	no/PFL	0	2/PPM	H,MP,PP	\$1,999
3/2M-2S	no/PFL	8	6/PPM	H,R	\$1,199
3/2M-2S	no/PFL	8	6/PPM	H	\$1,899
4/2M-2S	yes/PFL, SIP	16	10/PPM	H,MM,MP,PP,T	\$3,199
4/4	yes/PFL, SIP	24	10/PPM	H,MM,MP,PP,T	\$4,199
4/4S	yes/SIP	0	2/PPM	H,MM,R	\$1,099
4/4S	no/no	0	2/PPM	H,R	\$599
4/4S	no/no	0	2/PPM	H,R	\$799
3/2	no/PFL	8	2/LED	H,R	\$899
2/2	no/no	2	2/LED	MP,P,PP	\$1,195
2/2S	no/no	0	2/VU	H,MP,P,PP	\$1,795
2/2S	no/no	0	2/VU	H,MP,P,PP	\$1,995
3/2S	no/cue	0	3/VU, 8/LED	H,MP,PP,T	\$825
3/2S	no/cue	0	3/VU, 12/LED	H,MP,PP,T	\$1,095
3/2S	no/cue	0	3/VU, 16/LED	H,MP,PP,T	\$1,295
4/4S	no/cue	2	8/VU, 16/LED	H,MP,PP,T	\$3,600
4/4S	no/cue	2	8/VU, 24/LED	H,MP,PP,T	\$4,300
3/2S	no/cue	8	6/VU, 8/LED	H,MP,PP,T	\$1,295
3/2S	no/cue	12	6/VU, 12/LED	H,MP,PP,T	\$1,595
3/2S	no/cue	16	6/VU, 16/LED	H,MP,PP,T	\$1,795

## LIST OF MANUFACTURERS

### Alesis

3630 Holdrege Ave.  
Los Angeles, CA 90016  
tel. (213) 467-8000

### Allen and Heath

5639 South Riley Ln.  
Salt Lake City, UT 84107  
tel. (801) 268-8400

### Biamp Systems

14270 NW Science Park Dr.  
Portland, OR 97229  
tel. (503) 641-7287

### Carvin Corp.

1155 Industrial Ave.  
Escondido, CA 92029  
tel. (619) 747-1710

### Electro-Voice Inc.

600 Cecil St.  
Buchanan, MI 49107  
tel. (616) 695-6831

### Fostex Corp. of America

15431 Blackburn Ave.  
Norwalk, CA 90650  
tel. (310) 921-1112

### Kawai America Corp.

2055 E. University Dr.  
Compton, CA 90220  
tel. (310) 631-1771

### Mackie Designs Inc.

16130 Woodinville  
Redmond Rd. 2 NE  
Woodinville, WA 98072  
tel. (206) 487-4333

### Peavey Electronics

711 A St.  
Meridian, MS 39301  
tel. (601) 483-5365

### Roland Corp./Boss

7200 Dominion Circle.  
Los Angeles, CA 90040  
tel. (213) 685-5141

### Ross Systems

1316 E. Lancaster Ave.  
Fort Worth, TX 76102  
tel. (817) 336-5114

### Samick Music Corp.

18521 Railroad St.  
City of Industry, CA 91748  
tel. (818) 964-4700

### Soundcraft

8500 Balboa Blvd.  
Northridge, CA 91329  
tel. (818) 893-4351

### Soundtech

255 Corporate Woods Pkwy.  
Vernon Hills, IL 60061  
tel. (708) 913-5511

### Soundtracs PLC

262 Duffy  
Hicksville, NY 11801  
tel. (516) 932-3810

### Speck Electronics

925 S. Main St., Ste 255  
Fallbrook, CA 92028  
tel. (619) 723-4281

### Studiomaster Inc.

3941 Miraloma Ave.  
Anaheim, CA 92807  
tel. (714) 524-2227

### Tascam

7733 Telegraph Rd.  
Montebello, CA 90640  
tel. (213) 726-0303

### Vestax Corp.

2860 Cordelia Rd., Ste.120  
Fairfield, CA 94585  
tel. (707) 427-1920

### Yamaha Corp. of America

6600 Orangethorpe Ave.  
Buena Park, CA  
tel. (714) 522-9011





# Introducing The Midi Time

MACINTOSH MIDI INTERFACE • STAND-ALONE MIDI PATCHBAY AND 8X8 MERGER • SMPTE TIME  
8 OUT) • 128 MIDI CHANNELS • NETWORK UP TO 4 UNITS FOR 512 CHANNELS • HIGH MIDI DATA  
CHANGE • ADJUSTABLE SMPTE FREEWHEELING AND "JAM SYNC" • CUSTOM 20-MHZ MIDI PRO

Mark of the Unicorn, Inc. 222 Third Street, Cambridge

World Radio History



# Piece II. It Stands Alone.



**Mark of the Unicorn**

CODE CONVERTER • FULLY PROGRAMMABLE FROM THE FRONT PANEL • 16 MIDI PORTS (8 IN AND  
TRANSFER RATE • 128 SCENE, BATTERY-BACKED MEMORY • RECALL SETUPS VIA MIDI PATCH  
CESSOR • INTERNAL POWER SUPPLY • 2 PEDAL INPUTS FOR CONTINUOUS OR SWITCH PEDALS

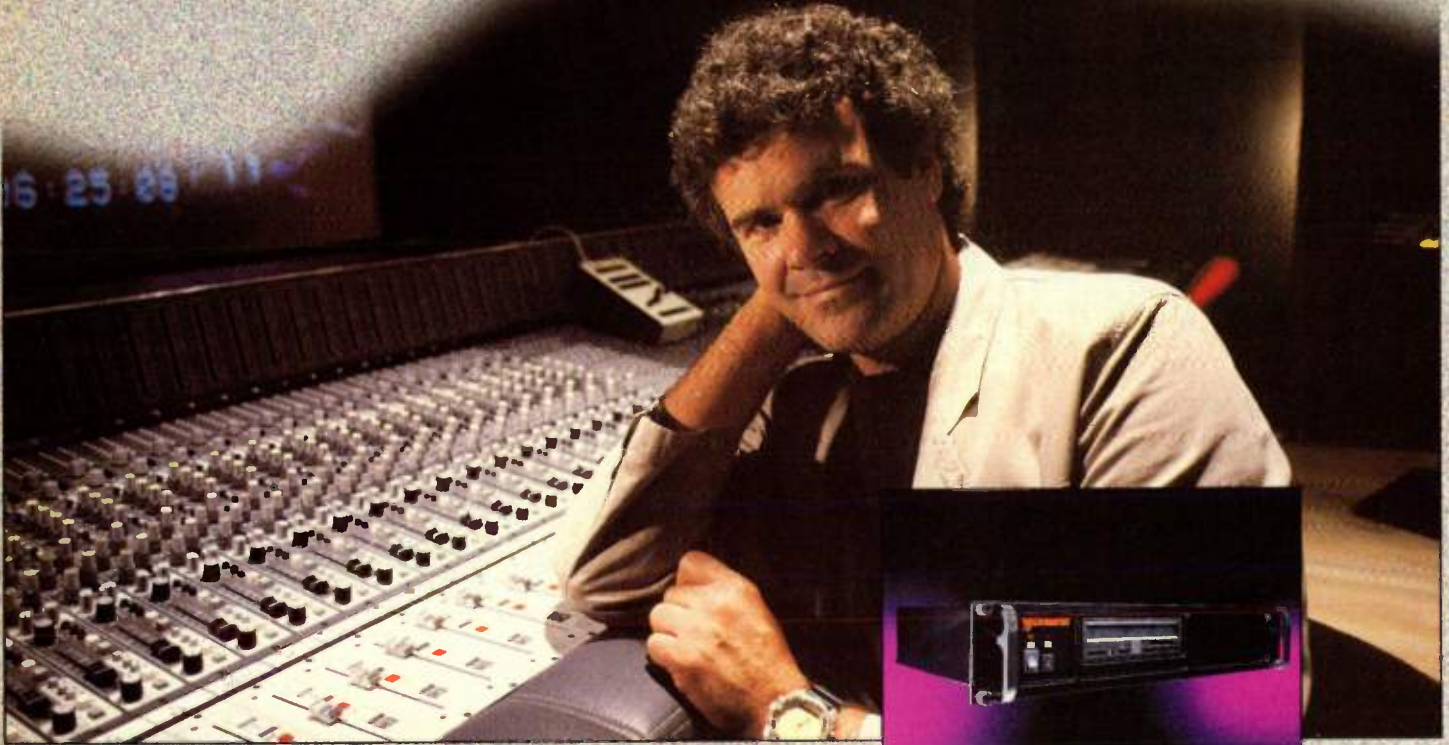
ge, MA 02142 Phone 617.576.2760 FAX 617.576.3609

World Radio History



*“Intelligent design, dependable...  
flawless performance”*

*Frank Serafine, President Serafine Inc.*



*Frank Serafine exclusively used DynaTek Track Series Rack Mountable Data Storage in the production of*

## THE LAWNMOWER MAN™

Hollywood knows it can depend on Frank Serafine for creative sound design.

For digital data storage, Frank knows he can depend on DynaTek.

For years, Frank has used digital technology to produce sound effects for such innovative projects as “Tron,” “The Day After,” “Star Trek” and most recently, “The Lawnmower Man.”

Low noise, ergonomic design and its vast selection of media has made DynaTek’s “TRACK” series Frank’s choice for rack-mountable data storage.

Whether for hard disk recording, sampling, or archive, DynaTek’s “TRACK” series provides quiet, dependable performance, time after time.



DynaTek Automation Systems Inc., 15 Tangiers Road, Toronto, Ontario Canada M3J 2B1 • (416) 636-3000 Fax (416) 636-3011

*“The Lawnmower Man” image courtesy of Allied Vision Lane Pringle Productions and New Line Cinema Corporation. “CyberBoogie” created by Angel Studios.*

FEATURING



**SyQuest**  
REMOVABLE  
TECHNOLOGY



## ● COMMAND CENTERS

the stereo panning of soloed inputs. A cue function routes the selected input to the headphone jack without affecting the master monitor mix.

### TAPE RETURNS

Consoles intended for sound reinforcement don't require multi-track tape returns, but mixers in this price range often attempt to service recording and live sound. Tape returns are either *in-line* or *split*. In the former case, the tape monitor pot appears on the correspondingly numbered channel slice; in the latter, there is a separate section of tape monitors (typically in the master section). Tape return connections usually are unbalanced 1/4-inch phone or RCA.

True in-line setups, where the channel input and tape return signals are separate signal paths, don't usually appear in the level of console we've charted. Most designs share tape-return jacks, which can be switch-selected from the front panel to access the tape monitor or channel input.

Some split monitor designs also utilize dual features. A submaster module might have a button that switches between a group-submaster function and a tape-return function. In addition, tape returns can be brought into a channel line input.

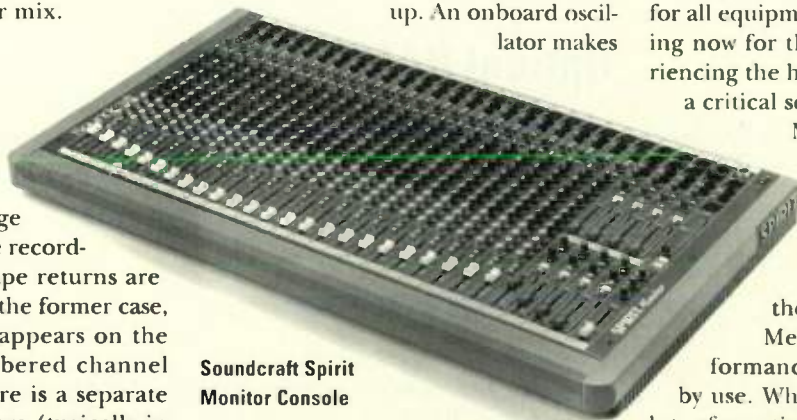
### METERS

There are three types of metering commonly found on the mixers surveyed: an LED peak/clip indicator, a PPM (peak reading) LED ladder, and the good, old-fashioned VU meter. The most common arrangement is a clip (or overload) LED on each channel and either a PPM or VU display in the master section. VU meters also may contain a peak/clip LED. On some models, meters in the master section can be switched to select alternate sources for metering.

### SHOPPING TIPS

Yes, now that you ask, there *are* other details you should look at when shopping for a mixer. Check out the length of the faders and the integrity of the controls. Mixing is a tactile art, so the feel of a control is a reasonable indicator of its quality. Look for convenience features like a separate solo

(sometimes marked "PFL") volume level pot so you don't blast yourself accidentally when soloing something up. An onboard oscillator makes



Soundcraft Spirit Monitor Console

calibrating levels an easier chore. See if channel muting is noiseless. If the mutes click, your practical uses of the feature are severely limited.

Grounding is a vital issue. Because all signals meet at the mixer, a coherent grounding scheme is essential. Does the mixer have only a two-wire AC plug? This configuration makes grounding

considerably more difficult. Is there a grounding post on the back which can be employed as the star ground point for all equipment in the system? Checking now for these features saves experiencing the heartbreak of hum during a critical session.

Most important, consider carefully what you want to use the board for—now and in the foreseeable future—and make sure it suits the application.

Mechanical and audio performance can be evaluated only by use. When you're shopping, ask lots of questions. Don't nod your head until you understand the answers. Mixing consoles are a vast, complicated market, and any good salesperson tempers that fact with understanding and consideration.

Larry "the O" Oppenheimer *chases electrons to and fro under the name Toys in the Attic.*

## Software Solutions



For IBM, there are many good music programs to choose from today, and several MIDI interfaces too. There's just one problem. Your software won't work if your interface doesn't. And a lot of them don't: game cards that won't play, dead-end UART cards, incompatible clones, and unreliable rogues.

There's an easy solution: Secure your software investment with a Music Quest interface. We've been making MPU-401 compatible MIDI interfaces since 1987, and with a track record for innovation, reliability, and expert support that's second to none. Because your music depends on it.

For your software's sake, choose a Music Quest interface. Recommended by more leading PC software makers than any other brand.

MADE  
IN  
USA



**Music Quest** US/Canada: 1-800-876-1376

1700 Alma Drive, Suite 330 Plano, TX 75075 (214)881-7408 Fax: (214)422-7094

All product and brand names are trademarks or registered trademarks of their respective manufacturers.



## Optical RAM

New materials and beam-steering technologies make optical random-access storage a reality.

By Gary Hall

The October 1991 "Technology Page" featured a new class of materials that might store digital information in three-dimensional arrays of enormous capacity. It turns out we may see these materials sooner than I thought. Labs at the University of California at Irvine and San Diego have already made substantial progress toward *optical RAM* (ORAM), with commercial products expected in a few years.

Optical RAM promises enormous storage capacities, on the order of a *terabyte* in a block about the size of a sugar cube. A terabyte is a million megabytes. In other words, a terabyte is to a megabyte as a megabyte is to a single byte. Or look at it this way: The number of bytes in a terabyte is one followed by twelve zeros. Numbers like this change things at a fundamental level.

Optical RAM also promises to be astonishingly fast

and will be non-volatile to boot. All of this bodes extremely well for the development of new computing technologies because memory capacity and speed are the great enablers of computer power.

Computers manipulate symbols. More memory means that more symbols can be manipulated at once. More important, it means that the symbols themselves can be more complicated and interesting. Computers couldn't even boot up until they had a few hundred to a few thousand bytes of mem-

ory. My first KIM-1 had 1 KB of RAM and could barely manage to communicate in hexadecimal on a 6-digit LED display. With 16 to 64 KB of RAM, computers could work with letters, words, and short phrases as commands.

Today, with a few megabytes of dynamic RAM (DRAM), we use full-bore graphic interfaces and handle complex chunks of information effortlessly, cutting, pasting, and passing data between multiple programs running simultaneously. It's more fun and more useful than the computers of yore. Memory capacity goes a long way to determine the richness and complexity of the computer's universe.

Technically, ORAM is a cube of transparent styrene plastic impregnated with a *photochromic* substance, which changes color under the influence of light. Holographic lenses focus a pair of polarized laser beams onto spots as small as a single micrometer (one millionth of a meter), changing them from transparent to opaque and back again (see Fig. 1). These lasers can focus at any depth into the material, creating many thousands of layers of storage, as though a huge number of high-capacity RAM chips were stacked on top of one another.

Information is retrieved one layer at a time, using a two-dimensional array of phototransistors to read a layer in a single flash. This promises to give ORAM an enormous data-transfer rate, perhaps a megabyte every five microseconds. The individual bits retain their state without power, but only if kept at the low temperatures of dry ice or liquid nitrogen. The photochromic *dopants* that have been studied so far do not retain data at room temperatures.

The real story behind the technology

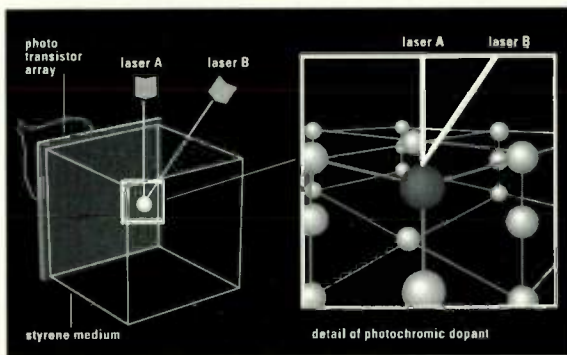


FIG. 1: Tightly focused and phased laser beams turn tiny areas of a "doped" styrene matrix opaque or transparent. Each tiny area represents a single bit of information.



**IT JUST DOESN'T  
GET ANY  
BETTER  
THAN THIS**

**ALL MUSIC  
24 HOURS A DAY**

- **LIVE PLAYING - AS MUCH AS YOU CAN IMAGINE**
- **CUTTING EDGE TEACHERS**
- **ONE ON ONE INSTRUCTION**
- **MATH, SCIENCE, HISTORY (JUST KIDDING)**
- **REAL MUSIC CONNECTIONS**
- **GUEST ARTISTS WEEKLY**

**THE  
PROLEARN  
SYSTEM**

**NOW YOU CAN EXPERIENCE  
MI IN 3 MONTHS, 6 MONTHS  
or 12 MONTHS.**

**THE PROLEARN SYSTEM  
IS NOW AVAILABLE**

SEND FOR FREE INFORMATION  
MUSICIANS INSTITUTE 1655 McCadden Place,  
P.O. Box 2070, Hollywood, CA 90028

**MI**  
MUSICIANS INSTITUTE

To talk to a counselor CALL (213) 462-1384

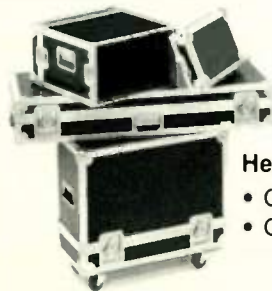
If you're interested in private lessons with a qualified MI graduate instructor in your area, please contact GradNet at MI.

**THE FINEST PROFESSIONAL MUSIC  
TRAINING AVAILABLE...ANYWHERE.**





# PROFESSIONAL QUALITY AT THE RIGHT PRICE!



Medium to Heavy Duty  
Keyboard Cases  
• Prices starting at \$126



Heavy Duty ATA  
• Custom and stock sizes  
• Quick turn around



Heavy Duty AMP  
and Effect Racks  
• Prices starting  
at \$129



Carpet Covered  
Hardshell Cases



Available for: guitars racks  
keyboards mixers

**DISCOUNT  
DISTRIBUTORS**  
*The Case Specialists*

**FOR INFORMATION  
AND FREE BROCHURE**

Call 800 346 4638  
(In N.Y.) 516 563 8326

## ● TECHNOLOGY PAGE

of ORAM is the focusing mechanism. Scanning holographic lenses are used to handle addressing in the first two dimensions. A number of these lenses are electro-optically "dropped into the beam" of the lasers at a frequency of around 1 MHz. The right lens is selected by timing the laser to flash at the exact moment that the lens is "in the beam."

In addition to the angle of the beam, the *phase* of the light itself must be swiftly and accurately controlled. An element called a *spatial modulator* is used to control the phase of the laser beams in order to focus on individual points in 3-D space.

When can we realistically expect to



### Optical RAM

**promises enormous  
storage capacities,  
on the order of a  
terabyte in a block  
the size of a  
sugar cube.**

see ORAM in use? Current predictions include real-world devices within a few years, but the first products are expected to be expensive appliances that cost as much as current mini and even mainframe computers. The costs of these machines eventually will come down, of course, but the cost curve is hard to predict because the technology is different and, at least at first, bulky.

Even the initial costs are a fraction of the cost of comparable amounts of conventional RAM. Perhaps entrepreneurs will figure out how to sell timeshare memory, renting out storage space and access to richly modeled interface worlds. It could start a whole new industry; maybe we could call it "virtual realty." Yeah, that's the ticket.

**Gary Hall** would like to remind readers that the information in this column is abbreviated and not sufficient to build a working unit.

## MIDI control of

- lights
- tape machines
- industrial systems
- motors
- projectors
- valves / relays
- displays
- smoke / pyro
- air / hydraulics

## Introducing THE DIGITAL ANIMATOR

Now you can run complex performance scenarios from your desk top. Create lock-sync coordination between music or midi clock, lighting and all manner of mechanical devices.

Each self-contained DIGITAL ANIMATOR offers 16 channels of 0-24 volt variable control. Fully compatible with *your* PC and software. Compact, safe, easily expandable, a cinch to connect.

**And it costs under \$500.**

Find out more:

TEL (718) 636-9535

**G2DESIGNWORKS**

316 Clinton Avenue  
Brooklyn NY 11205  
FAX (516) 367-9301



Although it goes without

saying, we'll say

it anyway. The new Roland

R-70 Human Rhythm

composer is unlike anything

you've ever seen before.

It features 242 professional-

quality percussion

sounds and a whole slew

of digital effects

including reverb, delay, cho-

rus and flange. Add

layering and you've literally

got 58,564 different

sounds at your fingertips.

What you also have

at your fingertips are sixteen

velocity-sensitive pads, as



**It's as close as  
you can get to a  
real live drummer.**

**In fact, it's a lot  
closer than you'd  
want to get to  
most of them.**



well as the new Positional Pad.

Which, among other things, gives you sensitivity

and versatility

by letting you influence

different parameters

depending on where you play.

Not to mention a unique

Rhythm Expert System that auto-

matically creates quick

original patterns and songs.

In short, the R-70 is

like the best drummer you know.

Only it won't show up

late to a gig or make passes at

your girlfriend.

**Roland®**

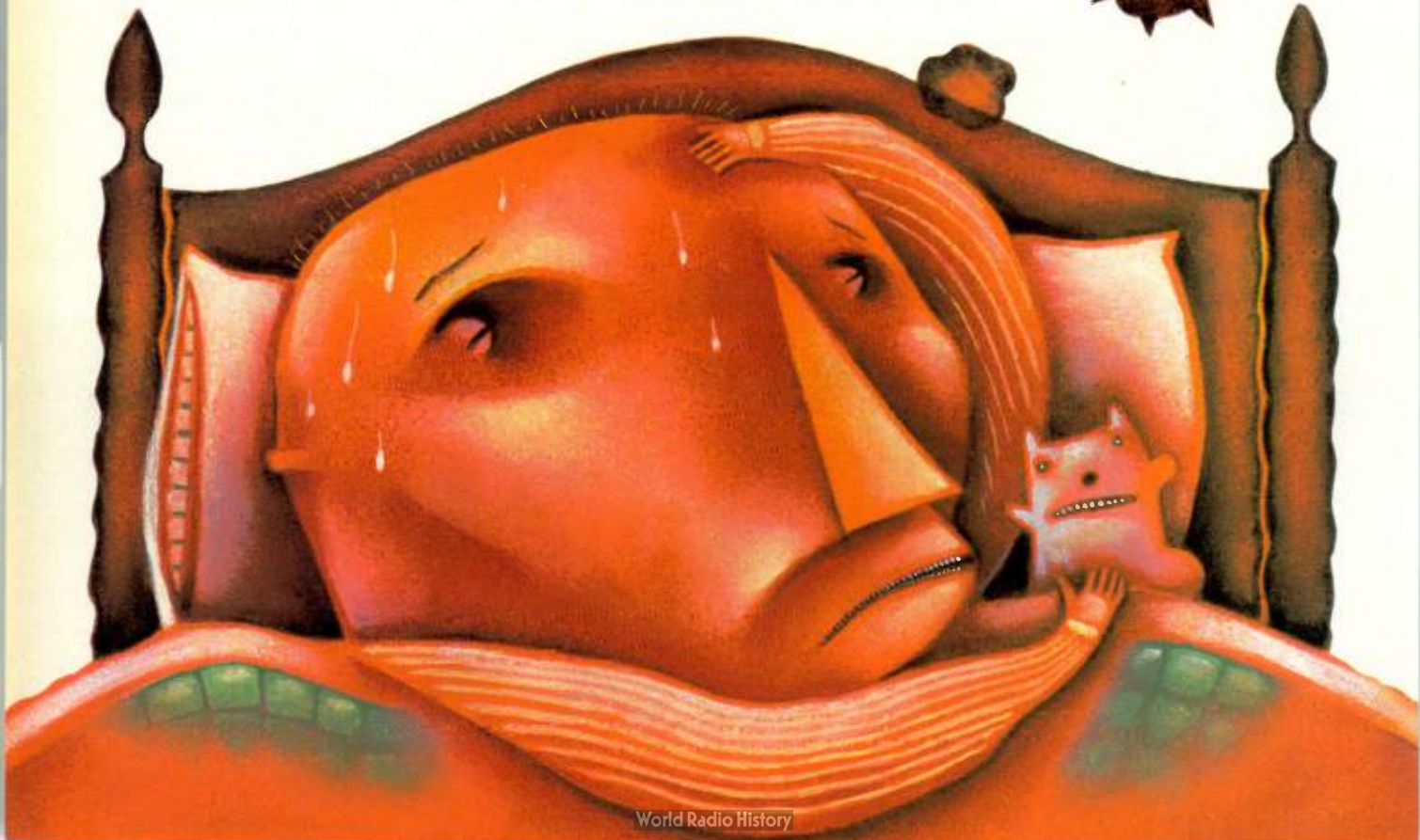
Roland Corporation US, 7200 Dominion Circle,  
Los Angeles, CA 90040-3647 213 685-5141.



# TRAGIC PERFORMANCES

**Voices of experience reveal the nightmares that  
haunt live gigs.**

BY  
MICHAEL MOIENDA





In

a rational world, one plus one equals two. The perfect predictability of mathematics allowed Sherlock Holmes to invoke deductive reasoning with the utmost confidence that the geometry of evidence would unmask the criminal. And today, as more and more musicians translate volatile creativity through computers, the infallibility of numerical equations is vital.

Unfortunately, the concert stage is not a rational world. It is a lawless wasteland of improbabilities masquerading as certainties. The only infallible truth is that live performance tallies more tortures than Dante's nine circles of hell. I know. I've been there.

I've been knocked unconscious by bolts of lightning exploding from poorly grounded microphones and nearly crushed by falling spotlights. In Texas, I actually played inside a chicken-wire cage while drunken collegiate cowboys (who presaged virtual reality by believing they were trapped inside *The Blues Brothers* movie) tried to decapitate me with Lone Star beer bottles. I've tripped over stomp boxes, fallen off stages, accidentally knocked bassists into the audience, and outlived more pieces of equipment than I can count. None of this was supposed to happen.



**B**efore you buy any brand of 16-channel mixer, consider why the CR-1604's become the rack-mount mixer of choice for top pros (request our literature packet and we'll include an astonishing list of touring and session players, studio producers, engineers, songwriters, sound track composers and late-night talk show bands who rely on Mackie).

**E** Exclusive design features. One reason we specialize in mixing boards is so we can be maniacally meticulous about details others overlook. Some details help make the CR-1604 rugged and roadable. Others contribute to the mixer's excellent sound quality. And some, like our unique gain architecture and mix amp topology aren't really details at all, but rather represent a fundamentally better way to mix music.

**F**anatical engineering means phenomenal sound. Compare our specs and features with anyone. But remember that the bottom line is what your ears tell you. Put a CR-1604 through a hands-on work-out and you'll understand why several major-label CD releases have been recorded and mixed solely on Mackie mixers.

**OUTPUT-O-RAMA:** Main stereo outputs with enough oomph to drive any balanced or unbalanced input. In fact, all outputs have sufficient level to drive any input. Naturally all outputs/inputs are fully protected.

**TRIM** matches any signal from instrument levels to -10dBm semi-pro to +4dBu pro gear.

**7 SENDS** via 4 knobs with plenty of gain above unity for special effects and center detent at unity gain. **4 STEREO AUX RETURNS** with super-high headroom, low noise and enough gain to work with all levels.

**MUSICALLY-USEFUL EQ.**

We're amazed at how many users tell us that our 80Hz, 2.5kHz and 12.5kHz turnover points and EQ circuit design not only sounds sweet but in some cases have replaced outboard equalization!

**COLD-ROLLED STEEL CASE**

**BUS 3&4 ASSIGN**

**STEREO IN-PLACE SOLO**

maintains stereo perspective for all soloed channels and returns.

**UNITY PLUS** special-taper faders with 6dB gain at center detent minimize noise, maximize headroom, provide 20dB more gain above unity to reduce constant trim re-adjustment as input levels change.

**BETTER-THAN-DIGITAL** -90dB SN ratio with 108dB dynamic range (vs. digital with -90dB SN and 90dB dynamic range). Incidentally, when comparing specs, make sure they reflect real world conditions as ours do. We're so fanatical that we include a short White Paper on Mixer Specifications with our lit packet. Read it to appreciate the fanatical engineering that went into the CR-1604's specs. And why we differ vastly from mixers that merely masquerade as a Mackie.

**STUDIO-GRADE MIC PREAMPS.** Only the CR-1604 incorporates discrete, large-emitter-geometry transistor preamplifiers instead of just simple ICs. That's why only our mic preamps deliver -129dBm E.I.N., 0.000% THD yet can handle +14dBu max inputs without need for a pad. Whether you're miking a 22" bass drum or a nose flute, you'll get all the punch and delicacy of expensive studio board preamps.

**LARGE INTERNAL POWER SUPPLY**

provides power for +48V phantom mike power, 12V BNC lamp socket, and bi-polar power for main circuitry, hi-output headphone amp and sophisticated enhancements such as our XLR10 mic preamp expander & internal full-fader/muting MIDI automation board (late summer availability). Our supply not only eliminates inconvenient "wall warts & wire lumps" but gets rid of their hum-inducing magnetic fields, too.

They're typically driven into non-linearity (15kiloGauss or more) causing stray 25-35V magnetic fields that are easily picked up by shielded audio cables. Our oversized, instrumentation-grade transformer leaks at 10kiloGauss reducing stray fields to under 1µV for quiet operation.

**GNARLY CIRCUIT BOARDS.**

Unlike brittle phenolic, our horizontally-mounted, double-sided, through-hole-plated fiberglass boards and rigid, multi-point suspension prevent damage from external impact.

**MIX AMPS WITH TWICE THE HEADROOM.**

Signals from all inputs simultaneously converge here. Conventional mix amps can overload and distort when you start piling on the channels. Our gain structure solves the problem for audibly better sound. Crank the CR-1604 with 16 hot signals and it still has more headroom than other mixers running 3 inputs. No wonder ours is the mixer of choice among top percussionists like Baby Face (C+C Music Factory) and Bashin Johnson (Whitney Houston).

**ULTRA-DENSE CIRCUIT TOPOLOGY.**

For example, unlike budget mixers which cut corners with passive circuitry, we added input and output buffers so the CR-1604 is compatible with a much wider range of devices. This ultra-minutization was an engineering and manufacturing challenge. But what can you expect from fanatics?



# MACKIE.

MACKIE DESIGNS INC • 16130 WOOD-RED RD NE N°2 • WOODINVILLE, WA 98072  
1-800-258-6883 • FAX 206/487-4337 • COMPUSERVE: GO MACKIE

Patented Circuit Solutions. Anybody who used Eng. Ch. 3 or Ch. 3 "Hummed" don't be safe!  
If you get the Mackie effect of our top-line line.



## ● PERFORMANCES

Fortunately, experience counts for something in this business. If a musician lives through a few years of everything going wrong, he or she learns to prepare for the inevitable. Therefore, to save future generations from the horrors of stage blight, we've assembled some cagey professionals to discuss survival techniques. (For a more technical look at preparing for a live performance, see "Making the Gig" in the April 1991 EM.)

### THE ART OF NOISE



Larry Walker  
Live-sound engineer, Hatfield and Walker Sound and Lights

Most musicians distrust live-sound engineers and immediately assume we're going to mess them up. This is why communication is so important. I always call the act to determine their needs and deal with equipment and budget limitations long before load-in. Nobody enjoys unpleasant surprises on the day of the performance.

Starting the gig on a good vibe helps ensure a smooth performance. Always set up everything before the act arrives, even if it means getting to the hall an hour earlier than scheduled. Make sure all of the mics are wired, monitors tested, feedback tuned out, and basic monitor and house volume levels set. It's emotional suicide to tweak system problems in front of an anxious band; they'll never trust you. However, if the act walks onstage and everything is ready to go and sounding good, they'll elect you emperor of the world.

Sound checks are problematic because you're mixing in an empty room. The audience isn't there to absorb sound, the band often is uninspired, and stage volume levels tend to be unrealistically polite. So the *real* sound check is initiated during the first few songs of the set. It's crucial to keep

focused here because, in effect, you become a member of the band. It kills me the number of times I've seen a vocalist desperately waving down a soundperson who is at the bar talking to friends. The soundperson is responsible for catching the performer's cues regarding monitor levels, as well as assessing and adapting to sound changes prompted by the artist's adrenaline rushes.

Because stage volume levels tend to increase, I recommend additive mixing for the house sound. For instance, you can assume the rhythm section in a small club is going to be plenty loud, so it doesn't make sense to pump up the drums in the system. I start with the instrument fader levels very low to avoid burying the vocals in the mix. Then I close my eyes and listen to the live mix as I would a record and make sure every sound is clearly audible.

### OF DRUMS AND DRUMMERS



Chad Smith  
Drummer, Red Hot Chili Peppers

Spare parts are essential. I always carry enough extra hardware to completely assemble a second snare drum and always have a spare snare and kick pedal readily available onstage. These are minimum survival tactics because I play hard and blow through snare heads every show. I even weight down the snare stand with sand bags so it doesn't dance around.

But if you really want to fend off performance nightmares, don't piss off the monitor mixer. Occasionally you go on and everything that was great during the sound check is all twisted when you hit the stage for the first song. Maybe all you hear are guitars screaming: no drums, no bass, no vocals. This really throws you because you're worried about how everything sounds and can't concentrate on your playing.

Obviously, if you start screaming at the monitor mixer, he or she won't do a thing for you. It pays to be polite and patient; after all, they're often trying to do six mixes at once.

And remember, absolutely everything you need to know about the art of live [rock music] performance is in the movie *This Is Spinal Tap*.

### "GUITAR GUILD"



Joe Gore  
Guitarist, Tom Waits

Sometimes avoiding catastrophe is a matter of protecting yourself against the obvious. I saw the Blasters open for Queen at the Inglewood Forum and [guitarist] Dave Alvin walked onstage without his guitar strap. It wasn't the coolest thing to do in front of thousands of people. Also, prepare yourself for "acts of God." I once played a show where the left side of the stage collapsed. Equipment was sliding off the stage like the ballroom piano in that old movie scene dramatizing the capsizing of the Titanic. Luckily, I had Velcro-ed my Lexicon LXP-5 to the top of my amplifier and taped all my stomp boxes and cables to the floor.

Regarding more mundane tragedies, remember that anything digital can crash and probably will. Digital signal processors aren't happy sitting on top of each other in equipment racks, so leaving ventilation space between units helps avoid system crashes.

Stage-monitoring tensions can be alleviated by determining the directional nature of your guitar speakers. The classic problem with guitarists cranking up their volume is less a matter of deafness than amp placement. Sometimes, if you stand two feet in front of an amp, you can't hear a thing, yet twenty feet away the volume is at the pain threshold. The volume debacle is one reason I'm a fan of low-wattage



# DON'T LET YOUR KIDS SEE THIS PHONE NUMBER:

1(800)800-4654



Because someone left this number in plain view... The crumb-crunchers put two and two together. Normal kids turned starstruck, got a recording contract, a tour, an attitude. They buy where the pros buy and get same day shipping. Gonna let this number get out? Be sure the kids have some talent.

## THOROUGHbred

America's In-stock Music Department store

Electronics, Guitars, Keyboards, Drums, Accessories, Rentals



2204 East Hillsborough Ave, Tampa Fl. Fax # (813) 238-5443 In Florida Dial (813)237-5597

## PERFORMANCES

about it: Would a soundperson ask a guitarist to use another guitar? Hey, don't use that Takamine, the house Martin sounds better.

## BASSIC INSTINCTS



Glenn Letsch  
Bassist, Robin Trower

Always make sure your bass is fed into the house sound system so the audience can hear you if your amp goes down. I even carry a spare direct box to ensure [a club's] equipment limitations don't knock me out of the house mix. If your amp blows, make sure the monitor mixer puts some bass in the side fills so you can hear yourself. Amps always seem to blow up or melt down, so have spares available. Also, preventative maintenance saves a lot of headaches. I have my rig checked out and serviced at regular intervals.

## KEYBOARD CRASHES



Harry Mello  
Keyboardist, XTender

keep everything pretty simple live because the band complains if I don't change tones fast enough. Sometimes the pause between songs is just a few seconds, so I use general tones that need only minor adjustments for specific arrangements. I also program

(continued on p. 116)

# Voice Crystal

## BLOWOUT

<b>D50</b>	D50, D550 RAM CARDS With 64 Sounds TYPE M256D RAM, 6 CARDS, VC1-VC6
<b>\$66</b>	<b>PER CARD</b>
<b>ROLAND</b>	S-50, S-550, W-30, S-330, S-770, S-750 25 3.5" Sampler Disks, VC1-VC25
<b>AKAI</b>	S-1000, S1000KB, S-1000PB, S-1000HD, S-1100 26 3.5" Sampler Disks, VC1-VC26
<b>ENSONIQ</b>	EPS, EPSM, EPS16, EPS16+M 27 3.5" Sampler Disks, VC1-VC27
<b>\$99</b>	<b>PER COMPLETE SET</b>
<b>EPS16+</b>	EPS16+M 3.5" Sampler Disks, VC1-VC25
<b>\$149</b>	<b>NEW COMPLETE SET</b>

(PLEASE CIRCLE)

ROLAND D50 RAM CARDS  
VC1 VC2 VC3 VC4 VC5 VC6

ROLAND  AKAI  ENSONIQ  
 ENSONIQ EPS16, EPS16+M

**EYE & I PRODUCTIONS**  
930 Jungfrau Court  
Milpitas, CA 95035  
(408) 945-0139

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\*Limited to sock on hand/add \$7 S&H for Sample Sets, \$3 S&H for RAM Cards





# Light as a feather

at only twelve pounds  
and with 350 watts  
RMS continuous per channel,  
the **new** Peavey DPC™ 750  
is truly a power amplifier heavyweight!

This next generation of digital power amplifiers  
utilizes a patented digital phase-modulated MOSFET  
design which represents a totally new concept than  
any previous amplifier technology, linear or digital.  
So, step into the ring with the new



lightweight heavyweight champion ... the  
DPC 750 ... It'll knock you out! And as you  
catch your breath, notice the price of  
this *single rack space* wonder! Bolt to your  
nearest Peavey dealer and hear the power!

#### FEATURES:

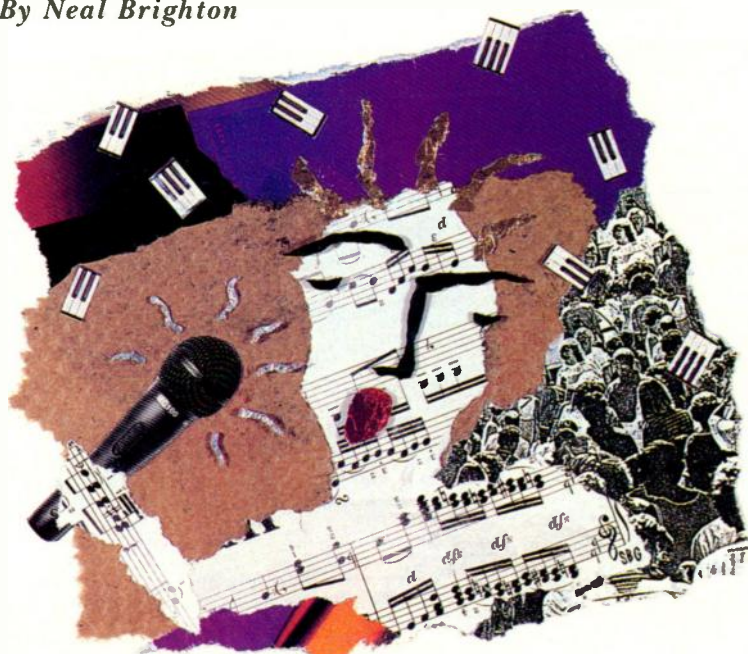
- 350 watts RMS continuous per channel. ■
- 90% output stage power transfer efficiency. ■
- Single rack space. ■
- No measurable TIM. ■
- Digital phase modulated MOSFET design. ■
- Combined power supply and power section. ■
- LED status and level indicators. ■
- Output protection circuitry. ■
- Digital DDT - compression. ■
- Stereo or bridged mode capability. ■
- Linear phase Bessel amplifier response. ■
- Low feedback design. ■
- Excellent open loop characteristics. ■
- Twelve pound package. ■
- 500 watts per channel music power. ■
- Thermal, short circuit, and overload protection. ■
- Automatic two speed fan. ■
- 1/4" outputs. ■
- Five-way dual binding post output. ■
- Balanced input capabilities. ■



# Location Recording

By Neal Brighton

*Getting the excitement of a live performance on tape can be an ordeal if you cower from the unexpected.*



**L**ive location recording provides a sterling example of Murphy's Law run amok: Whatever can go wrong will go wrong. Unfortunately, it doesn't always pay to hide within the controlled confines of the studio because the sweat and energy of a live performance is nearly impossible to capture in a clinical recording environment.

A classic example of the vitality inherent in live recordings is Peter Frampton's "Frampton Comes Alive," a multi-million seller in the 1970s (and for a time, the biggest selling rock album in history). Frampton's pop genius literally came alive onstage, as few noticed the original albums that provided material for the live shows. Subsequent studio releases also paled by comparison, and Frampton's popularity sputtered into one-hit wonderland.

## FOOTWORK

Can good recording technique exist harmoniously amidst the unpredictability of a live performance? It's not an easy relationship, but careful pre-planning can make the difference between capturing an incendiary performance and tripping over a

beehive of frustration.

First, it's extremely important to visit the venue before the show. A thorough site-check fills in important details such as room acoustics, what equipment is needed, what length audio (microphone line) snake is required, and the AC power situation.

Be sure to take comprehensive notes and introduce yourself to the stage manager or house soundperson. You must co-exist with this person during the performance, so it helps to familiarize yourself with his or her personality and technical chops. The soundperson has valuable information such as the number and type of mics and direct boxes available, whether the house board has phantom power, and other tips that can make your job easier.

## POWER

Clean, consistent AC is often the biggest problem facing the location recordist. Pristine power is a pipe dream when the venue is an old church or theater with lines that have been wired and rewired over the years. For most situations, a rack-mounted line conditioner with voltage regulation offers surge protection, maintains

consistent voltage levels, and diminishes radio frequency (RF) and electro-magnetic interference (EMI). Extreme cases may require an isolation transformer. This device transfers power through two separate, shielded coils that completely filter out RF and EMI.

Because power spikes and grounding problems are common in old buildings, it's best to find a free circuit that can be dedicated to your recording system. (Most recording equipment doesn't require a lot of juice, so a 20-amp or 25-amp circuit should work fine.) If this isn't possible, make sure the chosen circuit is free of lighting equipment or motorized appliances that can cause power surges and audible pops, crackles, and hums.

To minimize grounding problems, plug all of your equipment into one central power strip that is directly linked into your circuit. Do not lift all your grounds. Proper grounding is essential in live applications where power fluctuations and other problems are common.

## EQUIPMENT

This is where the fun begins. A professional live recording often requires



When it comes to  
**Music Equipment Mail Order Companies,**  
 there's only one number one, and ...

# We're #1 HERE'S WHY!

## #1 In Shipping...

- We ship more music gear than anyone — over 10,000 shipments a month to over 100,000 satisfied customers.

## #1 In Service...

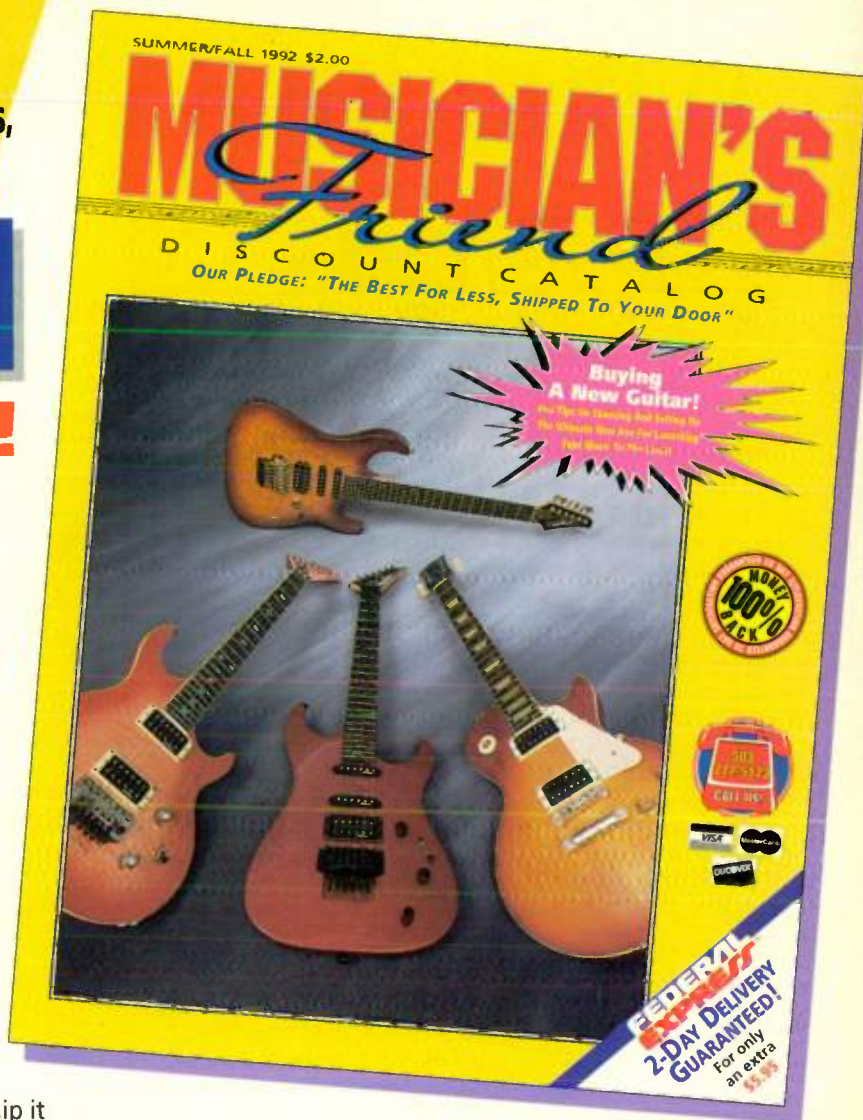
- Our 30-day money back guarantee is legendary. This no-risk advantage lets you buy with complete confidence.
- Toll-free ordering, knowledgeable technical support, and customer service that's dedicated to your complete satisfaction.
- On-line order entry for immediate up-to-the-minute inventory and pricing info.
- Huge multi-million dollar inventory assuring you of fast delivery — most orders are shipped within 24 hours!
- Two-day Federal Express delivery for just an additional \$5.95. Order it by noon and we ship it the same day.

## #1 In Product Presentation...

- Quality photography with lots of color photos, so you get to see every knob and button before you buy.
- Copy information that's written in musicians terms, to help you make intelligent buying decisions.
- Full page product reviews on the latest products, keeping you up to date on all the hot, new gear.
- Magazine quality product articles give you more in-depth information, and great ideas for getting the best from your setup.

## #1 In Circulation...

- We mail three or more new editions a year totaling over 2,000,000 catalogs to musicians like yourself.



Here's a sampling of just a few of the quality brands featured in every Musician's Friend catalog ...

**ZETZEL** **ARC** **DiGiTech** **ADA** **KORG**

**Marshall** **Roland** **BOSS** **Fender**

**TASCAM** **Seymour Duncan Pickups** **DOD** **Fostex** **Ey**

**lexicon** **SAMSON** **NADY** **Jackson** **Channel** **t.c. electronic**

**WASHBURN** **Epiphone** **Gibson USA** **FURMAN** **CARVER**

## FREE 1 Year Subscription ...

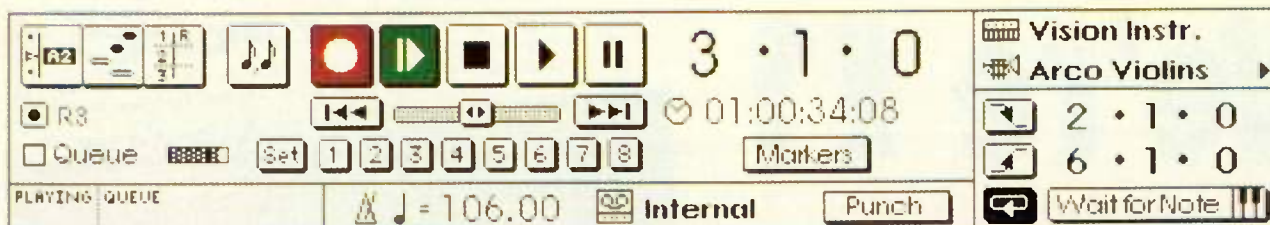
Now's your chance to join hundreds of thousands of satisfied musicians in receiving the #1 catalog, absolutely free! Call 503 772-5173 or mail in this coupon to Musician's Friend, P.O. Box 869, Dept. 107, Eagle Point, OR 97524.

Please send me the next 3 editions of Musician's Friend totally FREE of charge!

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_



# Whaddaya Waiting For?

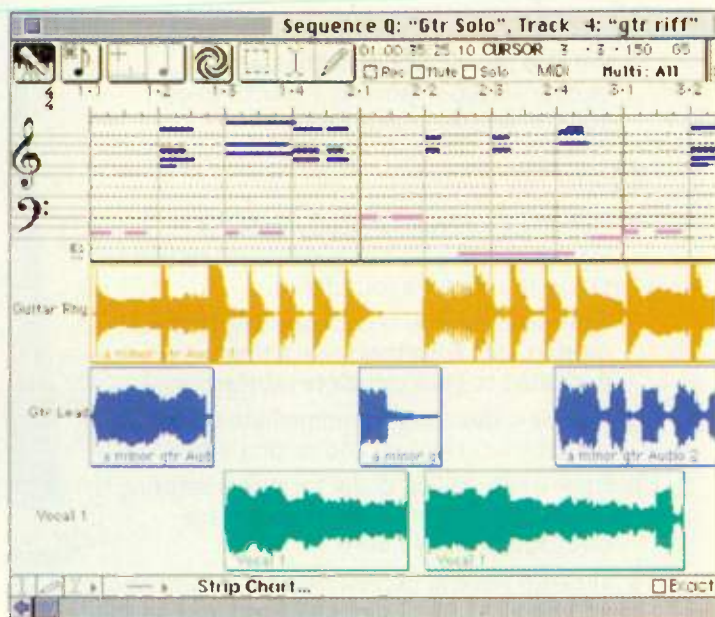


New Control Bar in Vision and Studio Vision 1.4

If you've been wanting to get into Macintosh software sequencing to complete your studio setup or thinking of switching to a better system like a lot of pros are doing, Opcode's got what you want.

Vision and Studio Vision® just turned 1.4. This new version brings you features you'd expect from the world's premiere Macintosh MIDI software company. Realtime editing of MIDI and digital audio — move the audio and *hear* the change, loop play or record *anywhere* in a track, drum machine style record and edit with note *repeat* for fills and MIDI pressure to velocity for natural crescendo (time to trade in that hardware sequencer). And industry standard 480 ppq resolution so your music sounds the way you *played* it. The new transport controls let you get around your music *quickly*: record, play, stop, continue, pause, fast forward, rewind, scrub, and autolocate.

Our new markers make your life easy. Create markers on the fly, then choose them by *name* from the markers pop-up — the sequence jumps to the location instantly — plus there are SMPTE based markers that won't change time when you change tempo. And OMS (Opcode MIDI System) gives you a central location for storing information about your entire MIDI studio with access to hundreds of MIDI channels.



## Free Galaxy Librarian!

Included with every Vision and Studio Vision you get a free Galaxy universal librarian that supports over 130 devices and offers special links to Vision and Studio Vision — a \$250 value!

And check out what you get in Studio Vision: 16 tracks of digital audio in *each* editing window, so making a vocal composite isn't complicated, and you can have MIDI in the track too. Record *stereo* files. You can mix up to 16 channels of digital audio with automated volume settings — even mix files with pan into a *stereo* file. Compact digital audio files to discard unused data and *save* expensive hard disk space. And see your work in *color*. Studio Vision is being used in pro sessions every day and has been for almost *two* years. All the things you expect from professional software.

Just what you always wanted. Vision and Studio Vision, the unequaled choice — now with a *free* Galaxy universal librarian. Wanna switch? If you own any \$495 sequencer, you can upgrade to Studio Vision for only \$500. Call your local dealer or Opcode for details. So don't wait anymore, get your copy today.

Trademarks: Studio Vision is a registered trademark of Opcode Systems, Inc.; Galaxy: Opcode; Macintosh: Apple Computer, Inc.

**O P C O D E**  
S Y S T E M S I N C

Opcode Systems, Inc. 3950 Fabian Way, Suite 100 Palo Alto, CA 94303 (415) 856-3333 FAX (415) 856-3332

World Radio History



● RECORDING MUSICIAN

more than two microphones and a DAT recorder, although simple systems certainly deliver the goods for reference or personal documentary recordings. Be prepared to cart a considerable load of gear: a mixer, assorted microphones and mic stands, a snake and cable junction box, cables, headphones, small monitor speakers (if applicable), duct and masking tape, felt pens, notepads, and a tool box.

The mixing console is the heart of the system. Whether you're recording to multitrack or 2-track, professional recordings require a quality mixer to effectively process the signals and route them to the tape deck.

Live recording applications often are not as stringent as studio mixing sessions, so live recording consoles don't need bells and whistles. However, the board should be well-constructed (it's

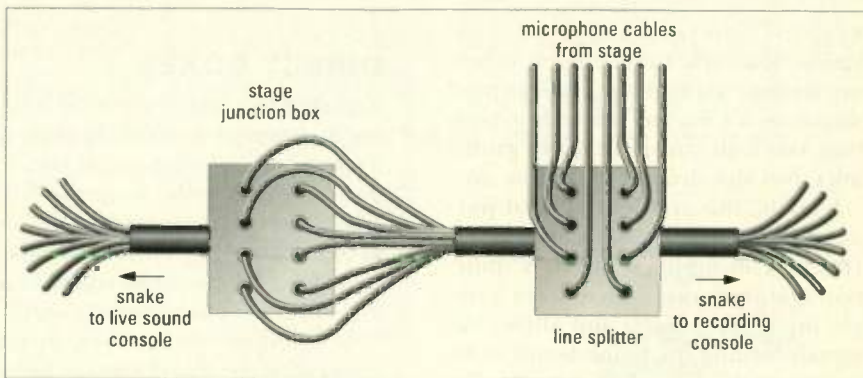


FIG. 1: Line splitters allow recording and live-sound engineers to "share" microphone lines during a performance.

going to take many lumps and bumps during transport) and feature insert points on its input channels, reasonable equalization, a few aux sends, and enough bus lines to feed the applicable recording deck.

Don't even dream of tapping into the house console. Few boards are capable of servicing two masters (in this case, live sound reinforcement and recording) simultaneously. In addition, taking your feeds off the live sound board puts you at the mercy of someone else's

equipment and mixing skills. Although I have produced reasonably successful "live to DAT" recordings using a combination of feeds from the live mixer and my own microphones, it's a tricky practice, and I certainly don't recommend it for multitrack recordings.

**SPLIT PERSONALITIES**

Once the mixer is positioned, and you've established your audio "nerve center," logistics take center stage. For example, you have your job, and the

**TRAGEDY CHECKLIST**

Because the live environment is a whirlpool of uncertainty, the sensible recordist is steered against a possible Waterloo. Here are a few of my favorite safeguards:

1. A flashlight to search out the faulty cable connections you'll discover as soon as the house lights go out.
2. A collection of adapters and odd cables to hook up last-minute equipment changes no one told you about.
3. Extra batteries to run direct boxes when the phantom power on your board fails and all your spare batteries turn up dead.
4. Extra microphones and micstands because the house doesn't have the microphones they promised.
5. Miles of extra 1/4-inch cables to save the skins of dullard musicians who forgot to bring their own.
6. A solid hand truck to move all the extra junk you swore you wouldn't need.
7. A good selection of candy and soft drinks because you won't have time to eat dinner.
8. A pad of paper and a pen to write down the mistakes you won't make next time.

**PC MIDI For Less**



If you've been looking for a low cost MIDI interface for your IBM PC or compatible, then check out the PC MIDI Card. It's MPU-401 compatible to run over 100 popular programs. In your computer, and with your instruments. And most importantly, it'll work like you expect. Because it's made by Music Quest, the name that means MIDI interfaces for IBM compatibles.

**The PC MIDI Card**  
US / Canada  
1-800-876-1376



**Music Quest**  
1700 Alma Dr. Suite 330 Plano, TX 75075  
(214)881-7408 Fax: (214)422-7094

PC MIDI Card™ Music Quest, Inc. Other trademarks acknowledged.

**PC MIDI For More**



If you need a multi-port MIDI interface for your IBM PC or compatible, then get the dual-port interface with pro quality tape sync supported by all professional sequencers for IBM. Like Cakewalk Professional, 64-Track PC, Cadenza, Master Tracks Pro, Forte II, Musicator, Sequencer Plus Gold, and Texture. Get the MPU-401 compatible MQX-32M.

**The MQX-32M**  
US / Canada  
1-800-876-1376



**Music Quest**  
1700 Alma Dr. Suite 330 Plano, TX 75075  
(214)881-7408 Fax: (214)422-7094

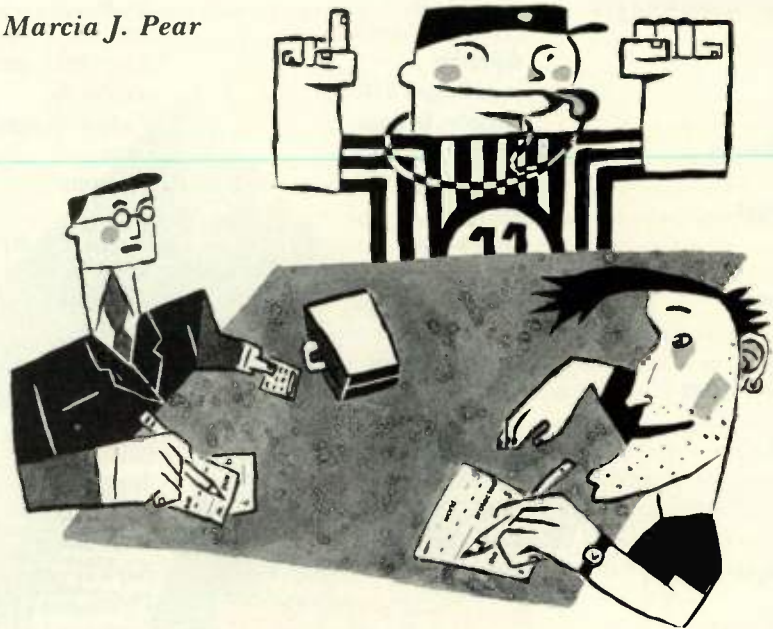
MQX-32M™ Music Quest, Inc. Other trademarks acknowledged.



# Mediation: Let's Make a Deal

By Marcia J. Pear

*You say you  
want a  
resolution?  
Don't litigate,  
mediate.*



AD MCCAULEY

**A**n entertainment mediator is the working musician's Monty Hall: a skilled third party who can suggest a harmonious alternative to the "sue me, sue you" blues. Making a deal that everyone can live with is what mediation is all about. Together with its close cousin, arbitration, mediation helps artists avoid the clogged court system and years of costly litigation.

Conflicts over contracts, royalties, song ownership, and creative control crop up frequently (and often unexpectedly) in the course of a musical career, and blind faith is no substitute for legal savvy. Because 95 percent of all disputes settle before going to trial, a skilled mediator can save a musician the expense of traditional legal proceedings.

## MEDIATION DEFINED

Think of mediation and arbitration as winning with words, not warfare. These methods are quicker, cheaper, and less stressful than a lawsuit because they return justice without judge or jury.

In mediation, an experienced and neutral third party (the mediator) helps both sides assess their positions,

consider the arguments of the other side, and reach a mutually acceptable solution. An arbitrator is required when the two parties cannot reach a settlement through mediation. Like a judge, the arbitrator listens to evidence regarding the dispute at a hearing and renders a binding decision.

A combined approach, med./arb., offers the best of both worlds. If a mediator is unsuccessful, the same person (acting as arbitrator) can render a legally binding decision. The clients benefit by avoiding the time and expense of preparing another appeal.

## WE'VE ONLY JUST BEGUN...

In practice, mediation and arbitration can help a musical relationship evolve (or dissolve) and work to mitigate differences during the "marriage." Unfortunately, just as early domestic bliss prompts couples to turn deaf ears to potential problems, eagerness for commitment—from a manager, record label, video production company, or band member—often causes musicians to tune out caution. An awareness and commitment to mediation/arbitration in the genesis of a relationship can help avert hard feelings (or even a

break-up) down the road.

"Someone who knows what a production deal or record contract should include helps all parties come to a sound, informed decision," states Lynda Martyn, principal of the San Francisco-based Arbitration & Mediation Association, Inc. (AMAI). "Attorneys negotiate deals only with their clients' interests in mind. An entertainment mediator/arbitrator accommodates the interests of each party, and helps move the deal forward quickly and inexpensively. Also, negotiations take on a different personality when the participants discuss an agreement face-to-face."

Mediation strategy formed part of the career plan for D'Cückoo, a percussion-based technopop band that designs and builds its own marimbas and drum triggers. D'Cückoo attorney and mediator Cherie Porter has drafted numerous contracts for the four female members, including an exclusive distribution agreement with Tower Records, deals with computer companies to feature the band's likeness and sound in video games, and live performance video rights.

"I insert an arbitration clause into





# DOESN'T YOUR MUSIC DESERVE A LEXICON?

## THE OVERWHELMING CHOICE OF LEADING ARTISTS AND STUDIOS

Over 80% of the world's top studio engineers use a Lexicon. And many of the most successful artists depend on the "professional edge" a Lexicon system gives them—on stage as well as in the studio. In fact, for over 20 years, audio professionals have relied on the legendary sound of Lexicon digital signal processors.

Now that "professional edge" can be yours—with the surprisingly affordable LXP-15. The discerning musician's multi-effects processor—with the spectacular sounds that you can hear in all the right places.

The LXP-15 has 128 extremely useful presets—plus another 128 User registers. There's stunning reverbs and delays (with precise equalization control). Tasty multi-chorusing and pitch-shifting (mild to wild). A phenomenal range of world-class, studio quality sounds to create a unique acoustic

personality that's your's alone. And with Lexicon's Dynamic MIDI<sup>®</sup>, you can control any of the LXP-15's exclusive parameters remotely via MIDI (with our MRC or any other MIDI controller) or with conventional footpedals.



Every LXP-15 function is easily controlled from the front panel. A large, illuminated display keeps you informed. Just select the effect, choose a parameter (up to 27 per effect), and create the sound you like. Precise, fast and intuitive.

The LXP-15 joins the renowned LXP-1, LXP-5 and MRC Midi Remote Controller in Lexicon's affordable LXP Series. Each gives you that unsurpassed, legendary Lexicon sound.

Now ask yourself, "Doesn't my music deserve a Lexicon?" Then call us for name of the right place where you can audition your own LXP-15.

# Lexicon

## HEARD IN ALL THE RIGHT PLACES

LEXICON INC., 100 BEAVER STREET, WALTHAM, MA., 02154-8425 TEL: (617) 736-0300 FAX: (617) 891-0340

World Radio History



## ● WORKING MUSICIAN

every contract," asserts Porter. "Although we haven't exercised it, an arbitration clause is a great safeguard against expensive litigation."

### CREATIVE LICENSE

Creative contributions always should be converted to percentages of ownership, or they can sound a discordant note when you've scored a hard-earned hit. That's what happened to songwriter Ingrid Chavez.

Chavez contended she wrote the lyrics to Madonna's "Justify My Love," but was persuaded to surrender credit and reasonable royalties. Although Chavez eventually received fair compensation after an out-of-court settlement, the situation illustrates the importance of mediating creative ownership before a product is released.

For instance, songwriting partners must decide whether the composer/lyricist is entitled to a bigger chunk of royalties than the partner who contributes musical ideas alone. A mediator/arbitrator schooled in music publishing rights can help the parties determine the contributions to

the final product and how to allocate copyright privileges.

### SPLITSVILLE

Even if your partnership is amicable, splitting up can be far from friendly once the tangible and intangible assets

of an association (instruments, leasehold interest, copyrights, licensing agreements) are up for grabs. "From a future business standpoint, it makes sense to avoid hostility if possible," counsels AMAI's Martyn. "Mediation is the best alternative precisely because

### CRYSTAL BLUE PERSUASION

Early in 1990, pianist Kevin Setchko and his band Crystal Wind received an offer from a management team. Letters flew between the band's Mount Shasta base and Los Angeles, and within two months, Crystal Wind had a management contract. The group was delighted.

"It was a mutual search," explains Setchko. "We were looking for a manager to relieve us of the business end so we could concentrate on music."

But their elation was short-lived. One of the two managers began embezzling money from

Crystal Wind's account. When repeated phone calls failed to resolve the situation, Setchko reviewed his contract and discovered an arbitration clause that could be used to legally dissolve the management partnership. He hired an entertainment attorney, filed for arbitration, and a few months later received a judgment in the band's favor.

"Arbitration was a lot simpler and cheaper than a lawsuit," says Setchko. "People told us there was nothing we could do, but the arbitration process forced a resolution."

# Why Wait, It's MusicTime

If you think good music notation programs are too out of reach or hard to use, check out **MusicTime!** Discover a fast,

fun and affordable way to play, compose, record and print out music. Hot player? Record your live performance from a MIDI instrument, and like magic, watch it appear in standard music notation. Prefer to compose without MIDI? Simply click in notes and symbols with a mouse and print out your music with a publisher's quality. Playback an entire ensemble instantly from your MIDI instrument or sound card. Easy editing tools let you work out and rearrange a

song—until you're satisfied. **MusicTime** is so easy to learn and use, you'll be putting your ideas on paper in no time.



**MusicTime** also ships with the Adobe® Sonata® Font and ATM™ so your music will look even better. It's a great way to get started making music on a Macintosh® or PC with Windows™ —for under \$250!

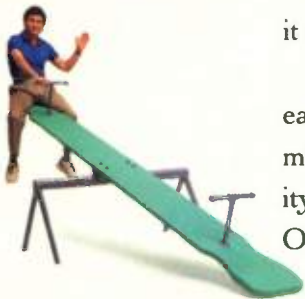
MusicTime for Macintosh and Windows is available at fine music and computer stores worldwide. Contact Passport for a free catalog and the dealer nearest you.

**PASSPORT**

100 Stone Pine Road, Half Moon Bay, CA 94019  
Telephone: (415) 726-0280 Fax: (415) 726-2254

All products are trademarks or registered trademarks of their respective holders.





They say you can't have it all. Don't believe it.

On one side, you need an easy-to-operate powered mixer with great sound quality and just the right features. On the other side, you need it at a reasonable price. It's the proverbial balancing act.

Now Yamaha has a line of powered mixers, perfectly balanced to meet your needs. The EM2820 is a console-type, stereo powered mixer. The EM1620 is a rack-mount mono powered mixer. Both are easy to set up and operate, have three-band channel EQ, inputs optimized for mic or line, and individual effect and monitor sends. And both are built around a 200-watt, high-fidelity power amplifier. The 2820 carries two of them.

You only need a stage monitor amp?

The Yamaha P120 has the same power amplifier and graphic equalization you find in the mixers. It's the easy way to power stage monitors. And as your needs and budget grow, it's an ideal addition to an EM2820 or EM1620 system.

All three of the units have a built-in limiter to protect the power amp from being over driven. They have forced-air cooling for reliability under the most extreme conditions. And both the P120 and EM1620 are rack mountable in Yamaha's RK319 rack case or any 19-inch equipment rack.

Contact Yamaha at 1-800-937-7171, ext. 300 for more information about the perfectly-balanced EM2820, EM1620 and P120. And the location of your nearest Yamaha Audio dealer.



Forget conventional wisdom. Remember to call.

**YAMAHA®**

According  
to conventional  
wisdom, these  
should cost more.  
Or sound cheap.





AUDIOMEDIA II  
\$ 1295

# Big Studios Hate Us.\*

Leave it to the leader in direct to disk recording to stand up for the little guy.

Being musicians ourselves, we understand how hard it is to aspire to musical greatness on a budget that can barely afford the rent—let alone studio time. Therefore, it's with great pleasure that we introduce Audiomedia II, direct to disk recording for the rest of the world.

We've packed big studio performance into Audiomedia II with features like high quality analog and digital ins and outs for recording your favorite instrument, or recording digitally to DAT. True 16 bit, CD-fidelity for crystal clear reproduction of the whole musical spectrum, from the highest splash cymbal to the most subterranean synth rumble. And a full-featured version of our much-imitated (but never equaled) Sound Designer II™ software, the industry standard for editing tracks with the speed and precision that only a disk-based system can provide.

Last but certainly not least, Audiomedia II provides the hardware backbone for the biggest names in music software—Studio Vision™, Digital Performer™, Cubase Audio™ and DECK™ digital multitrack software.

And the beautiful thing is, all of this power is contained on a single card that fits into any Macintosh® II or Quadra computer. And virtually any budget.

Audiomedia II. Because after all, why should the big studios have all the cool gear?

Call 800-333-2137 for a free brochure and the name of your local dealer.

\* We're only kidding. Big studios actually love us for our professional direct to disk systems, Pro Tools™ and Sound Tools™. But that's another ad.



**digidesign**

1360 Willow Rd. #101  
Menlo Park, CA 94025  
415.688.0600

© 1992 by Digidesign Inc. Features, specifications and price subject to change without notice. All trademarks are property of their respective holders. \$1295 suggested U.S. list price.



● WORKING MUSICIAN

you *have* been partners, and the musical community is small and close-knit. From an emotional standpoint, mediation also helps you get on with your career and your life. If your songs or other assets are tied up for years in the courts, it not only diverts your creative energy, but freezes your potential income from those sources."

Unfortunately, many bands exist for years without written partnership agreements. It's easy to fall into these "casual relationships" if an act doesn't hit the big time (no money, no worries). However, it's amazing how many assets are accumulated by marginally successful working bands who perform consistently and release self-produced records. And what happens if two members of a band want to leave and form a new band using the same name?

"A mediator/arbitrator is extremely helpful in identifying the key issues of a dissolution, such as ownership and control of creative properties, future distribution of recordings, cost allocation, and the rights to the group's name," advises entertainment attorney (and recording artist) Pennie Sempell.

**PAPER TRAILS**

Aural tradition ensures that the beat goes on, but keeping your musical career on firm legal footing requires committing your ideas and plans to paper.

By now it should be obvious that an arbitration and mediation clause is an essential element in any contract or agreement. AMAI (tel. [415] 563-0254) has developed a standard, three-paragraph clause stating exactly what parties can expect from the arbitration and mediation process in the event of a dispute. If an argument precedes a contractual arrangement, you can gain after-the-fact protection by getting all parties to submit to binding mediation/arbitration.

Additional insurance is secured by documenting everything from discussions about idea origination and creative control to transactions regarding fees, royalties, and copyrights. While a formal agreement drafted by an entertainment attorney is always best, a letter of understanding signed by all parties is preferable to a handshake. Also, save receipts for studio time, equipment

rental, dinner with a prospective business manager, and other related expenses.

**A FINAL NOTE**

Mediation and arbitration are two alternatives for musicians in potential or actual conflict, enabling both parties to let off steam and arrive at a viable resolution, guided by an objective and knowledgeable catalyst. Especially if the relationship is or has been of value to you, these options can help you feel comfortable with the outcome and, hopefully, allow you to remain friends.

Within this framework, a mediation/arbitration attorney who specializes in entertainment is the ideal choice because this individual has an intrinsic understanding of what you do. Sempell offers a colorful analogy: "If you have a skin problem, you wouldn't go to a dentist."

*Marcia J. Pear is a San Francisco writer, principal of Pear Communications, and novice keyboard player. She's made a contract with herself: practice, practice, practice.*

# LAPTOP • NOTEBOOK • PC MIDI

SERIAL TO MIDI INTERFACES FOR ALL IBM PC COMPATIBLES

## NEW! 64 CHANNELS \$179.95

**MORE  
MIDI**



**MS-124**

**LOWER  
COST**

Our new MIDIATOR™ MS-124 sets a new serial MIDI standard. Exploit the power of a notebook, laptop, or PC while maintaining full compatibility with all MIDIATOR models and over 45 popular programs. Treat yourself to the portability and power musicians need and deserve. 1 MIDI In, 4 MIDI Out Ports, IBM PC Serial, Full Speed, Self Powered (AC supply optional). Single port models \$119.95.

**KEY**  
INC.  
ELECTRONICS

SEE YOUR DEALER OR CALL TOLL FREE

**1-800-533-MIDI**

Sales 800-533-6434 Office 817-560-1912 Fax 817-560-9745  
7515 Chapel Avenue Fort Worth, Texas 76116

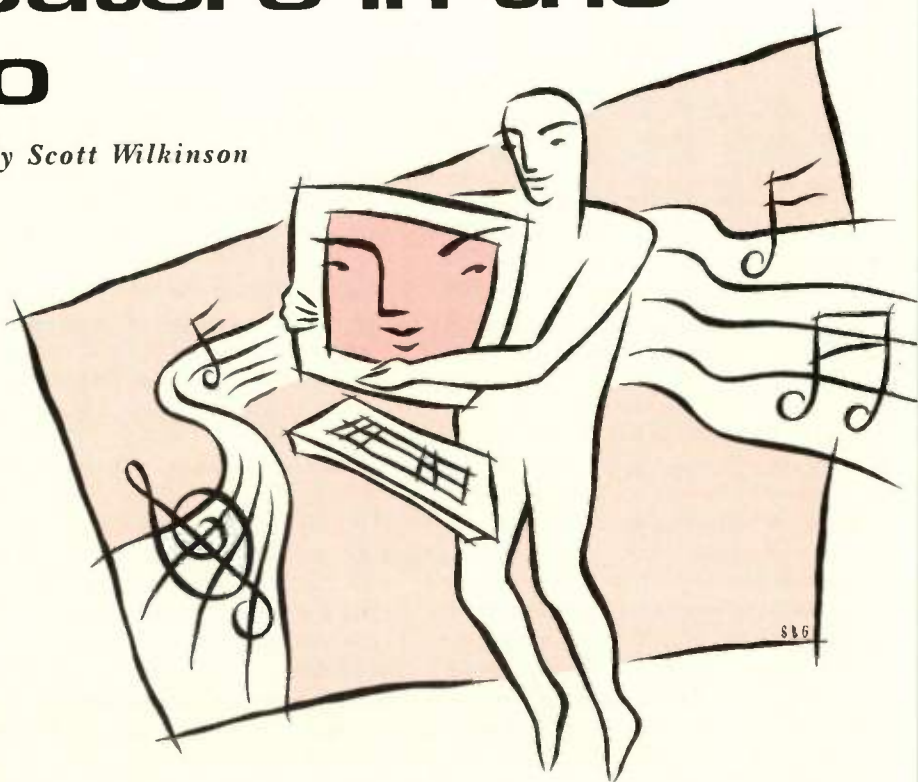
**KEY**  
INC.  
ELECTRONICS



# Computers in the Studio

By Scott Wilkinson

*If your computer hasn't done much for you lately, it might be time to make some music.*



**M**ost people believe MIDI was developed to connect and remotely control keyboards from different manufacturers. But there was another incentive: Developers wanted to use personal computers to make music, and they hoped MIDI—a standard digital code that represents performance gestures and other information about electronic musical instruments—would accomplish this. Shortly thereafter, music software was created, and low-cost computers became music collaborators.

Today, creative developers have produced an enormous variety of software, from music printing to compositional aids to sound editing and organizational tools. Taken as a whole, these programs have made personal computers an invaluable assistant in any personal electronic music studio.

## BASICS

Before exploring the musical applications of computers, let's cover some basic information. First, there are four types of computers, or "platforms," commonly used by musicians: Apple Macintosh, Commodore Amiga, Atari

ST and TT, and IBM PC-compatibles. Each type of computer comes in several varieties with different levels of computing power.

Connecting a computer to a MIDI system requires a *MIDI interface*. The Atari ST and TT include a MIDI interface as standard equipment, but the other platforms require a separate, optional interface. An interface can take the form of an external box that connects to one of the computer's *serial ports*, or a circuit board installed in an expansion slot. Either way, the interface includes one or more MIDI In and Out jacks, which allow MIDI data to be sent back and forth between the computer and connected MIDI devices, such as synthesizers and samplers.

Most musical applications for computers involve MIDI in some way, so it would be a good idea to brush up on this subject. (For more information see "From the Top: What is MIDI, Anyway?" in the January 1991 EM.)

## SEQUENCING

One of the most common musical applications of computers is sequencing. This application requires little computing power because the amount

of information carried by MIDI is relatively low. In contrast, sequencing provides a lot of musical options.

By recording the *sequence* of MIDI messages (which result from such performance gestures as playing keys on a keyboard, hitting drum pads, stepping on a sustain pedal, etc.) on different "tracks," a sequencer program simulates a multitrack tape deck within the computer. These MIDI messages can then be edited and manipulated in a wide variety of ways and sent to MIDI instruments, which respond as if their own keyboards were being played directly. (For more about the concept and process of sequencing, see "From the Top: How Sequencers Work" in the April 1991 EM and "From the Top: Sequencing Made Easy, Parts 1 and 2" in the March and April 1992 issues.)

Quite a few sequencer programs are available for the four platforms. Among them are Opcode's *EZ Vision* and *Vision* and Mark of the Unicorn's *Performer* for the Mac; Steinberg's *Cubase* for the Mac, Atari, and PC-compatibles; Dr. T's *KCS* and *Tiger Cub* for the Atari and Amiga; The Blue Ribbon SoundWorks' *Bars and Pipes Professional* for the Amiga; and Twelve Tone's *Cakewalk* and





# K2000 PERIPHERALS

Sweetwater Sound is your headquarters for a full line of K2000 peripherals and support. Let us help you make the most of your keyboard investment with these exciting new products!

## THE FINEST SAMPLE LIBRARY IN THE WORLD

Since 1986 STRATUS SOUNDS has been producing sample disk libraries for such state-of-the-art instruments as the Kurzweil 250 and the Akai S1000 — sounds that reviewers have dubbed “the best samples money can buy” (*Electronic Musician*, Feb. 1992). Now Stratus Sounds has turned its attention to what is surely the finest sample playback instrument *and* synthesizer in the world: the astounding Kurzweil K2000!

Literally thousands of hours have gone into the development of this library, as well as the talents of dozens of the finest musicians in the world. The result is the definitive, world-class library of acoustic and electric samples, including stunning new programs that take the K2000 to the next level of sonic excellence.

From lyrical woodwinds, sweet solo strings and beautiful concert grand pianos to red-hot electric guitars, earth shaking basses and powerful percussion, the Stratus Sounds library has rewritten the standards by which all other samples will be judged for years to come.

Sweetwater Sound has just acquired the exclusive rights to this incredible sample collection and, once you hear these sounds, you will agree they are the finest, most musically useful samples available at any price, for any instrument. The library is available on floppy disks, Syquest cartridges, CD ROM and specially-formatted hard disks.



**STRATUS  
SOUNDS**

## NEW! SWEETWATER K2000 DANCE SET

Today's hottest dance grooves are driven by fat snares, punchy kicks and unique percussion effects. Now you can have access to the very same samples and dance loops used on the latest chartbusting albums by the biggest names in the music business with the new eight volume Sweetwater Sound Dance Set.

From hip-hop to house and beyond, these spectacular sounds will have you and your audience dancing to a tight, driving groove. This library has been developed by one of the industry's top sound designers to take you to the next level of pop music excellence. Call today for complete details!

## SWEETWATER SOUND K2000 DISKMAKER

What could be better than owning the hot, new Kurzweil K2000 with all its sonic potential? How about a hot, new K2000 **PLUS** the entire SampleCell™, Sound Designer™ and Kurzweil 250 sample libraries only a mouse click away!

Introducing **K2000 Diskmaker**, Sweetwater Sound's fantastic new computer program that converts Macintosh-based sample libraries into floppy disks readable by the K2000 without the need to own any additional expensive hardware or software.

# K2000 DISKMAKER

Simply open the original sample disk or file on your Mac with **K2000 Diskmaker** and *voila!* thousands of megabytes of samples are immediately available for your K2000 library. With Diskmaker, it's safe to say you won't need to start from scratch!

### AND WE DON'T STOP THERE! SWEETWATER ALSO OFFERS:

- Several internal and external hard drives for the K2000
- RAM memory upgrades up to 64 meg
- K2000 cases and carry bags
- A complimentary subscription to our exclusive *Sweet Notes* newsletter
  - Specially-formatted hard disks filled with K2000 sounds
- **Call now for details and pricing information!**



Visit your local pro music dealer or contact Sweetwater Sound today!

5335 BASS ROAD • FT. WAYNE, IN • FAX (219) 432-1758 **(219) 432-8176**



● FROM THE TOP

Voyetra's *Sequencer Plus* for PC-compatibles (see Fig. 1).

A variation of sequencing called *algorithmic composition* generates new musical phrases or whole compositions based on parameters that you specify. For example, you might play a single phrase into the computer, which then repeats the phrase and alters it in real time as you play something else. Programs that provide these capabilities include Dr. T's *M* for the Mac, Atari, and Amiga; and *Jam Factory* for the Macintosh.

Another variation is called *automatic accompaniment*. These programs allow you to type in the chord changes to any song and then generate bass, drum, and rhythm parts in a style that you select from a menu. Some even include a sequencer that allows you to record your own parts along with the accompaniment. Such programs include PG Music's *Band-in-a-Box* for the Mac, Atari, and PC-compatibles; Soundtrek's *The Jammer* for PC-compatibles; and Blue Ribbon's *Super Jam* for the Amiga.

**NOTATION**

One of the first things most musicians want to do with a computer is transcribe a performance and print music notation. Unfortunately, music notation is very complex, and no program yet exists that can transcribe perfectly what you play. Depending on what you want to do, using notation software can be more frustrating and time-consuming than writing by hand. Also, unless you read music, these programs are virtually useless; they don't provide a shortcut for untrained musicians.

But notation programs can also be quite useful. Those of us with illegible hand notation are spared the embarrassment of exposing our music to other musicians. Also, individual parts can be extracted from a score with a minimum of fuss and bother. Notation programs also allow relatively easy transposition, in case your clarinet part must be read by an alto sax player.

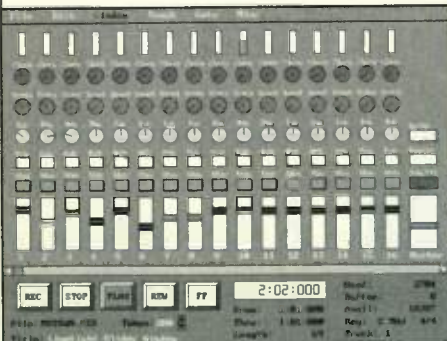


# LimeLight™

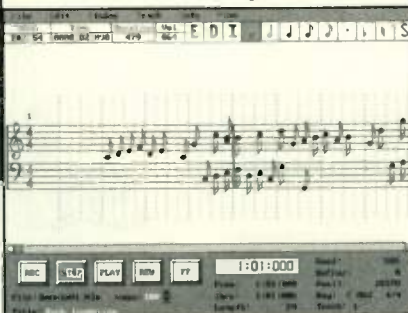
MS-DOS Sequencer

We listened to what you wanted in a MS-DOS sequencer and wrote it! LimeLight™ looks great, works great and is loaded with features. Like notes on a grand staff (which you can print), piano-roll with 88-note view, sliders, and graphical editing of virtually every musical event. And at a price you can afford, **only \$99.95**; \$199.95 with a Music Quest PC MIDI Card and two 10-foot MIDI cables. Call for more information.

**Only \$99.95**



LimeLight Mixer Screen



LimeLight Staff Screen

**BeBop Systems**  
 1-800-775-5557  
 fax 214-328-1092

LimeLight requires MPU-401 interface, VGA color graphics, mouse  
 P.O. Box 550363 Dallas, TX 75355-0363 214-320-2723  
 Distributed in the U.S. by Joel Sampson MIDI Source

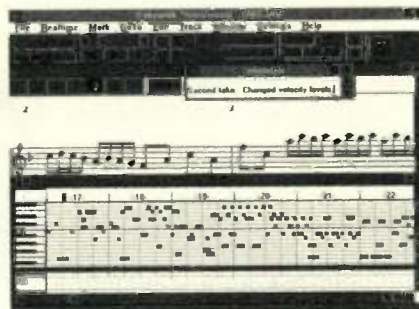


FIG. 1: Twelve Tone Systems' *Cakewalk Professional for Windows* sequencer for PC-compatibles. The lower portion of the screen is displaying notes in "piano roll" format, above which are some notes in standard notation.

Word-processing functions such as cut-and-paste and global editing make certain tasks far easier than taking pen or pencil to manuscript paper.

Most notation programs let you enter music in one of two ways: directly, or by importing a sequence file. Direct entry is accomplished using the computer keyboard and/or mouse, or by playing on the MIDI keyboard. Most programs also transcribe sequence files, particularly those in the Standard MIDI File format. (For more about computer notation, see "Computing the Score" on p. 24.)

Fueled by dreams of musicians everywhere, many companies have developed notation programs (see Fig. 2). These include Passport's *Encore* and Coda's *Finale* and *MusicProse* for the



SQ R PLUS SYNTHESIS  
DRUMS  
EFFECTS

Memory Card

SQ-R PLUS

SQ-1 PLUS

ALL WITH 32 VOICE POLYPHONY

SQ-2

SD-1

SQ2

SD 1

# No matter where you go, there we are.

Whether you're recording, composing, playing live or just getting started, you owe it to yourself to voice your music as fully as possible. That's why you should do it with an ENSONIQ synthesizer.

No matter which you choose, you'll now have full 32-note polyphony, for more complete music-making capability. So you can play more notes, layer more sounds, and sequence more tracks. All on a synth whose combination of advanced synthesis, dynamic effects and creative sequencing is second to none.

That's because at ENSONIQ, we've pioneered and perfected

the synth workstation concept into a line of instruments that are right for any player in any situation. Like our top-of-the-line SD-1 Music Production Synthesizer, offering exclusive performance features, unparalleled on-board sequencing and incredible sound.

Or our SQ-1 PLUS and SQ-2 Personal Music Studios, which now come with an additional Megabyte of new 16 bit waves, offer a complete range of musical possibilities to the budget-conscious musician. And for the perfect addition to your existing MIDI setup, there's the SQ-R PLUS, giving you

the great sound of the SQ instruments in a rack-mount.

So no matter what kind of music you make, we've got you covered, with notes to spare. For the dealer nearest you, call 1-800-553-5151.



Please send me the FREE ENSONIQ Guide to Choosing a Synth vs. a Sampler.

Please send me information on :  SD-1 32 Voice  SQ-2  SQ-1 PLUS/SQ-R PLUS  EPS-16 PLUS

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Mail to ENSONIQ, Department E-29  
155 Great Valley Parkway, Malvern, PA 19355



*Of course, ENSONIQ has long been an acknowledged leader in affordable samplers, such as the EPS-16 PLUS Digital Sampling Workstation and EPS-16 PLUS rack-mount unit.*



THE TECHNOLOGY THAT PERFORMS



# MAGICAL MIXOLOGY

Introducing the SM 82  
Stereo 8-Channel  
Line Mixer

M

ore mini-mixer sorcery from Rane. The SM 82: a mixing powerhouse in a minuscule chassis. Packed with the functions and features that cutting-edge performers desire.

**16 SEPARATE INPUTS** on the rear accept discrete Left and Right line level programs. Or a single cable plugged into the Left input will drive both L and R from a mono source, without having to use a "Y" adapter.

**STEREO AUX SENDS**, along with the stereo aux loop and return level control, allow you to create very flexible effects magic.

**FULLY EXPANDABLE** via the Master and Auxiliary Expand jacks, any number of SM 82s can be linked together to handle a staggering number of inputs.

**SUPER LOW-NOISE PERFORMANCE** allows you to mix and route programs to your ear's content, with virtually no loss in signal quality. In fact, the SM 82's specs are better than 16-bit digital performance!

**THE MS 1 MIC STAGE** accessory, available separately, allows you to use mic level programs with the SM 82, complete with phantom power and variable gain.

The new SM 82 Stereo 8-channel Mixer. Another supernatural musical miracle. From the wizards at Rane.



**RANE**

10802-47th Ave. W.

Everett, WA 98204

(206) 355-6000



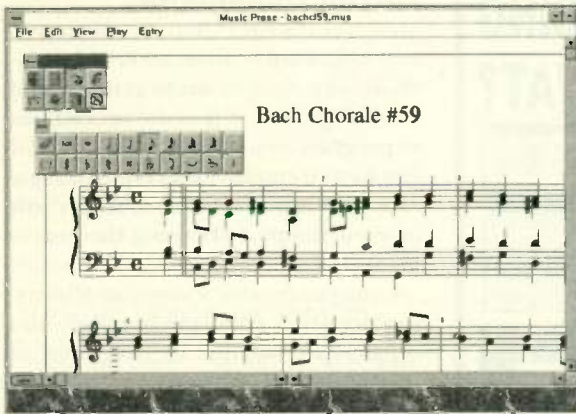


FIG. 2: Coda's *MusicProse* notation software for PC-compatibles. The symbols in the upper left portion of the screen provide access to common music notation elements.

Mac and PC-compatibles; C-Lab's *Notator* for the Atari; Dr. T's *The Copyist* for Atari, Amiga, and PC-compatibles; and Temporal Acuity Products' *Music Printer Plus* for PC-compatibles. Being rather intensive graphics applications, notation programs need as much graphics computing power as you can provide.

### HARD-DISK RECORDING

As personal computers have become more powerful, and memory and hard-disk storage less expensive, recording audio digitally onto a hard disk has become practical for home studios. (Though at 10 MB a minute for CD-quality stereo, you still need a huge hard disk for any serious work.)

Hard-disk recording systems use an *analog-to-digital converter* (ADC) to convert an incoming analog (audio) signal into digital format. It sends the signal directly to the hard disk, creating a *sound file*. If the incoming signal comes from a DAT or CD player with direct digital outputs it is already in digital form. Many systems include digital inputs for this purpose.

Once it is on disk, the sound file can be edited and manipulated on the screen in ways that would be impossible with analog tape recordings (see Fig. 3). Digital audio files can be edited using cut-and-paste, digital signal processing (DSP) such as reverb and EQ, and many

other functions. To hear the sound file, the signal is converted back into analog form by a *digital-to-analog converter* (DAC) and played over speakers. The file also may be transferred directly to a DAT without leaving the digital domain.

Most personal computer-based hard-disk recorders are limited to two tracks of playback due to the speed at which data can be retrieved from a hard disk; there can be no

delays while sending digital audio data from the hard disk to the DAC. However, many systems let you assemble many tracks of digital audio and select the parts of each track you wish to play at any particular time. You also can mix many tracks down to two within the computer without the sonic degradation that accompanies analog tape mixdowns.

Common hard-disk recording systems include Digidesign's *Sound Tools* and *Pro Tools* (a 4- to 16-track system) for the Mac; SunRize Industries' *Studio 12* for the Amiga; and Turtle Beach's *56K* and *Spectral Synthesis' The Digital Studio* (four to sixteen tracks) for PC-compatibles. Several companies have combined MIDI sequencing and hard-disk recording into one integrated package. These systems include Opcode's *Studio Vision* and Mark of the Unicorn's *Digital Performer* for the Mac.

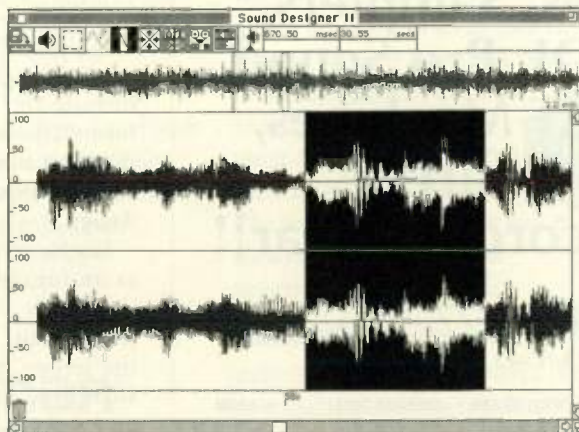


FIG. 3: Digidesign's *Sound Tools* hard-disk recording system for the Mac uses the company's *Sound Designer II* software. The inverse-highlighted area is selected for editing.

## MO' BETTER MIDI

for the **Oberheim OB8**

- Easy to install!
- All new hardware!
- Dual channel MIDI response!
- Pitch bend / Modulation!

We have added new features and removed a few bugs from the original MIDI interface. If you have an original interface, you can trade it in for \$50 credit. For those of you that missed the original, here's a chance to MIDI your OB-8 for only **\$175.00**

for the **MOOG Source**

- 256 patch locations!
- Pitch bend!
- MIDI clock for arpeggio!
- Sysex dump capability!
- No external switches!

Get that classic "MOOG" sound without spending the big bucks! All parameters are accessed through the front panel. **\$225.00**

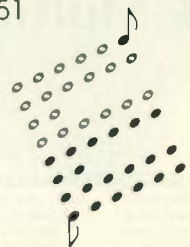
for the **Roland JUPITER 8**

- 128 total patch locations!
- Dual channel MIDI response!
- No DCB required!
- No external switches!

Responds to note, patch change, pitch bend, sustain, volume, filter cutoff, breath controller, tune request, clock, portamento, and various sysex data transfers. Also responds to many sysex and non-registered parameters to control panel, key, assign and arpeggio modes. The note response is very fast and it works with all versions of the Jupiter 8. **\$275.00**

## Encore Electronics

30 Glenhill Court Danville, CA 94526  
(510) 820-7551



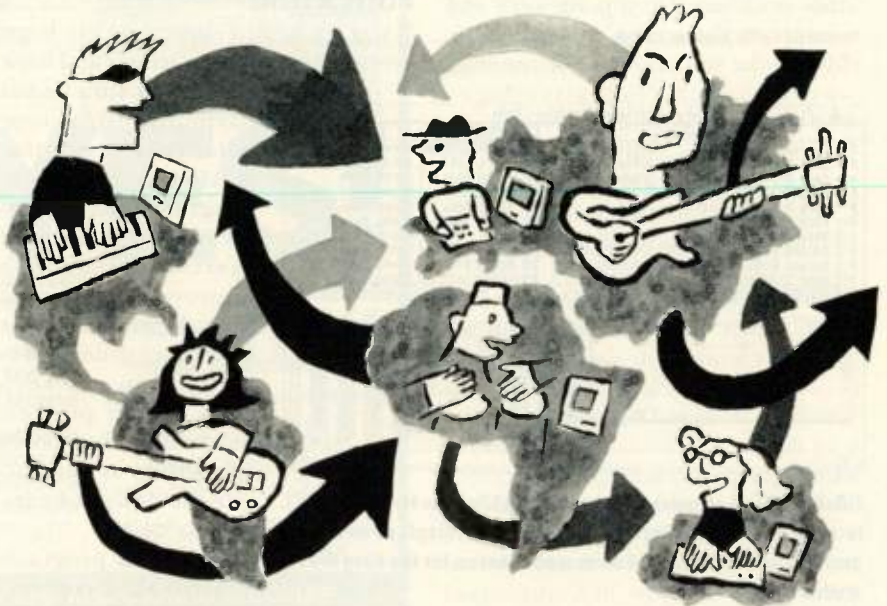
VISA and Mastercard accepted



# Remote Collaboration

By David (Rudy) Trubitt

*In the high-tech  
global village,  
musicians can  
collaborate  
no matter where  
they live.*



**O**ne unfortunate side effect of electronic music technology is the isolationist view it fosters among its users. I certainly fell for the notion, "Wow, I've got all this stuff and I can do everything myself!" After a few years of frittering, I've realized there is more to working with other musicians than the hassle of scheduling rehearsals.

Ironically, the technology that brought us this isolation also makes it possible to work with musicians anywhere on the planet. Remote collaboration can take many forms, from simply discussing or playing musical ideas over the phone to mailing scores or multitrack tapes back and forth. This month's column looks at a different aspect of remote collaboration.

## STANDARD MIDI FILES

Standard MIDI Files (SMFs) offer an easy way to exchange all sorts of musical ideas. Using SMFs is not entirely worry-free, as discussed in the January 1992 "Computer Musician" column, but they are an effective tool for remote collaboration. By exchanging SMFs among two or more people, musical ideas can be developed and arrangements fleshed out. Hopefully,

the resulting music will be greater than the sum of its parts.

However, this type of remote collaboration is a non-real-time experience. Missing are the benefits of the direct human interaction that is at the core of successful working relationships. But there's something to be said for the parties involved having some time to work on their own.

Successful collaboration is more than simply sharing SMFs. Once you've received a file, you need to find the appropriate patches, unless you happen to have the same MIDI equipment as your collaborators. Even if you do, you may need to embed System Exclusive patch dumps into your sequences to ensure that you have the right patches. Also, details such as pitch bend range and the function of assignable controllers like mod wheels must be considered. The goal, obviously, is to allow everyone to hear more or less the same piece.

General MIDI (GM) can be a big help in this regard (see "MIDI for the Masses" in the August 1991 EM). If you've got GM-compatible equipment at both ends, everything will be that much easier. Even so, using GM files is no guarantee that the music will

sound identical from one system to the next. Good verbal communication and thorough documentation is essential for successful file sharing.

## TELECOMMUNICATION

You could simply mail floppy disks back and forth, but telecommunication (or telecom) lets you send the data over phone lines directly. Using a modem and a telecom program with your computer, you can exchange SMFs, programs, and text files with anyone else who has a modem and telecommunication program.

There are two basic approaches to remote collaboration using telecom: online services and direct connection. Online services include large national and international computer systems such as PAN, CompuServe, and GENIE, as well as smaller local bulletin board systems (BBSs). These systems provide a variety of services, including databases of synth patches, samples, sequences, shareware, and other information. Typically, you can download (receive) files from and upload (send) files to these databases, allowing them to be shared by all the members of the system.

Other common services include private electronic mail ("e-mail") to other



# Finally! Music notation as simple as 1-2-3.

**1** ENTER YOUR MUSIC in realtime, steptime, or with the mouse. Play your composition back and watch it scroll.

**2** EDIT YOUR TUNE, add notes, lyrics or symbols anywhere on the page. Even import MIDI files.

**3** PRINT YOUR SONG as a full score on PostScript® or most dot matrix printers.



**F**rom the initial idea to the printed page, **QuickScore Deluxe** is the fastest and easiest tool available for IBM PC compatible computers. Play your music in or import a MIDI file and immediately see and hear your score play back through MIDI or any popular PC sound card, up to a full 16 tracks! Both amateur computer musicians and seasoned pros alike will find **QuickScore Deluxe** indispensable.



**Dr. T's**<sup>®</sup>  
MUSIC SOFTWARE

Manufacturers suggested retail \$149. For more information or the number of an authorized dealer near you call 1-800-989-MIDI or Fax 617-455-1460.

**Quick  
Score  
Deluxe**<sup>™</sup>



## ● COMPUTER MUSICIAN

members of the system and public forums in which a wide variety of topics are discussed. You can use the e-mail system to exchange SMFs and other files between other collaborators on the system. To participate in a forum discussion, download the messages pertaining to the topic of interest, read them at your leisure, write your own contribution to the discussion, and upload it the next time you connect with the system. For more on this topic, see "Going Online" in the November 1990 issue of EM.

One advantage of online services is that you and your collaborators can each connect with the service at your convenience. However, you also can connect your own computers directly in order to transfer files. Depending on your relative proximity, the cost of a phone call to your partner might be far less than the online service's connection charges. Also, this approach usually is quicker if time is of the essence.

If you are transferring large files using either online services or direct connection, it helps to compress them

before sending. File-compression programs remove any wasted space in a file, making them much smaller in the process, saving disk space and transmission time. However, it creates a "binary" file that must be sent using a binary protocol such as XMODEM, YMODEM, or ZMODEM, even if the compressed file was originally text-only. In most cases, the person receiving the file must have a copy of the same file-compression program to "extract" the file, although some programs allow the file to "self-extract."

To put all this theory into practice, I'll describe a remote collaboration resource in operation today, linking musicians across the country and potentially across the world.

### NETJAM

Netjam is part of Internet, an international computer network that evolved from a Department of Defense network called Arpanet. "I call it a computer network for music," says Netjam coordinator and guitarist Craig Latta. "It started out in 1990 with Standard MIDI Files as the basic data format. But Net-

jam is meant to be protocol independent. We also support digital audio data and *C-sound* [an academic computer-music language] data as well as Opcode *Max* patches and external objects."

Today, Internet connects nearly every major university computing center with research institutes and commercial businesses. If you're not attending a university, or don't work for a large corporation, don't despair; many online services such as PAN and The WELL offer Internet access.

Internet includes the Usenet news groups, a collection of SIGs that carry on lengthy text-based conversations and electronic mail. "Netjam started out on Usenet as a huge computer music bulletin board," says Latta. "As people started discussing computer music, they were really eager to talk about theoretical things. But after a while, they started to get tired of all this talking and wanted to hear some music. Of course, this is difficult in a text-based format. A few people thought, 'Well, we could send MIDI files around.'"



ES-50 synchronizer and RTS 14 rack sold separately



Unfortunately, Internet e-mail was designed for text files, not binary files like SMFs. However, most UNIX systems (and PAN) offer a pair of utilities called *uencode* and *udecode*. These utilities are the opposite of file-compression programs; they convert binary files to plain ASCII text, increasing their size by about a third in the process. After encoding, they can be transmitted by e-mail. Once the message is received, it is decoded back into the original binary file, which can then be downloaded from the system.

Netjam is almost entirely automatic, receiving submissions from participants and maintaining an archive of about 8 MB of SMF, *Max*, and digital audio files. If you have access to Internet, log on and send e-mail to "Netjam-request@xcf.Berkeley.EDU". When asked for a subject header, enter "request for info". You don't need to put anything in the message body; Netjam will recognize the subject line and quickly send you a detailed document about itself.

What's it like interacting with Netjam and its participants? As Latta

explains, "The basic steps are: create a file of musical data and then document what you've done in a text format." Your file then is submitted by uploading it to Netjam.

One of the Netjam members has even devised a program to detect the differences between people's studios. According to Latta, "All you have to do is specify your setup in a certain way. This program then takes your submission and converts it into an intermediate generic format, which uses General MIDI as its starting point. Each person in Netjam has a file describing their environment.

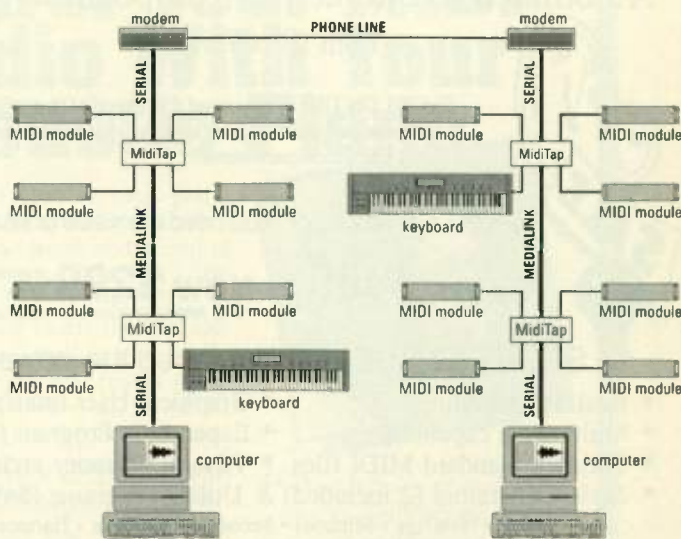


FIG. 1: With two MidiTaps each, collaborators can connect their MIDI systems over the phone line and jam in real time.

The intermediate format is then converted so it maps most reasonably onto what they have.

"Typically, a piece is submitted and people listen to it. There are a lot of compositions in the Netjam archive that are first takes. They haven't been

## YOU NEVER THOUGHT WE COULD SYNCH SO LOW.

A synchronizable eight track for under \$3500?

Shocking. After all, that's \$1000 less than the next lowest synchronizable half-inch eight track. But our new TSR 8 proves that when Tascam decides to build in value, nothing is sacred.

Starting where the popular Tascam 38 left off, the TSR 8 is a real power player, synching to video for audio sweetening. Or to other decks for sophisticated

multitrack capabilities.

But this eight track has more than just a great price and synchronizability going for it. Spot erase, built-in dbx<sup>®</sup> Type 1 noise reduction, gapless punch-in/out and rugged Tascam quality all make the TSR 8 a deck that can get the job done.

See the TSR 8 at your Tascam dealer today. As its suggested retail price of \$3499 shows, there's almost no limit to how low we'll go to get one into your studio.

# TASCAM<sup>®</sup>

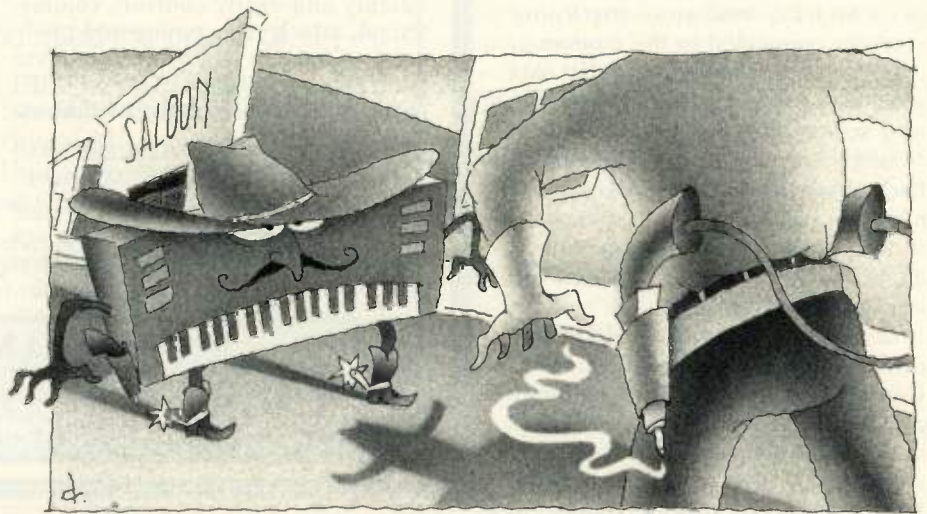
© 1989 TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640. 213/726-0303. \*dbx is a trademark of dbx, Inc.



# Questions and Answers

By Alan Gary Campbell

*Our tech guru offers a heated discussion of soldering gear, explains why what you see isn't what you 'scope, and reflects on infrared remotes and forgetful K2000s.*



JACK DEROCHE

**Q.** What are the technical differences that distinguish soldering guns, soldering irons, and soldering stations? What are their different applications?

**A.** A soldering gun is so named because of its size, shape, and method of operation. The power to the heating element is controlled by a trigger in the handle. When the trigger is not engaged, the power to the element is disconnected and the tip remains cool, allowing the tip temperature to decrease after each use. Though a typical soldering gun has a high heat capacity, there is a brief delay after the trigger is engaged before the tip temperature rises to a useful level.

A soldering gun is used in soldering connections to large terminals on speakers, AC power-switching devices, large power transistors, etc. Many of these tasks also can be handled by a soldering station (discussed shortly). However, a soldering gun is not normally used with the smaller hardware and electronic components found in keyboards, effects, and the like. Many soldering guns produce a strong magnetic field and exhibit high static

voltages at the tip; both can easily damage sensitive solid-state components.

A soldering iron is a pencil-shaped device that contains a heating element designed to run continuously. Most modest-sized soldering irons have considerably lower heat capacity than soldering guns, and irons designed for use in soldering small solid-state components should not be used for larger work. Good-quality soldering irons (Ungar, Weller, etc.) exhibit a weak magnetic field and have a grounded, zero-potential tip to allow safe use with solid-state components. The principal disadvantage in using a soldering iron is that its low heat capacity requires that the user allow adequate recovery time between joints. This can be difficult to judge, as the heat capacities of disparate connections vary, and there is a tendency to rush. These factors can lead to poor work.

A soldering station makes use of a pencil device, similar in construction to a soldering iron, that is connected to a closed-loop, temperature-control network. This allows a control circuit to sense the tip temperature and compensate for varying thermal loads, which greatly improves the speed and

reliability of soldering. Such a circuit allows easy, dial-in adjustment of the tip temperature so the soldering station can be used effectively with work of various sizes and heat capacities. Moreover, modern soldering stations are free of extraneous magnetic and electrostatic fields and are safe to use with solid-state components. Many of these stations have sufficient reserve capacity to allow their use with large tips and large work.

A soldering station is a necessary accoutrement for a service center, as is a desoldering station. Although a station costs considerably more than an iron, it is a much better long-term investment for the serious do-it-yourselfer. A soldering station will outlast several soldering irons, and the quality and reliability of work produced with a station can be much higher. That means one less entry on the "Why doesn't this prototype work?" list.

**Q.** I have a 20-megahertz-bandwidth, dual-trace oscilloscope that, when used to monitor high-frequency clock and data pulses, gives a distorted, sometimes unstable image. Is this a defect, a limitation of 'scope design, or a sign that I need a better oscilloscope?



# The Keyboardist's Drum Module that's Good Enough for Chester.



## PRO/CUSSION))))))

How good is E-mu's ProCUSSION drum module? Ask Chester Thompson, touring drummer for Genesis. He includes ProCUSSION in his kit because it gives him the greatest flexibility and hottest sounds available.

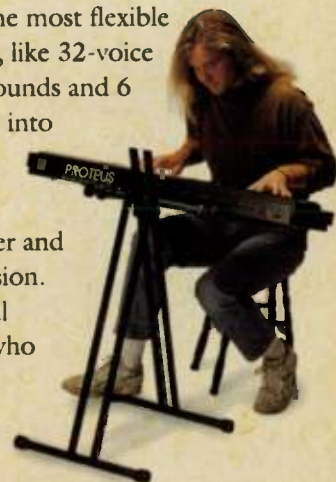
But don't think you need to be a drummer to use ProCUSSION. With over 1,000 drum and percussion sounds from the Emulator III library of 16-bit samples, ProCUSSION is perfect for anyone who wants realistic kicks, snares, toms, hi-hats and cymbals. Add exotic, Latin and tuned percussion like marimbas, vibes and bass samples and you've got the most complete set of percussion sounds on the market.

But ProCUSSION doesn't stop there. To make it easy to use, ProCUSSION arranges these sounds into 128 drum kits—64 of which are user definable! With

ProCUSSION's multi-timbral capabilities, you can play up to 16 kits simultaneously—all with the control you demand for shaping your sounds (like opening and closing your hi-hat using your keyboard's modulation wheel). And ProCUSSION lets you create your own sounds whenever you need more selection and variety.

Because it's part of E-mu's Proteus family of sound modules, ProCUSSION features the most flexible editing and layering capabilities, like 32-voice polyphony for thick, complex sounds and 6 polyphonic outputs—all packed into the industry's most straightforward interface.

So visit your nearest E-mu dealer and listen to a demo of ProCUSSION. It's not just for professional drummers. Just for those who need to sound like one.



**E-mu Systems, Inc.**

P.O. Box 660015, Scotts Valley, California 95067-0015  
U.K. E-mu Systems, Ltd., Suite 6, Adam Ferguson House,  
Eskmills Industrial Park, Musselburgh, EH21 7PQ  
All trademarks are property of their respective companies.

E-mu Systems is a proud sponsor of WOMAD,  
the World of Music Arts and Dance.

Made in the USA





“This thing’s alive.”

**YAMAHA**  
**SY99**

You can hear some great music, and the SY99, on Chick Corea's new album, *Beneath the Mask*, available on compact discs and cassettes on GRP Records.  
© 1991, Yamaha Corporation of America, Digital Musical Instruments, P.O. Box 6600, Buena Park, California 90622-6600 (714) 522-9011





● SERVICE CLINIC

**A.** When you say "high-frequency," I assume you mean clock and data rates of 10 MHz or higher. Consider that to construct a square wave (the approximate shape of a 50% duty-cycle pulse) using additive synthesis, the first ten harmonics are required to produce a waveform that even resembles the shape in question, and a hundred or more harmonics would be better. With an average, 20 MHz oscilloscope, the rated bandwidth represents not the limit of flat response, but the -3 dB point. Thus, when monitoring a 10 MHz square wave with such a device,



**A soldering station will outlast several soldering irons.**

you are not able to fully register even the second harmonic, and each subsequent harmonic is further attenuated, as if the square wave were processed through a lowpass filter (which, in effect, it is). The resulting displayed waveform will necessarily exhibit "rounding" and "ringing," and these effects are made worse by using an incorrect probe, or one that is improperly grounded. Poor trace stability can be caused by inadvertently selecting the wrong trigger mode, or by a poor-quality oscilloscope. Set the trigger control for high-frequency, capacitively coupled triggering (often termed "AC HF" or "AC Fast").

These problems do not necessarily indicate the need for a better oscilloscope, just a faster (read: more expensive) one. Fortunately, logic probes and analyzers can aid in troubleshooting high-frequency circuits at much less expense than a new 'scope.

**Q.** When I use one infrared remote control in my studio, several devices—even different brands—try to respond to the signal. Is there a way to stop this? Also, the remotes work poorly at angles. Is there a way to improve this?

**A.** A few remote-control devices allow the user to select transmit/receive channels, but most don't. The only solution in the remaining cases is to tape or velcro a small piece of

board or plastic over the infrared sensor window on the affected equipment. Wired remotes solve these problems but clutter the control room.

Infrared sensors are most sensitive to signals impinging at a 90° angle to the plane of the device. Also, on some units, the sensor is mounted on a PC board that is set slightly back from the front panel, placing it in the "shadow" of the panel when viewed at an angle. (The transmissive cutout of the panel is generally not much larger than the sensor.) One solution is to place a piece of white cardboard or plastic near the sensor window at an angle of 90° or more to the panel, to reflect the signal back to the sensor. Some trial-and-error adjustment of the reflecting surface's angle may be necessary to achieve good results.

Note: Some materials that block or reflect visible light are transparent to infrared. If the above "fixes" don't seem to work, try using different materials.

**Q.** My Kurzweil K2000 synth keeps showing a "low battery" message in the display. I assumed I had bogus AA batteries, so I replaced them. That fixed it temporarily, but then it acted up again. This time, I tested the batteries, and they were fine! What gives?

**A.** The battery holders of the K2000 have crimped terminals. On a few units, the terminals are loose, which can cause these symptoms. (This is a defect of the terminal and is not Kurzweil's fault.) I suggest you take the unit to a Kurzweil authorized service center and have a technician solder the terminals.

Service tip: If the memory of the K2000 becomes "confused" (e.g., due to a power glitch), and the unit will not reset, turn the unit off and remove the batteries for about five minutes. This clears the memory. Then reinstall the batteries and power up normally.

Aside: The K2000 disk drive can format and write to 720 KB or 1.44 MB, MS-DOS disks. Some apparent disk drive "errors" result from nothing more than selecting the wrong format for a given disk.

EM contributing editor Alan Gary Campbell is owner of Musitech, a consulting firm specializing in electronic music product design, service, and modification, and review editor of H&B Classical magazine.

**Audiophile Quality...**

**EUROPADISK, LTD.**

**US' Most Complete Facility!**

**New, Low Cost Packages with Free Graphic Design!**

- **CD Production**  
Complete, Low-Cost Packages
- **Cassette Duplication**  
Finest European Equipment
- **12" Dmm Vinyl**  
Cleanest, Hottest 12" Vinyl
- **Printed Graphics**  
In-House Art Dept. - Free Design!
- **Mastering Studios**  
Neve DTC & Digital Editing

Call or FAX for Complete Catalog

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

**MIDI POWER TOOLS To Go!**

**HYPER 2MIDI 2.0**

**IS...**

powerful Macintosh MIDI programming made easy—with HyperCard!

versatile—remap, delay, zone, filter, record, and play back MIDI events, create MIDI slider controls, work with sysex, and more

great for interactive presentation and education, editors, librarians, custom control of your MIDI studio, algorithmic composition...

Call or write us for more information!

21213-B Hawthorne Blvd., Ste 5305 Torrance, CA 90509-2881

tel.: (310) 316-2939  
fax: (310) 540-8459



# Reviews

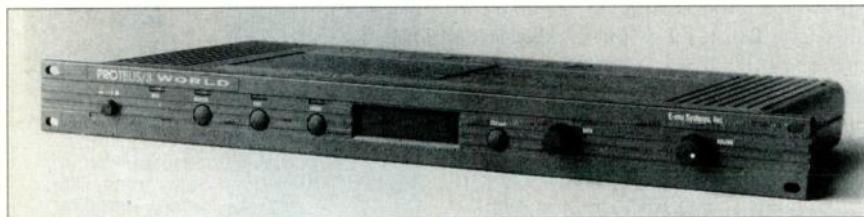
## E-mu Proteus/3 World Sound Module

By Scott Wilkinson

**Can the world fit in a single-rackspace sound module?**

**W**hen E-mu announced the newest member of the Proteus family at the last NAMM show, I made a beeline for their booth. After all, over the past twenty years I've studied and performed in a wide variety of world-music ensembles, including Indonesian, Japanese, Chinese, Indian, Celtic, South American, and klezmer. How could I resist a Proteus filled with samples of instruments from around the world?

Except for the sounds, the Proteus/3 is identical to the Proteus/2 and Proteus/1, so I'll provide only a brief overview. For a more detailed look at the



E-mu's Proteus/3 World features 56 ethnic instrument samples, several common Western instruments, and a handful of synthesized sounds.

organization and operation of the Proteus family, see the Proteus/1 review in the October 1989 *EM*, "The Art and Craft of Using E-mu's Proteus" in the March 1990 issue, and the Proteus/2 review in the December 1990 issue.

### OVERVIEW

Like the other Proteus models, the Proteus/3 is 16-part multitimbral and 32-note polyphonic, with dynamic voice allocation. There is no onboard effects

processor or sequencer. The Sub Outs are TRS stereo jacks that can be used as insert points for outboard effects, or as auxiliary line inputs. The user interface is wonderfully simple and straightforward; if you know how to use one Proteus, you know how to use them all.

In the Proteus/3, four megabytes of sample ROM hold some 56 new ethnic instruments, including winds, strings, and lots of percussion with various articulations and many tuned bars and gongs. In addition, there are some standard offerings (trombone, trumpet, French horn, pizz bass, arco strings, some trap percussion) and the ubiquitous harmonic, digital, and single-cycle waveforms. Contrived sounds include a variety of synthesized insects.

The samples are combined in various ways across the keyboard to form a total of 211 Instruments in the system ROM (which is different from sample ROM). These include multisampled instruments, ensembles, and percussion maps.

Instruments are combined into Presets, of which there are 128 in the system ROM and 64 in user RAM (256 RAM locations in the XR version). Each Preset includes one or two Instruments that are independently mapped to the keyboard and can be layered, split, or overlapped. Up to four Presets can be linked and independently mapped to the keyboard. Of course, layering at any level reduces the polyphony of the instrument.

It's important to remember there's more to the Proteus than sample playback. Proteus synthesis is based on combining samples and other complex waveforms as additive elements to be layered and crossfaded using EGs, LFOs, and real-time modulators. The Proteus/3 is rich with potential in this regard.

Like the previous models, the Proteus/3 includes five tunings to accommodate different styles of music: equal temperament, just intonation, Vallotti, 19-Tone, and gamelan (Pelog on the white keys and Slendro on the black keys). Also, one user-definable tuning



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

# BAND-IN-A-BOX™

**INTELLIGENT SOFTWARE FOR IBM, MAC & ATARI COMPUTERS**

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

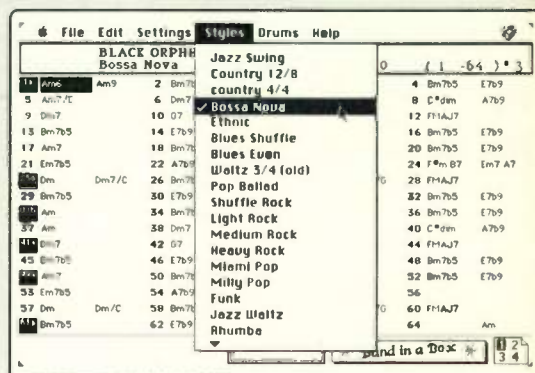
**Automatically generating professional quality five instrument accompaniment of  
bass, drums, piano, guitar & strings in a wide variety of styles**

**24 Styles built in...**

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

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

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



1990  
- FINALIST -  
PC Magazine Award  
for Technical Excellence

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

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

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

**PC Magazine Jan. 15, 1991  
Technical Excellence Awards**

**DownBeat - the #1 Jazz Magazine says...**

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

**DownBeat October 1991**

"I can't imagine a better way to spend \$59."

**Electronic Musician October 1990**

"One of the neatest programs I've seen in a long time."

**Start magazine 1990**

"Every studio teacher and songwriter needs to own Band-in-a-Box."

**Music Paper Magazine August 1990**

**Standard Edition (24 styles)..... \$59**

**Professional Edition (75 styles)..... \$88**

**ADD-ONS FOR REGISTERED USERS**

- NEW! Upgrade to Ver. 5 for registered users..... \$29
- NEW! Midi-FakeBook with Melodies (100 songs on disk)..... \$29
- NEW! Styles Disk #2 - 25 new styles for Ver. 5..... \$29
- Any 2 of above..... \$49
- Any 3 of above..... \$59

IBM with MIDI - 640K, MIDI (any MPU 401 / Midiator / YamahaC1 / SoundBlaster M/D)  
IBM with no MIDI - 640K + AdLib / SoundBlaster (reduced version)  
MACINTOSH version REQUIRES 2 mb RAM (reduced version for 1 mb included)  
ATARI 1040ST / 1040STE / Mega / TT - reduced version for Atari 520 included

**- 30 day Unconditional MBG -**



**TO ORDER TOLL FREE:  
1-800-268-6272 or 416-528-2368**

to hear recorded demo 416-528-2180 (24 hours)

**or send cheque/m.o.**

**for \$59 + \$3.50 shipping to: PG Music Inc. 111-266 Elmwood Avenue, BUFFALO NY 14222**



● PROTEUS/3

table lets you specify the tuning of each note in the entire MIDI range.

While I applaud the inclusion of alternate tunings, they fall short of filling the requirements of this particular instrument. For one thing, Vallotti is a European Baroque temperament, and 19-Tone is a relatively contemporary tuning, neither of which are needed in this instrument. E-mu should have replaced them with some additional ethnic tunings such as the Indian 22-note octave or any one of several known Arabic tunings. As for user-specified tuning, I would like to see an octave-based user table in addition to the individual-note table. Also, the tuning resolution is a rather coarse 1.56 cents. I encourage E-mu (and other manufacturers) to implement the new MIDI Tuning Standard in future synths and samplers.

The operation manual is the same for all three models. It is well-organized and well-written, with plenty of illustrations and examples and a good index. An Instrument list reveals the samples that make up each Instrument. However, it should (but doesn't) indicate the key that plays the original pitch of each sample, as many of the samples are stretched over a large interval, making it hard to find the original pitch. I also wish the addendum included some discussion of world music and the appropriate use and orchestration of the sounds.

**SAMPLING AND PROGRAMMING**

And now to the heart of the matter. For starters, the sound quality is clean as a whistle. This is not surprising; E-mu has a well-deserved reputation for noise-free sample playback.

As I expected, some of the pitched instruments are multisampled. However, the split points between the multisamples in some of the Instruments exhibit an obvious and distracting tonal shift; examples include Troubadour (a French, nylon-string folk harp), Nylon Guitar, and the brasses. This effect is less obvious in the context of an entire sequence.

More disturbing is the fact that many Instruments consist of single samples stretched across most of the keyboard. This is also true for the Combination Instruments, in which several sampled instruments form an ensemble. As a result, articulations get compressed in

the high range and elongated in the low range of these Instruments. Some of the worst examples are percussion Presets such as the Stereo Shake and Tabla Tarang, which should be part of percussion maps and not assigned to their own dedicated Preset. The Shakuhachi was sampled with vibrato, the speed of which changes radically across the keyboard.

Many ethnic instruments have relatively narrow pitch ranges. But unlike the Proteus/2, the Instruments in the Proteus/3 are not restricted to their normal ranges in the factory Presets. Restricting them would help in several ways. It would minimize the effect of single-sample transposition. More important, it would automatically educate musicians about appropriate use of these sounds. Of course, the ranges can be edited and saved to user locations, but most musicians don't know what the correct ranges are. Even if they did, it would be easier to extend a few ranges manually than to restrict many ranges.

Some of the instruments were sampled with a variety of articulations and variations, particularly percussion instruments such as Bata drums, Tablas, and Udu drums. The Jew's Harp is exceptional, offering four different and well-chosen variations. (Although this has become the accepted name of the instrument, I prefer to call it a Jaw Harp. This is less derogatory and more accurate because the instrument is not even used in Jewish music.)

Unfortunately, other instruments were sampled with only one or two different articulations or playing techniques. This limits the flexibility and minimizes the impact of these sounds, which often depend on a variety of playing techniques to compensate for their narrow pitch range. Examples include the Shofar, Shakuhachi, Shenai, Bagpipe, and Steel Drums.

On the positive side, some of the sounds include variations that are invoked with the mod wheel or sustain pedal. For example, Mod Sitar adds a scooping attack with the mod wheel, Fsw Bagpipe adds a finger trill attack to the chanter notes with the sustain pedal, Mod Harmonica adds a hand vibrato with the mod wheel, and Ocarina adds a sustaining trill with the mod wheel.

The earlier Proteus models were cited for some annoyingly short loops,

and some of the sounds in the Proteus/3 suffer from the same problem. These short loops result in a static quality during sustained notes, particularly in the Pizz Bass and brass sounds. The problem is exacerbated by the lack of EG rate-scaling, combined with samples that are stretched over wide intervals. In the lower ranges, the envelope decay covers the effect of a short loop, but in the higher ranges, the loop becomes obvious. Examples include the Saron and Oud.

Some of the sounds have inappropriate envelopes. For example, the Ocarina Solo decays rather quickly when it should sustain as long as the key is held down. The Tambura plays its entire characteristic droning figure with one key, but it decays to silence in the East Indian Combination Instrument. (It sustains as it should in the Tamburas Instrument.)

**HOW DOES IT SOUND?**

Many of the ethnic sounds are quite convincing as simulations of real instruments, at least in their appropriate ranges. Among others, I particularly liked the Koto, Spirit Catcher, Jew's Harp, Mbira and Bass Mbira, African Mallets, and Vodun Drums. The percussion samples are excellent in general, but the different keyboard mappings are surprisingly similar.

However, a number of ethnic sounds aren't convincing replicas. These include the Shenai, Shofar, Bagpipe, Shakuhachi, Penny Whistle, Irish Harp, and Didjeridu. The Clarinet, Trumpet, Trombone, and French Horn also are thoroughly unconvincing. Mediocre replicas include the Banjo, Suling, and Ney Flute.

**Product Summary**

**PRODUCT:**

Proteus/3 World

**PRICE:**

\$995

**MANUFACTURER:**

E-mu Systems, Inc.  
1600 Green Hills Rd.  
Scotts Valley, CA 95066  
tel. (408) 438-1921

EM METERS	RATING PRODUCTS FROM 1 TO 5				
FEATURES	●	●	●	●	●
EASE OF USE	●	●	●	●	◐
PRESET QUALITY	●	●	●	●	◐
VALUE	●	●	●	●	●



Interestingly, the electronic sounds are almost universally excellent. My favorites include Mizmerized, Ice Bella, Foreboding, and Heavy Tibet. There are several metal/industrial/pop sounds such as Kraftbass and Metal Cutter that acknowledge urban culture as part of the global community.

## CONCLUSIONS

Two questions must be asked of the sounds in the Proteus/3: Are they quality simulations of ethnic instruments, and are they good, useful sounds regardless of their origins? In answering the first question, ethnomusicology purists might be disappointed. Although there are a fair number of excellent replicas, quite a few are not.

The answer to the second question is more positive. Although they aren't all accurate simulations, many of the sounds suggest an ethnic flavor and are useful in their own right. The electronic sounds are quite good, particularly for pads and sound effects. But despite their quality, I would trade the electronic sounds for more ethnic

instruments. Electronic sounds are a dime a dozen, but where else are you going to find six different Cuban Bata drum articulations in a single-rackspace sample player?

A related complaint is the inclusion of standard sounds such as Western brass, arco orchestral strings, and trap percussion, which also should be replaced with more variations of ethnic sounds. These certainly are world instruments (we're still part of the world, aren't we?), but they are available in many other instruments, including the Proteus/1 and 2.

E-mu's ads strongly push the module's world music applications, and judged strictly in this context, it is uneven. However, it certainly provides many interesting and exotic sounds that expand the MIDI musician's tonal palette. From this perspective, the Proteus/3 is successful as a supplemental sound module that complements the other Proteus models.

(Special thanks to Jeff Rona and Ernie Rideout.)

## Turtle Beach MultiSound (PC)

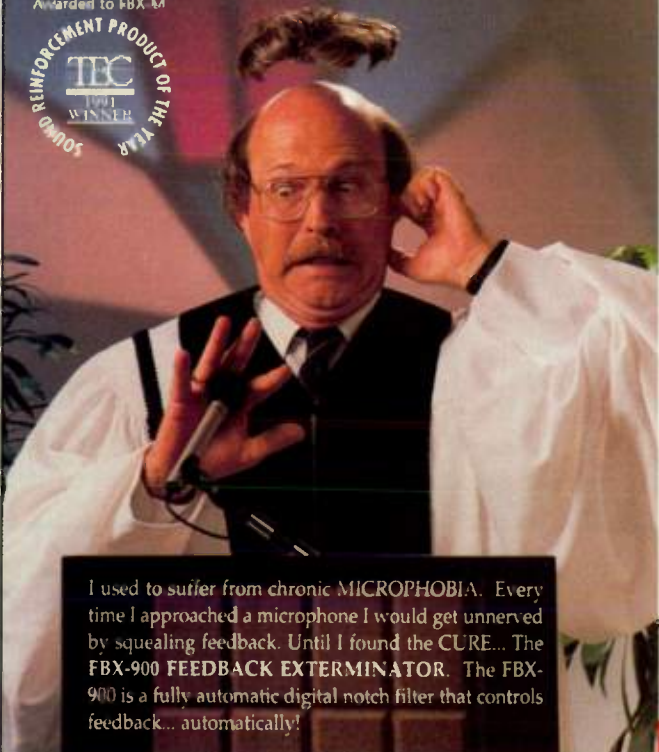
By David Miles Huber

**Is this the 16-bit audio  
card PC owners have been  
waiting for?**

**W**ith the release of Microsoft's *Windows 3.1*, multimedia computing is the hottest trend in the world of PC-compatibles. PC users everywhere are discovering the joys and pains of multimedia and in the process are realizing the importance of audio to the multimedia experience. To fill the growing need, numerous manufacturers are offering plug-in boards with digital audio and synthesis engines. Up until now, however, these boards have been far below professional standards, typically offering 2-operator FM synthesis and 8-bit


# Microphobia

(mī·krə·fō·bē·ə) n. The fear of feedback.



Awarded to FBX-M  
SOUND REINFORCEMENT PRODUCT OF THE YEAR  
TEC  
1991 WINNER

I used to suffer from chronic MICROPHOBIA. Every time I approached a microphone I would get unnerved by squealing feedback. Until I found the CURE... The FBX-900 FEEDBACK EXTERMINATOR. The FBX-900 is a fully automatic digital notch filter that controls feedback... automatically!




## THE FBX-900 CURES FEEDBACK!

*"Recently, we installed a sound system into the aerobics instruction area of a new health club facility. Normally, feedback occurs when a microphone moves in front of the speaker system, but here, we installed the FBX and it cured the feedback! Now the aerobics instructors can move freely around the entire room with their wireless."*  
Dean Sims - Intelligo Inc, Winona, MN

*"I have used the FBX on a number of different venues and I knew that it worked. I didn't know just how good it worked until I faced a three day conference with changing humidity, temperatures and over 50 open mics... WITH NO FEEDBACK!"*  
Peter Archambault, PMA Industries, Johnson, RI

The FBX-900 Feedback Exterminator continuously monitors the sound program, detects resonating frequencies and places narrow 1/10 octave digital notch filters, automatically terminating feedback!

Call Sabine at 904/371-3829 for more information.



**Sabine**  
Musical Manufacturing Company, Inc.

4637 N.W. 6th Street • Gainesville, Florida 32609 • (904)371-3829 • FAX - (904)371-7441  
\*The names FBX-900 and FBX Feedback Exterminator are registered trademarks of Sabine Musical Mfg. Co., Inc.

MADE IN U.S.A.



Listen to the sound of silence.....

# .....the D&R Orion.

## Everything you ever wanted.....and more!

In-line format • high definition electronics • 4 band sweepable equalizer with monitor and channel switching • 8 mix subgroups • 8 busses with 4 "Floating Subgroups" • 8 aux send busses • aux sends on monitor or channel • stereo in place solo or pfl on monitors and channels • three inputs per module (2 usable at same time with EQ and aux sends) • dual stereo effect return modules with EQ, aux sends, mutes, solos, and bussing • LED bargraph meters (optional high resolution LED bargraphs or VU meters) • three frequency oscillator • +4 dBu or -10 dBv interface built-in • extensive communications • phase meter • frame 30 (72 mix inputs), frame 38 (88 mix inputs), frame 51 (96 mix inputs) • custom size frames available • balanced inputs and outputs • balanced TT patchbay built-in or optional • optional pedestal base • automation ready • free installation consultation • regional product support • and "Factory Direct" pricing!



**the Orion** (starting at \$12,500)

**D&R.** Every sound under control!

**D&R**  
MIXING CONSOLES

D&R West (818) 291-5855 • D&R Nashville (615) 661-4892 • D&R Southwest (409) 756-3737 • D&R USA (409) 588-3411  
D&R Electronica b.v. • Rijinkade 15B • 1382GS Weesp • The Netherlands • Ph. (--) 31 2940 18014



## ● MULTISOUND

digitizing with low sample rates. Turtle Beach's new MultiSound card changes all that.

Packed onto a full-size AT card are a 16-bit, stereo, hard-disk recording system based around a 40-MHz Motorola 56001 DSP chip; a 32-voice Proteus/1 sound engine, complete with 4 MB of 16-bit sampled sounds in ROM; a Windows-compatible MIDI interface; and a built-in audio mixer for combining all these elements. Best of all, it retails for under \$1,000.

### THE NITTY GRITTY

The MultiSound card transfers digital audio to and from disk at any of three sampling rates: 11.025, 22.05, and 44.1 kHz. It offers 64x oversampled, 16-bit A/D converters and 64x oversampled, 18-bit D/A converters and boasts an impressive -87 dB (unweighted) s/n ratio. Standard 1/8-inch, stereo mini-jacks on the card's backplate provide analog I/O connections (In, Aux In, and Out). The company also offers an optional kit for connecting the audio outputs of an internal CD-ROM drive directly to the Aux input on the card, without having to fuss with outside cables.

The card's MIDI interface terminates as a 9-pin multiconnector on the card's backplate. The (unfortunately optional) interface adapter is available for \$24. It connects your system to the card by three one-foot-long (In, Out, and Thru) cables.

The Proteus sound engine and ROM on the board are the same as in an E-mu Proteus/1XR. The MultiSound includes all Proteus/1XR presets and a separate set of 128 General MIDI patches, thus ensuring compatibility with both Proteus/1 patches and GM applications.

### SOFTWARE

Out of the box, the MultiSound system includes the card, user's manual, and audio cables. Two 3.5-inch diskettes contain several applets (small applications; see Fig. 1), system drivers, and *Wave Lite*, which is a scaled-down ver-

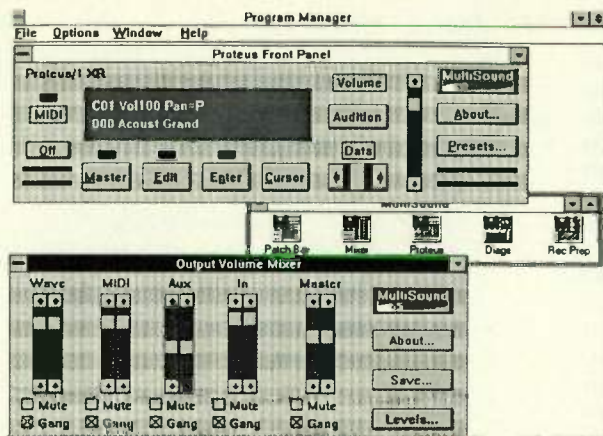


FIG. 1: Several "applets" are bundled with MultiSound, including the *Proteus Front Panel* and *Audio Mixer*.

sion of Turtle Beach's *Wave* digital-audio editing program.

The *Proteus Front Panel* application provides a computer version of the standard Proteus front-panel layout. The controls give direct access to all MIDI and parameter controls found on the module. One exception is the Preset button, which allows access to either Proteus, General MIDI, or user patches. I would have preferred a full-blown editor/librarian with graphic editing, but at least you can use this to create your own sounds.

*MIDI Patch Bay* lets you move MIDI data between the Proteus, the MIDI interface, and the Windows operating environment.

*Record Prep* displays incoming analog levels for recording to hard disk. The most striking feature is the stereo VU-meter section. Each meter has two moving needles, one calibrated to VU ballistics and the other registering peak-hold levels. I'm not sure why this wasn't simply incorporated into *Wave Lite*.

*DOS* and *Windows Diagnostics* are intended for testing your computer environment after installing MultiSound.

The onscreen, 8-channel (four stereo-pair) *Output Volume Mixer* lets you combine the Proteus' output, hard-disk playback, CD-ROM audio (or any other signal plugged into the Auxiliary jack), and any stereo signal plugged into the Input jack. The program offers independent channel-muting, L/R channel balance, or ganged stereo level changes.

### WAVE LITE

*Wave Lite* has a variety of basic cut-and-paste audio editing tools (see Fig. 2).

# SuperSuperSuper LIBRARIAN™

The ORIGINAL Universal Librarian

FOR THE ATARI  
IBM PC & COMPATIBLES  
AND APPLE MACINTOSH

STORES & ORGANIZES  
PATCHES FOR MORE THAN ONE  
HUNDRED MIDI INSTRUMENTS

NOW ONLY \$99  
Free shipping  
worldwide

Available direct or  
at fine music stores  
around the world

International Distributors  
Canada: Musiconline (416-785-3311)  
United States: Thinkware (415-255-2091)  
Germany: MSC (030-213-2202)  
United Kingdom: Digital Music (0703-252131)  
Holland: MIDI Music (034-77-600)  
Japan: Nihon Eniac (03-5256-2781)  
Singapore: West Plaza Music (747-4374)

PIXEL PUBLISHING™

641 CALEDONIA RD.  
TORONTO, ON, CANADA M6E 4V8  
TEL (416) 785-3036 FAX (416) 785-6416

## AUDIO / MIDI SPECIALISTS

- ✓ KNOWLEDGABLE
- ✓ ALL MAJOR LINES
- ✓ DISCOUNT PRICING
- ✓ LARGE INVENTORY



MIDI Hardware & software  
Digidesign • JL Cooper  
Performer • Cakewalk • Finale  
Opcode • DR T • Passport  
synths & samplers • Akai  
Emu • Korg • Roland • Yamaha



24/16/8 trk digital/analog  
DAT • consoles • processors  
direct to disc recording  
automation retrofits  
synchronizers • monitors

LENTINE MUSIC  
PROFESSIONAL  
216 741-1400  
FAX 216 741-5111

10-8 Mon-Thu 10-5 Fri & Sat



# ADVERTISER INDEX

Advertiser	Reader Service #	Page	Advertiser	Reader Service #	Page
Alesis (Mixer)	501	2	Leigh's Computers	551	111
Alesis (SR-16)	502	3	Lentine Music	552	97
Allen & Heath	503	4	Lexicon	553	69
Applied Research & Technology (ART)	504	29	LT Sound	-	108
Bananas at Large	505	112	MacBeat	554	100
BeBop Systems	506	76	Mackie Designs	555	56
Big Noise Software	507	58	Mark of the Unicorn (MOSAIC)	556	16
Century Music	508	107	Mark of the Unicorn (MIDI Time Piece II)	557	46-47
C.I.R.I.A.S.	509	86	Maxell	-	34-35
C-Lab Software	510	39	Micro Technology Unlimited (MTU)	558	80
Clear-Stand	511	110	MIDIMAN	559	81
CM AUTOMation	512	115	Millennium Music	560	86
Coda Music Software	513	21	Mix Books	561	103
Computers & Music	514	101	Musicians Friend	562	63
Cool Shoes Software	515	111	Musicians Institute	563	51
Creative Potentials Unleashed	516	102	Music Quest	564	49
D & R	517	96	Music Quest	565	65
DAT — Audio Gallery	518	102	Music to MIDI	566	105
Digidesign	519	72	Opcode Systems	567	64
Digital Audio Labs	520	59	Passport Designs (MasterTracks Pro & Encore)	568	8-9
DigiTech	521	123	Passport Designs (MusicTime)	569	70
Disc Makers	522	112	Peavey Electronics	570	61
Discount Distributors	523	52	PG Music	571	93
DOD Electronics	524	15	Pixel Publishing	572	97
Dr. T's Music Software	525	83	Polyline Corporation	573	115
Duquesne University	526	109	PS Systems	574	27
DynaTek Automation Systems	527	48	QCA Custom Pressing	575	105
EarLevel Engineering	528	91	Rane Corporation	576	78
EFXX Products	529	106	Rhythm City Music	577	113
Electro-Voice	530	25	Roland	578	53
E-mu Systems (MPS Plus)	531	13	Romeo Music International (RMI)	579	104
E-mu Systems (Pro/cussion)	532	89	Sabine Musical Manufacturing	580	95
Encore Electronics	533	79	SongWright Software	581	108
Ensoniq (KS-32)	534	19	Soundtrek/Sound Magic	582	109
Ensoniq (Synthesizers)	535	77	Soundware Corporation	583	67
Europadisk	536	91	Sweetwater Sound (Retail)	584	20
E.U. Wurlitzer	537	107	Sweetwater Sound (Peripherals)	585	75
Eye & I Productions	538	60	Tascam	586	84-85
Eye & I Productions	539	113	Taxi	587	33
Fast Forward Video	540	100	Tech 21	588	14
Five Pin Press	541	106	Temporal Acuity Products (TAP)	589	87
G2 DESIGNworks	545	52	Thoroughbred Music	590	60
Goodman Music	542	80	Tran Tracks	591	104
Grandma's Music & Sound	543	110	Turtle Beach Systems	592	28
Grove School of Music	544	12	Twelve Tone Systems	593	10
Gulbransen	546	87	Voyetra (Sequencer Plus)	594	22
Howling Dog Systems	547	22	Voyetra (V-22, V-24)	595	38
JBL Professional	-	124	The Woodwind and The Brasswind	596	103
Kawai	548	32	Yamaha (SPX Series)	597	30-31
Key Electronics	-	73	Yamaha (Mixers)	598	71
Korg	549	7	Yamaha (SY99)	599	90
Kurzweil Music Systems	550	23			

## RATE THE ARTICLES IN THIS ISSUE!

AUGUST 1992

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. "Computing the Score," p. 24	701	702	703	704
b. "Command Centers," p. 36	705	706	707	708
c. "Tragic Performances," p. 54	709	710	711	712
d. "Recording Musician: Location Recording," p. 62	713	714	715	716
e. "Working Musician: Let's Make a Deal," p. 68	717	718	719	720
f. "From the Top: Computers in the Studio," p. 74	721	722	723	724



# FREE Information for Readers of Electronic Musician

FOR FREE INFORMATION ABOUT PRODUCTS ADVERTISED IN THIS ISSUE, USE THESE READER SERVICE CARDS.

- 1 Circle the reader service numbers on the card that correspond to each advertisement listed in the index on the opposite page.
- 2 Print your name and address on the card and answer ALL questions below.
- 3 Affix a stamp and mail!

IMPORTANT NOTICE TO READERS: Reader service inquiries are mailed directly to the advertiser, who is solely responsible for sending product information. *Electronic Musician* cannot guarantee response from all advertisers.

FREE INFORMATION

## Electronic Musician

6400 Hollis St. #12, Emeryville, CA 94608  
 Issue date: August 1992  
 This card not valid after November 1, 1992

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State/Zip \_\_\_\_\_  
 Phone # ( ) \_\_\_\_\_

1. Are you currently a subscriber to *Electronic Musician*?  
 a.  Yes      b.  No
2. Please check the ONE best description of your music involvement.  
 01.  Full- or part-time pro musician  
 02.  Aspiring professional musician  
 03.  Recreational or amateur musician  
 04.  Other \_\_\_\_\_
3. Please check the ONE best description of your recording involvement.  
 05.  Record in a professional studio only  
 06.  Record in both pro and home/project studios  
 07.  Record in a home/project studio only  
 08.  Have not recorded yet
4. Which ONE of the following is your main computer used for music?  
 09.  Apple Macintosh Plus, Classic, SE, or SE/30  
 10.  Apple Macintosh II series or LC  
 11.  Atari ST  
 12.  Commodore Amiga  
 13.  IBM PC or compatible  
 14.  Other brand \_\_\_\_\_  
 15.  Don't use a computer for music

RATE THE ARTICLES IN THIS ISSUE!  
 SEE FACING PAGE FOR DETAILS.

501	502	503	504	505	506	507	508
509	510	511	512	513	514	515	516
517	518	519	520	521	522	523	524
525	526	527	528	529	530	531	532
533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548
549	550	551	552	553	554	555	556
557	558	559	560	561	562	563	564
565	566	567	568	569	570	571	572
573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588
589	590	591	592	593	594	595	596
597	598	599	600	601	602	603	604
605	606	607	608	609	610	611	612
613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628
629	630	631	632	633	634	635	636

701	702	703	704	705	706	707	708
709	710	711	712	713	714	715	716
717	718	719	720	721	722	723	724

## Electronic Musician

6400 Hollis St. #12, Emeryville, CA 94608  
 Issue date: August 1992  
 This card not valid after November 1, 1992

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State/Zip \_\_\_\_\_  
 Phone # ( ) \_\_\_\_\_

1. Are you currently a subscriber to *Electronic Musician*?  
 a.  Yes      b.  No
2. Please check the ONE best description of your music involvement.  
 01.  Full- or part-time pro musician  
 02.  Aspiring professional musician  
 03.  Recreational or amateur musician  
 04.  Other \_\_\_\_\_
3. Please check the ONE best description of your recording involvement.  
 05.  Record in a professional studio only  
 06.  Record in both pro and home/project studios  
 07.  Record in a home/project studio only  
 08.  Have not recorded yet
4. Which ONE of the following is your main computer used for music?  
 09.  Apple Macintosh Plus, Classic, SE, or SE/30  
 10.  Apple Macintosh II series or LC  
 11.  Atari ST  
 12.  Commodore Amiga  
 13.  IBM PC or compatible  
 14.  Other brand \_\_\_\_\_  
 15.  Don't use a computer for music

RATE THE ARTICLES IN THIS ISSUE!  
 SEE FACING PAGE FOR DETAILS.

501	502	503	504	505	506	507	508
509	510	511	512	513	514	515	516
517	518	519	520	521	522	523	524
525	526	527	528	529	530	531	532
533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548
549	550	551	552	553	554	555	556
557	558	559	560	561	562	563	564
565	566	567	568	569	570	571	572
573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588
589	590	591	592	593	594	595	596
597	598	599	600	601	602	603	604
605	606	607	608	609	610	611	612
613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628
629	630	631	632	633	634	635	636

701	702	703	704	705	706	707	708
709	710	711	712	713	714	715	716
717	718	719	720	721	722	723	724





## Information for Electronic Musician Readers

Use the reader service cards on the previous page for free information on products advertised in this issue of *Electronic Musician*.

Place  
stamp  
here

### Electronic Musician

Reader Service Management Department  
PO Box 5323  
Pittsfield, MA 01203-5323

Place  
stamp  
here

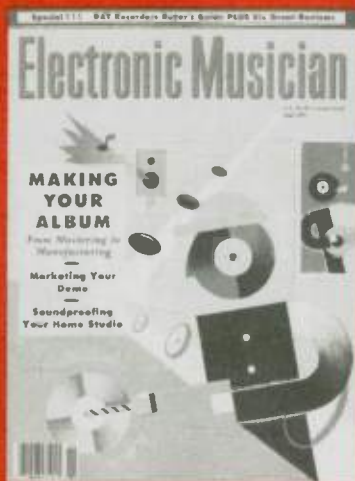
### Electronic Musician

Reader Service Management Department  
PO Box 5323  
Pittsfield, MA 01203-5323



SUBSCRIBE

SAVE  
OVER  
\$64



Electronic Musician is your  
complete guide  
to the technology  
that links electronic gear  
and computers with  
the world of music.

Start my subscription to Electronic Musician for:

- ◆ Two years (24 issues) for \$29.95. SAVE OVER \$64!
- ◆ One year (12 issues) for \$19.95. SAVE OVER \$27!
- ◆ Bill me later (U.S. only)     ◆ Payment enclosed

Name .....

Address .....

City ..... State .....

Zip ..... Phone .....

Add appropriate state sales tax where required. Offer good in U.S. only. Foreign subscriptions must be prepaid with U.S. funds. Canada and Mexico add \$15/year. All other foreign countries add \$30/year. Basic annual subscription rate is \$24.

B20805

Start my subscription to Electronic Musician for:

- ◆ Two years (24 issues) for \$29.95. SAVE OVER \$64!
- ◆ One year (12 issues) for \$19.95. SAVE OVER \$27!
- ◆ Bill me later (U.S. only)     ◆ Payment enclosed

Name .....

Address .....

City ..... State .....

Zip ..... Phone .....

Add appropriate state sales tax where required. Offer good in U.S. only. Foreign subscriptions must be prepaid with U.S. funds. Canada and Mexico add \$15/year. All other foreign countries add \$30/year. Basic annual subscription rate is \$24.

B20805



# SUBSCRIBE TO ELECTRONIC MUSICIAN TODAY



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**  
FIRST CLASS MAIL    PERMIT NO 7231    NASHVILLE, TN

POSTAGE WILL BE PAID BY ADDRESSEE

## Electronic Musician

P.O. Box 41525  
Nashville, TN 37204-9830



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**  
FIRST CLASS MAIL    PERMIT NO 7231    NASHVILLE, TN

POSTAGE WILL BE PAID BY ADDRESSEE

## Electronic Musician

P.O. Box 41525  
Nashville, TN 37204-9830



World Radio History



● MULTISOUND

Upon selecting the Record icon from the main set of function buttons, a Record dialog box appears, showing an LED-type meter display, standard tape-transport buttons, sample-rate selection box, mono/stereo select, and 8-bit/16-bit select boxes. A readout displays the remaining time available on the disk.

You select regions for cutting, copying, or editing by clicking the mouse and dragging over the desired portion of the waveform display. Pressing the space bar plays this region. If you want to change the in or out point, just press the Shift key and click the mouse over the appropriate edit point. Zooming is accomplished by using the Zoom bar located above the Waveform screen, or hitting the right mouse button. Using this feature, a segment of any size can be chosen and displayed in the larger Soundfile window. When the waveform is zoomed in far enough to see individual sample values, the Draw Waveform icon appears. This redraw application can be used to remove such "earsores" as ticks, clicks, and uneven edit splice points.

The full-blown *Wave for Windows* includes such necessary tools as markers, crossfades, and reverse waveform functions to *Wave Lite*'s basic set. It also

adds extensive DSP features, including gain adjust; 4-band, parametric, digital EQ; time compression/expansion; and 3-D FFT analysis. Registered MultiSound users can upgrade to *Wave* for \$79. (The suggested retail is \$149.)

**MIDI MAPPER**

MultiSound is set up to talk MIDI in two ways: internally to the Proteus chip and externally to either its own MIDI interface, or an external card such as a Roland MPU-401 or Music Quest MQX-32M. It does so via the nifty little *MIDI Mapper* control panel included with *Windows 3.1*. *MIDI Mapper* lets you do things like remap data coming in on channel 5 to channel 8, choose MIDI interface ports, set up entire patch maps for a specific song or stage setup, and route source and destination notes. All these settings can be saved to disk and easily recalled by name. I encourage all of you who work under *Windows 3.1* to get in there and play with *MIDI Mapper*; it offers more than you might think.

The *MIDI Mapper* MultiSound driver I reviewed offered the single option of routing data to both the Proteus and the card's internal MIDI port. Unfortunately, this meant data sent to my MIDI setup also was sent to the Proteus on the same channels, which isn't very useful.

Fortunately, help is on the way. Turtle Beach claims that the new driver they're working on will let you set your system up so each MIDI channel can be routed to either MultiSound's MIDI Out. MultiSound's MIDI Thru, another MIDI interface on the IBM bus, or the Proteus' MIDI In port. Not only will you be able to use your present 16-channel interface, but by adding a MultiSound you'll have access to 64 MIDI channels: sixteen directly to the Proteus chip, 32 to MultiSound's ports, and sixteen to your existing interface. I wasn't able to try this, but it's an intriguing thought.

**SYNC OR SWIM**

By itself, the MultiSound card does not

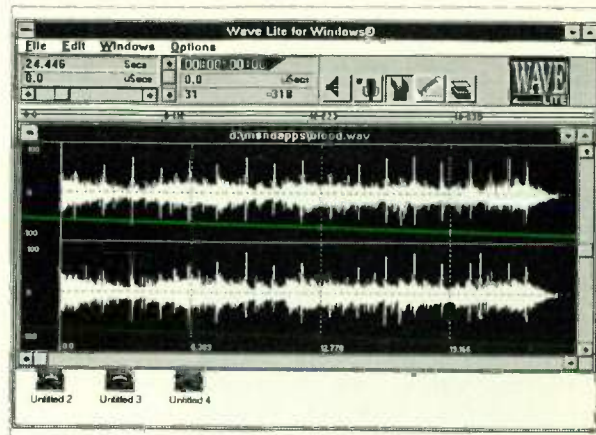


FIG. 2: The main screen of *Wave Lite* shows a graphic display of the audio waveform and offers tools for cutting, copying, and zooming into the data.

offer any synchronization capabilities to work with outside equipment, such as MIDI sequencers or video gear. However, if triggered by an external program that in turn is locked to MIDI Time Code, it allows you to play .WAV digital-audio soundfiles with sub-frame accuracy. Rumor has it that the next version of *Windows* will implement MIDI Time Code into its basic operating structure, which will make this procedure much easier.

In the meantime, Twelve Tone Systems' brand new *Cakewalk for Windows* sequencer offers the ability to trigger .WAV soundfiles directly from the sequencer, giving PC users a basic environment for locking together MIDI and digital audio. Unlike programs such as *Studio Vision* on the Mac, however, these .WAV files are not continuously resynched to a shared timing reference; they simply are triggered and then run under their own clock. On short files, this probably won't cause a problem, but files of a minute or longer might drift out of sync.

Another problem is that at the moment, you can't play a *Cakewalk* sequence (to hear the MIDI file) and record digital audio into *Wave* or *Wave Lite* at the same time. You must record the digital audio separately and then set up the trigger points in the sequencer. You can work around this limitation by playing back the sequence and recording the audio separately onto tape as you listen to the sequence over headphones. Once you're done recording, you can transfer the audio to disk and do any editing you desire. Remember to record multiple takes, as

**Product Summary**

**PRODUCT:**

MultiSound Multimedia Sound Card

**HARDWARE**

**REQUIREMENTS:**

80386 or 80486 PC-compatible running *Windows 3.0* with *Multimedia Extensions* or *Windows 3.1*, 2 MB RAM, VGA graphics adapter; CD-ROM drive optional

**PRICE:**

\$995

**MANUFACTURER:**

Turtle Beach Systems  
Cyber Center, Unit 33  
1600 Pennsylvania Ave.  
York, PA 17404  
tel. (717) 843-6916

EM METERS	RATING PRODUCTS FROM 1 TO 5			
FEATURES	●	●	●	◐
EASE OF USE	●	●	●	◐
DOCUMENTATION	●	●	●	◐
VALUE	●	●	●	◐





Digidesign,  
Opcode, Toa,  
Coda, Passport,  
Mark of the Unicorn,  
Ramsa, Roland,  
Emu, Apple, ART,  
Anatek, Mackie,  
Dr.T's, J.L. Cooper,  
Kawai, Microtech, Panasonic, Chinon  
Pacific Coast, Tascam, Rapco,  
Ultimate Support, Prosonus & much,  
much more...

**FREE CATALOG!**

**1-800-MAC-BEAT**  
1-505-473-4929

call the ext. **Mac BEAT**

1314 Rufina Cr., Ste. A4 Santa Fe, NM 87501

## ● MULTISOUND

*Wave Lite* lets you open four soundfiles at once. The next step is to break the part into sections and save them as separate files (Verse1.WAV, Verse2.WAV, Chorus1.WAV, etc.). All that remains is to program the .WAV trigger points into the sequence, and *voila!*

### MY TWO CENTS

I am impressed with this board and am particularly happy to see it appear for the PC. What can you say about a system that offers hard-disk recording, a MIDI interface, and a Proteus/1 for the same list price as a regular Proteus/1 alone? It's a great deal. This will be especially true when new drivers have been written to take better advantage of channel routing to the Proteus and the extra MIDI interface that probably is installed in your system.

On the down side, even though the manual contained a great section on the basics of digital audio, there could be better coverage of *MIDI Mapper* as it relates to the specific MultiSound driver. Some of this can be found in the *Windows* manual, but I'd rather see Proteus-specific examples. Speaking of Proteus specifics, the Proteus manual doesn't come with the package, but is available from the company for an extra \$11. One other drawback to the system is that although you can adjust the levels internally, the Proteus and digital-audio outputs share the single output jack; there's no way to separate them. As a result, you can't process them individually.

In the hard-disk department, I found *Wave Lite* to be a bit too "Lite." Its basic editing capabilities seem well-suited to the multimedia PC soundcard market for which MultiSound is primarily intended, but the full version of *Wave* is a necessity for serious work. Most EM readers will find it impossible to work without markers, and the DSP functions are a big plus.

Unfortunately, I feel that there has been a serious programming oversight in both programs. Instead of managing memory in an efficient manner by accessing edit segments from the original soundfile in a non-destructive fashion, the program, in effect, tags edit changes onto the original soundfile and rewrites the whole thing as a new, and often much larger, soundfile. This waste of valuable disk space isn't kosher. I strongly recommend that the program be updated to take full advantage

of the memory-saving benefits true random-access hard-disk editing offers.

My last gripe has to do with the speed (or lack thereof) with which waveforms are drawn onto the screen. Any time you zoom or make screen changes, it's coffee-break time. This can be sped up to a tolerable level by checking off the Turbo Plot option in the Display Setup menu. Nevertheless, I wish the program offered an option to write the waveform's graphic data to disk as a separate file. This would mean you'd only have to wait for the waveform file to be written once; after that, any screen redraws would be much faster.

Having said all this, my bottom-line feeling is that the MultiSound is a terrific deal. It offers features that would benefit most professionals who work under *Windows* and is the perfect starter system for the budding electronic musician or multimedia maven at a price that's hard to beat.

*After having written way too many books, Dave Huber is finally getting back to his first love: studio recording and production. His new philosophy: "To hell with rules, let's make Muzak!"*

## Roland R-70 Human Rhythm Composer

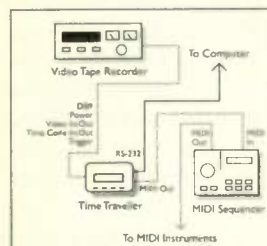
By Al Eaton

**The beat goes on with the latest in a venerable line of drum machines.**

**R**oland has been at the forefront of drum-machine technology for many years. From the classic sounds of the TR-808 to the modern-sounding R-8, the company consistently offers quality beat boxes at reasonable prices. The 16-bit, PCM sample-based R-70 carries on the tradition as a worthy member of the Roland line.

The R-70 is a 14-voice machine with 210 preprogrammed sounds, 32 user sound locations, pads, and a memory-card slot, but no sound-card slot. Unlike Roland's R-8 (reviewed in the May 1989 EM), you cannot add new samples, but the new beat box includes

## P2 Time Traveller



**LOCK YOUR MIDI SYSTEM TO VIDEO!**

**Everything you need in one compact, portable unit \$595.00**

- Generates SMPTE time code SYNCED TO VIDEO
- Converts SMPTE to MIDI time code for your sequencer
- Window dub
- Many other features

Call **Fast Forward Video**  
1-800-755-TIME (8463) for a dealer near you, or to order with VISA/MasterCard

Dealer Inquiries Invited.



a simple, built-in effects processor.

The R-70 uses the familiar pattern-song structure for creating its musical output. A pattern can be up to 99 measures long, and you can record up to 999 patterns (called "Parts" in Song mode) in one song. Up to twenty songs can be written into the 3,700-note internal memory or loaded on an optional M-256E memory card (\$79.95 each).

If you have any experience with previous Roland drum machines, operating the R-70 should be fairly simple. Even if you're new to the genre, the user's guide (a condensed version of the owner's manual) can get you up and running in no time. A wealth of diagrams and graphics prompt you through most of the commands and features, and a thorough MIDI section is included. It was easy to find answers to specific questions through the regular index and convenient topical index.

#### FRONT AND REAR

Unlike most drum machines, the front panel has a layout similar to a tape

recorder, with Start/Stop, Forward, Backward, and Record buttons. In Song mode, the Forward and Backward buttons skip you through measures, patterns, and markers.

One of the more irritating things about the implementation of these buttons is that you can't go between Record and Play without stopping. Having a record/punch-in feature would make programming less of a chore and, in most cases, would help in the creative process.

The rear panel contains the following: a headphone jack; four audio output jacks; MIDI In, Out, and Thru; a jack that accepts a normally-open footswitch; and Tape Sync I/O jacks. All are 1/4-inch phone jacks except the sync jacks, which are RCA. The R-70 offers intelligent tape sync, which means you don't have to rewind to the beginning of a tape to maintain synchronization. Roland's extra-large wall-wart external power supply covers three strip outlets, which is especially bothersome.

In lieu of using the footswitch for

Start/Stop functions, you can assign it to function as any one of several front-panel keys, such as Shift, Flam, Roll, Erase, Pad Bank, or Pad Group. The switch also can be used to set the tempo: Just tap the switch four times at the desired rate, and with the fifth tap, the R-70 will start playing at the tempo you tapped in. A sixth tap stops playback.

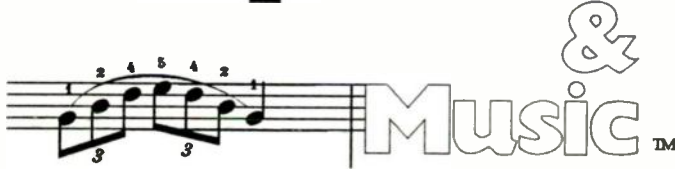
#### COOL PADS

The instrument pads (called "Key Pads") are well-placed and feel a bit more responsive than those on other Roland machines I've used, including the R-8.

The R-70 allows you to assign any of 242 instruments (32 user and 210 preset) to the sixteen velocity-sensitive Key Pads. One set of assignments constitutes a Pad Bank. You can switch between six Pad Banks using the Multi button or a footswitch.

One of the many useful R-70 features is Multi Bank, an idea introduced in the more expensive R-8 and R-8M. Multi Bank lets you assign a sound to

# Computers



*Are you confused about MIDI and music software?*

*We aren't.*

**800-767-6161**

*Serving Performers, Educators, Composers, Arrangers,  
Programmers, & Sound Designers since 1982*

Call or write for our 68 page catalog

Computers & Music • 647 Mission St. • San Francisco, CA 94105 • 415-541-5350

Vision  
Hip Software  
EZ Vision  
Avalon  
Turtle Beach  
Audio Media  
Deck  
Music Printer Plus  
Atari  
Emu  
MicroWave  
Proteus  
Doctor T  
Synthworks  
Hard Disks  
CD's for samplers  
Educational Software  
Beyond  
Pocket  
Altech  
Alchemy  
Sybil  
Max  
Sound Designer  
TurboSynth  
MIDI Files  
LAPC  
Listen  
The Director  
Farralon  
Sound Globes  
Texture  
Sonata  
Note Writer II  
Sound Exciter

Performer  
Composer  
Music Prose  
StudioVision  
Cubase  
Creator  
Notator  
Finale  
Roland  
Yamaha  
Kawai  
Cakewalk  
SMPTE  
Sampler Editors  
Synth Editors  
MIDI Interfaces  
Digital Audio  
Galaxy  
Sequencer Plus  
Score  
Encore  
Mastertracks  
Sequencers  
Books  
Practica Musica  
Harmony Grid  
SampleVision  
XOR  
MacRecorder  
Sideman  
Ars Nova  
Music Quest  
Mac Proteus  
ConcertWare  
Ad Lib



## Music Educators Dream!

A complete music midi lab.

"If you or your student can think of it,  
we can probably do it!!"

**C**reative

**P**otentials

**U**nleashed

Network & single user  
systems are available.

For information

call: 704 652 9346

or: 704 652 3329

C. P. U., Inc.

703 Rutherford Road  
Marion, N.C. 28752

Look for  
our  
multimedia  
products  
soon!!

Available from

one source:

keyboards,

computers,

software,

networks,

training,

service

& support.

\*Sequencing\* \*Scoring\*

\*Keyboard Tutorials\*

\*Theory tutorials\*

\*Ear Training\* \* & more\*

A professional staff with over  
25 years experience in the music  
education field as well as over 50  
years experience in computers have  
come together to help you make your  
music lab the most exciting place on  
campus. One source; one phone call.

## ● ROLAND R-70

all sixteen pads and detune or change the tonal characteristics of the sound to create melodic percussion or bass lines. (There are four bass sounds.) I like using it to create bass and drum patterns without having to use any other instrument.

Six Pad Banks and one Multi Bank constitute a Pad Group, and the machine can store up to three Groups.

In addition to the sixteen Key Pads, the R-70 sports an additional surface called the "Positional Pad." One sound can be assigned to the Positional Pad for each Pad Bank. By hitting this long pad in different places, you can get different pitches or different tones and colors of the same sound (via changes in the Pitch, Nuance, Decay, and Pan parameters—explained shortly).

The Positional Pad is one of the most creative and useful features of the machine, as it allows you to program the subtle nuances a live drummer would play. I used it extensively for hi-hat patterns and cymbal rolls, hitting all over the playing surface with different attacks and accents. It worked so well that when I played a tape of the patterns to a drummer, he initially couldn't tell it wasn't a real drummer.

### ASK THE EXPERTS

When programming drum patterns, you expect to find certain standard features, and the R-70 does not disappoint. It offers quantization and a Reframe function that lets you change the pattern's start point. The Swing feature lets you choose how many notes are affected, the delay time, and whether eighth or sixteenth notes are to be delayed to give a "swing" feel. The R-70's Flam and Roll buttons add to the ease of creating a "real drummer" feel. The Roll button uses pressure to modulate volume, but doesn't send Aftertouch messages.

In addition to the classic Roland drum-machine features, the company threw in a few unusual ones. With Rhythm Expert, the machine algorithmically creates patterns, called "Pattern Models," based on user-defined parameters. You can give

each pattern a different feel by adjusting three parameters. The Genre parameter selects the style of pattern, ranging from rock to African. Pattern Type determines whether the pattern will be a basic, fill-in, intro, or ending pattern. Pattern Length sets the number of bars for each pattern.

You can save up to sixteen Pattern Models in the Memo Box, a dynamic RAM location that is like a scratch pad. Once you shut off the machine, the Memo Box patterns are erased. This lets you work with different ideas and not take up regular user memory until you're sure you want to keep them. If you want to save your Pattern Models, you can convert them to user patterns and store them in battery-backed RAM.

Similarly, you can use Rhythm Expert to algorithmically create Song Models. Again, you select a genre and determine how many measures comprise each section. Rhythm Expert then composes a song structure, which you can convert into a normal song and save to a user-memory location.

The Rhythm Expert feature is a step in the right direction. The Models are fun and could prove especially useful to the novice programmer or the more experienced programmer looking for a basic pattern to get the creative juices flowing. I'd like to see Roland take it another step and let the machine algorithmically create variations on user-programmed patterns.

### SOUND THINKING

Most sounds are organized in groups: kicks, snares, toms, hi-hat, etc. Although it might be more interesting to have more exotic sounds from around the world, the R-70's sounds are crisp, clear, punchy, and best of



By striking different parts of the Roland R-70's unique Positional Pad (lower right), you can trigger distinct pitches and timbral variations of a sound.

# DAT

## AUDIO GALLERY

AMERICA'S BEST PLACE TO BUY  
DIGITAL AUDIO TAPE RECORDERS

- Best Prices, Service, Warranty
- Newest Models in Stock
- No Commission Sales Staff
- DAT Accessories, Mics, more

NOW AVAILABLE:

**SONY DAT WALKMAN**

**TCD-3!**

World-wide model available

**LOWEST DAT TAPE  
PRICES ANYWHERE!**

**Latest Sony DATs  
and Mics from Japan  
here now!**

Call us before you buy elsewhere

**AUDIO GALLERY**

**213 • 829 3429**

2717 Wilshire Blvd., Santa Monica  
CA 90403. FAX: 213 • 829-0304

MC-VISA-AMEX-DINERS-DISCOVER HRS: MON-FRI 10AM-6PM SAT 12PM-5PM



all, usable. There are no useless or poor-quality sounds. I could hear the sample loop on only one instrument (Vibslp), and it would not be noticed when mixed in a pattern with other sounds.

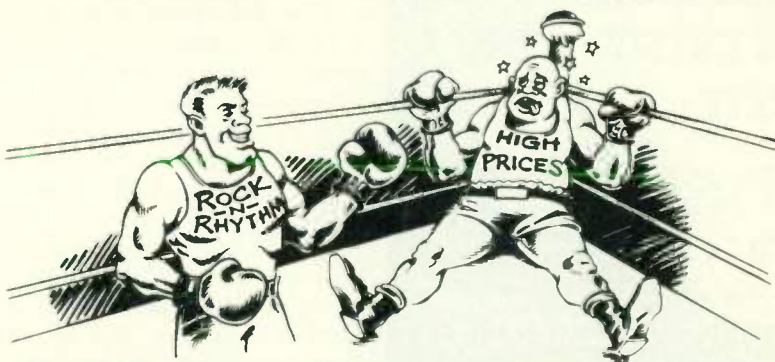
The instruments can be used for the coolest of jazz and the funkiest of rap. There's one nasty-sounding snare that no rapper should be without. You get a vast array of African, Latin, and Third World percussion sounds and an assortment of less-aggressive instruments (e.g., played with brushes). It is easy to put together highly processed rock sets or traditional, dry, country and blues sets. With the onboard effects, creating new-age sounds is no problem. I particularly like all the samples from old Roland drum machines, such as the CR-78, TR-808, and TR-909.

Some of the sounds can be found in other Roland products, and some can be found on one of the R-8 cards, but most are new and exclusive to this machine. The big advantage of the R-70 is that you get a great assortment in one machine, which is fortunate, as there is no way to add more samples. Up to two sounds can be layered per pad to give even beefier and more interesting instruments.

Although you can't add new sounds, you can edit several parameters of the factory patches. (You can use Solo mode to monitor a sound while editing.) The Pitch and Decay parameters are self-explanatory. Attack Damp changes the attack time. Nuance adds harmonic content, or gives the impression of the instrument being struck at different positions (e.g., near the rim or in the center). Brilliance adds high-frequency content, and Velocity Pitch raises an instrument's pitch as a function of Velocity. In general, you get enough editing features to make the machine sound like a drummer bashing away.

If you want realistic drum programming, it's important to determine which sounds will sustain and which will be cut off when you trigger the next voice. The R-70's solution is simple and straightforward. Assign Group is used when one sound is to be cut off by another, as with open and closed hi-hats. Polyphony determines whether an instrument with a long decay will be cut off (Mono), or continue to sound when that instrument is struck again (Poly).

# THE PRICE FIGHTERS!



Our Service, Selection & Prices will  
**KNOCK YOU OUT!**

- Keyboards • Multitrack Recorders • Microphones
- DAT Recorders • Signal Processors • Midi Software

*Rock 'n Rhythm*

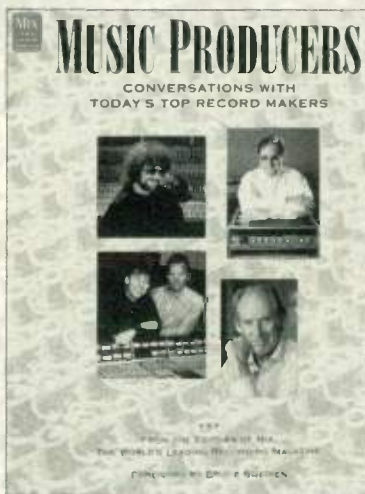
Div. of  
The Woodwind & The Brasswind  
19880 State Line Rd  
South Bend, In. 46637

CALL OR WRITE FOR FREE CATALOG: **1-800-348-5003**

NEW FROM MIXBOOKS

## MUSIC PRODUCERS

Top producers reveal exclusive details about their classic sessions and trademark sounds. From the editors of *Mix* magazine.



featuring:

Walter Afanasieff  
Bruce Fairbairn  
Daniel Lanois • Bill Laswell  
Tom Lord-Alge • Jeff Lynne  
George Martin • Hugh Padgham  
Rick Rubin • Don Was  
plus 14 others!

©1992, 120 pp. (P) \$17.95.  
Add \$2.50 for shipping. CA and NY residents add state sales tax.

**ORDER NOW!**

Call toll-free, U.S. & Canada  
(800) 233-9604 or (510) 653-3307;  
fax (510) 653-5142.

We accept Visa, MasterCard, American Express and Discover cards; or send personal check or money order payable to:

MixBooks, 6400 Hollis Street, Suite #12-S, Emeryville, CA 94608



## MIDI SEQUENCES

**MORE  
HOT LICKS  
IN EVERY  
BYTE!**



If you want faithful reproduction and unparalleled accuracy in MIDI programming, then you want the live-music sound of TRAN TRACKS MIDI Sequences.

With TRAN TRACKS you get quality service, great prices and a large selection of popular songs. We support all computer formats and most dedicated sequencers.

Experience the MIDGroove™—it's "music-friendly!"

Call today and play tomorrow.  
5 songs or more only \$10.00 each.

### ORDER LINE

-800-473-0797

Fax: (201) 383-0797

Technical Support

(201) 383-6691

Empire State Building

350 Fifth Ave. #3304, Dept. EM092

New York, NY 10118



AUSTRALIA • Rhythmic Bytes Ltd. • P.O. Box 433, Hornsby, NSW 2077 • Tel: 02-482-2086 • Fax: 02-477-6069  
UK • AMG • Hurst Lane, Privett Near Alton, Hants GU34 3P L • Tel: 07-3088-383 • Fax: 07-3088-390

## ● ROLAND R-70

### MIXER AND EFFECTS

Because the R-70 only has four outputs, you submix the instruments internally. The mixer is extremely basic, controlling output level, pan, and the output assignments. You also can use it to route signals to, and set levels for, the R-70's stereo effects processor.

The effects are divided into two independent sections. Effects 1 provides reverb and delay. The basic reverbs are Hall, Room, and Plate, and you can adjust the reverb time, cutoff frequency for the lowpass filter, and output level. Delay parameters include delay time (up to 450 ms), feedback, and output level.

Effects 2 provides chorusing and flanging. Adjustments include modulation rate and depth, feedback level, and output level.

The effects are of high quality and cause no degeneration in the audio. The reverb/delay section showed no digital grunge on any of the hall or plate effects and the stereo delays are quite nice. They proved especially useful in achieving ghost note effects, as the delay is almost indistinguishable from the original signal. The chorus/flanger section has enough control to create both subtle and far-out space effects.

### MIDI

The MIDI implementation is thorough and particularly well-suited to using the unit as a MIDI sound module. In addition to MIDI note messages, the R-70 transmits and receives Velocity; Start, Stop, and Continue; MIDI Clock; Song Position and Song Select; Pro-

gram Change; Volume; Modulation; and System Exclusive. Eight General Purpose controller messages (controllers 16 to 19 and 80 to 83) permit real-time modulation of pitch, decay time, Nuance, and pan. If you elect to control pan via MIDI, the pan settings in the internal mixer are overridden.

The machine also recognizes (but does not transmit) Expression Pedal, Pitch Bend, Release Velocity, Pan, All Notes Off, Controller Reset, and Data Entry messages.

The R-70's MIDI functions are classified into Instrument and Performance sections. To use the machine as a sound module—such as with a sequencer—you program Instrument sections, which consist of drum-set assignments together with settings for section volume, pitch bend range, and MIDI transmit and receive channels. The drum sets include seven common setups that are programmed for General MIDI—a power set, TR-808 set, jazz set, brush set, etc.—plus four user sets and two setups, called All 1 and All 2, that include everything. Drum sets can be changed via MIDI Program Change, and the instruments can be changed via MIDI General Purpose controllers. (The R-70 also can send the controller data when the instrument is played.)

The four Performance sections are sets of control parameters for playing internal instruments from a MIDI keyboard. Each section triggers one instrument mapped to a contiguous keyboard zone. You can set overall section volume and pitch-bend range and determine whether incoming Modulation messages control Decay, Nuance, or nothing. A Key Follow feature lets you modulate pitch, decay time, Nuance depth, and pan as a function of position on the keyboard.

### HERE'S THE BEEF

I enjoyed the overall quality of this instrument but would like to see a few features implemented to give it more bang for the bucks.

First on my list: more audio outputs. This is my beef with most new drum machines on the market, not just this one. The four-output configuration isn't enough for pro applications, as it would take two or more passes to lay most songs to tape for additional effects processing and EQ.

If you must have only four outputs,

### Product Summary

#### PRODUCT:

R-70 Human Rhythm

Composer

#### PRICE:

\$795

#### MANUFACTURER:

Roland Corporation  
7200 Dominion Circle  
Los Angeles, CA 90040-3647

tel. (213) 685-5141

EM METERS	RATING PRODUCTS FROM 1 TO 5			
FEATURES	●	●	●	◐
EASE OF USE	●	●	●	◐
SAMPLE QUALITY	●	●	●	●
VALUE	●	●	●	

## RMI CLASSICAL MIDI FILES and more!

### The MIDI File Library™ Series

12 Volumes of high-quality, low-cost General MIDI files, with Dover books and scores, by Romeo Music International!

### MAC, IBM, ATARI, AMIGA

- Vol 1: Beethoven: The Man & the Artist.
- Vol 2: Mozart: The Man & the Artist.
- Vol 3: The Music of J.S. Bach.
- Vol 4: Chopin: The Man & his Music.
- Vol 5: J.S. Bach's Musical Offering.
- Vol 6: The Music of Erik Satie.
- Vol 7: Mozart & his Piano Concertos.
- Vol 8: The Piano Works of Claude Debussy.
- Vol 9: The Music of Liszt.
- Vol 10: J.S. Bach, The 2 & 3 Part Inventions.
- Vol 11: A History of Musical Style.
- Vol 12: Five Centuries of Keyboard Music.

### FOR INFO/TO ORDER:

1 617 254 9109 or 1 800 852 2122  
Romeo Music • 214 Lincoln St. #104  
Allston, MA 02134  
Fax 617-254-9170

Check out our July and September ads!



being limited to two onboard effects at any one time doesn't help matters. Your mix could suffer from not enough, or too much, of a good thing. Nonetheless, the effects processor puts the R-70 ahead of most competing machines.

The unit's 14-voice polyphony (two more than the R-8) seems adequate, although I'd like a few more voices. I experienced some voice-stealing on long, sustained sounds when using intricate rhythm patterns or patterns with many parts.

#### CONCLUSION

Overall, the R-70 has relatively few drawbacks, except for the lack of a sound-card slot and the limit of four audio outputs. With its editing features and large assortment of good sounds, the unit is adequate for pro studios. In addition, the R-70's strong, clean sounds and ease of use make it a worthwhile investment for small pre-production studios. If you have a small home studio where mixer inputs and outboard gear are minimal, the R-70 could be just what you're looking for.

(Thanks to Mark Okimoto, Robert Blewet, and Sidney Payne.)

*Al Eaton is an independent producer and the owner of One Little Indian Recording and Productions in the San Francisco Bay Area.*

### Passport Designs Encore 2.5 for Windows (PC)

By Dennis Miller

**Passport opens new windows for notation software.**

**I**t's been a long time coming, but a new crop of high-end music software for Microsoft Windows has started to flourish. *Encore 2.5 for Windows*, an IBM-based notation/publishing program from Passport Designs, is among the first of these programs to take advantage of Windows' excellent graphics capabilities. It's a full-featured music-production

**We Build To Suit**



**We custom manufacture compact discs, cassettes and records to your specifications.**

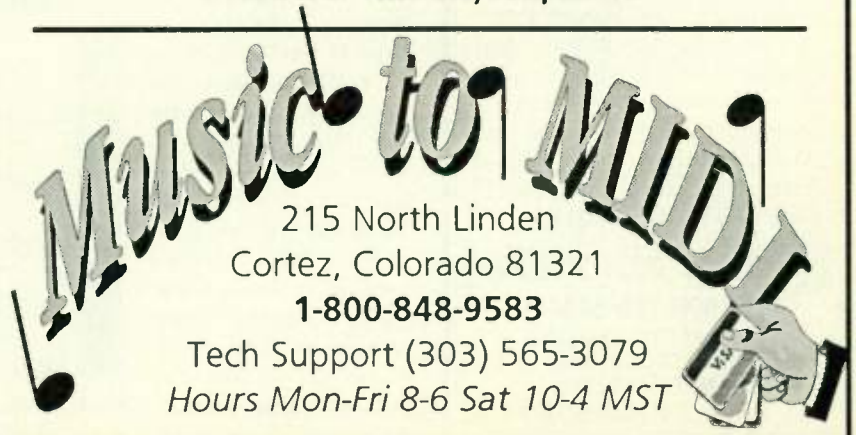
**QCA (513) 681-8400**

QCA, Inc. • 2832 Spring Grove Avenue • Cincinnati, OH 45225

# COMPUTERS MIDI Interfaces SOFTWARE

*All Major Brands*

Synthesizers • Digital Piano • Drum Machines  
Software • Mixers/Amplifiers



215 North Linden

Cortez, Colorado 81321

1-800-848-9583

Tech Support (303) 565-3079

Hours Mon-Fri 8-6 Sat 10-4 MST



# RACK DRAWER



- Economical
- Fits into any 19" Rack
- 2" Space Rackmountable Drawer
- Holds: Cables, Effects, Floppies, Cassettes & More
- Secures Drum Machines, Sequencers, Mixers, Etc.

Ask your dealer for a demonstration  
Call or write for a free brochure

**EFX** PRODUCTS  
22134 ROMAR STREET • CHATSWORTH, CA 91311  
(818) 341-4193 • (800) 468-3399

FOR ADDITIONAL EFX  
PRODUCT INFORMATION, CALL:  
1-800-468-3399  
SAY YOU SAW IT IN  
**ELECTRONIC MUSICIAN**

# RACK

ECONOMICAL 19" RACK MOUNT  
"FURNITURE" FOR THE PROFESSIONAL  
OR HOME STUDIO.

**FX RACK FEATURES**

- Holds up to 18 "spaces" of equipment.
- Attractive black textured vinyl laminate.
- Shown with optional wheels.

ASK YOUR DEALER FOR A  
DEMONSTRATION  
CALL OR WRITE FOR FREE BROCHURE

**EFX** PRODUCTS  
22134 ROMAR STREET • CHATSWORTH, CA 91311  
(818) 341-4193 • (800) 468-3399



## Instant Drum Patterns

200

260



Two all different book and software packages: 200 Instant Drum Patterns and 260 Instant Drum Patterns. One bar patterns and fills in a variety of styles. Use with any software sequencer that reads Standard MIDI Files (most do). Available for IBM, Macintosh and Atari computers. Only \$29.95 each, plus \$3.05 S&H (U.S.).



**Five Pin Press**

1-800-726-6434

Support 214-328-2730

Fax 214-328-1092

P.O. Box 550363

Dallas, TX 75355-0363

## ENCORE

tool that gives new meaning to the term "ease of use."

*Encore*, which has been around in an MS-DOS-only version since 1990, has always been considered quirky. (An early Mac version of the program was reviewed in *EM's* May 1990 issue.) A sometimes awkward interface combined with occasional printing problems plagued early versions.

With the release of version 2.5 for *Windows*, however, those problems are history. Instead, you'll find a program that's clearly designed, easy to use, and highly capable for many musical settings. Although it comes up short in one key area—playback of dynamic and articulation markings—its automatic spacing of notes, scrolling playback, huge symbol library, automatic part-extraction, and flexible page-layout options make it an exceptional tool for the composer or songwriter.

Like most new *Windows* software, *Encore* works best on an 80386 (or better) IBM-compatible PC with DOS 3.1 or higher. You'll need at least two MB of RAM and a Microsoft or compatible mouse. A color monitor is optional, but recommended. Printing tasks are handled directly by *Windows*, so almost any *Windows*-supported printer works. Because *Encore* is *Multimedia Extensions*-compliant, you can use any *MME*-supported MIDI interface, including the MPU-401, Creative Labs Sound Blaster, and Turtle Beach MultiSound. *Encore* also has drivers for the Software Toolworks Miracle Piano Teaching System. The program is not copy-protected and lists for under \$600. Educational discounts are available for qualified users.

## GETTING STARTED

If you've worked with *Windows* software before, you'll feel right at home with *Encore's* layout. If you're a first-time *Windows* user, get ready for a friendly interface. At the top of every screen is a menu line that provides access to many of the program's main features (see Fig. 1). Many of the options under these menus contain additional sub-menus, but you're never more than a keystroke or two from

the main screen.

Just below the main menu line is another set of icons (the Control Bar) that manage various functions, such as navigating around your score, setting the current score voice, choosing the current edit mode, and playing back and recording. The main portion of the screen, of course, contains the score. *Encore* offers numerous ways to choose how much music is displayed at once. On a Super VGA monitor, at a resolution of 800 × 600, the program defaults to seven staves per screen. But by dragging the staves closer together, I could easily display twelve readable staves. On startup, the program also displays the Notes palette, one of several movable mini-windows that contain the characters from which you'll create your score.

*Encore's* well-written manual contains both a good beginning tutorial and an extensive index. It's full of graphic examples, though it might have included additional material on the basics of notation (or at least a few references). Included with the manual is a handy introduction to the vagaries of using MIDI with *Windows* that most users will appreciate. Surprisingly, there's no online help.

## ENTERING DATA

The simplest way to enter data is the click-and-drag method. *Encore* provides seven palettes of symbols that, for the most part, are logically grouped by function. The Notes palette, for example, contains all note and rest durations from a whole note to a 128th note, standard accidental symbols, dotted-note characters, and a user-definable

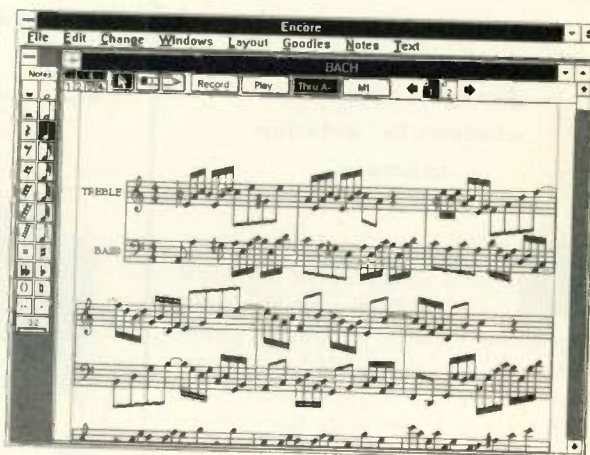


FIG. 1: *Encore's* main screen displays the score, and the Notes palette offers quick access to the most important music symbols.



tuplets indicator. Clicking on any symbol turns your cursor into that symbol; to enter it on your score, simply position the cursor and click the mouse. To delete the note, choose the eraser icon and click on the notehead.

Keyboard shortcuts are available for many options. For example, you can use the numeric keypad to select note durations, or toggle between a note and a rest simply by hitting the R key. Though you can't customize the palettes by creating your own groups of symbols, you can select which palettes appear onscreen when you first start the program. Unfortunately, the program lacks the user-designed symbols of Coda's *Finale* and thoughtprocessors' *The Note Processor*.

One of the true tests of a notation program is its ability to manage symbols that stretch across the page, such as slurs and crescendo marks. *Encore* handles these as well as any program I've seen. To create a slur, select that symbol from the Graphics palette, then click on a beginning, middle, and end point. If you have the Show Control Points option enabled, you'll see three small points on the slur that you can move independently to alter its shape or contour. With this level of control, it's easy to phrase groups of notes that extend across two staves, or that span an entire page. It's just as simple to create a crescendo: Once you've entered the symbol, you can change its size or position by dragging it into place.

*Encore* supports four distinct voice parts per staff. To designate a voice as current, select one of the four choices shown along the control bar. If you forget to select a voice before entering data, simply highlight the notes you want to assign to that voice and choose the Set to Voice option from the Notes menu. Like most editing operations, you can highlight single notes, entire measures, an entire page, discontinuous measures, or even the whole score by using simple key combinations.

#### RECORDING

Recording directly into the program from a MIDI controller can be done in real time or step time. To set up a real-time recording, choose a quantization level (half-note to 64th note) from the Goodies menu, then choose Record Options to filter out unneeded MIDI data. If you need to split notes

# Wherever you live, there's a great local music store

**In some places,** it's hard to get the best keyboards, computers, mixers and multitrack recorders. And mail order houses just don't give you the service and support you need. But now, you have a great local music store no matter where you live that gives you expert advice and product support. Call E.U. Wurlitzer Music & Sound or circle our name on the reader survey card. We'll send you complete information on the products and services we offer.



**E.U. WURLITZER**  
**MUSIC ★ SOUND**

Call now or circle our entry on the reader survey card to receive free information about our products and services

Memorize This Number!

**1-800-966-9686**

This free call is your musical connection!

- Knowledgeable Sales Staff
- Courteous Service
- Fast Delivery
- Major Brands
- Leasing and Financing available
- Specializing in Keyboards, Multitrack, Software, and Signal Processing
- Fax us your wish list

Get ready for the 21st Century!

Call Century Music Systems Now!



**CENTURY**  
**MUSIC**  
**SYSTEMS**



**A SINGER'S DREAM!**

**REMOVES VOCALS FROM RECORDS!**

Our **VOCAL ELIMINATOR** can remove most or virtually all of a lead vocal from a standard stereo record and leave most of the background untouched! Record with your voice or perform live with the backgrounds. Used in Professional Performance yet connects easily to a home component stereo system. Not an equalizer! We can prove it works over the phone. Write or call for a free brochure and demo record.

**Listen.**

**Before You Buy!**

- Time Delay
- Reverb/Reverberation
- Crossovers
- Noise Reduction
- Compressor/Limiters
- Expanders
- Spectrum Analyzers
- Parametric EQ

Don't have regrets about paying too much for a lesser product. In demos and comparisons, we'll show you why we're Better! Our Factory Direct sales allow us to produce a Superior product and offer it to you at a Lower price. Call or write for a free full length Demo Album and 24 page brochure.

**LT Sound, Dept. E.M-9, 7980 LT Parkway**  
Lithonia, GA 30058 (404) 482-4724  
**24 HOUR PHONE DEMO LINE: (404) 482-2485**

● **ENCORE**

to different staves—to create a piano part, for example—set the boundary note here, too. Then click the Record icon, wait for the one-measure lead-in, and start to play. At first, you'll only see note heads on the screen. But when you've finished, the program guesses the proper durations for each pitch and spaces them according to your time signature. In general, *Encore* transcribed my performances accurately. But I could get even more usable transcriptions if I tweaked the quantization value.

During recording, *Encore* retains certain types of data that are not displayed on your screen. For example, Velocity values are recorded but are not converted into dynamic markings in your score. If you're planning to export your score to a sequencer, you'll find it useful to keep all the MIDI data on hand. But if you're just creating notated music, you can save disk space and memory by using the filter option.

**KEEP IN STEP**

Step-time recording involves picking a note duration from the Notes palette, then playing pitches on your keyboard. Keeping one hand on the mouse for changing duration and the other on my synth, I found step-time entry a quick and useful method for many situations. There was a small problem though: In Step mode, the program allows you to enter the wrong number of notes in a measure, i.e., you don't get the automatic note-spacing that real-time recording provides. (According to Passport, this bug has been corrected.) Also, *Encore* cannot split pitches into two staves in Step mode. If your

keyboard skills are poor, you might try real-time recording at a slow tempo to take advantage of these features.

A final method for entering data is to import Type 1 Standard MIDI Files or sequences created by Passport's *Master Tracks Pro* or *Trax*. You also can load *MusicTime* files with no problem (see sidebar), or cut-and-paste among any of the fifteen files *Encore* lets you open at once. Speaking of MIDI, *Encore* can be configured to send and receive over two output ports, allowing you 32 channels of output if you have two MIDI cards or a dual-port card such as the Music Quest MQX-32M. You also could use the two ports to route MIDI to an MPU-401-compatible interface and a sound card, such as the Sound Blaster or Audio Spectrum.

**EDITING**

*Encore* has an enormous range of editing options for refining your score. While it's not optimized for some of the more modern notation conventions, such as beaming across staves, its extensive toolkit can handle most situations. Certain options, such as changing the height or angle of a beam, are done directly on the screen: Just click-and-drag the beam to a new position. Altering the pitch of individual notes is also easiest to do directly on the staff lines.

Accessing edit functions is straightforward. First highlight the note or range you want to work on, then pull down the Change menu and make your selection. You can alter note attributes such as duration, note-head type, and accidentals; transpose large groups of notes; and change the time signature

Symph

**SongWright**

**New! Version 5.1**  
Mouse, AdLib, DeskJet drivers  
Page Preview, Macros, Undo, & much more!

**PG MUSIC PROCESSOR**

**Versatility**  
Compose • Record • Edit • Play  
Transpose • Score • Publish  
all in standard notation

**Virtuosity**  
PC, MIDI, SMF entry and performance.  
Real-time and stepped transcription.  
9/24 pin, laser printer output.  
Symbol editor/librarian.

**Value \$119.95**

**SongWright Software**  
7 Loudoun St. S.E., Leesburg, VA 22075  
(800) 877-8070 • (703) 777-7232

**MUSICTIME**

If you're mainly interested in creating lead sheets or music for small ensembles, you might find Passport's *MusicTime* suits your needs. It uses an interface that's identical to *Encore's* but omits several features of the full-blown package. For example, in place of *Encore's* 64-staves-per-system limit, you only have six staves available in *MusicTime*, and it only allows you to open one file at a time.

In the area of page layout,

you won't find the automatic header and footer feature of *Encore*, though you easily can create your own using the standard text-entry tool.

Don't think this scaled-down version can't create complex music. Its seven palettes of musical characters match those found in *Encore*, and all of the options in the Change and Edit menus also are the same. At a list price of \$249 (even less at the educational price), *MusicTime* looks like an excellent bargain.



for one or more measures. Unfortunately, the Set Meter feature won't reformat note values already entered into your score. Passport claims this feature will appear in a future release.

In the Edit menu, you'll find flexible tools for cutting, copying, pasting, and the like. Once a block has been cut or copied, it can be pasted into your score, or overlaid onto existing notes using the Mix Data command. Another set of options are available to alter the playback of your score—for example, changing the velocity or tempo of a selected region—but these are preview capabilities that won't change the appearance of your music.

#### LEAD ON

For many musicians, creating lead sheets is the main reason for using a notation program, and *Encore* is well-suited to the task. To enter lyrics, switch to the Graphics palette and click on the L symbol. An arrow appears at the beginning of the current staff indicating the vertical position of the text. Click the note where you want the first word to appear, then begin to type, using the Tab key to move from note to note. Each word becomes associated

### Product Summary

#### PRODUCT:

*Encore 2.5* for Windows notation software

#### SYSTEM REQUIREMENTS:

IBM AT-compatible computer (80386 or better recommended) with Microsoft *Windows 3.0* or *3.1*; 2 MB RAM; Microsoft-compatible mouse; *Windows*-compatible printer; MPU-401-compatible or *Windows Multimedia Extensions*-compliant MIDI interface

#### PRICE:

\$595

#### MANUFACTURER:

Passport Designs  
100 Stone Pine Rd.  
Half Moon Bay, CA 94109  
tel. (415) 726-0280

EM METERS	RATING PRODUCTS FROM 1 TO 5			
FEATURES	●	●	●	●
EASE OF USE	●	●	●	●
DOCUMENTATION	●	●	●	●
VALUE	●	●	●	●

**JAM RECORD RIFF FUSE MELD MIX PRODUCE  
ARRANGE EXPLORE EXPERIENCE . . .**

**. . . UNTIL THE WIRES MELT**

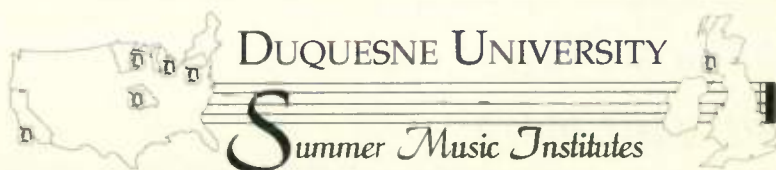
**Take Control!** Turn your PC into the ultimate MIDI studio with the JAMMER. Take a seat in the Producer's chair and get ready to create a musical masterpiece. An array of studio musicians and a 256-track studio await your creative command. Available for PCs with 401-type MIDI cards. Only \$175.

the  
**JAMMER**<sup>TM</sup>  
"The Complete PC MIDI Studio"  
(Studio Musicians Included)



FREE DEMO DISK for PCs WITH 401s  
Order Line: 404-623-0879  
Recorded Demo: 404-623-5887

3 3 8 4 Hill Dr. Duluth GA 3 0 1 3 6



**NEW TECHNIQUES FOR RECORDING AND  
TEACHING ELECTRONIC MUSIC**  
DON MURO

July 20-24 • Duquesne University, Pittsburgh  
August 3-7 • Avila College, Kansas City

**AN INTRODUCTION TO THE MIDI WORKSTATION**  
RAY GRIZZEL

July 13-17 • The College of St. Catherine, St. Paul

**SPECIAL TOPICS IN MUSIC TECHNOLOGY  
FOR THE HOME AND STUDIO**

DAVID ROSENTHAL, MAC MCCORMICK, BILL PURSE,  
LYNN PURSE, TOM KIKTA, FRANK RODRIGUEZ  
July 6-10 • Duquesne University, Pittsburgh

**TECHNOLOGY IN THE 1990S: KINDERGARTEN  
THROUGH COLLEGE CLASSROOMS**  
CHRISTINE HERMANSON

July 6-10 • The College of St. Catherine, St. Paul  
July 20-24 • Avila College, Kansas City

For more information, contact Larry D. Allen at (800) 274-2588.



## clear-stand™ transparent utility stand



Holds music, mini-synths, drum machines, small equipment, computer keyboards.

Clear:  
24" — \$49.95 + \$4.00 S&H  
34" — \$59.95 + \$5.00 S&H

U.S. Patents Pending

## extenda-stand™



Tired of turning pages?

Smoke only, 35" width:  
\$39.95 + \$4.00 S&H

Slips onto your music stand to accommodate charts of 4 or more pages.

Call 1-800-745-5475 (10am-6pm Eastern)

Method of payment:  Visa/MC  American Express  
 Check/M.O. payable to: Clear-Stand Add tax in NJ

Visa/MC/AmEx Number Exp. Date

Signature

Name

Address Apt. #

City State Zip

Clear-Stand™—Box 777, Carteret, NJ 07008  
Please write for shipping rates outside continental U.S.A.

## ENCORE

with a specific note, so text will stay in place if you move pitches around, even when cutting and pasting large areas. An entire line of text can be moved up or down by dragging the arrow at the beginning of the staff, or a single word can be moved left or right by clicking and dragging it to a new position.

Chord symbols are handled just as easily. Select the Chord option from the Graphics palette, click anywhere on the screen, and choose from the huge list of chord types displayed in the pop-up menu (see Fig. 2). Like lyrics, chord symbols can be moved at any time.

Working with other types of text is similar. Choose the T symbol in the Graphics palette, then create a text entry box by clicking anywhere and dragging down and to the right with the mouse. In several cases where I chose to use an extra-large font, the original box was too small to display all my text. Resizing the box and dragging a few staves down and out of the way solved the problem in an instant. You also can move a text box anywhere on the page, even after you've entered all your text.

## PLAYING THE SCORE

*Encore* allows you to orchestrate your score by assigning a single voice or an entire staff to a different MIDI channel when playing back. *Encore's* Staff Sheet screen resembles the main display of many sequencers (see Fig. 3).

Within it, you can name staves, change their size (using one of the four default options), and set various playback options, including MIDI channel and Program Change. There also are options to transpose a staff or change its default volume. But keep in mind these are playback settings only; like certain Change commands, they have no effect on your printed score.

One thing I'd like to see added is a way to embed a Program Change directly within a measure. As it stands, you only can change programs when first

starting playback, unless a change was recorded with the rest of your data. In addition, except for Velocity, duration, and tempo, the program does not let you edit the underlying MIDI data in your recordings (or in an imported Standard MIDI File).

## LAY IT OUT AND PRINT IT

Like a good desktop publishing program, *Encore* offers a wide range of page-layout features. There are simple functions to increase staff and note size, add or delete entire staves or measures, insert or delete entire pages, etc. Using drop-down menus or simple key combinations, you can change just about any attribute of your score. For example, to change the size of a measure, just click on its barline and drag it to the left or right. Everything in the measure (and aligned measures in all other staves of a score) will be respaced accordingly. Best of all, most changes can affect only a single measure in a single staff, so you have the capability to create highly customized scores.

When it's time to print, there are still more options to create just the type of output you want. Using the Score Settings option, scores can be reduced or enlarged from 10 to 400%. Headers, footers, and page numbers can be added easily, and if your printer supports it, you can specify Portrait- or Landscape-mode printouts. *Encore* is bundled with Adobe's Sonata PostScript

**You're a Pro.  
You want more  
than just a price.  
You want Pro  
Service...**

**grandma's  
music & sound**

PRO GEAR FOR MUSICIANS!

Customer Support & Orders  
**800-444-5252**

Prices & Information  
**505-292-0341**

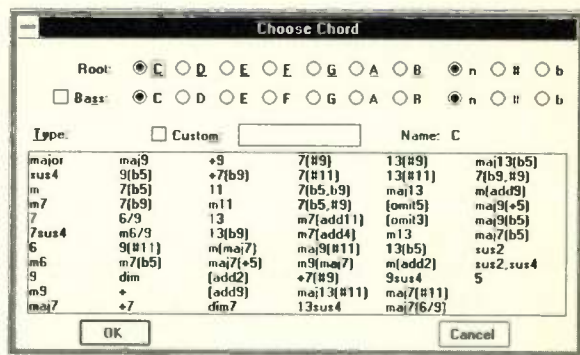


FIG. 2: *Encore* offers easy access to a multitude of different chord types.

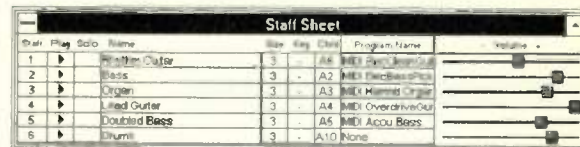


FIG. 3: The Staff Sheet offers a sequencer-like overview of all the staves.

music font and *Adobe Type Manager* utility, so onscreen and printed resolution is as high as the connected monitor and printer permit, even when enlarged.

*Encore* offers another special printing option I found particularly useful. As someone who writes for large ensembles that often contain twenty or more staves, I was happy to see that *Encore* allows a system to contain up to 64 staves. In one score, I used 23 staves of eight measures each. When I was ready to print, I determined exactly where page breaks would occur, then used the program's tile-printing feature to print a single score page on several sheets of paper. The results were especially useful when I printed in Landscape mode: My entire score came together in a highly readable size on only two printed pages.

## SUMMARY

*Encore* provides an excellent example of the new generation of *Windows* music software long awaited by IBM users. It takes advantage of all *Windows* has to offer and, as a result, is a fast and flexible tool for creating many types of music. While playable dynamics and articulation markings would greatly increase its value as a composition tool, *Encore* is so full of features and easy to use, there's no reason not to give it a try. This is one program I hope to have around for a long time.

Dennis Miller is associate professor of music at Northeastern University in Boston, where he teaches courses on music and technology.

## Gulbransen KS20 MIDI Retrofit for Piano

By Michael Krewitzky

**Don't shoot, I'm only the  
MIDified, digitally  
enhanced piano player.**

**W**hen I was young, they gave me a mondo piano. I practiced like I was told, and somewhere along the line I came to believe that this was the best and most expressive

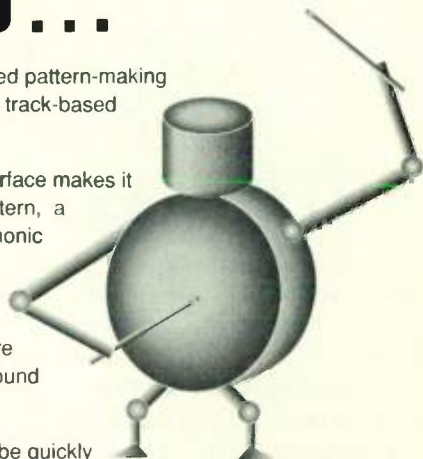
# DRUMMER

## IF YOU OWN CAKEWALK™ YOU NEED . . .

DRUMMER adds advanced pattern-making capabilities to Cakewalk's track-based way of working.

DRUMMER's graphic interface makes it easy to create a drum pattern, a looping melody, or a harmonic texture. You can quickly chain patterns together into a longer score. And our unique Auto Fill feature will make your patterns sound more alive than ever.

DRUMMER patterns can be quickly loaded into Cakewalk. Then use Cakewalk to add to and refine your music further. And DRUMMER works just as well with all other IBM sequencers, like *Cadenza™*, *Sequencer Plus™*, *Master Tracks™*, and *Music Printer Plus™*.



C O O L  
S H O E S  
S O F T W A R E

Find out how easy it is to create exciting patterns.

See your local dealer, or call us today for a free DRUMMER demo pack!

116 Churchland Drive • Winston-Salem, NC 27101 • 919-722-0830

Trademarks are the property of their respective companies.



## MIDI SOFTWARE



*Latest Versions – Shipped World Wide*

### IBM

Band In A Box  
Big Noise M1 Multi-D Editors  
Cadenza Cadenza Windows  
Cakewalk Cakewalk Windows  
CMS 401 II Interface  
Dr. T Copyist 2.0  
Dr. T Quickscore Deluxe  
Encore 2.5  
Finale 2.0 Educational Finale  
Key Elec Laptop Interfaces  
Jammer  
JL Cooper Synboxes/Patchbays  
Laser Music Processor  
Master Tracks Pro 4.5  
Midisoft Studio for Windows  
Miracle Piano System  
Multisound  
Musical 2.0  
Music Quest Interfaces  
Music Printer Plus 4.0  
Music Time  
Musicator GS  
O View Proteus/ O View VFX  
PianoWorks  
Play It By Ear/Rhythm Ace  
Roland LAPC-1 SCC-1  
Roland MPU w/ Cakewalk  
Roland Sound Canvas  
Sample Vision 2.0  
Score 3  
Sequencer + Gold  
Showtune  
Songwright V 5.1  
MIDI Quest Generic Editor 2.0  
Voyetra V 245M / V-24S  
XOR by Dr. T

### MACINTOSH

Alchemy 2.0  
Altech MIDI Basic/Pascal  
Altech EX Interface  
Automedia Deck  
Band In A Box  
Ballade  
Cubase / Digital Cubase  
Encore 2.5  
Finale 2.5 Music Prose 2.0  
Mi Bac Jazz  
MIDI Time Piece by MOTU  
Miracle Piano System  
Opcode Galaxy / Galaxy+ Ed  
Performer 4.0  
Digital Performer  
Composer's Mosaic  
MIDI Mixer 7s by MOTU  
Music Time  
Opcode Overture (New Notation)  
Protazoa Proteus Editor  
Sound Designer II SK  
Sound Tools II  
Studio-2 / Studio3 Interface  
Studio IV/Studio V  
Turbosynth 2.0  
Upbeat 2.0  
Vision/EZ Vision by Opcode  
XOR

### AMIGA

Bars & Pipes Professional  
ECE MIDI Interface  
M  
MIDI Quest Generic Editor  
Patchmeister  
Take Note

### Tiger Cub by Dr. T XOR

Avalon 2.0  
Band In A Box  
C Lab Human Touch  
C Lab Explorer M1 Explorer 32  
Creator 3.1  
Dr. T Copyist (all versions)  
Dr. T KCS OMEGA  
Dr. T Tiger Cub  
Dr. T XOR  
Edit Track Gold  
EZ Score+  
Interval Music Sys K1 K4 Ed  
Hybrid Arts Edit Track  
Hybrid Arts SMPTE Track II  
Hybrid Arts Gen Edit  
Hybrid Arts Digital Master  
Genwave Univ. Sample Ed  
M  
Trax by Passport  
MIDI Quest Generic Editor 2.0  
Niche  
Notator 3.1 (Soft link) NEW  
Notator/Unitor SMPTE  
Notator Alpha  
OMEGA  
Protazoa Proteus Editor  
SMPTE Track Gold  
Steinberg Cubase 3.0  
Steinberg Midx +  
Super Librarian  
Unitor II

**ATARI COMPUTERS IN STOCK!**



ATARI STe w/ 14" Mono. Monitor \$599



## LEIGH'S computers

1475 Third Ave. • New York, NY 10028  
(212) 879-6257 • Fax (212) 772-1689  
(800) 321-MIDI (321-6434)





**The News  
is Out!**

**BANANAS  
8:00**

The latest edition of our audio and musical hardware catalog is hot off the presses. Call the number below, or circle our reader service number to receive your free copy!



**BANANAS AT LARGE**

ORDER LINE:

**1-800-786-7585**

FOR INFORMATION: CALL 1-415-457-7600

1504 FOURTH ST. • SAN RAFAEL CA 94901

**DISC MAKERS**

**Complete Manufacturing  
For The Audio Industry**

Complete packages for:  
Cassette Duplication,  
Record Pressing,  
Compact Disc Replication.  
In-house art department for design, typesetting, film work and printing.  
In-house mastering department for a great sounding product.

7 Day Express Cassettes Available!

**300 cassettes**  
B & W Express Series  
for **\$550**  
(Includes Black & White inserts, clear shell, and Dolby HX Pro)



Call TODAY for this free, full color catalog:  
**1-800-468-9353**

Call us free and we'll show you how to get started

**DISC MAKERS**

1328 N. 4th Street, Philadelphia, PA 19122  
215-232-4140, FAX 215-236-7763

● **KS20**

way to make my music. There was something about the way I hit the keys; all that wood, ivory, felt, and metal jumped around, and the music vibrated up my arms and hit me in the face.

And that was exactly the way it was supposed to be.

A few years later, I heard and saw my first synthesizer. My head nearly exploded from imagining the possibilities. Somehow, though, no matter how many amps, speakers, and effects I plugged it into, it never quite hit me the same as a good old piano. No combination of synths and electronics ever seemed to let me play the music in my head with the same degree of nuance I found in that antique, mechanical, bone-shaking, musical appliance.

Then came the Gulbransen KS20 MIDI retrofit for piano. At last.

**OVERVIEW**

The KS20 consists of a keyboard sensor strip, a pedal sensor strip, and a control panel/brain that mounts under the left side of the piano keyboard and slides in and out (see Fig. 1). The keyboard sensor strip is available in 88-, 73-, or 61-key configurations. The sensors use optical scanning technology to track the key travel, generating MIDI note, Velocity, and Aftertouch data.

Pieces of plastic—called “Nessies” because they resemble a famous serpent-headed, Scottish monster (see Fig. 2)—open and close between a light source and the light sensors, producing



FIG. 1: The Gulbransen KS20's control panel/brain mounts under the left side of the piano keyboard and slides in and out.

accurate Velocity tracking. The optical scanning system is based on infrared rather than visible light, so it's unaffected by ambient light.

Because a piano typically doesn't make sound until a key bottoms out, and the sensors close before the key bottom is reached, it is possible to adjust the MIDI “speaking” time slightly ahead of the acoustic sound. Each key has its own Nessie, so the product is capable of either Channel or Polyphonic Aftertouch. The control box has twenty buttons with LEDs, four programmable sliders, and two assignable pedal inputs.

The manual provides the information necessary to rapidly program simple setups in minutes. As it turns out, the information given in the “Quick Start” section of the manual supplies most of the instruction needed to get more than your money's worth from the device.

**THE TOUCH**

When people look for the ideal MIDI master controller, the most important feature is the touch. If you have an acoustic piano or a Fender Rhodes with a touch you love, and you want a MIDI

controller for studio or live use, the Gulbransen KS20 may be just the ticket.

The KS20 passed the all-critical “does-this-change-the-piano-action” test with flying colors. I couldn't feel the difference. According to Gulbransen, the Nessies only add about two grams of force to the 60 grams of force that are required to depress the typical piano key. Normal playing force is in



FIG. 2: The KS20 sensors (foreground) use optical scanning technology to track the key travel. Pieces of black plastic—called “Nessies” because they resemble a famous photo of the Loch Ness monster—open and close between the light source and light sensors.

the neighborhood of 100 to 500 grams.

Even at its simplest level, the device does an absolutely wonderful job of translating pianistic nuance into MIDI messages. In this regard, I found it superior to regular MIDI keyboard controllers. Although you can adjust the attack velocity sensitivity, the factory default turned out to be quite good and matched the standard velocity curves available in most of my samplers and synths. The KS20 also provides adjustable Release Velocity sensitivity.

### IN THE BANK

Gulbransen organized the KS20's programming assignments a bit differently from other MIDI controllers. At the top of the hierarchy are four Banks, each of which has a preprogrammed split/layer Zone setup. Banks 1 and 2 provide either two layers or an assignable two-Zone split. Banks 3 and 4 provide four Zones, similarly programmed. Zones can be configured as hard splits or they can overlap; they are mapped to specific areas by pressing the Range button followed by two notes on the keyboard.

Each Zone contains eight Presets. Each Preset can send separate Volume and Program Change messages over any or all of the sixteen MIDI channels. In addition, the KS20 can transpose the MIDI notes on all sixteen channels in the Preset. Thus, you could set up four Zones, with eight Presets each, sending data over sixteen MIDI channels per Preset.

### MIDI

On power-up, the KS20 transmits note and pedal commands on MIDI channel

### Product Summary

#### PRODUCT:

Gulbransen KS20 piano/MIDI retrofit

#### PRICE:

\$1,990

#### MANUFACTURER:

Gulbransen, Inc.  
PO Box 82838  
San Diego, CA 92138  
tel. (619) 296-5760

EM METERS	RATING PRODUCTS FROM 1 TO 5			
FEATURES	●	●	●	
EASE OF USE	●	●	●	●
DOCUMENTATION	●	●	●	●
VALUE	●	●	●	●

# KEYBOARD SPECIALISTS

FOR MUSICIANS/BANDS/STUDIOS  
CHURCH/HOME/SCHOOLS

ALL MAJOR BRANDS



- SYNTHESIZERS
- DIGITAL PIANOS
- SAMPLERS
- DRUM MACHINES
- SOFTWARE
- MIXERS/AMPLIFIERS
- RECORDING EQUIPMENT

VOLUME DEALER

NEW & USED

ALL BRANDS

ALL MAJOR  
CREDIT CARDS

PROFESSIONAL  
ADVICE

Call for a catalog and pricing information

## RHYTHM CITY

1485 NE Expressway, Atlanta, Georgia 30329

1 (404) 237-9552 • 1 (404) 237-7661

**Bobby Lyle**  
Album: "The Journey"  
"The new Voice Crystal cartridges give me a whole new array of dynamic sounds to color my music with. I'm looking forward to making them an integral part of my sound for the 90's."

*Bobby Lyle*

**Chris Stein**  
Guitarist & Composer for Deborah Harry  
"The sounds are really great, I sat down to listen and wound up spending hours playing them and fitting them into various sequences. Voice Crystal sounds saved me a lot of time."

*Chris Stein*

**Professional Sounds Programmed and used by Professional Musicians**

**AVAILABLE AT YOUR LOCAL DEALER**

<p><b>ROLAND</b> JD-800 D-70 D-50/D-550 D-20/D-10/D-110/D5 U-20 R-8 W-30/S-50/S-550 S-330/S-770/S-750 Blank RAM</p>	<p><b>ENSONIQ</b> SQ1/SQR SQ1 Plus/SQ2 VFX/VFX-SD/SD-1 EPS/EPS-M EPS 16+/EPS 16+M Blank E<sup>2</sup> Prom</p>	<p><b>KORG</b> Wavestation Wavestation AD M1/M1R T-Series Blank RAM</p>	<p><b>AKAI</b> S-1000/HD/PB/KB S-1100</p>
<p><b>PEAVEY</b> DPM-3/SE</p>	<p><b>E-MU</b> EMAX EMAX II</p>	<p><b>KAWAI</b> K4/K4R K1/K1R/K1M K1 II/K1 IIR</p>	<p><b>YAMAHA</b> SY-77/TG-77 SY-55/TG-55 SY-22/TG-33</p>

**PRODUCTIONS, INC.**  
MUSIC PRODUCTS DIVISION

930 Jungfrau Court  
BUS: (408) 945-0139

Milpitas, CA 95035  
FAX: (408) 945-5712

**Waldorf**  
Microwave

Watch for new products and endorsements!



1, along with MIDI Volume from slider 1 and Mod Wheel from slider 2.

The KS20 has four sliders and two inputs, each of which can accommodate either a momentary pedal (normally-open or normally-closed) or a linear-taper CV pedal or similar device. Each controller is programmable in each Zone as any MIDI controller. All four sliders, as well as the two pedal controllers, can be used simultaneously in the active Zones.

Unfortunately, the sliders are somewhat small and not particularly well-positioned for on-the-fly MIDI performance control. However, they are completely usable. Any of these or other functions can be optionally controlled by a pedal plugged into either of the auxiliary pedal inputs. Overall, the KS20 is a well-endowed MIDI controller, and as such, it takes some time and effort to grasp all of its capabilities.

Rest assured, there's plenty of MIDI power. Without going into great detail (the manual does a good job of that), the MIDI channels of Presets can be changed, and it has a friendly Panic button.

As mentioned earlier, one significant feature is the ability to send either Channel or Polyphonic Aftertouch data. The relative smoothness of the Aftertouch function seems tied to the

pliability of the felt cushioning at the bottom of the particular piano's key dip. Aftertouch is generated during the compression of this felt after the key hits bottom, and according to my measurements (using *MIDIScope*), seems to vary from key to key. Nonetheless, these variations subjectively fell into a musically useful range.

The KS20 can be used in conjunction with other MIDI controllers to enhance their capabilities. To do this, just feed data from the other instrument's MIDI Out to the Gulbransen's MIDI In; the KS20 filters the data it receives and passes modified and rechanneled data to its MIDI Out.

Other nifty features include the ability to adjust the velocity curve to taste and adjust the MIDI "speaking time" in advance of the moment the key bottoms out. The contents of memory can be saved and retrieved with a System Exclusive dump to an external storage device. All in all, there is more MIDI functionality here than most of us will ever get around to using.

Notable in their absence are the traditional pitch bend and modulation wheels. The sliders can be programmed for these functions, but aren't spring loaded, lack a center detent, and are uncomfortable as performance controllers.

The KS20 has just enough non-volatile memory to save the Program Change and Volume settings for one channel (called the Save channel) of each Preset. Otherwise, your programs go away when you power down. This regrettable design makes it necessary to dump the memory (via SysEx) to an external storage device, or lose your programs. It's a pain to do and a big limitation if you want to do serious synth layering.

## CONCLUSIONS

I started out wanting to write a completely balanced review of this product. But after living with the KS20 for two months, I found more to gush about than tear apart. At first, I believed it would be nice to have an LCD to help give feedback in programming. But with a bit of mental application, this slight shortcoming soon was forgotten. As mentioned earlier, the unit would benefit from a well-designed pitch bend controller.

There are only a few notable limitations and omissions, but one stands out: Many of the MIDI features are wasted because the unit lacks a battery-backed memory. Gulbransen really goofed here; I suggest you forget the KS20's fancy MIDI functions, stick with the Presets, and use external MIDI processing (software or hardware). Otherwise, keep your synth keyboard online for the bulk of the electronic parts, and use the KS20-fitted piano for its strengths: recording piano performances and selected overdubs where a piano touch is useful, and music notation.

One of the obvious problems with using a piano as a MIDI controller is that you hear the piano's natural sound along with the MIDI-triggered sound. Unless you are trying to layer piano and MIDI tracks in a single pass, this could be quite disconcerting. Therefore, when using the KS20 for programming non-keyboard sounds, the folks at Gulbransen suggest Quiet Keys (\$84.95, including shipping; available from Quiet Keys, R3 Box 179, Austin, MN 55912; tel. [507] 433-4835), a string-dampening device that is said to eliminate approximately 75 percent of the piano's acoustic sound. Quiet Keys is working on a version designed specifically for use with MIDI-enhanced pianos that is said to reduce the piano's sound by 90 percent.

## INSTALLING THE KS20

The installation begins with the disassembly of the piano and the removal of the keys. Next, the sensor strip is mounted in the keybed, positioned with one Nessie under each key. Then, a few simple plug-in connections are made and the piano is reassembled. Nessies also install beneath the pedals. Finally, the electronics unit is mounted beneath the lower end of the keyboard (see **Fig. 2** in main text). No soldering or complex electronic work is necessary.

The entire installation takes about 1½ hours and is a straightforward task for any reasonably handy person. However, I strongly advise you to have it done by a piano technician who doesn't fear electronics, unless you are completely comfortable working with the innards of your piano and a bit of electronics.

I found the instructions for installation to be clear, concise, and to the point. Gulbransen offers an installation video tape, but things can be different from piano to piano. Some instruments may require a bit of woodworking (such as routing) in order to allow the Nessies to lie correctly beneath the keybed.

An Advanced Function menu lets you customize and modify the control unit's functions. This menu includes parameters for reinitialization and recalibration of the keyboard and pedal settings. These calibrations must be done at the time of the installation and whenever the instrument is moved or dropped, or if the temperature and humidity change significantly. The adjustment procedure only takes a minute or two, thanks to clear documentation.

This product is unique. Nothing else allows you to bring your favorite piano or Rhodes into the MIDI age. The KS20 is ideal for people used to playing piano, as opposed to plastic keyboards. Its overall touch response is so good that its shortcomings are easily forgiven. You still might prefer a plastic keyboard for certain synth parts, but if you spent a lot of time practicing to develop chops, this is the piano device that will let you use them.

Michael Krewitsky is the owner of Professional Sound and Music/Musicians Repair Service, a MIDI, recording sales, and service boutique in San Diego. He has spent entirely too much time searching for the ideal musical physical-to-virtual-reality converter.

## Audio-Technica AT4033 Microphone

By Michael Molenda

**A sonic socialist delivers  
pro sound to musicians on  
a budget.**

**S**mall project studios and home recordists usually can afford one good vocal microphone. Unfortunately, no microphone records all vocal styles equally well, and the models with the largest vocabularies often carry the biggest price tags. Obviously, the recordist on a budget craves an affordable microphone that reproduces myriad timbres without sacrificing quality for quantity.

Sound like the impossible dream? I used to think so myself until Audio-Technica's new AT4033 cardioid condenser microphone put its multi-lingual talents on the block for \$699.

Handsomely rendered in the style of classic broadcast models, the AT4033 utilizes a transformerless, direct-coupled signal path and a low-mass diaphragm to enhance reproduction and reduce distortion. Frequency response is rated at 30 Hz to 20 kHz, with a maximum sound-pressure level of 140 dB. Switches for a highpass filter and a 10 dB pad are included on the base of the mic. The manufacturer offers two

mounting options: a stand clamp or shock-mount. (I recommend the latter.) Power is derived from any 48V phantom source.

### GETTING VOCAL

I started my test with an operatic baritone. Most affordable microphones record tenors quite well, but seldom do justice to rich, full-bodied voices. The singer stood six inches from the mic and was recorded without equalization or compression. No problem here. The lows were extremely lush and sensuous, even with the mic moved back to add room tone to the sound. When compression (2:1 ratio/-10 dB threshold) was employed to smooth out vocal performances, a slight muddiness appeared, but clarity was restored by cutting 3 dB at 100 Hz.

On tenors, the AT4033 exhibited an eerie, transparent quality. High voices seemed to float in mid-air, whether crooned, screamed, or whispered. This characteristic proved invaluable for recording rock 'n' roll vocals, where singers must cut through a cacophony of rampant instruments. But the AT4033 is not just a rock microphone. I recorded a folk singer with a single acoustic guitar as the backing track and achieved a sparkling vocal tone that was almost angelic in its purity. The AT4033, matched with a good singer, never failed to produce a clear, intimate sound.

Voice-over work was also a breeze. Regardless of the artist's timbre, the AT4033 recorded pristine, well-articulated speech with minimal processing. I recorded a few public-service announcements with only a slight cut at 100 Hz to avoid plosives (ugly pops often caused by "b," "p," or similar sounds). The AT4033's internal foam windscreen provided enough additional pop protection that further adjustments were unnecessary.

The trade-off for the AT4033's brilliant sonics is a propensity towards increased sibilance. In every vocal application (spoken word or singing voice), "s" sounds exhibited an uncomfortable shrillness. Close-miking intensified the problem. Audio-Technica is aware of this characteristic, and recommends an external pop filter to tame harsh s-s-s-s-s sounds. Even with a filter as a buffer, I found additional processing necessary to diminish sibilance, and employed a de-essing device

## professional Audio Supplies immediate shipment



ask for our free PolyQuick catalog

Chicago  
(708) 390-7744 Fax: 390-9886  
Los Angeles  
(818) 969-8555 Fax: 969-2267

**PolyQuick**

1243 Rund Road, Des Plaines IL 60016  
16018 C Adelante Str. Irwindale CA 91702

## MX-816 PROFESSIONAL MIXING AUTOMATION

### Features

- \* The MX-816 is a rack mount unit with 8 audio inputs, outputs & sum
- \* Expandable to 16 channels
- \* Cascading units with PRO MIX-net™ will automate up to 32,000 audio channels
- \* MIDI controlled
- \* Programmable muting
- \* Front panel controls for easy manual control
- \* Uses noiseless VCA technology
- \* 100 patch internal memory to store and recall snap shots and scene fade times
- \* Save internal memory as system exclusive data
- \* 28 internal pre programmed master autofades
- \* Supports continuous faders
- \* Joystick scene control
- \* Automate effects
- \* Pro audio ranges
- \* Works with MIDI sequencers
- \* Gold plated audio connectors
- \* Available thru fine pro audio stores

Call for free detailed spec sheet

**CM AUTOMation**

402 MUSEUM DR., L.A., CA 90065  
(800)238-7010, IN CA(714)488-0024





A shock-mounted AT4033 in a classic vocal miking position.

in the signal chain. The toil and trouble of these adjustments is insignificant compared to the beautiful sound the AT4033 delivers when all timbral factors are optimized.

**MOONLIGHTING**

No one should use a vocal mic exclusively for vocals. (Don't tell me you're one of those musicians who actually reads directions, follows the rules, and worships the status quo?) Wringing the maximum from each piece of equipment is essential for the budget recordist's sonic survival. So what else can the AT4033 do?

**Drums.** Not surprisingly, the AT4033 worked beautifully as an overhead drum mic. The same characteristics

that make vocals shimmer deliver the high-frequency goods on ride and crash cymbals. Tom miking produced mixed results: rack toms sounded a bit papery, but floor toms rumbled like King Kong's footsteps. I also employed the AT4033 as a mono room mic by positioning it ten feet in front of the kit, at the drummer's chest level. This mono track sounded so good, I considered using it as *the* drum track. (Here we go, back to the 1950s.)

**Guitars.** The AT4033 sounded great employed as a room mic when recording amplified guitars. Careful mic placement captured gentle decays that produced wonderful blends with close-miked sounds. At the final mix, this natural reverb often was the only element adorning the original source sound. I also used the AT4033 as an off-axis mic (placed four feet from the

speaker cone at a 45-degree angle) to elicit sharp, jewel-like tones. In a welcome example of infallibility, acoustic guitars sounded bright and well-defined no matter where the AT4033 was placed.

**Brass.** Few affordable microphones record horn sections as funky and punchy as the AT4033. I just put the mic up and let the players blow. Articulation between horns (baritone sax, tenor sax, trumpet, trombone, etc.) was marvelous.

**Other instruments.** I'll stop being long-winded. Just take my word for it that the AT4033 sounds great on grand pianos, harmonicas, timbales, handclaps, flutes, and barking Golden Retrievers.

**POWER TO THE PEOPLE**

It's a miracle that the AT4033 sounds as good as it does for what it costs. An affordable mic that bestows truly professional quality brings us one step closer to destroying the concept that commercial master-tape production is the domain of big-shot technocrats housed in expensive recording studios. Along with the Alesis ADAT, recordable CD decks, and other sonic socialists, the AT4033 offers home recordists the opportunity to produce tracks that sound as good as anything gracing a major-label release. That's a lot of power for \$699. ●

● **PERFORMANCES**  
(continued from p. 60)

comprehensive internal levels for each sound, so that patch changes don't jump up in volume and overdrive my keyboard mixer.

The worst technical thing that's happened to me was a stuck MIDI note. Fortunately, my Roland D-70 has a panic button that kills the stuck note and resets the MIDI controllers.

**SEQUENCER WOES**



Myke Reilly  
Programmer/Keyboardist, Voice Farm

Live performances seldom unfold as planned, so always have something to fall back on. Once, one of our dancers tripped over the main power cord during a show. Luckily, [guitarist] Ken Weller and [singer] Charly Brown knew a few acoustic numbers, so they entertained the crowd while I reloaded sequencer data. The acoustic numbers worked out so well that we made them a permanent part of our stage show.

**FINAL ENCORE**

The rare moments of shared bliss between audience and performer are indescribably beautiful and addictive. The more you protect yourself against technical (and emotional) sabotage, the easier it is to attain those moments. For me, that's what performing is all about. I certainly didn't relish getting beer bottles hurled at me, but the band managed to win over the crowd at that Texas gig. By set's end, the yahoos were cheering, stomping, and treating us like we were the forgotten offspring of Hank Williams. Let me tell you, it doesn't get much better than that.

EM associate editor Michael Molenda still courts calamity on Bay Area stages with his band, Soul Poets.

**Product Summary**

**PRODUCT:**

AT4033 Studio Condenser Microphone

**PRICE:**

\$699 (with shock-mount)

**MANUFACTURER:**

Audio-Technica U.S., Inc.  
1221 Commerce Dr.  
Stow, OH 44224  
tel. (216) 686-2600

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



# CLASSIFIEDS

**ELECTRONIC MUSICIAN**  
*Classified Ads are the easiest and most economical means to reach a buyer for your product or service. For complete information on prices and deadlines call (800) 747-3703.*

## EMPLOYMENT OFFERED

Let the government finance your new or existing small business. Grants/loans to \$500,000. Free recorded message: (707) 448-0270. (NS9).

## EQUIPMENT FOR SALE

**Looking for used or new MIDI equipment?** We've got tons of super clean Yamaha, Roland, Korg, Ensoniq, Kawai, and E-mu products in stock. **Come in or do it all through the mail.** Call, write, or fax for prices & details. **Caruso Music**, 20 Bank St., New London, CT 06320, USA. (203) 442-9600; Fax: (203) 442-0463.

**Mail order prices** with knowledgeable, helpful people! Major brands of MIDI-based music and recording equipment: Korg, Roland, Kurzweil, E-mu Systems, Akai, Tascam, TOA, JBL, Lexicon, Mackie, DOD/Digitech, AKG, Crown, Panasonic, Ramsa, Fostex, Carver, Amek/TAC, and much more! Plus all Macintosh, IBM, and Atari software and interfaces. We take trade-ins! **Sweetwater Sound, Inc.**, 5335 Bass Rd., Ft. Wayne, IN 46808. (219) 432-8176.

**Attention Mac & Atari users!!** Now your Mac or ST can have the feel of a tape recorder with the Mac-K..AT or ST-K..AT remote controls from Friend-chip. Control up to 21 transport & edit functions (14 for ST) from this compact unit. Available now, Mac-K..AT, \$199; ST-K..AT, \$149. Call (800) 726-6491, or send check/MO to: Euro-stuff, 4455 Torrance Bl., Ste. 159, Torrance, CA 90509 (CA res. add 8.25%).

## INTERNAL HARD DRIVES

**Emax II • Akai S1000/S1100 Kurzweil K2000 • MacIntosh**

Fast 40 to 320 Megabyte Hard Drives that fit inside your sampler. Reduce loading time to seconds! From \$399.

**1-800-567-5475**

**Kirkwall TECHNOLOGIES**

34 Killarney Way  
 Regina, SK., Canada S4S 6X8  
 Tel: (306) 584-8030  
 Fax: (306) 585-0944

**MIDI LIGHTING CONTROLLER** Call 1-800-388-8115 **MIDI LIGHTING CONTROLLER**



Now you can program your light show in your sequencer or foot controller. Control up to 1500W of lighting, flash pots, confetti launchers. This controller gives you 3 independent MIDI controlled lighting channels with dual outlets for each channel. Channels can control up to 1500W and may be set to 128 intensity levels. Up to 16 controllers may be used on a single MIDI channel via a rotary switch on the unit. The unit has a MIDI THRU output. Send \$229.95 COD or check.

CompLife 840 Hooper Road  
 Suite 278 Endwell, NY 11740

**Aries studio synth.** Beautiful analog system, 24 modules, kybd, JL Coop MIDI-to-8CV. For det. (415) 285-2047. \$2k or BO.

**Kurzweil K250**—Excellent condition, studio use only, \$3,200. Soundblocks A & C, plus 50 kHz sampling option. White Crow Audio. (802) 658-6475.

**New, used, demo equipment. Largest selection of digital/analog recorders, consoles, outboard pro tools, sound tools, MACs, DATs, CD recorders, tube gear, 24-tk recorders, Trident, Tascam, Otari, Soundcraft consoles, Genelec, KRK, Tannoy, JBL monitors, Apogee converters, samplers, Lexicon, Sony processors, Eventide H3000, Microlynx synchronizer.** Equipment leasing and systems specialists—new and used components. Call for current fax listing of equipment. **EAR Professional Audio/Video**, (602) 267-0600.

**Prophet 3000** – 16-bit stereo sampler complete w/latest operating system, documentation, and 40-disk library. Exc. Cond. \$1,350. Call Bob at (415) 567-5961.

Over 100 Pro Audio lines!

For \$7500 you can record onto your own compact discs!

**Kingdom Sound & Recording Systems**

MIDI, Passport, Mark of the Unicorn, Digidesign, Opcode, JL Cooper, Tascam, Mics, Decks, R-DAT Recorders and Tape, plus much more! Everything for your project studio!

Call for our Free Catalog  
 Call 1-800-334-1456

8:30am-5:00pm EST (FAX) 717-662-3875  
 Request catalog # EM 8-92

**digital audio systems**

*the digital specialist*

*Studio Vision, Audiomedia & Galaxy for one low price!*

adat-digidesign-hybrid arts-ii cooper  
 SoundTools 2, Protools 8+ ch exp. Digital performer & Waveboard in stock for immediate delivery!

**PCT Rackmount Hard Drives in stock for immediate delivery!**

opcode sonic solutions sony turtle all the major brands at major discounts unsurpassed in knowledgeable consultation!

español-français  
 7 day (24hr) tech support/ Miami export  
 305.666.2890 fax 305.666.5284

## DON'T GET BEAT

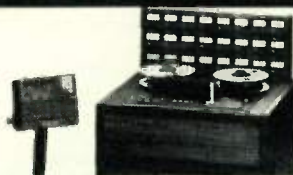
When you need equipment call

**8TH STREET MUSIC**  
 (800) 878-8882

**PHILADELPHIA'S LARGEST MUSICAL INSTRUMENT DEALER!!!**

8th Street Music, 1022 Arch St. Philadelphia, PA 19107

## American Pro Audio



- Sony/MCI • Trident •
- Tannoy • Eventide •
- Yamaha • Tubetech •
- Fostex • Soundtracs •
- Beyer • Roland • Akai •
- Ramsa • Panasonic •

## Mini Lease Program

New or used, trade-ins 24-60 months with buyout option \$5K-25K **no** financials required min. 2 yrs in business.

**1-800-333-2172**

## THEREMIN

The original space-controlled electronic musical instrument, redesigned with 1992 technology by Bob Moog. New features include solid state analog and digital circuitry, MIDI, and choice of cabinets. Write, call or FAX for photo and specs.

## Big Briar, Inc.

Rt. 3, Box 115A1, Dept. E  
 Leicester, NC 28748  
 Phone or FAX: 704/683-9085

**EXTREME • BOSTON • DE LA SOUL**

## TOURCASE

ATA Hard Shell Cases  
**FREE** Catalog **800-228-8233**  
 FACTOR DIRECT 30% 50% Below Retail  
 Direct 508-537-8252  
 VISA/MC  
**AEROSMITH • KENTUCKY HEADHUNTERS**

## Synthe-Sound Musical Products

- ◆ KAWAI-Keyboards/Pro Audio
- ◆ Waldorf Microwave/Accessories
- ◆ Steinberg-Jones Software
- ◆ Music/Lighting Equip/Accessories
- ◆ Free Catalogue - MC/VISA

Call/Fax-Order/Quote/Cat: 802-985-3277  
 PO BOX 248, Shelburne, VT 05482

## THE PRICE FIGHTERS



Service, Selection & Prices that will **KNOCK YOU OUT!**

- DAT RECORDERS
- MIDI SOFTWARE
- RECORDING GEAR
- KEYBOARDS

Call or write for free catalog!  
**1-800-348-5003**

**Rock 'n Rhythm**  
 Div. of  
 the Woodwind & the Brasswind  
 19880 State Line Rd  
 South Bend IN 46637

EM Classifieds (800) 747-3703



# CLASSIFIEDS

## EQUIPMENT FOR SALE

We want your used MIDI equipment and well-maintained recording gear. We'll give you cash, or take it in on trade. Come in, or do it all through the mail. Call, write, or fax for prices and details. **Caruso Music**, 20 Bank St., New London, CT 06320. (203) 442-9600; Fax: (203) 442-0463.

The MIDI-Metro visual metronome translates MIDI clock into a beat you can see. Forget about click breakthrough. Forget high volume foldback, and even forget headphones. Make the MIDI-Metro part of your studio or stage set, and kick the click. Call toll-free (800) 726-6491 now, or write to: Euro-Stuff, 4455 Torrance Blvd., Ste. 159, Torrance, CA 90509.

APO or FPO as a mailing address? Then call, write, or fax our special department for absolutely all of your new or used musical equipment needs. Worldwide delivery! **Caruso Music**, Dept. OS, 20 Bank St., New London, CT 06320, USA. Phone: (203) 442-9600; Fax: (203) 442-0463.

**Casio Closeout:** VZ-1 synths, FZ samplers, VZ-10M modules, digital pianos, PG-380 MIDI guitars, ROM cards, piano modules, DATs, MIDI horns! (We also buy used Casio pro gear!) (414) 784-9001.

Sell your gear through EM Classifieds (800) 747-3703

**ATARI COMPUTERS \$419.00 !!**  
**AKAI 8 MEG EXPANDER \$599.00**  
**EP516 + TURBO KIT \$385.00**  
**ENSONIQ / EMU / MAC. SCSI COMPATIBLE**  
**45 MEG \$379.00 HARD DRIVES**  
**105 MEG \$479.00**  
**44 MEG REMOVABLE \$525.00**

**TECH WAREHOUSE**  
 13 YOUNG RD. FOXBORO, MA. 02035  
 1-508-698-0142

Electronic Bow For Guitar



Call Our 24 Hr Demo Line To Hear The E-Bow (213) 625-EBOW

To Order call (213) 687-9946 VISA/MC Check/MO  
 Heet Sound Products 811 Ducommun St. LA. Calif. 90012

## INSTRUCTION

Dr. Maury Deutsch: Symphonic composition, modern arranging, Schillinger, multimedia, improvisation, applicable to computer electronics, films, TV, theater. Send for catalog: 150 W. 87th St., NY, NY 10024. (212) 724-4722.

**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 and software design. Fully equipped individual MIDI work stations. Careers for music, electronics, and computer industries. Accredited. **Cogswell Polytechnical College**, 10420 Bubb Road, Cupertino, CA 95014. (408) 252-5550.

**Videos for Roland Sound Canvas and Roland U20.** Cover all functions and aspects of programming & operations. Sound Canvas 90 min., U20 2 hr., 10 min. \$39.95 ea. Check or MO to: Video Instruction Service, PO Box 1905, Simi Valley, CA 93062. (805) 523-8462.

**Be a recording engineer.** Train at home for a high-paying, exciting career, or build your own studio. Free information. **Audio Institute of America**, 2258-A Union St., Suite F, San Francisco, CA 94123.

**Los Angeles Recording Workshop.** Intensive hands-on training on nine consoles. Housing and financial aid available. 12268-EM Ventura Boulevard, Studio City, CA 91604. (818) 763-7400.

**MIDI KEYBOARD LESSONS** For IBM PC  
 Learn and Play Faster! Highly interactive! Vol. 1 Major Studies; Vol. 2 Minor Studies; Vol. 3 Jazz Modes; Vol. 4 Jazz Chords. Prices \$49.95 ea. For info write or call (516) 536-0298. To order send check or m/o.

Call 1 800-327-0209

**FAST FINGERS**  
 MUSIC SOFTWARE  
 Box 741, Rockville Centre, NY 11571

## LEARN TO PLAY ANY KEYBOARD AND READ MUSIC OVERNIGHT !!!

With this new and exciting 84 minute video production

### "BEGINNING KEYBOARD"

Includes a fourteen lesson study book. Only \$29.95 plus \$3.50 s/h

VHS only CK-VISA/MC

Phone (801) 292-6331

611 Lacey Way

No. Salt Lake, Ut 84054



**Contemporary keyboardist course** by John Novello now available via mail correspondence. No one-size-fits-all cassettes. Same course studied by platinum songwriters and top studio musicians. Endorsed by **Chick Corea**. Free applic./brochure. RIP Productions, 1618 Monroe Ave., San Diego, CA 92116.

**Learn Cakewalk quickly!!!** Our video walks you through the manual step-by-step so you can see how to do it! Available in English, Spanish, and French. Send MO for \$29.95 + \$3.50 S & H to: Multimedia International, PO Box 260786, Tampa, FL 33685. (813) 889-9198.

## Frustrated

with owner's manuals?

Get a free copy of our catalog, which features tips and techniques books for equipment by Roland, Alesis, Yamaha, Casio, Korg, Ensoniq, Kawai, Kurzweil and Oberheim. All titles reviewed and guaranteed!

## BOOKSHELF

6400 Hollis St. #12-N  
 Emeryville, CA 94608  
 (800) 233-9604 • (510) 653-3307

## CLASSIFIED AD DEADLINES

AUGUST 1, '92 closing...OCTOBER '92 issue  
 SEPTEMBER 1, '92 closing...NOVEMBER '92 issue  
 (800) 747-3703  
 Fax (510) 653-5142

## PARTS & ACCESSORIES

**Factory-direct flight cases** for keyboards, guitars, lights, amp racks, utility trunks, etc. Best quality; low factory-direct prices. Custom orders shipped in five days or less. Sound Engineering, (800) 837-CASE.

**Simmons SPM8:2 mixer users.** Now save & load setups thru MIDI sys. ex. Eprom/Mod \$50. SYNTHLAB, 2729 Newbold St., Raleigh, NC 27603. (919) 832-3559.

No more bogus TX81Z presets! Put your voices in Bank A, B, C, D. Send us IBANK voice dump(s) on cassette or MC500 disk, you get a new ROM chip. \$39 to \$79. TX81Z 5X RAM expansion, \$119. Spare Change Music, Suite 402, 427-3 Amherst St., Nashua, NH 03063. (800) 852-2178.

## MT-32 OWNERS AND D-110, D-10, D-20 OWNERS MODIFICATIONS FROM REAL WORLD INTERFACES

**MT-32 Battery Back-Up**  
 Less Noise & Distortion  
 50 Reverb Settings  
 Front Panel Memory Access  
 D110 Reverb Sounds  
 Individual Outputs

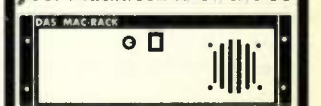
**D-110: 5.4 db More Gain**  
 2.2 db Less Background Noise  
 New Reverb Outputs

**D-10 & D-20: 5.4 db More Gain**  
 4 New Outputs  
 Smoother Reverb

Call for Free Brochure  
**L.A. Custom Instruments**  
 1979 N. Lake Ave., Altadena, CA 91001  
 (818) 797-8529

## MacRACK™

19 in. rack mount kit for your macintosh le si ci 700



Quick & easy installation of your mac in a foam-lined, flight-proof enclosure featuring lockable fold-down front panel & fan port check or mo for \$200 + 15 shipping specify model allow 4-6 weeks UPS delivery No P.O. Boxes, lifetime warranty

**Digital Audio Systems**  
 Box 52, 3941 Miami, Fl 33152  
 305 666 2890 fax 305 666 5284  
 dealer inquiry welcome

Now Only **\$39.95 (us)** WIRELESS! Distortion pedal!

ULTRA LOW NOISE! VISA


The RadioActive Transmitter KIT has a FULL FEATURED Distortion Effect built-in! Transmits to ANY FM radio!

Order NOW! TOLL FREE 24hrs/day 7days/week  
 1-800-263-9272 Ext. 2587

**RadioActive Transmissions**  
 45 Bramblea Rd. Box 141  
 Brampton, Ontario  
 L6T 2W4 CANADA  
 Info (416) 459-2780  
 Fax (519) 250-0560



# CLASSIFIEDS



**MIDI CHECKER**

Pinpoint trouble fast. LED lights when MIDI signal occurs. \$7 ea. 3 for \$18. Send Money Order to Tech 21, 1600 B'way, NYC 10019.

## PUBLICATIONS & BOOKS



**MIDI GUITARIST**

Unravel the mysteries. Discover new territory. Read *MIDI Guitarist*.

Warren Sirota, Editor  
Published Quarterly: Send \$26 US, \$28 Canada, \$34 elsewhere for a year of reviews, patches, interviews, tweaks & tips. Visa/MC/US Checks

MG Subscriptions  
P.O. Box 75  
Jacksonville, OR 97530

(503) 899-1948

**Books, Tapes, Videos**

Get our free catalog featuring resources on

- MIDI • Instrument-specific guides
- Synthesis & sampling
- Drum machine patterns
- Recording • Composition
- Music business • A&R Lists and more

All titles reviewed and guaranteed!

**BOOKSHELF**

6400 Hollis St. #12-N  
Emeryville, CA 94608  
(800) 233-9604 • (510) 653-3307

**MUSIC SUPER MEMORY**

Memorize ANY music, quickly, easily, and with greater retention.

A powerful, new, revolutionary, easy to learn music memorization technique.

Includes method book and 85 min. tape

Send \$22 Plus \$5 S&H to:  
MSM, PO Box 862, ISLINGTON MA 02090  
ORDER PHONE: 617-320-9542

## RECORDING SERVICES

**\*\*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.**

Looking to release worldwide, new hard-beat techno/rave electronic dance composers and musicians! We also produce masters. Send demo tape to: Peter R. Schleger, Teaspoon Music, 200 Central Park So., New York, NY 10019.

**\*\* Cassettes duplicated \*\***

The highest quality cassette duplication. Custom-loaded blank cassettes. Lowest prices. Visa/MC accepted. Call or write: Cup of Water Productions, 13780 12th Road, Plymouth, IN 46563. (800) 242-2015.

**AUDIOPHILE QUALITY... EUROPADISK, LTD.**

US' MOST COMPLETE FACILITY!

- Cassette Duplication
- Compact Disc Production
- DMM Vinyl Pressing • Custom Graphics • Mastering Studios

COMPLETE PACKAGES with state-of-the-art Neve Digital Mastering for CD, Studer & Lyrec HX-Pro Cassette Duplication, DMM Mastering for Vinyl and a complete in-house art department - design, layout, typesetting, color separation. Get THE BEST at no extra cost!

For a Complete Brochure, call or write:  
EUROPADISK, LTD.  
75 Varick Street, New York, NY 10013  
(212) 226-4401 FAX (212) 966-0456

**Send your sounds direct to disc.**

Finally. An affordable way to transfer your audio to compact disc.

Get the latest in audio storage & playback technology

All the benefits of tight cues, digital storage, and long life on the most durable format available

**SOUND CONCEPTS** 108101010

PO Box 1847  
Manhattan Beach, CA 90266

Call for FREE brochure:  
(800) 524-5706, Ext. 135

**DISC MAKERS**

**Cassette & CD Manufacturing**

FREE Graphic Design • Complete Packages • Major Label Quality • Money Back Guarantee •

500 CDs with B&W inserts in two piece jewel box only \$1790

Call Today For Our FREE Full Color Catalog:  
**1-800-468-9353**

1328 N. 4th St., Phila., PA 19122  
215-232-4140 FAX: 215-236-7763

**IF THE TAPE QUALITY SUCKS, THEY'LL NEVER HEAR YOUR MUSIC!**

**HIGH QUALITY REAL-TIME PACKAGE SPECIALS!!!**

**250 Cassettes with J-Cards \$695.00**

**500 Cassettes with J-Cards \$1095.00**

REAL-TIME DUPLICATION PACKAGES INCLUDE

- CHROME TAPES (TO C-32)
- PROOF CASSETTE
- CLEAR SHELL
- FULL COLOR J-CARD (4 X 4)
- ON SHELL PRINTING
- OR 1-2 COLOR J-CARD (4 X 5)
- REAL-TIME DUPLICATION
- ASSEMBLY / SHRINK WRAP

**1-800-393-TAPE**  
also 1,000 CD'S COMPLETE - \$2,695.00

**Total Tape Services**  
Quality tape copies that sound like the master  
639 Cleveland St. / Clearwater, FL 34615

**COMPLETE CD AND CASSETTE PRODUCTION**

**DIGITAL HOUSE**  
212-333-5950

MASTERING REPLICATION  
PRINTING TOTAL PACKAGING  
POSTERS GRAPHIC DESIGN STUDIO  
PERSONALIZED EXPERT SERVICE

101 WEST 57TH ST. NEW YORK, N.Y. 10019

"FOR THOSE WHO HEAR THE DIFFERENCE"

## SOFTWARE & PATCHES

**Gig-proven MIDI sequences.** Top 40, 50s and 60s, country, standards. Macintosh, IBM, Atari, Akai, Roland, Kawai, Yamaha, and Alesis formats. Call or write for free song catalog and demo. **The Works Music Productions, Inc.**, PO Box 22681, Milwaukie, OR 97222. (503) 659-3964, or (206) 254-3187.

**Best of the Real Book Sequences—IBM or Roland.** Sound Mind. About \$0.30 per song. Send for free list. Demo \$10, or top 160 songs \$50. Robert Williams, 520 N. Pegram St., Alexandria, VA 22304, or call (703) 370-2943.

**MUSIC FOR THE IBM**

- SEQUENCING - From \$39 to \$109
- NOTATION - \$99. FREE CATALOG
- TRAINING - From \$39. BEST PRICES
- MIDI & SOUND BOARDS - \$79.

□ **OPTRONICS** ♦ (800) 950-MIDI  
Box 3239 Ashland, OR 97520

**CoolPro Sequences**

Hear the difference!

For complete demo package, (disk w/30+ demo seqs, docs, info sheets, song list, etc.) send \$5 check or MO to:

**CoolPro Sequences**  
38 Observatory Avenue  
Haverhill, MA 01832

Or phone (508)373-9101 for more info.  
\$5 applied to your 1st purchase.  
Specify disk size, capacity & IBM seq. format.

**MONEY-BACK GUARANTEE**

**The Best, Most Highly Organized Sound Libraries Available!**

T-1/2/3 - 2 Sets	..... Total 2,000+ Voices
M3R - 2 Sets	..... Total 2,000+ Voices
M4 - 2 Sets	..... Total 2,306 Voices
MI-32	..... 1,001 Voices
D-10/11/20	..... 1,199 Voices
D-50 - 2 Sets	..... Total 2,194 Voices
K1 - 2 Sets	..... Total 2,113 Voices
TX81Z/DX11	..... 2,250 Voices
DX7/TX802 - 2 Sets	..... Total 6,225 Voices
ESQ-1	..... 2,095 Voices

All Libraries — \$100 Each Set  
All Formats Available • Free Librarian Demos  
Visa/MasterCard/COD • Call Today!

**ManyMIDI Products**  
213-650-6602  
Box 2519-EM, Beverly Hills, CA 90213

**MIDI Software Tools for IBM**

- ▶▶▶ **MIDI Programmer's Toolkit**  
Software tools, tech ref for Music Quest & other MPU-401 compatibles \$39 95
- ▶▶▶ **Standard MIDI File Toolkit**  
File utilities & reference manual to read and write Standard MIDI Files \$39 95
- ▶▶▶ Use with Turbo C, C++, Turbo Pascal, Microsoft C, Quick C, Quick BASIC

Call toll-free: **1-800-876-1376**  
U.S. / Canada

**Music Quest**  
214 881-7408 Fax 214 422-7094  
PO Box 260963 Plano, TX 75026

**"Unsolvable" Problems quickly fixed with these two IBM programs**

**FASTPATCH** swaps drum tracks between any MIDI drum machines. There's more...it also swaps patch change lists between synths. You build tables, use whenever & wherever, creates MIDI file tailored to your equipment list. *Songs with mismatches now sound great!*

**MEASURE4MEASURE** builds big song arrangements using your MIDI files. NOT hours of cutting and pasting, just name your sections, list in any order, any key, any number of times. With track drops, each section repeated sounds new. *Band-in-a-Box™ 4.0 & 5.0 users are no longer stuck with just one loop!* **Just \$49, or both \$75**

IBM COMPATIBLE, MIDI FILES REQUIRED. M4M REQUIRES MPU401 EQUIV. CALIF RESIDENTS ADD SALES TAX

**METRONOMIC'S CORP** 1618 W. Brookdale Place Fullerton, CA 92632 **VISA MASTERCARD 800-443-6303**



# CLASSIFIEDS

## SOFTWARE & PATCHES

**Emax, Emax II**, best performance samples, copyrighted, super memory-efficient, over 70 titles, **1,000-sound multi-sampled cassette**. Excellent quality, great prices. Stoklosa Productions, PO Box 13086, Pittsburgh, PA 15243. (412) 279-8197.

**IBM Users Group** exchanges MIDI information, help & ideas. For free newsletter: Jeff (813) 697-2293.

**Overlei**, the expandable lib./edit. for IBM PCs. Currently supports the **Proteus, U220, TX81Z, DW8000** w/more modules to come. \$29.95 incl. 1 free module. \$9.95 ea. add'l module. Maile Works Programming, 47000 Warm Springs Blvd., #380, Fremont, CA 94538. (510) 490-6039. CA res. add sales tax.

**SOUND MANAGEMENT BBS**  
4 GIGABYTES ONLINE  
MIDI DEMOS (708) DATA LINES  
PATCHES 948MIDI 948KEYS  
SEQUENCES 9494BBS 9494301  
SAMPLES  
**ENSONIQ EPS SAMPLES!**  
SEND \$1 FOR HUGE DISK LIST  
\$777 DYNAMITE SOUNDS!  
9 Disk Collection #1 OVER 2800 patches \$49.95  
9 Disk Collection #2 OVER 2800 patches \$49.95  
SALE! SAVE! Both collections ONLY \$99.95!  
MONEY ORDER OR VISA/MASTERCARD  
SOUND MANAGEMENT BBS  
P.O. BOX 304, MUNDELEIN, IL 60060

**SEQUENCES by MUS-ART**  
Past / Present  
Large library  
All formats  
Licenced  
FREE CATALOG  
Box 680664  
Orlando FL 32868-0664  
TEL: 407-290-MIDI  
FAX: 407-291-2266  
BBS: 407-292-0444

**Nkey**  
The Music Performance Program for Windows  
Nkey transforms your PC's computer keyboard into a polyphonic musical instrument.  
Play Music directly from a PC, and NEVER Play Wrong Notes — Set the key & scale, and begin improvising, playing along with any standard MIDI file as background. (Over 40 SMF song files included.) Plus Full Mixing Control—Built-in graphic real-time Mixer allows full control over individual channels. And, Nkey can output to your choice of Sound Cards and MIDI keyboards.  
**NEW! Version 2.0 Only \$79**  
Requires IBM compatible, Windows 3.1, MPU-401 compatible or sound card (Sound Blaster).  
To order, send check for \$79 & diskette size. Or call with your Visa/MasterCard

**Roland GR50** editor/librarian for PC or C64 w/256 tones, \$50. **WinDump**—generic MIDI dump for Windows w/256 tones for MT32, D10/110/20/5/GR50, \$25. Add \$3 p/h. Blue Ridge Music, Rt. 4, Box 227AA, Charlottesville, VA 22901. (804) 978-3735.

**Original jazz rock fusion** Standard MIDI File sequences. Import to your sequencer, assign sounds & enjoy new, tight, crisp orig. IBM or Mac disc. Jeff Stover, 2711 Los Felices, Palm Springs, CA 92262. (619) 322-0618.

**Macintosh** users! Large selections of **MIDI public-domain/shareware** software. Various kinds of great MIDI software! \$5/disk. Send SASE for catalog. **MIDI Mac**, 15568 Brookhurst St., Suite 234-E, Westminster, CA 92683.

**MIDI SEQUENCES**  
TRAN TRACKS—quality service, great prices & a large selection of popular songs. All computer formats and most dedicated sequencers supported.  
ORDERS: 1-800-473-0797  
Fax: (201) 383-0797  
Technical Support: (201) 383-6691  
Major credit cards

**TRAN TRACKS**  
MIDI SEQUENCES  
350 5th Avenue #3304 NY, NY 10118

Public Domain MIDI Software For Atari ST, Commodore 64/128, IBM Compatibles From \$3.00 Per Disk. Write Today For Your Free Catalog Disk! Please Specify Computer Type.  
**MIDI Software**  
Post Office Box 533334  
Orlando, FL 32853-3334  
Telephone (407)856-1244

**Korg owners**—read/write/format or copy Korg disks on IBM PCs w/our Korg Diskette Manager (KDM) software, \$22. **Transfer sequences to/from Standard MIDI Files**. Each package T1/T2/T3 or 01/W FD includes KDM & costs \$44. **Alesis, Ensoniq, and Yamaha** also available. Visa/MC accepted. **Giebler Enterprises**, 8038 Morgan Rd., Liverpool, NY 13090. (315) 652-5741.

**HOT..!**  
Give your act a good kick in the gas..!  
Over 2900 sequences with that off-the-record sound  
Top 40 - Classic Rock - Jazz C&W - Standards - Big Bands  
**Phil Wood's midi hits** FREE CATALOG  
485 Claneill St, Tracey, CA 95376  
(800) 484-1096 ext. 3525  
Int'l (209) 832-0225 Fax (209) 832-0460

**SAMPLER OWNERS**  
We have the sounds you need!  
Akai - S900/S1000/MPC-60  
E-mu - EMAX/EMAX II  
Ensoniq - EPS/EPS 16+  
Korg - DSS-1/T-Series/Wavestation  
Roland - S-330S-550S-50W-30  
Dyna-cord - ADS Sequential - P-3000  
Strings, brass, piano, drums, percussion, FX, Fairlights, and other classic keyboards.  
Call for FREE CATALOG - Demo disks Available.  
SampleCall™ Owners - CD-ROM Now Available!  
Over 550 Megs of Studio Quality Sounds - \$2999  
Also works with Alchemy™ and Sound Designer™

**grey sounds**  
8700 Reach Blvd., Suite 101 • Northridge, CA 91324  
818-773-7327 • FAX: 818-773-9203

**KID NEPRO**  
THE PATCH KING  
incredible sounds available worldwide  
**KID NEPRO IS THE PATCH KING!**  
We have more quality sounds, for more instruments, than anyone in the entire universal ORIGINAL, USEABLE PATCHES. Sounds available on RAMS/ROMS/DATA SHEETS/ALESIS DATADISK/MAC & ATARI FORMATS. Thousands worldwide agree our sounds are incredible. AUTHORIZED DEALER KORG/ROLAND/DR.T/PASSPORT & MORE! WE SELL HARDWARE TOO! Disks/RAMS/Cartridges Expanders for most instruments. Write or Call for FREE CATALOG!  
Kid Nepro Productions  
PO BOX 360101 (DEPT. E)  
Brooklyn, NY 11236  
718-642-7802/212-629-3708  
FAX # 212-947-0027

**TRYCHO TUNES**  
PERFORMANCE SEQUENCES™  
Over 1300 current Top 40, oldies, standard, and c&w songs for most brands of sequencing equipment.  
We're the oldest and still the best!  
Trycho Tunes are available at many fine pro audio/computer stores.  
Or order direct at:  
**1-800-543-8988**  
TRYCHO MUSIC INTERNATIONAL  
2166 W. BROADWAY ST. • Suite 330  
Anaheim, CA 92804  
Phone (714) 826-2271  
FAX (714) 995-8079

**NEW! NEW! NEW! NEW!**  
**Multimedia Artists™ Songs**  
Soft Hits for Classy Rooms  
Wedding Songs  
Great for Easy Listening  
Multimedia Ready

**NEW! NEW! NEW! NEW!**  
**ADAT Support Group**  
Hip Tracks on S-VHS Tape  
Classical Tracks on S-VHS Tape  
Industrial Tracks on S-VHS Tape

**NEW! NEW! NEW! NEW!**  
**The Parker Adams Group**  
12335 Santa Monica Blvd. #124  
Los Angeles, CA. 90025  
310-450-2175

→ Sale • Interfaces • Software  
**discount Sequencing/Notation SOFTWARE**  
IBM MAC ATARI AMIGA C64 APPLE GS  
Catalog or Foreign 508-531-6192  
Fax 508-532-6106 Open Weekends  
**SOUND MANAGEMENT**  
P.O. Box 3053 • Peabody, MA 01961

**SUPERSEQUENCER!**  
COMMODORE 64/128  
Excellent Multi-Track Sequencer and MIDI Interface for just \$109 for C64 & \$119 for C128. Other programs available. Atari ST also! Call for free catalog.  
**SOFTpacific**  
12240 Perris Bl., Ste 157  
Moreno Vly, CA 92557  
714/242-0454

**MIDI SEQUENCES**  
All types of music available on most formats. Call or write for FREE catalog and demo tape. Specify sequencing software and hardware.  
**THE MIDI INN**  
P.O. Box 2362, Dept. EM  
Westmont, IL 60559  
(708) 789-2001

# CLASSIFIEDS

## WANTED TO BUY

**ARP** equipment! Especially 2500 (modules or system) & PRO/DGX. Let's make a deal. Call Kevin at (612) 454-3705.

**AKAI** EVI-1000 wind controllers (valve version) wanted. Must be in good, working cond. Will pay cash. Mark (312) 769-4014.

## MISCELLANEOUS

**Notator/Creator/Omega/Real-time** users. Get a **2nd independent MIDI Out** for only \$39! For info or to order, write: M. Dunn, 68 Rectory St., London, Ont., N5Z 1Z8 Canada.

**Keyboard** and piano player seeking work and/or booking agent. I am a seasoned pro. Call Rich at (201) 478-1163.

**Integrated Digital Systems** consulting and brokerage services specializing in digital recording and editing. **Recordable CD available now.** Full range of services. (310) 478-4264, M-F, 9-5 PDT.

**RACK AND CHASSIS BOXES**

MODEL	H	D	PRICE	FEATURES	MODEL	H	D	PRICE
TR10	7 1/2	10	\$175	EASYS TO FABRICATE	MIC-1A	4	3	\$175
TR10	7 1/2	10	\$175	SHIPPED (FLAT)	MIC-2A	4	3	\$175
TR10	7 1/2	10	\$175	ALL SURF PANELS ARE	MIC-3A	4	3	\$175
TR10	7 1/2	10	\$175	FLAT FRONT AND REAR	MIC-4A	4	3	\$175
TR10	7 1/2	10	\$175	ARE CLEAR FINISHED	MIC-5A	4	3	\$175
TR10	7 1/2	10	\$175	ROCKED TOP	MIC-6A	4	3	\$175
TR10	7 1/2	10	\$175	BOTTOM AND THE	MIC-7A	4	3	\$175
TR10	7 1/2	10	\$175	FRONT PANELS ARE	MIC-8A	4	3	\$175
TR10	7 1/2	10	\$175	BLACK FINISHED	MIC-9A	4	3	\$175
TR10	7 1/2	10	\$175	INTERIOR	MIC-10A	4	3	\$175

**VISA / MC** THIS ORDER WITH OUR MASTERCARD ORDER ONE (1) FROM THE FACTORY. ON PRE-PAID ORDERS SHIPPED UPS. LEADING NO. CHARGE SECOND DAY AIR. PLEASE SEE IT ON OUR BROS.

**RESCOM INC.** 3700 WILSON DRIVE HENDERSON, KY U.S.A.  
8013-048 (ORDERS) 800-834-3457 (TECHNICAL HELP)  
702-565-3400 FAX 702-565-4828

**Free-Manny's first-ever music catalog!** Manny's brings 48th St. to your doorstep. Become a charter subscriber. Send name and address to: AudioTechniques, c/o Manny's Mail Order, #8, 1600 Broadway, Suite 803, New York, NY 10019.

**Cover Sale!**  
-Ensoniq SD1/EPS 16+  
-Korg M1/T3, 01/W  
Reg. **24.95** Sale **19.95**  
Call Now...  
while supplies last!  
**(800) 228-DUST**

**Lo Cover™**

**QUALITY PRODUCTS**  
1 N. 353 Bloomingdale Rd.  
Carol Stream, IL 60188

## We Will Sell Your Electronic Music

If you have composed original Electronic Music, there now is an avenue for you to get your music to market.

- No up-front fees
- You retain all rights
- No exclusive contracts
- For an application or to receive our catalog write:

**AFTERTOUCH™**

Computer Musician Coalition  
1024 W. Willcox Ave.  
Peoria IL 61604

**ELECTRONIC MUSIC DISCOVERIES**

EM Classifieds (800) 747-3703

# PUT EM CLASSIFIEDS TO WORK FOR YOU!

- Text rate:** \$8 per line (approximately 25-32 character spaces per line); seven-line minimum. Add \$0.50 per bold word. Each space and punctuation mark counts as a character, \$56 MINIMUM CHARGE for each ad placed.
- Enhancements:** \$10 black border, \$15 for a grey screened background, \$25 for Post Office box service. Charges are based on a per-insertion basis.
- Display rate:** \$90 per inch (1" minimum / 1/2 page maximum). Logos or display advertising must be camera-ready, sized to EM column widths and specs. Frequency discount rates available; call for information.
- Special Saver rate:** \$25 for up to four lines, including first word in bold. **Only available to individuals not engaged in commercial enterprises.** No additional copy allowable for this rate.
- Closing:** **First of the month**, two months preceding the cover date (for example, the April issue closing is February 1). Ads received after closing will be held for the next month unless otherwise stated. **Cancellations will not be accepted after the closing date.** Copy changes and cancellations must be submitted in writing.
- Other requirements:** Full street address (PO boxes aren't sufficient) and phone number must accompany all requests, whether included in ad or not. All words to be **bold** should be underlined. Copy must be typed or printed legibly in standard upper/lower case. Copy in all capitals is not permitted. Publishers are not responsible for errors due to poor copy. Arrangement of characters may be altered in typesetting process due to space. The publishers are not liable for the contents of advertisements.
- The small print:** Only ads dealing with music, computers, or electronics will be accepted. No stated or implied discounts allowed on new equipment sales. Publishers reserve the right to refuse or discontinue any ad deemed inappropriate.
- Send Coupon & Payment To:** **Electronic Musician Classifieds:** Attn: Robin Boyce, 6400 Hollis St., #12, Emeryville, CA 94608, tel. (800) 747-3703 or (510) 653-3307, fax (510) 653-5142.
- Payment:** **Must be included with copy: check, Visa, MasterCard, or American Express accepted. Sorry, no billing or credit available.**

INSERT THIS AD IN THE \_\_\_\_\_  
ISSUE OF EM.

Categories available (check one):

- EMPLOYMENT  
 EQUIPMENT FOR SALE  
 INSTRUCTION & SCHOOL  
 PARTS & ACCESSORIES  
 PUBLICATIONS & BOOKS  
 RECORDING SERVICES  
 RECORDS, TAPES & CDS  
 WANTED TO BUY  
 SOFTWARE & PATCHES  
 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 (\$90 per inch) \$ \_\_\_\_\_  
Lines @ \$8 \$ \_\_\_\_\_  
(seven line minimum)  
Bold @ \$0.50 additional \$ \_\_\_\_\_  
Border @ \$10 \$ \_\_\_\_\_  
Screen @ \$15 \$ \_\_\_\_\_  
Special Saver Rate = \$ 25  
TOTAL PAYMENT INCLUDED \$ \_\_\_\_\_  
 Visa  MC  AmEx  
 Check/Money Order # \_\_\_\_\_  
Card # \_\_\_\_\_  
Exp. \_\_\_\_\_



## The Tyranny of the Tools

How do we balance learning the equipment vs. practicing creative techniques?

By Howard Sandroff



**F**ifteen years ago I read a book about the process of sculpting by Henry Moore. Moore, a sculptor himself, wrote eloquently about the artist's relationship with his or her tools and how mastery over them was the first step in developing creative technique. He lovingly showed his students how to sharpen a chisel so that its edge was an extension of their eyes and hands. He spoke at length about how one should purchase only a few basic cutting tools and spend years learning to use them before acquiring the more advanced and specialized edges.

Moore gave me many things to think about, but the most timely was his strict admonition to his students *never* to use power tools in their work. Power tools, he argued, removed the material too quickly. He felt that each cut should be made only after most careful consideration. As a result, power tools could not be mastered.

Do our "power tools"—computers, synthesizers, audio recorders and processors—allow us to work too quickly, without careful consideration? Are our power tools also unmasterable?

Humans continually invent better ways to extend our reach, sharpen our vision, strengthen our grip, and expand our hearing. We can move faster, sing louder, look farther, fly higher, and,

sadly, kill quicker than ever before. Technology extends and expands our capability to create or destroy.

So why not use a power chisel or saw? After all, it's only the cutting that is hastened, not the consideration. Using power tools reduces the tedium and gives the artist more time to consider the work.

When I began composing, I used basic tools: some paper, a pencil, perhaps a piano. Perfecting my skill with these tools wasn't easy or quick, but I could look forward to the day when I would begin to master them. The tools served me. Today, I regularly confront new and better power tools that are designed, manufactured, and distributed at an unimaginable rate. Just when I think I have mastered one new tool, a newer tool takes its place. Sometimes it seems I serve the tools.

The explosion of electronic technology has affected our culture in many wonderful ways, however.

Recording technology makes it possible to study and experience music from distant lands and past times. For the cost of a CD, I can experience the intellectual probing of Toscanini interpreting Brahms or the emotional power of a West African Griot chanting his tribal lineage.

Advanced audio technology has made it possible to stretch our musical perceptions. Performers and composers can imagine and create new sounds, new structures, and new ways of thinking about music.

On the other hand, recording technology has all but replaced the necessity of learning to play an instrument. Families no longer gather around the piano to sing the hit of the day. The only instrument most people play is their stereo.

Computers and synthesizers often are used to generate sterile digital clones that pale in their attempt to replace the beauty and warmth of a human

bowing, plucking, striking, or blowing.

Live music is on the decline, too. Musicians on the radio, at the ballet, and in clubs are being replaced by "perfect" recorded renditions. Processed and overproduced recordings by musical superstars have become the yardstick by which we measure the artistic merit of all musical expressions.

Sonic wallpaper in elevators, shopping centers, and telephone hold systems obliterate silence. New venues for the solitary musician (hunched over a computer) have not materialized. Next week's hit was created by a Harvard Law School graduate.

In the past, it took many generations of artists and craftsmen before a single new tool found its place. Now, many generations of new tools are created within a single artist's lifetime.

As stressing as this dilemma may be, it can serve as a great challenge: How does one maintain mastery over the tools without stopping the tide of technological advancement?

I'll close with a few suggestions:

- Before acquiring a new tool, learn everything that can be done with the old one, and then learn some things that can't be done.

- Time saved using a power tool should be used to examine more possibilities, find better solutions, and create new techniques.

- Be aware that power tools make it faster and easier to create "bad" music.

- Master the tools, don't be mastered by them.

- Prepare for the day when there aren't any power tools left to use.

I'd like to think Henry Moore was wrong, after all.

*Between wild swings of optimism and cynicism, Howard Sandroff composes, teaches, and consults on the design of music and audio hardware and software. He is director of the Computer Music Studio at the University of Chicago.*



# Vocalist named Product of the Year!



The Vocalist from Digitech

The Vocalist<sup>™</sup> has two new features for 1992. *Most Innovative Product of the Year* and *Most Innovative Effects Device* from *The Music & Sound Retailer Magazine*. It's the only voice processor that really sounds like human voices, not like chipmunks.

The Vocalist from Digitech<sup>™</sup> delivers *real* voice harmony and pitch correction. It even remembers every song and



The Music & Sound Retailer Magazine, 1992 Most Innovative Product of the Year. 1992 Most Innovative Effects Device in the category of signal processor.

never gripes about rehearsal time.

The Vocalist is perfect when you need one or two harmonies for back-up, or when you need up to five harmonies

to save time in the studio.

No other harmony processor can give you natural sounding, human voice harmony and can compensate for off-key voices.

If you want award-winning harmony, check out the Vocalist from Digitech.

Send \$10 for the Vocalist Video Demo.

## Digitech

H A Harman International Company



# The 4200 Series. Designed For The Control Room, Not The Living Room.

Today's recording studio has evolved into a multi-function facility which simultaneously addresses the specialized needs of music recording, film and video post, and radio production. In this environment, where the most critical listening often occurs in the final mix, close proximity monitors are often more important than the mains. The problem: most console top monitors, unfortunately, were designed for the living room not the control room. Until now.

With the 4200 Series we're taking our stand from where you sit: right where you work at the console. Designed, engineered and tested from this position, the 4200 Series is the first console mount monitor created specifically for the professional recording environment.

Both models give you pin-point imaging by delivering high and low frequency information to your ears at precisely the same instant. By virtue of their symmetrical design the 4200 Series monitors are mirror imaged.

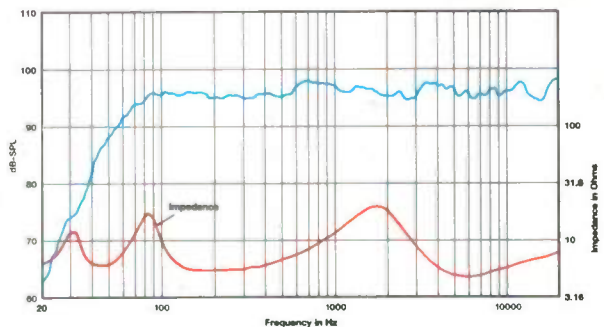
And so nothing gets in the way of your music, the 4200 Series introduces our uniquely sculpted Multi-Radial™ baffles incorporating newly designed pure titanium tweeters and low frequency transducers. The combination of these technologies successfully corrects time arrival anomalies and eliminates baffle diffraction distortion.

4200 Series: console top monitors designed in the studio, for the studio, with sonic performance rivaling much more expensive monitors. 4200 Series: the shape, and sound, of things to come. Available at your local authorized JBL Professional dealer.

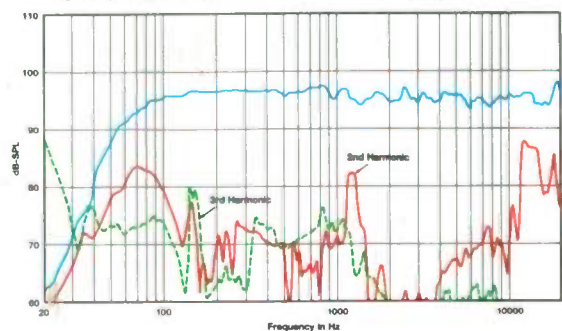


JBL Professional  
8500 Balboa Boulevard, Northridge, CA 91329

A Harman International Company



Frequency Response (Model 4206): 96 dB at 1 m, typical console listening levels



Distortion vs. Frequency (Model 4208) 96 dB at 1 m, typical console listening levels (distortion raised 20 dB)