

Electronic Musician

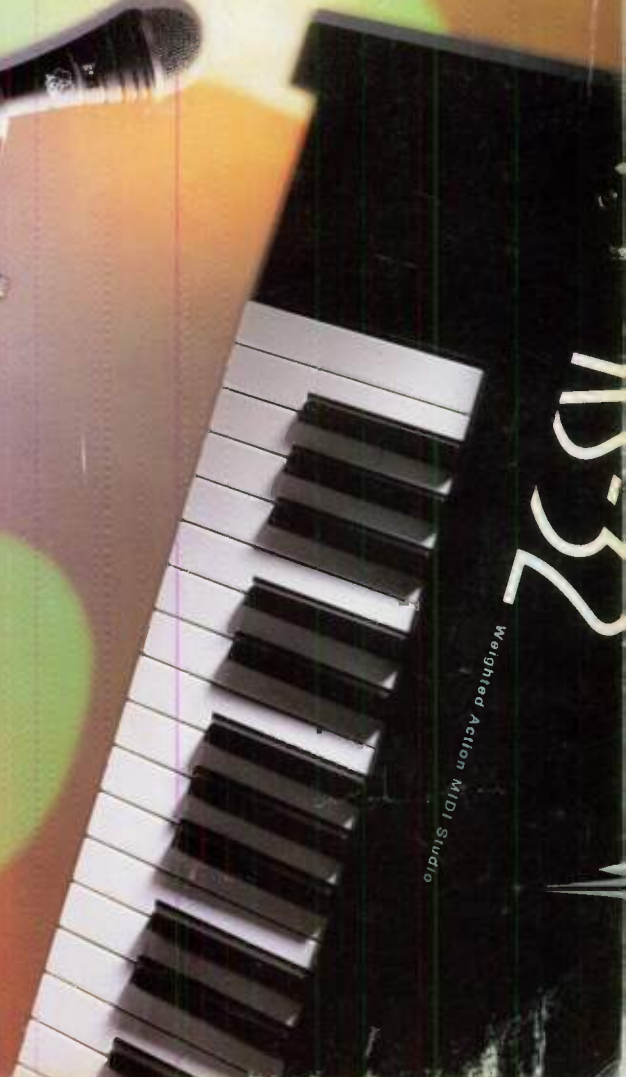
U. S. \$3.95/Canada \$4.95
December 1992

Editors' Choice

20 of the Year's
Coolest Products

Tune Up Your
Home Studio

Build Your Own
Headphone Amp



Weighted Action MIDI Studio

MS-32

8 Tracks

RECORD
INPUT

1 2 3 4 5 6 7 8

POWER

1 2 3 4 5 6 7 8

Demos to masters. Creativity to tape. Dreams to reality. Magic phrases for those who want to make music that sounds as good as it feels.

The inspiration for these thoughts is the **Alesis ADAT Professional Digital Audio Recorder**, a technological revolution that tears down the walls to your creativity while delivering world class master recordings. Too good to be true?

Here's the concept. ADAT fuses a supersonic Alesis-designed very large scale integrated chip set with the proven reliability of an industrial grade S-VHS* tape transport and a logical, sensible user interface. The result is a digital tape recording system that exceeds the most demanding requirements of professional audio and that can be used by literally anybody. Hard to believe?

Here's some specs. Bandwidth 20Hz to 20kHz ± 0.5 dB. Total Harmonic Distortion plus Noise 0.009%. Wow and flutter unmeasurable. ADAT uses the professional standard 48kHz sample rate and delivers better than 92dB dynamic range.

Here's some features. ADAT uses the familiar tape recorder controls that you already know how to use so

recording is fast, intuitive, effortless. Connections are provided for balanced +4dBu levels on a single 56 pin ELCO** connector and unbalanced -10dBV signals on 1/4" jacks. And ADAT uses S-VHS tape because it's a proven, robust recording medium with wide 1/2" tape to solidly support ADAT's 8 recording tracks while delivering 40 minutes of recording time.

The best part. ADAT's Proprietary Synchronization Interface (Patent Pending) locks multiple ADATs, independent of the audio tracks, to single sample accuracy $\pm 5\%$ of 1/48,000th of a second! In other sciences this is referred to as 'air tight'. So multiple ADATs function in perfect mechanical and electronic unison: up to 16 ADATs without an external controller. That's 128 tracks!

More best part. ADAT's Proprietary MultiChannel Optical Digital Interface (Patent Pending) simultaneously sends all 8 tracks of recorded information out the Digital I/O for perfect safety tapes and perfect track bounces.

Even more best part. The optional BRC Master Remote Control opens a whole other door to the ADAT miracle. With it you can control up to 16 ADATs (128 simultaneous tracks) with full transport functions, track offsets, machine offsets,

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*VHS is a registered trademark of JVC **ELCO is a registered trademark of Elco Corporation-a Kyocera Group Company
Also available: The AI-1 ADAT to AES/EBU and S/PDIF Digital Interface with sample rate converter.
RMB 32 Channel Remote Meter Bridge.
Call 1-800-5-ALESIS for information about the ADAT Worldwide Network.



To Megatracks



digital assembly editing via the Digital I/O, SMPTE and MIDI Time Code, Video Sync and more.

What does all this mean? Here's just a few benefits.

It's commonly known that many hours are wasted during expensive album projects while the artist, producer and engineer work in vain to reproduce the rhythmic feel and tonal nuance of demos. Demos that couldn't be used because they suffered from noise, limited bandwidth and overall sonic feebleness. Those days are over forever. ADAT's Sync and Digital I/O perpetually link your demos to your masters making them all part of the same creative process. Every track you record on ADAT is a master track that can be flown into any other ADAT recording, at any time. The best part is that ADAT can be there at any time to catch you at your best, flawlessly stored in the digital domain...forever.

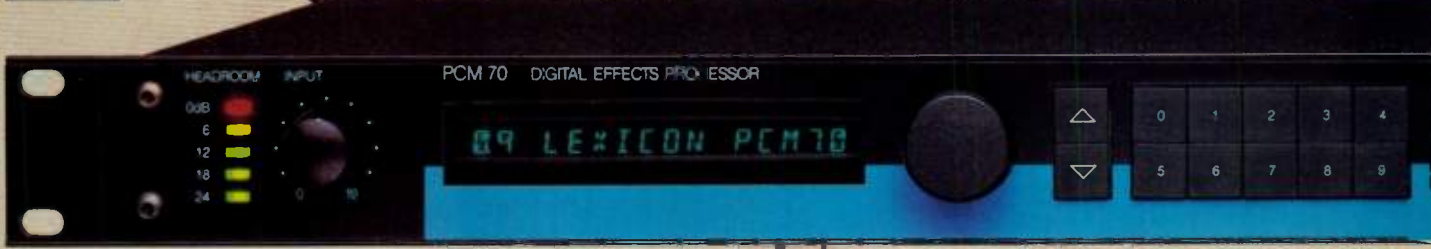
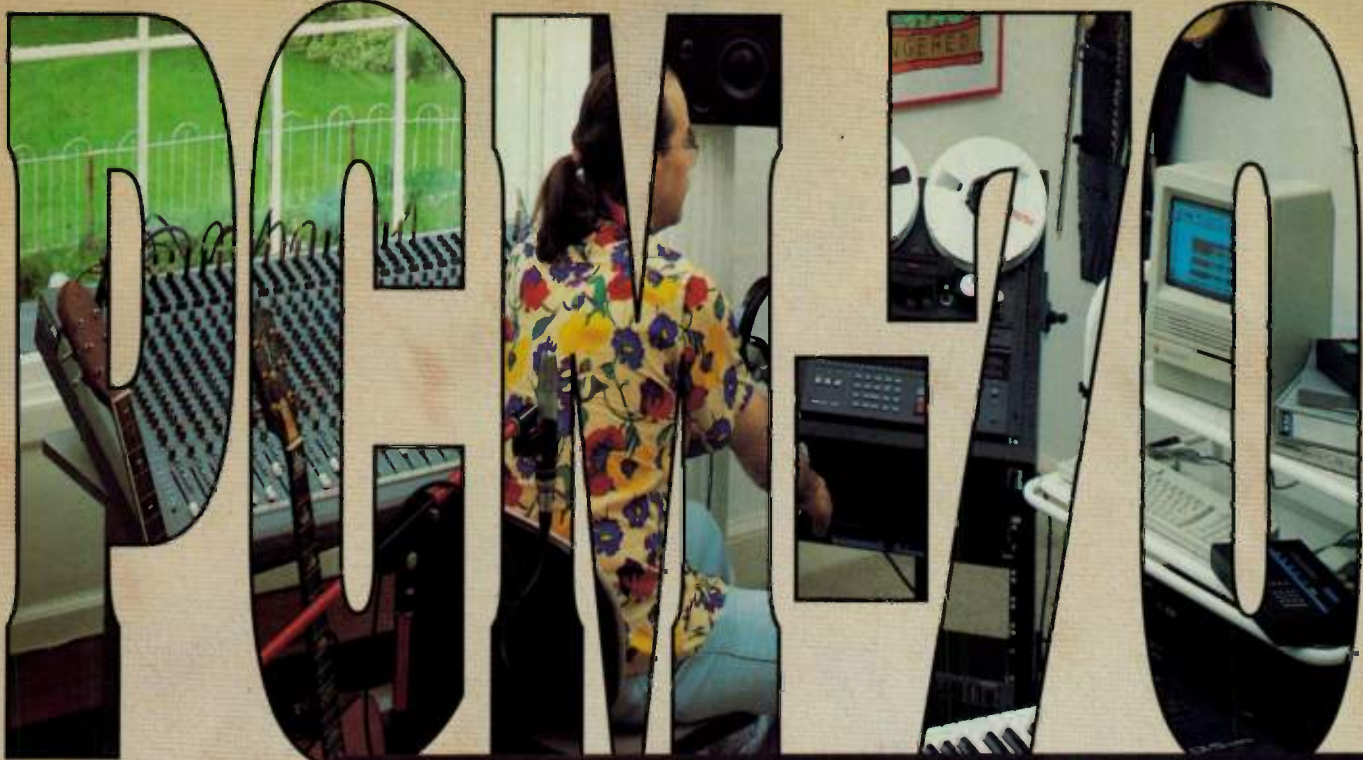
Need more tracks? ADAT studios can be expanded at any time. The cost of a single ADAT is remarkably inexpensive and new ADATs can be added as budgets permit. Add the BRC at any time for more control and advanced editing. Producers please note: with ADAT, Megatrack™ recording is a reality.

Your favorite sax player lives in Idaho? No problem. Send 'Supersax' a formatted tape with a guide track of your song. You'll get back 7 tracks of burning solos you can fly back into your production. All in perfect sync, all in the digital domain. All dripping with soul. Want more tracks? Just send more tapes.

ADAT is not only a new recording medium, it is the new recording standard. Imagine a network of ADAT users from bands, composers and project studios to professional studios, video editing suites and broadcast production studios. All recording master quality tracks with full compatibility and no barriers between their creative disciplines. In fact, we're launching the ADAT Worldwide Network™ multitrack recording group to facilitate communication between ADAT studios.

In time we'll all start taking these little miracles for granted. Before that inevitable event, unpack your first ADAT and track a minute of single notes and chords on your favorite instrument. Play loud, play soft. Play it back and listen really close. It's always a good feeling to have your mind completely blown.

See your Alesis ADAT Dealer today and start Megatracking on ADAT.



THE PROFESSIONAL'S PERSONAL PROCESSOR

THE LEXICON PCM-70: BIG STUDIO PERFORMANCE ON A PERSONAL STUDIO BUDGET

For over 20 years, audio professionals have relied on the superb quality and control of Lexicon Digital Effects Processors. So much so that today, 80% of the most successful productions are processed with a Lexicon.

Designed especially for the discriminating musician and recording engineer, the legendary PCM-70 offers brilliant sound quality (*it has the same algorithms as the acclaimed 224XL*) — and Lexicon's exclusive Dynamic MIDI™ control. Since 1986, the artist-friendly '70 has set the standard for processing effects and MIDI control which remains unrivalled by any other brand.

On the job, the '70 gives you the vital sound effects you need. Superb, lush reverbs. Shimmering 6-voice chorusing. Mind-altering multi-band delays. With a PCM-70 in your rack, any ordinary instrumental or vocal track can be instantly rescued from mediocrity — effortlessly, because the '70's front panel

is designed for creative people who want unique, useful results. Does this mean there's a Nerd-gratifying interface with a plethora of inspiration-killing buttons? Of course not.



The '70 is renowned for its reverb; chambers, halls, plates, gates and inverse room — great sounds for primary lead vocals or percussion tracks. Undoubtedly, you've heard the PCM-70 on chart-topping songs or seen it lurking in a favorite player's stage rack. It's no surprise that in the world's best recording studios (*large or small*), the PCM-70 has earned a reputation as the professional musician's most useful effects processor.

When you audition a PCM-70 at your Lexicon Pro Audio dealer, check-out our surprisingly affordable LXP Series too. Whichever you choose, *any* Lexicon will deliver the finest sound available.

Lexicon

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World Radio History

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Cover: Robert Cardin.

Format Wars

Inexpensive digital multitracks are proliferating, but at what cost?

If events at the recent Audio Engineering Society (AES) convention are any indication, the future is here. Walking the show's speaker- and console-adorned aisles and talking with company representatives and other press-folk, it was apparent that the once-sacred domain of professional recording studios has come within reach of the electronic musician. More and more manufacturers are developing less-expensive products that offer similar functionality to the high-priced gear.

As a result, the differences between "professional" and home or project studios are diminishing. In fact, with the appropriate engineering chops and some of this new, less-expensive gear, there's no reason that recordings produced in home and project studios can't sound as good or better than projects recorded in big-budget studios. (For more news on the convention see "What's New" on p. 16.)

One of the primary factors in this trend is the appearance of affordable digital multitrack tape decks. These products were the buzz of the show, forcing even those in the high-end professional market to sit up and take notice. The big news was the formal introduction of Tascam's DA-88 digital 8-track, which is expected to list for \$4,495. The DA-88 uses Hi-8 video tapes to store up to 100 minutes of 44.1 or 48 kHz digital audio on eight independent tracks (a total of 800 track minutes).

Equally important was Fostex' announcement that they have licensed the Alesis ADAT technology and will build an S-VHS-based 8-track digital tape recorder that offers complete compatibility with ADAT tapes. The as-yet-unnamed and unpriced Fostex recorder is scheduled for an early 1993 introduction.

Unfortunately, different tape formats preclude the use of ADAT (or Fostex) tapes in the Tascam machine, and vice versa. This incompatibility will undoubtedly lead to a marketplace format war similar to the VHS vs. Beta contest. Of course, incompatible formats are nothing new in the electronic music or audio industries; Yamaha and Akai use proprietary tape formats in their more-expensive digital multitrack tape recorders. But compatibility is critical to products in the lower price ranges. It'll be interesting to see if other companies throw their hats into this ring and what formats they choose.

Another significant problem is that no standard yet exists for transferring multiple channels of digital audio. For example, if you bring your DA-88 to an ADAT-equipped studio with the intention of copying tracks from one to the other, you'll have to use the analog ins and outs, unless you have the time and money to hassle with expensive AES/EBU converters. Admittedly, both machines offer 18-bit DACs and 64x oversampled ADCs, so the sonic difference is probably minimal. But what's the point of having a digital tape recorder if you can't transfer sounds digitally? Alesis and Tascam both offer 8-track digital transfer capability on a single cable, but these formats also are incompatible.

The industry would benefit greatly if the companies concerned agreed to develop a multichannel digital audio standard. As with MIDI, the result could foster the development of an entire cottage industry from which all manufacturers and customers would benefit. I'm eager to see how it all works out.



ANNE HAMERSKY

Publisher Peter Hirschfeld

Editor Bob O'Donnell

Products Editor Steve Oppenheimer

Managing Editor Michael Molenda

Technical Editor Scott Wilkinson

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Editorial Assistant Mary Cosola

Contributing Editors Alan Gary Campbell, George Petersen

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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

East Coast Advertising Office

tel. (212) 315-1800

fax (212) 315-1848

Subscription Services Office

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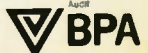
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Audit

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Bob O'Donnell

With Digidesign's Audiomedia II Almost Anyone Can Afford to Record Direct to Disk.



And We Do Mean Anyone.



If you thought direct-to-disk recording was only for a privileged few, think again. At **\$1295**, Audiomedia II proves that anyone can record like the pros.

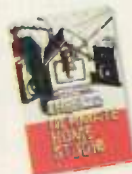
That means working at the same professional CD-fidelity. With the

same awesome power to digitally edit, rearrange, and flawlessly produce the best music you've ever made.

Of course, some people may not be ready to sound this good. But that's OK. After all, *someone* has to use tape.

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FACE IT. YOU NEED

It's enough to drive you crazy.



You've been searching for software that will help you turn your musical ideas into polished performances. But the first program you tried wasn't powerful enough. And the other was so complex, you didn't know where to start.

Maybe it's time to see a Professional.

Cakewalk Professional for Windows™ is the 256-track MIDI sequencer that's powerful and easy to use.

Professional Staff

A multi-track Staff view lets you edit up to 10 staves of standard notation. You can insert, delete, and move notes with your mouse. Like all views, the Staff window scrolls during playback.

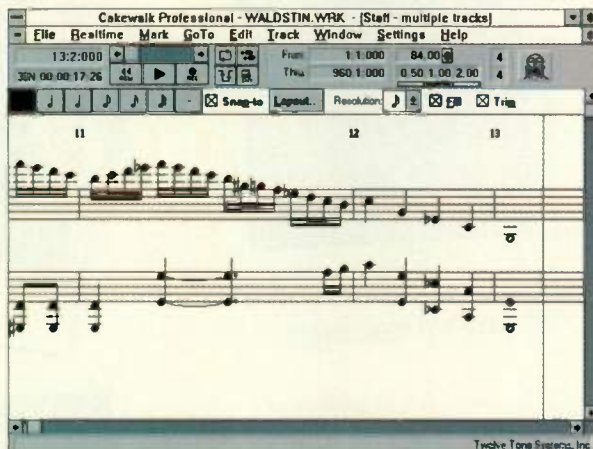
Use the Piano-roll view for inserting, resizing, and moving notes in a piano-roll grid. You hear the notes change pitch as you move them. And you can redraw note velocity levels as well.



Markers

Express Yourself

The detailed Event-list view lets you view and edit all MIDI events on multiple tracks at once. You can even insert non-MIDI



Staff view

“special” events like digital audio waves (voice, special effects) that play back on .WAV-compatible sound cards.



Tempo

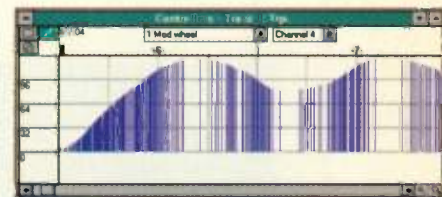
Get On Track

Use the Track/Measure view for assigning track parameters like MIDI channels and patches. And you can adjust parameters in real time, like volume, pan, key offsets, and velocity levels. All Track parameter columns can be moved and sized. Use the Measure pane for fast “drag-and-drop” editing of selected measures.

Take Control

Cakewalk Professional also has a graphic tempo map and Controllers view for drawing tempo and Controller changes with your mouse.

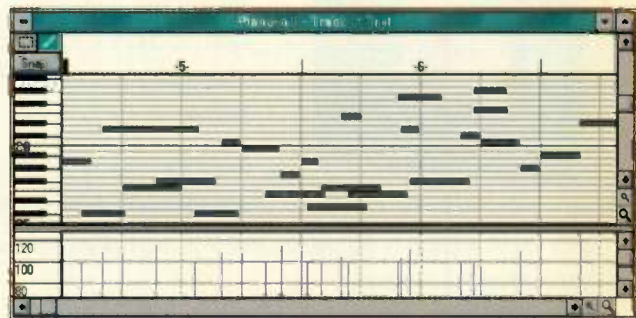
Use up to 16 assignable faders to send out MIDI Controller events while recording or during playback. Fader positions update in the Faders view during playback to show Controller values.



Controller view

Professional Experience

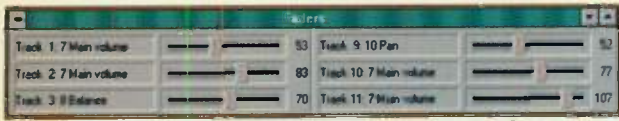
Cakewalk Professional works hard to earn its “professional” status: a variable timebase of up to 480 pulses per quarter note; support for all SMPTE/MTC formats; a Meter/Key map; a Markers view for creating a text list of “hit points”; and a powerful



Piano-roll view

PROFESSIONAL HELP.

Event Filter for selective edits, like splitting out drum notes onto separate tracks.



Faders view

Cakewalk Professional has a 256-bank System Exclusive generic librarian, for storing and sending your instrument sound banks and presets.

Trk	Hr:Min:Sc:Fr	Meas	Beat	Tick	Chn	Kind	Values
5	00:00:03:01	5:4	081	10	Control	7	108
5	00:00:03:01	5:4	081	10	Control	7	123
7	00:00:03:01	5:4	082	10	Note	D 7 127	32
7	00:00:03:01	5:4	082	n/a	Text	scream .WAV on Multisound card	
5	00:00:03:04	5:1	001	n/a	Wave	1.25 sec @22KHz 8-bit Mono, 27K	
1	00:00:03:05	6:1	012	1	Note	D 5 100	1:000

Event-list view

And the built-in Cakewalk Application Language (CAL) even lets you create your own editing commands, like chord generators, drum maps, and "swing quantize" routines. (A free library of CAL routines is available to all registered users.)



Sysx



Meter/Key

See A Professional Today

Cakewalk Professional for Windows (\$349) is sold at finer music and computer stores worldwide. For more information, or for the name of a dealer near you, call

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

A demo disk is available for \$10.

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 ports on devices with Multimedia Extensions drivers (including Roland MPU-401 compatibles and Music Quest MQX interfaces).

Cakewalk Professional for Windows is a trademark of Twelve Tone Systems. Other products mentioned are trademarks of their respective owners.

Twelve Tone Systems, Inc.
P.O. Box 760 Watertown, MA 02272
Fax: 617-924-6657



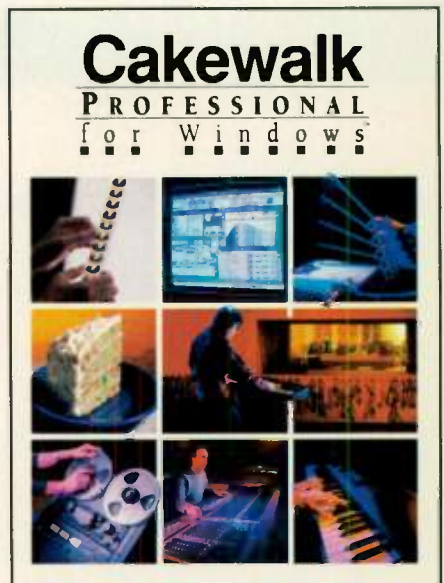
Own
Another Sequencer?
**CALL ABOUT
OUR TRADE-IN
OFFER!**

Get Help Fast

Unlike some sequencers, Cakewalk Professional has context-sensitive, on-line help available at any time. Just press the F1 key to get help with what you're working on. Examples, definitions, and even a list of answers to common questions are a mouse-click away, supplementing the comprehensive *User's Guide*.



Comments



Twelve
Tone

S Y S T E M S



Perfect For Any Environment

Admittedly, your particular PA environment probably wouldn't be this demanding. But even if it was, you'd find a Samick PA component that could handle the job.

At Samick, we've recently introduced a complete line of Pro Audio products to the marketplace: from professional-grade power amplifiers, to sound reinforcement loudspeakers, monitors, equalizers, cross-overs and much much more.

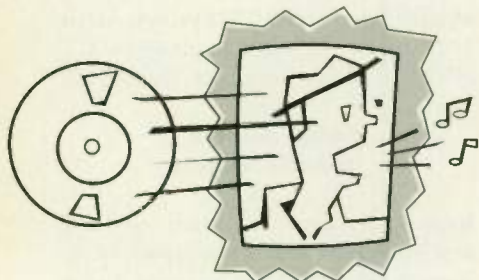
Our System Series Mixers, for example, feature totally modular construction for maximum isolation and signal quality. Available in 24, 16, 12 and 8 x 4 channel configurations, the System Series also features extensive signal patching, Stereo inserts, 4 Aux busses, and 100mm faders—all at prices that are unbelievably down to earth. And for the budget minded, the Samick SM Series Mixers deliver many of the same features in non-modular construction at even lower prices.

So when you're putting your next system together, check out what Samick has to offer. You'll find a world of products that deliver top quality and performance for any acoustic environment, while at the same time being very friendly to the most important environment: your bank account.

Samick Pro Audio
Where Dreams Begin

SAMICK

For more information, contact: Samick Music Corporation, 18521 Railroad Street, City of Industry, CA 91748, (818) 964-4700.
For a copy of our Samick Pro Audio Catalog, send \$2.00.



OCTOBER RETURNS

Great October issue! I especially liked "3-D Audio" and "The Digital Home Studio." The home studio article did a nice job of explaining the good and bad points of digital for the home recordist. I get asked about this subject a lot, and the people who give me those blank stares when I start "tawkin' that tawk" about S/PDIF, AES/EBU, interfacing, sync, and that sort of thing should be served well by this article.

Kenneth McGee
Eatontown, NJ

3-DELIGHTED

I read with great interest Ron Goldberg's article on psychoacoustic processing ("3-D Audio"). I've been experimenting with "expanding the stereo soundstage" since the days of ill-fated quad (4-channel) sound, encoding L-R information into my base-magnet tapes.

However, I feel the author did Bob Carver an injustice by failing to mention the Carver Sonic Hologram Generator. This was my first experience with 3-D sound from two speakers. It created music that wrapped 180 degrees around me, ear-to-ear, sometimes even appearing a dozen feet behind the walls. After an incredible demonstration in 1984 using Pink Floyd's *The Final Cut* LP at an area stereo store, I bought one. Despite the critical speaker placement and wall-treatment requirements, it continues to amaze me.

I appreciated the article's 3-D graph-

ics image. Fortunately, I saved my glasses from years ago, so I could see the monitor speakers revolving around the subject's head in a sea of musical notation.

Every issue of your magazine has something of special interest. I thoroughly enjoy *EM*, and I've kept every issue since I started subscribing in 1986.

Pete Rickard
Naugatuck, CT

ALMIGHTY ADAT

The review of the Alesis ADAT in the October issue was great. A few of the ADAT advantages your article did not mention are the cost and availability of tape. Most multitrack tape is scarce; even DAT is hard to find. But S-VHS is available at almost any electronics retailer, and it's cheap. The tapes average \$10 to \$15; and even at \$15, you only pay 38 cents per 8-track minute! Compare that to reel-to-reel.

I first heard about ADAT in *EM* and began to ask about it at the local dealer. I made a down payment in March and took delivery in June. I never dreamed of having digital multitrack and mastering (DAT) by the time my home studio was finished. My songs have come to life in incredible digital quality. I can say from experience *this thing will change your life*. Alesis is to be commended for bringing the power of digital to songwriters and composers like myself.

Frank Coffey
Dallas, TX

SECOND OPINION

Judging by your review of Soundtrek's *The Jammer* software (October 1992), your readers and the company definitely deserve a second opinion. The article simply does not do the product justice.

The Jammer is a must for songwriters of all levels. It'll compose complete songs, or compose that bridge, ending, or hook you just can't seem to find on the guitar or keyboard. It'll generate fresh instrument parts with each press of a function key. The software is extremely intuitive and free of bugs

that I have found in other products of this nature.

Reviews can make or break a product or company, and Soundtrek's *The Jammer* certainly deserves more credit.

Allan Judd
Ijamsville, MD

THE QUIET ELECTRIC GUITAR (NOT!)

I am sure by now someone else has pointed out that electric guitars induce a minuscule amount of noise on the power line, especially when compared to electric motors and solid state (triac) dimmers ("On Solid Ground," September 1992). Nonetheless, at Gibson Labs we got quite a chuckle over the thought.

Richard Bugg
Gibson Labs
Los Angeles, CA

TAPE KILLERS

I've just read "Tape Killers: The *EM* Guide to Hard-Disk Recorders" in the September 1992 issue. It's very interesting and informative, but I'm surprised that it doesn't mention any of the European systems. I can think of at least one French and two British systems that would be worth mentioning: the Plasmec ADAS, the Studio Audio SADiE, and the Digigram Xtrack.

I think you might do your U.S. and international readership a favor if you covered the British and European side a bit more comprehensively.

Brian Heywood
St. Albans, England

Brian—I'm sure there are many excellent hard-disk systems produced by European manufacturers. However, if a system was not distributed in the United States (at press time), it was not covered. We just didn't want to frustrate readers by mentioning products in a buyer's guide that cannot be purchased readily.

By the way, Plasmec's ADAS-ST is on the chart. At press time, it was distributed by Digital I/O from sunny Marina Del Rey, California (tel. [310] 398-3993). Unfortunately, the product has been dropped

because of the introduction of Atari's new Falcon030 computer. Digital I/O will be distributing software for the Falcon, however, as well as a stand-alone 4-track system called ADAS-SA. Also, the Studio Audio SADI-E system recently picked up a U.S. distributor. See the "What's New" item on p. 18 for more.—Michael M.

With mixed emotions, I wish to respond to "Tape Killers." While I am encouraged to see an increase in direct-to-disk coverage, it is obvious that the short summary/comparison matrix format employed by this article "pigeonholes" features to the point that useful comparisons are impossible.

For example, a short paragraph dedicated to the number of tracks mentions the fact that virtual tracks may or may not be available for playback at one time. However, your matrix lumps the two categories together and MicroSound is listed with two simultaneous tracks and a total of 38 virtual. In reality, MicroSound plays back up to 38 mono, stereo, or quad "tracks" at the same time, with a maximum of 1,500 available throughout the mix.

By definition of matrix, diversity is ignored. For example, MicroSound simultaneously records and plays back on one drive, is one of the few network-compatible workstations, and allows archiving of fully editable 38-track mixes to DAT. Even by category, the fact that MicroSound supports black-burst video as a house reference or synchronization source was entirely omitted.

Michael K. Stierhoff
Micro Technology
Unlimited
Raleigh, NC

Michael—The primary goal of an EM buyer's guide is to introduce readers to a product line, not to deliver in-depth comparisons. We admit up front that our overview format—necessitated by limited editorial and art space—"pigeonholes" products. Generally, this is not a problem. For instance, mixers have set numbers of channels, connectors, aux sends, and so on. The hard-disk recorder chart was difficult because manufacturers in this relatively young field often implement functions or conceptualize recording processes in different ways. As you are aware, after our mandatory fact check, both EM and MTU

realized (before publication) that MicroSound possessed unusual and diverse features. Unfortunately, we couldn't change the chart to accommodate one product. Thank you for writing and setting the record straight. In our defense, EM attempts to minimize these incidents by advocating that readers contact manufacturers for specific, in-depth information (hence, the "List of Manufacturers" in every guide).—Michael M.

DIY DEVOTEE

I wish to commend Jules Ryckebush on what appears to be a wonderful compressor ("DIY: Build the EM Dual Compressor" October 1992), and I'm very happy to see another Do-It-Yourself project in EM. (I thought they had forgotten about us fellow DIYers.)

Recently I requested data and applications sheets on both the 2120 and 2122 from PMI. I'm very much interested in using the 2120 as a dynamic expander/noise filter as featured on p. 11 of PMI's SSM-2120-2122 spec sheet, though I found all data sheets somewhat vague as a way to get you started.

I have a couple of questions regarding the taper of the potentiometers you're using in the compressor design. Are they log or linear taper? Also, is there a way to add gain reduction and level meters to the project?

Once again, I wish to thank your magazine for a great project that I'm sure I will enjoy.

Carl A. Dennis
Orlando, Florida

Author Jules Ryckebush responds: *Thanks for the letter. I'm glad to hear from fellow DIYers. As to the potentiometers, all are linear taper. The SSM2120 converts the voltages to a log function. Regarding your suggestions, I have a couple of other projects to knock out first, but I plan to design the single-ended noise-reduction unit. I have already received several letters requesting it.*

MORE MIKES

I enjoyed your September 1992 issue immensely and consider EM a valuable timesaving tool in my quest to put together a reasonably good quality MIDI home studio for \$2,500.

I think EM readers could benefit from

a mic review to find the best vocal and instrumental mics for under \$500. (At least with acoustic instruments, you can always find a Shure SM57 microphone for around \$100.)

I would like to know if you have done any reviews or are planning any reviews in the future on the following: the Mackie Microseries 1202 mixer, Alesis 1622 mixer, Alesis Quadraverb GT effects processor, and Boss/Roland SE-50 effects processor.

Carl A. Dennis
Orlando, Florida

John—We periodically review both vocal and instrument mics. For instance, in the August 1992 issue, we reviewed Audio-Technica's AT4033, and in September 1992, we covered the AKG Tri-Power mics. In addition, we published a buyer's guide, the "EM Guide to Microphones," in the December 1991 issue. We have not reviewed the Mackie 1202 or the Quadraverb GT, but the Alesis 1622 was reviewed in July 1990 and the Boss SE-50 in June 1991. Incidentally, if you want to find out when we published mic reviews or other articles, send us an SASE and request a free copy of the EM back-issue listing. Also check out this year's article index on p. 122—Steve O.

ERROR LOG

August 1992, "From the Top: Computers in the Studio," p. 79: SunRize Industries' digital audio editing program for the Amiga is called *Studio 16*, not *Studio 12*.

September 1992, "Tape Killers: The EM Guide to Hard-Disk Recorders," pp. 50-51: SunRize Industries' Studio 16/AD1012 offers four simultaneous tracks and an infinite number of virtual tracks. The AD516 offers eight simultaneous and infinite virtual tracks, and it has two RCA analog inputs and two RCA analog outputs. In addition, it does not support time compression/expansion.

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.

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another module. But that's
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(Or song, as the case may be.)

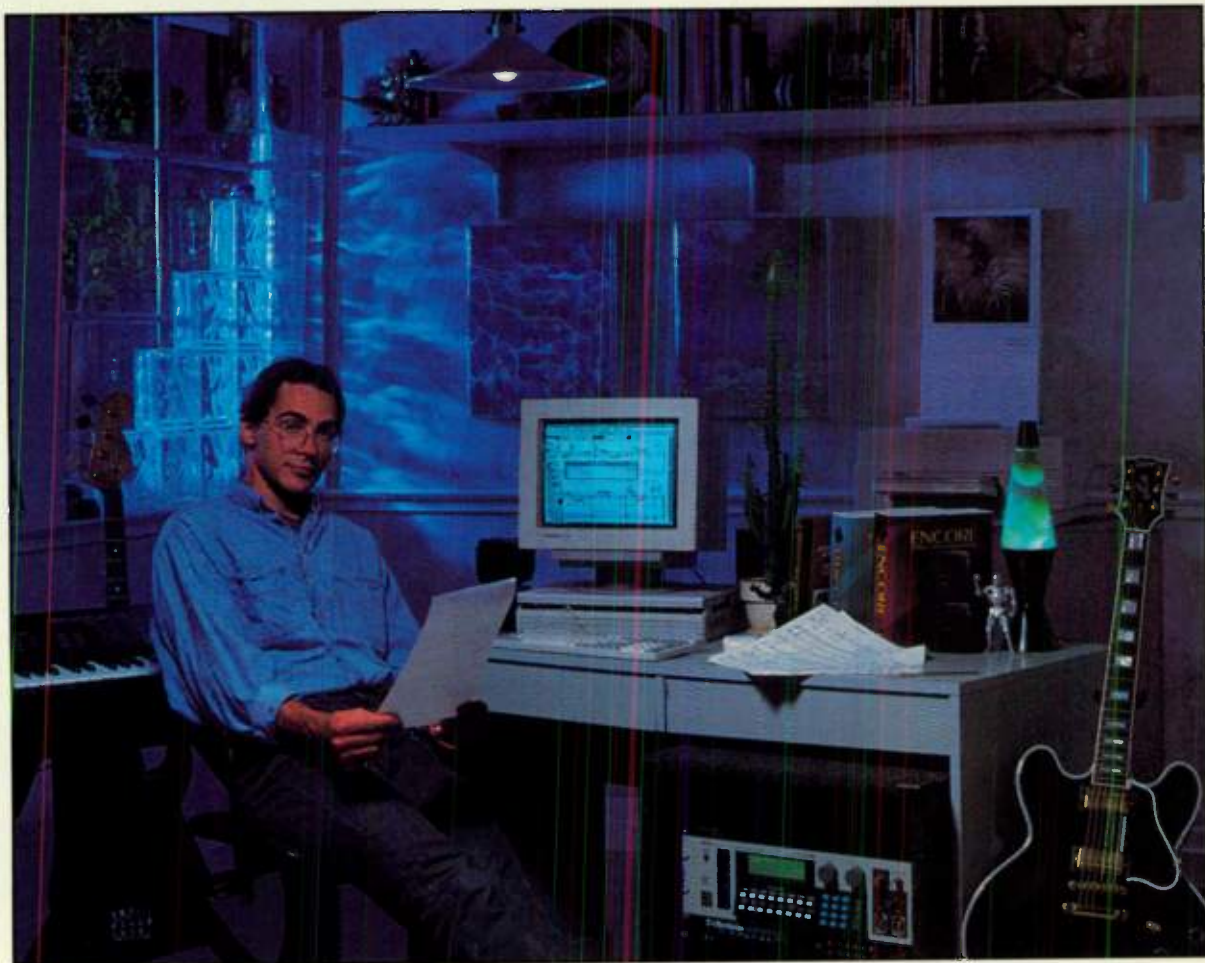
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twenty-four voice polyphony
and built-in effects. And
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third-party Standard MIDI File
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"Minus One" feature that lets
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part of a song. Which is
great news if you're a
musician. Provided, of
course, you're not one
who plays the accordion.

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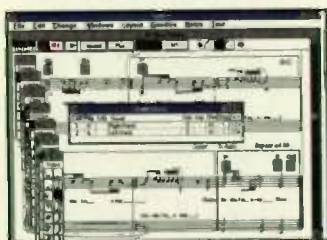
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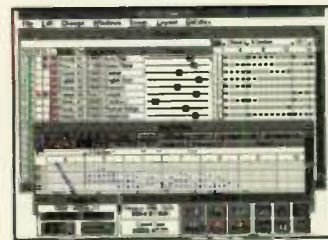
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WHAT'S

NEW



▲ YORKVILLE AUDIOPRO 1212

Yorkville introduced the Audiopro 1212 and 1216 (\$2,449 and \$2,699, respectively), a pair of stereo, compact, powered mixers. The mixers offer two monitor buses (one pre-fader and one post-fader); one external effects bus with stereo returns; stereo aux inputs; and a bus that feeds an onboard, 16-preset, Alesis effects processor that produces reverb and delay. In addition to 3-band channel EQ, the Audiopros have a dual 9-band graphic EQ for mains and monitors. The 1,200-watt, stereo power amp operates with loads as low as 2 ohms. A speaker processor provides switchable EQ curves. The mixers include phantom power and have Yorkville's Self Correcting Hum Reduction system on the sub, main, and monitor outputs. The headphone feed is selectable between mains, monitors, subs, and the aux bus. Yorkville Sound; tel. (716) 297-2920; fax (716) 297-3689.



▲ ENSONIQ ASR-10

Ensoniq announced the ASR-10 Advanced Sampling Recorder (\$2,695), the successor to the EPS-16 Plus sampler. The unit offers 16-bit linear, stereo sampling (with 64x-over-sampling, 1-bit, Sigma Delta technology) at 44.1 or 29.76 kHz. It comes with 2 MB of sample RAM, upgradable to 16 MB (eight times the EPS-16's memory) with standard SIMMs. Although its voice architecture is similar to that of the EPS-16 Plus, the ASR-10 is based on a new oscillator chip that provides hardware envelopes, up to 31-note polyphony when played back at 29.76 kHz, and 23-voice polyphony at 44.1 kHz.

Its 24-bit effects processor includes 50 algorithms, many derived from the company's DP/4 effects processor. Signals at the main outputs can be routed through the effects processor and resampled, and external signals also can be routed through the effects and sampled. Other features include a high-density floppy-disk drive; 16-track sequencer; 61-key, velocity-sensitive keyboard with polyphonic aftertouch; and the ability to read EPS and EPS-16 Plus samples. Options include SCSI, a digital I/O board, and a 6-output expander. Ensoniq Corp.; tel. (215) 647-3930; fax (215) 647-8908.

▶ SOUNDCRAFT SPIRIT AUTO

Soundcraft introduced the Spirit Auto mixer (16-channel, \$5,995; 24-channel, \$8,450), a version of its Spirit Studio mixer with automated control of fader levels and channel and monitor mutes. Spirit Auto consoles offer 4-band EQ, with two sweepable midrange bands that can be split between the channel and monitor paths. Other features include six aux sends, four stereo returns, eight subgroups, and an in-line monitor section. Because the mixer saves its automation settings as MIDI data, it can be controlled with any sequencer that can record MIDI controller messages. In addition, JLCopco's *SoftMix* Spirit Auto automation software for the Macintosh (\$499) provides moving fader graphics, SMPTE display,



status information, and off-line editing of faders and mutes. *SoftMix* uses 8-bit fader resolution and includes an Auto Archive feature that transparently saves mixer data to hard disk. (For more information, contact JLCopco; tel. (213) 306-4131; fax (213) 822-2252.) Steinberg is planning to support the Spirit Auto with automation software for the Atari ST. Soundcraft Electronics; tel. (818) 893-8411; fax (818) 893-3639.



▲ ETYMOTIC RESEARCH ER-4

Etymotic Research introduced the ER-4 Canal Phones (\$330), lightweight (less than 1 oz.) earphones. The phones fit into the ear canal, sealing the canal with soft-flange eartips or optional custom-fitted earmolds. The result is an estimated 20 to 25 dB of external noise exclusion, so the listener can hear the full dynamic range without monitoring at high levels. The company rates frequency response at 20 Hz to 16 kHz (± 4 dB). Sensitivity at 1 kHz is 108 dB SPL. Two models are available: the ER-4S (stereo) and the ER-4B (binaural). Etymotic Research; tel. (708) 228-0006; fax (708) 228-6836.



▲ ZOOM 9120

Zoom's 9120 Advanced Sound Environment Processor (\$599) is a single-rackspace, 16-bit, stereo multi-effects processor that focuses on creating ambient effects, with an emphasis on reverbs. The device provides hall, room, plate, and gated reverbs; early reflections; chorusing; delay; pitch shifting; and two sets of special effects. Other features include a delay-time calculator, a vocal eliminator, trigger-controlled gating, surround simulation, and pedal-controlled pitch bend. The 9120 has a front-panel trigger button, a 1/4-inch CV footswitch input, real-time parameter control via MIDI, and 99 user memory locations. The front panel is designed for easy programming, with nine "quick control" keys, seven dials, an array of LEDs, and a large LCD display. Zoom Corp.; tel. (415) 873-5885; fax (415) 873-5887.

THE AES CONVENTION ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲

The 93rd Convention of the Audio Engineering Society (AES), held for the first time in San Francisco's Moscone Center, offered its share of high-end delights, including Neve's all-digital Capricorn console, TOA's digital sound-reinforcement board, and Sony's 24-track digital recorders. But more important for EM readers, there also were many products geared toward lower-budget project and home studios. Affordable mixers, monitors, hard-disk recorders, and signal processors were in great evidence.

The highlight of the show was Tascam's (tel. [213] 726-0303) DA-88 8 mm-based, 8-track digital tape recorder (\$4,499; \$175 for the single-unit remote controller; \$1,499 for the large system remote controller). Scheduled for shipment in early 1993, the DA-88 records up to 100 minutes of 44.1 or 48-kHz digital audio on Hi-8 120 videotapes. Standard connections include eight RCA analog ins and outs, a 25-pin D-sub connector carrying balanced ins and outs, another 25-pin connector for eight tracks of digital audio, word sync I/O via BNC connectors, and a 15-pin connector for sync-locking up to sixteen units. Tascam also plans to offer the SY-88 plug-in synchronizer board (\$799), which adds an RS-422 port, video sync I/O, and MIDI Machine Control and gives the DA-88 the ability to sync to SMPTE without using a tape track. In addition, Tascam will offer optional AES/EBU and SDIF2 connectors (each with eight ins and outs) and a remote meter bridge.

On the other side of the convention floor, Fostex (tel. [310] 921-1112)

announced that they would license ADAT technology from Alesis and produce an ADAT-compatible, S-VHS-based, 8-track, digital tape recorder. No price or name was given, but the machine is expected sometime in the first quarter of 1993.

Atari (tel. [408] 745-2000) debuted the impressive Falcon030 computer (\$799 w/1 MB RAM; \$1,299 w/4 MB and 65 MB hard disk), which incorporates a 16 MHz 68030 microprocessor and a 32 MHz Motorola 56001 DSP on the motherboard. The computer also has 16-bit stereo audio inputs and outputs. According to Atari, with the appropriate software and hardware, the machine is capable of working with eight audio tracks at once.

The Digidesign suite featured a number of new products, but most impressive for long-term potential was the announcement of the TDM 256-channel 24-bit digital audio bus. This digital audio bus, which you will be able to add to Pro Tools and Sound Tools II systems for under \$500 sometime in 1993, is based around a custom VLSI. However,



Tascam DA-88

Digidesign is sharing the specifications with selected manufacturers. In conjunction with the company's NuBus expansion chassis, this digital audio bus will permit the creation of the long-awaited "studio-in-a-box." Several manufacturers, including Apogee and Lexicon, plan to create cards that work with the system.

▼ FATAR STUDIO 2001

Music Industries Corp. is shipping the Fatar Studio 2001 (\$2,275), an 88-key, weighted, velocity-sensitive, MIDI master keyboard with channel aftertouch. The 2001 supplies eight overlapping zones, four independent MIDI Ins, and four independent MIDI Outs. Programmable controllers include two CV inputs, four sliders, two wheels that can send eight different messages per preset, an increment/decrement

footswitch, and two footswitch inputs that can send any switch message or enable/disable any zone. Other features include 64 internal program locations, 64 additional locations on an optional memory card, and a 48-character, backlit LCD. The instrument is available in a contoured cabinet (which weighs 55 pounds) or a hard-shell case (66 pounds). Music Industries Corp.; tel. (800) 431-6699 or (516) 352-4110; fax (516) 352-0754.

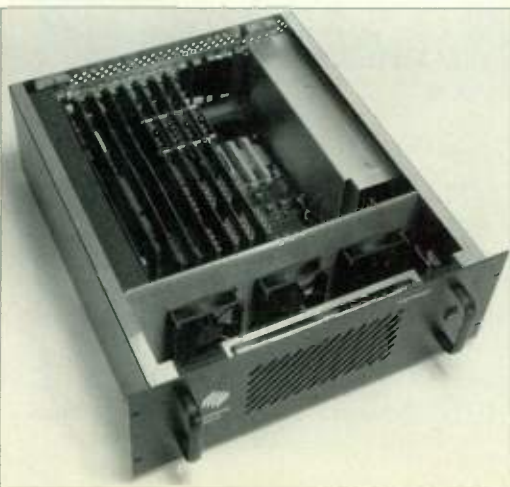


▼ DIGIDESIGN EXPANSION CHASSIS

Digidesign introduced several new products at this year's AES convention. ProMaster 20 (\$5,995) is a stereo, 20-bit mixdown and mastering system based on the company's popular Sound Tools hard-disk recording and editing system. The new product adds true 20-bit, 128x oversampling, Ultra Analog A/D converters, which produce a S/N ratio of 108 dB. (Sixteen-bit systems typically offer a 90 dB S/N.) In addition, the company displayed its Digidesign Intelligent Noise Reduction

software (DINR; \$995). DINR is the first in Digidesign's new series of software "plug-in" DSP modules for Pro Tools and Sound Tools II and for a limited time is included with Sound Tools ProMaster 20. The company claims the software achieves dramatic reductions in ambient background noise, hum, tape hiss, etc., with virtually no audible signal coloration.

Digidesign also is shipping a 12-slot Macintosh NuBus expansion system for its card-based digital audio products. The 4U rack-mount Expansion Chassis (\$2,295) includes a 225-watt power supply; three low-speed, high-volume fans; and a flow-through case. The Expansion Chassis is compatible with all current Digidesign cards, including Pro Tools, Sound Tools II, Audiomedia II, and System Accelerator. It works with all Mac II and Quadra computers except the IIx (which doesn't support NuBus expansion systems). The system is certified for use with Digidesign cards only. Digidesign; tel. (415) 688-0600; fax (415) 327-0777.



▲ STUDIO AUDIO & VIDEO SADiE

AR.A.S. is distributing British manufacturer Studio Audio & Video's SADiE hard-disk recording system for IBM PC-compatibles (\$3,999 to \$6,999). SADiE's hardware consists of the X-S floating-point digital audio processor card and the X-ACT analog converter and time-code interface card. The X-S card uses 24-bit processing and supports sampling rates of 32, 44.1, and 48 kHz. It comes in 2- and 4-channel versions; the X-S2 includes software-switchable AES/EBU and S/PDIF digital audio inputs and outputs, while the XS-4 offers one software-switchable AES/EBU and one S/PDIF digital audio input, two AES/EBU outputs, and one S/PDIF output (all are phase-locked). Both versions have SCSI and an expansion connector that carries all digital signals and has an RS-422 interface.

The X-ACT card uses 64x oversampling Sigma Delta A/D and D/A converters, offers two channels of analog input and four channels of analog output, and receives digital audio (AES/EBU) from the X-S. It includes a SMPTE generator/reader (supporting 24, 25, 29.97, 30, and 30 drop-frame) and an MTC reader-generator.

The *SADiE Disk Editor* software runs under *Windows 3.1*. It records in mono or stereo and plays back up to eight audio clips on four channels. Crossfades are performed in real time, with any of twenty curves. Two edit-decision lists are maintained for non-destructive editing, and EDLs can be saved to disk. Both graphical and text-based editing are provided. Hardware requirements include a 33 MHz 80486 PC with 4 MB RAM, mouse, and a VGA monitor. A.R.A.S.; tel. (313) 572-0500; fax (313) 434-2281.

▶ PEAVEY PRM 28i

Peavey released two new 2-way, nearfield reference monitors, the PRM 26i (\$399/pr.) and PRM 28i (\$499/pr.). The PRM 26i utilizes a 6.5-inch woofer with a specially treated fiber cone said to provide high efficiency and smooth response. The highs are handled by a 1-inch metallic dome tweeter. The crossover frequency is intentionally overlapped for a smooth transition between components. A similar, complementary, net phase shift is

maintained throughout the crossover region. The drivers are magnetically shielded for use near video monitors and other magnetically sensitive gear. The PRM 28i is similar to the 26i, but offers an 8-inch woofer and two switchable modes. In Reference mode, frequency response is nominally flat, while in Equalized mode, the mids are boosted for extra punch and clarity. Peavey Electronics; tel. (601) 483-5365; fax (601) 484-4278.



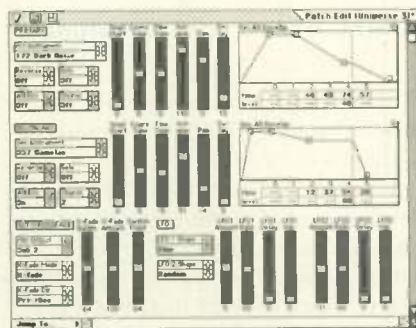
MARK OF THE UNICORN UNISYN ▶

Mark of the Unicorn announced *Unisyn* (\$395), a universal patch editor/librarian for the Macintosh that offers graphic editing templates for over 100 MIDI devices. The librarian



▲ FOSTEX DCM-100

Fostex is shipping the 1U rack-mount DCM-100 MIDI-controlled mixer (\$799) and complementary MIXTAB remote controller (\$549). The DCM-100 features eight -10 dBV stereo pairs (with 1/4-inch jacks), two effects buses with stereo returns, 2-band EQ, pan, and mute. All parameters can be controlled with MIDI messages, and up to 100 settings can be stored in memory as "snapshots." Up to three units can be linked for up to 48 inputs. The MIXTAB is a full-function remote controller for the DCM-100. When a snapshot is recalled, the difference in settings between mixer and controller is reflected on the MIXTAB by blinking, tri-colored LEDs. Fostex; tel. (310) 921-1112; fax (310) 802-1964.



database offers searches with multiple, user-definable keywords. *Unisyn* can create a performance "snapshot" that records the state of all attached MIDI devices. It includes device-specific online help and a Profile-development system for supporting new devices. The program integrates with *Performer* and *Digital Performer*. Mark of the Unicorn; tel. (617) 576-2760; fax (617) 576-3609.

▼ ROLAND JV-880 SYNTH

Roland announced the JV-880 (\$1,050), a 1U rack-mount version of its 28-voice polyphonic, 8-part multitimbral JV-80 synthesizer. The module offers two pairs of stereo outputs, which can be configured as four individual outs. Other new functions include Part Mute and Part Monitor, which enable part-muting for use with a



▼ AKAI PROFESSIONAL S01

Akai Professional unveiled the S01 (\$999), a 2U rack-mount sampler aimed at the entry-level user. The 8-voice polyphonic, 8-part multitimbral instrument samples at 32 kHz (fixed), with 16-bit resolution, and offers 8x oversampling output filters. The unit comes with 1 MB RAM (which yields 15.625 seconds of sampling time), expandable to 2 MB. Editing features include Sample Trim, looping, level, and pitch. The unit has a 3.5-inch floppy-disk drive, two MIDI In ports, and MIDI Out and Thru. Akai Professional/IMC; tel. (817) 336-5114; fax (817) 870-1271.



sequencer, and Preview, which lets you trigger a sound without using an external controller.

Roland also is shipping its new 8 MB Pop Expansion Board (\$350), which adds 224 new ROM-based waveforms to the JV-80/880. More expansion boards are planned. New sounds include grand piano, soprano sax, acoustic bass, lead guitar, and assorted synth textures. A Load Patch feature in the JV-880 lets the user load Single Patches or Group Patches from the expansion board into the sound module's internal RAM. Roland Corporation; tel. (213) 685-5141; fax (213) 722-0911.

Photonic Computing

The 21st century may see digital information carried by photons instead of electrons.

By Scott Wilkinson

Most people mark the birth of electronics with the invention of the transistor in 1947. This device single-handedly overcame the limitations of vacuum tubes—especially in terms of size, heat dissipation, and reliability—and led the way to supercomputers, personal computers, and a vast assortment

of electronic musical tools in less than 50 years.

Today, electronic technology is starting to reach the limits of its capabilities, and many labs are working on *photonics*, a new technology with the potential to far exceed these limits. While electronics is concerned with manipulating streams of electrons, photonics deals with light, which consists of a stream of photons. (A photon is a quantum of electromagnetic energy, with no mass or electric charge.)

Photonic computing offers many advantages over its electronic counterpart. For one thing, light can be switched on and off faster than electrons, allowing much higher digital data rates. In addition, light is much more energy efficient and less prone to pulse degradation, especially over long distances. Finally, crosstalk is eliminated because there are no electromagnetic fields to interact.

However, these advantages are not cheap. The lack of interaction between photons means that the technology to manipulate them is more sophisticated than its electronic equivalent. And photonics is in its infancy, with critical breakthroughs appearing only in the last few years.

Some of the most striking breakthroughs have occurred in the area of light sources. In 1989, Bellcore developed the first microlasers, some no larger than one micron across, with switching rates in the tens of gigahertz. The Defense Research Agency in the U.K. recently discovered the presence of electroluminescence and photoluminescence in acid-etched silicon. Both

of these projects are important in the development of OEICs (optoelectronic ICs).

Another vital area of research is the development of nonlinear optical materials, which change their optical properties depending on the light that enters them. One of the most important nonlinear effects is photorefraction, in which the intensity of the incoming light changes the refractive index of the material (see Fig. 1). This changes the angle at which the light is "bent" as it passes through the material, suggesting the possibility of multi-



FIG. 1: Researchers at IBM are developing nonlinear polymers with photorefractive properties. (Photo courtesy of IBM Research Division, Almaden Research Center, San Jose, CA.)

state optical switches.

Photonic logic elements include a device called an S-SEED (Symmetric SELF-Electro optical Device), which acts like an optical transistor at switching rates over 1 gigahertz. An optical CPU known as the O-CLIP (Optical Cellular Logic Image Processor) is under development at Heriot-Watt University in Edinburgh, Scotland. It uses a 16×8 array of S-SEEDS to achieve cycle times hundreds or thousands of times faster than electronic logic.

Optical memory offers potential capacities far beyond those available in silicon (see "Technology Page: Optical RAM" in the August 1992 EM). The interconnections within a computer also can be made optically. For example, AT&T and UCSD are working on interconnections between chips using free-space transmission. In this approach, light travels from one OEIC to another through a transparent substrate with no physical waveguide (such as optical fiber).

One of the most intriguing prospects for photonics is holographic computing. Caltech is working on optical neural networks using holograms in nonlinear crystals (for more on neural networks, see the January 1991 "Computer Musician" column). The O-CLIP project uses holograms to direct light beams in and out of the logic arrays.

Perhaps the most fruitful short-term approach is to combine electronic and photonic technologies. Conductus, Inc., is working on combining optical and superconductor techniques with cooled semiconductors to achieve supercomputer performance in a desktop machine. Such an integrated approach may lead to the first applications of photonics in the digital media, where terabytes of storage and gigahertz of bandwidth would not be wasted.

EM technical editor Scott Wilkinson created holograms during his studies in physics at the University of California-Santa Cruz. It was great fun.

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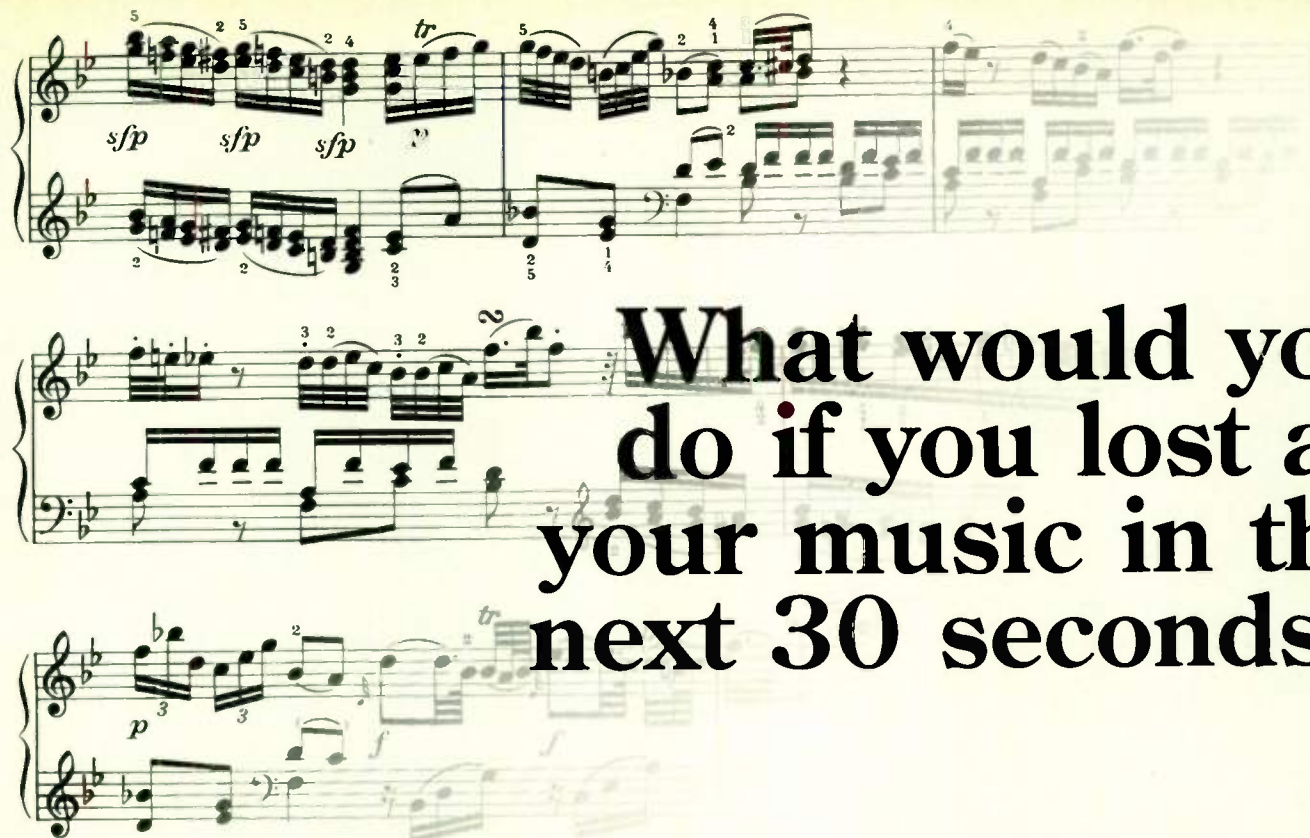
In the old days, before battery-backed RAM, acquiring new sounds meant programming them yourself. Eventually instruments became more complex, and interest in programming dropped exponentially. Today, a handful of dedicated musicians keep the tradition alive, but most rely on professional designers to enhance their sound libraries. In fact, an entire cottage industry of third-party sound manufacturers thrives on musicians' need for sounds.

Like many small industries, the third-party sound market is quite volatile. Musicians look to third-party manufacturers to produce some of the most brilliant sounds in the business. But the industry's history also includes high manufacturer turnover, poor marketing and distribution, and charges of mail fraud and piracy. ►

**This cottage
industry is
as colorful as
the sounds it
produces.**



by Anne-Marie Praetzel



What would you do if you lost all your music in the next 30 seconds?

Cry. A lot, probably. But that wouldn't help you remember the subtleties of a great melody. Or bring back the project you're working on under deadline. What a nightmare.

We have a simple solution to this very real possibility. **DataDisk**. The direct MIDI to disk storage unit that backs up your hard work in an instant push button operation. Connected to the end of your MIDI chain, it stores 800K of Sys Ex data directly to standard 3.5" floppy disks.

And DataDisk is multi-lingual, capable of receiving data from all popular brands of

musical equipment. So why pay \$50 a piece for ROM cards when you can store 1000s of synth patches on a single one-dollar floppy disk? You can even name files, so you're safe, cost-effective and organized. Plus, our new *SQ* software lets you use DataDisk as a real time MIDI sequencer so you don't have to lug your computer to gigs.

A power failure or loss of data could turn your musical dreams into bad memories, in just seconds. Protect your time and creativity. Pick up a DataDisk at your Alesis dealer today.



19" Rack mountable. 800K of direct MIDI to disc Sys Ex data storage on 3.5" floppy disks. Real time sequencer. \$449 suggested retail. Slightly higher in Canada.

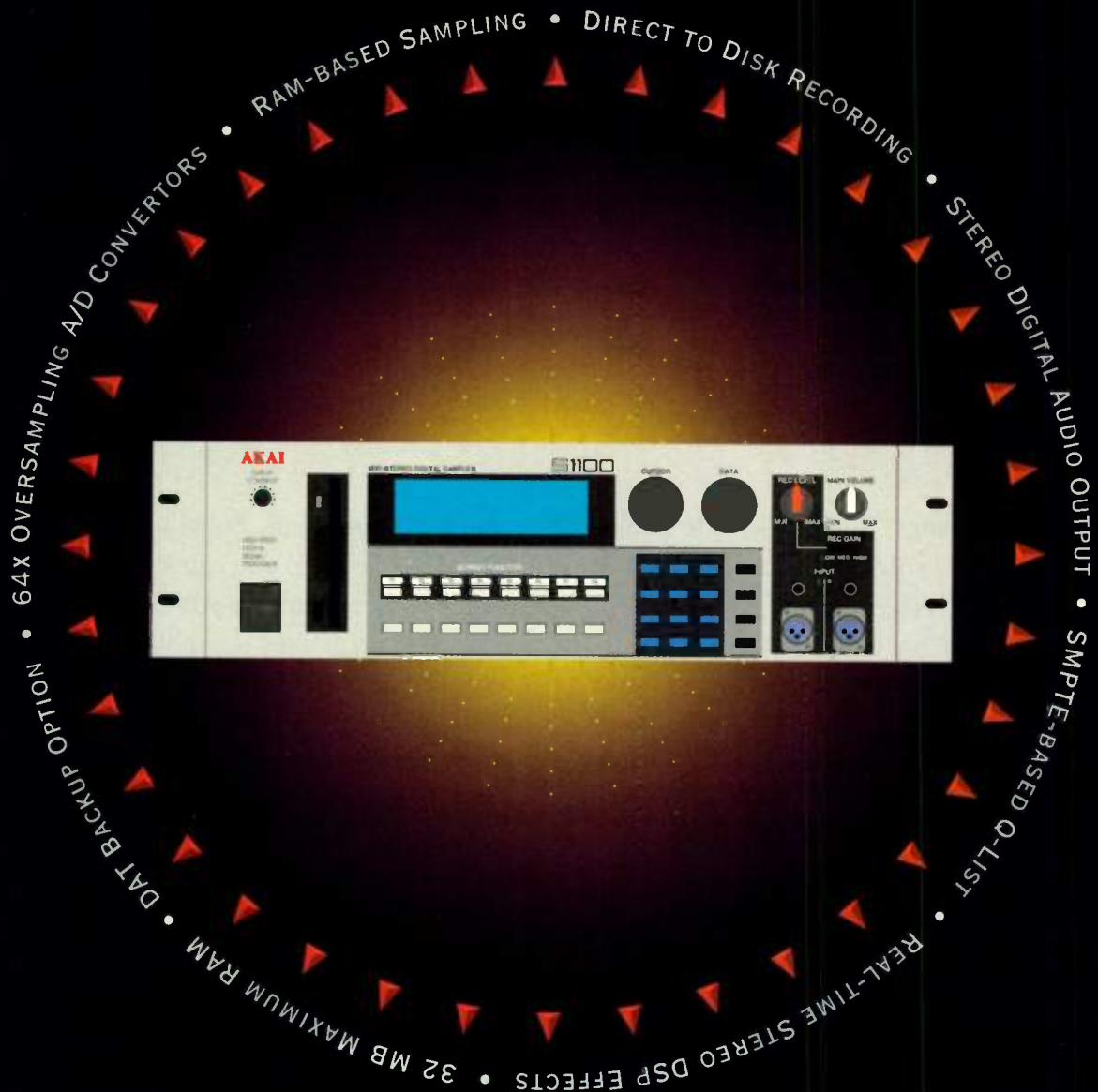
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S1100 STEREO DIGITAL SAMPLER VERSION 2.0

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AKAI



Sounds For Sale

THE STORY OF SOUNDS

It all started in 1978, when a revolutionary synthesizer hit the market. Sequential Circuits' Prophet 5 contained battery-backed memory, which gave musicians the ability to store the sounds they created. It also meant musicians could easily share or sell their patches. Then in 1983, Yamaha introduced the DX7. The public devoured it, but soon discovered that programming new sounds for the synthesizer was quite a chore. As a result, the demand for commercially created sounds soared. Numerous entrepreneurs jumped in to meet that demand, and within months an industry was born.

Initially, most companies sold their patches direct and through dealers.

Unfortunately, some dealers and manufacturers didn't recognize the value of patches and soon began giving them away, often to sweeten the sale of a synthesizer. Other companies followed suit, giving the public the impression that patches and samples were free and available to copy. Once the precedent was set, piracy ran rampant. It's a problem that continues to affect the industry today.

THE PLAYERS

Sound companies range in size from garage hobbyists who create sounds in their free time for fun and little profit, to larger, established manufacturers who make a living selling sounds and sequences (see sidebar for a partial list). Product quality depends little on the company's size. According to musician Jeff Burger, "The guy in the garage can have the most lethal sounds, but not the best marketing, while a big company can have a glut of sounds that you have to sift through to find any of

decent quality."

Larger companies often employ hobbyists who enjoy tinkering around to create unusual sounds. Vince Bitetti, owner of Sound Source Unlimited contracts people who love their particular instrument and love to spend hours creating sounds for it. Many of Bitetti's sound creators maintain a separate professional career in the daytime and create sounds by night. Sound Source customers love the sounds created by Manny Fernandez, a dentist by profession. "They call up and say, 'I want whatever Manny programmed,'" says Bitetti.

Both large and small third-party manufacturers sell to individuals, dealers, and major instrument manufacturers. Jerry Kovarsky, director of marketing at Ensoniq, claims his company contracts up to 40 percent of their factory presets and Ensoniq-label sound cards from third-party manufacturers, including Eye & I Productions, Livewire Audio, and Greysounds.

THIRD-PARTY SOUND MANUFACTURERS

Angel City Audio Designs
2 Liberty Place
Middletown, CT 06457
tel. (203) 347-5166

Eye & I Productions
930 Jungfrau Ct.
Milpitas, CA 95035
tel. (408) 945-0139

Greenhouse Sound
601 E. Walnut St.
Nappanee, IN 46550
tel. (219) 773-2678

Greysounds
8700 Reseda Blvd., Suite 101
Northridge, CA 91324
tel. (818) 773-7327

Kid Nepro Productions
PO Box 360101
Brooklyn, NY 11236
tel. (718) 642-7802
or (212) 629-3708

Livewire Audio
PO Box 561
Oceanport, NJ 07757-0561
tel. (908) 222-1227

ManyMIDI Products
Box 2519
Beverly Hills, CA 90213
tel. (213) 650-6602

Martunes
2586-B Waterloo St.
Vancouver, BC V6R 3H5
Canada
tel. (604) 736-2434

The MIDI Inn
PO Box 2362
Westmont, IL 60559
tel. (708) 789-2001

Northstar Productions
13716 S.E. Ramona
Portland, OR 97236
tel. (503) 760-7777

The Parker Adams Group
12335 Santa Monica Blvd.,
#124
Los Angeles, CA 90025
tel. (310) 450-2175

Patch/Works Music Software
PO Box 450
New York, NY 10024
tel. (212) 873-2390

Pro-Rec
106 W 13th St.,
Suite 13
New York, NY 10011
tel. (212) 675-5606

Sound Ideas
105 W. Beaver Creek Rd.,
Suite 4
Richmond Hill, ON L4B 1C6
Canada
tel. (800) 387-3030
or (416) 886-5000

Sound Management
PO Box 3053
Peabody, MA 01961
tel. (800) 548-4907

Sound Management BBS
PO Box 396
Mundelein, IL 60060
write for info

SoundSations
370 Mt. Vernon
Grosse Pointe Farms, MI
48236
tel. (313) 885-2571

Sound Source Unlimited
2985 East Hillcrest Dr.,
Suite A
Westlake Village, CA 91362
tel. (800) 877-4778
or (805) 494-9996

Stoklosa Productions
PO Box 13086
Pittsburgh, PA 15243
tel. (412) 279-8197

Synthware
1400 New Holland Rd.
Reading, PA 19607
tel. (215) 796-0377

Technosis
3960 Laurel Canyon Blvd.,
Suite 353
Studio City, CA 91614-3791
tel. (213) 656-3515

The Works Music
Production, Inc.
PO Box 22681
Milwaukie, OR 97222
tel. (503) 659-3964

Sounds For Sale

SHOPPING FOR SOUNDS

Despite the industry's volatile nature and the fact that many of today's instruments come with hundreds of sounds instead of the previous 64 or 128, the third-party sound market survives due to one simple fact: People always want more sounds. According to Kovarsky, "Out of 100 sounds they get with their machine, maybe they like twelve. So they buy another library." In addition, third-party sounds have a reputation for being creative, high quality, and unique. "Manufacturers just don't have the time to create some of the more interesting sounds. They're more concerned with the hardware. And third-party sounds are cheaper," adds Mick Seeley, owner of sound company Livewire Audio.

Sounds are primarily sold through mail order. Companies advertise in the classifieds section of major music magazines, including *EM*, as well as with MIDI user's groups and musicians' personal newsletters. In addition, some major dealers, such as Sam Ash and Guitar Center, still carry a limited selection of sounds.

If you want to buy sounds for your instrument, you should be aware of several factors. First, due to the fly-by-night nature of some companies, you need to be careful. Second, shop around. Quality, prices, and support vary considerably. If you've got a computer, the most economical route is to buy patch data only. By loading the patches directly from the computer, you can avoid the unnecessary expense of RAM and ROM cards. On the other hand,



Greysounds ROM cards

cards offer convenience and the ability to use internal RAM sounds and new sounds simultaneously.

The best way to approach buying sounds is to investigate a few companies. *EM* classifieds manager Robin Boyce suggests buyers start with a company's ad. "Make sure it has a phone number, and try to talk to an actual person before you order anything." Boyce also suggests that consumers request literature and references. Some companies also provide a demo disk on request, so you can check out quality.

Once you decide to buy, Boyce suggests using a credit card and keeping all documentation of the purchase. "That makes it a lot easier to get your money back," she says. "Try to avoid sending a money order because a company can just cash it, and if you don't get a product, you can't get your money back or get ahold of them."

Purchase terms vary between manufacturers. Few provide unconditional warranties, but most companies provide at least a limited warranty against defects. Some also conditionally guarantee customer satisfaction. That is, depending on the situation, a manufacturer might allow you to exchange a sound collection you dislike.

Be sure to check out a company's support documentation. Better collections feature a brief description, particular modulation routings, and suggested applications for each of the sounds.

In addition to buying, there are other sources for new patches. Instrument user's group magazines often feature free sounds for particular instruments. *Transoniq Hacker*, for example, regularly publishes patch data for Ensoniq synths, and the *Roland User Group* magazine does the same for their instruments. (See this issue's "From the Top" column on musician's user's groups on p. 58.) In addition, some electronic bulletin boards feature a wide variety of sounds. (Unfortunately, many are illegal copies.)

THE PIRACY PROBLEM

As brilliant as third-party sounds may be, piracy remains a dark underside to this industry. Few agree on who stole what from whom, but most third-party manufacturers complain that someone has, at one time or another, stolen sounds from them.

Part of the problem is the nature of programmable sounds, which, like most computer software, can be easily and undetectably copied. At one point,



Sound Source Unlimited sounds for the computer

a few synth and sampler manufacturers apparently considered copy-protection schemes to prevent this problem, but decided the inconvenience would outweigh any benefits. In addition, until about a year-and-a-half ago, patches couldn't be copyrighted. Even with the ability to copyright, the problem remains.

It often starts as an innocent transaction. When someone buys the latest U2 CD, friends often borrow it to tape it. The same thing occurs when a musician obtains a new library of sounds. In addition, fledgling companies often buy up an individual's sounds without realizing which are copied or stolen. "Most smaller companies have some stolen goods, but not always on purpose," comments Seeley.

Then there's a third, less innocent level of theft that occurs between established third-party manufacturers. Boyce keeps a thick file in her drawer that includes letters from classifieds advertisers and third-party customers accusing other companies of stealing. Charges include companies ripping off each other's sounds and reselling them, then trying to return them to the company they stole the sounds from in the first place.

Boyce calls these situations "the



IF ONLY GETTING IN SYNC WAS THIS EASY FOR EVERYBODY.

You see it every day. The quarterback lofts the ball over the wide receiver's head.

The cab pulls up to the terminal as the airplane pushes back from the gate. The guy on tv moves his mouth before the words come out. Classic cases of a world slightly out of sync.

In the audio environment, it's the same problem, times ten. The machines you use, most often don't speak, read, or respond to the same language. You can't just line them up, push the "go" button and have them all operate in unison. How, then, do you get the various formats of audio and video tapes to work in sync?



Well, you probably know about those magic "black boxes" called synchronizers that the guys with the mega-budgets use. What you might not know is that this same magic is now available, and easily affordable, for any home studio.

The breakthrough comes thanks to TASCAM's ATS-500, priced below \$800.* It's a two-machine chase-lock system with a SMPTE time code generation capability that can resolve to video sync using your existing VCR and 8 track.

It's got all the professional features—an offset function, wide-band reader,

jam sync—yet it's easy to understand and operate. It's also auto-calibrating and requires no mastery of hidden screens or functions. And, it not only works with TASCAM's serial control transports, but by adding TASCAM's IF-500 interface, it'll work with other parallel transports as well.

To see the ATS-500 first hand, just sync up with your nearest TASCAM dealer. He'll show you how easy synchronization can be.

TASCAM

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Sounds For Sale

worst-case scenario. These days [pirating] only comes up sporadically." When anything arises, she diplomatically calls the accused and reports of the complaint. She also encourages the accuser to write a letter to the accused and send a copy to her or EM publisher Peter Hirschfeld. "It usually solves the problem," she says. "Maybe it's cleaner today. Some stealing goes on, but word gets out fast. People who do it don't stay in business very long."

Readers naturally question why companies don't take measures to protect against pirating. Unfortunately, copy



**Despite the industry's
volatile nature, the
third-party sound
market survives due
to one simple fact:
People always want
more sounds.**

protection isn't an easy solution. According to Mick Seeley, "It would take months to copyright all of the patches, and we can't afford to sue anybody." Adds Vince Bitetti of Sound Source, "It's difficult to prove anything. It's like squeezing blood out of a turnip." Bitetti says he recently saw that a new company advertised 1,000 sounds for the Yamaha DX7 for \$50. "It takes three months to program just one bank. And all of our sounds were in that company's collection. I have no time to chase anyone around. Those people will suffer just from the karmic nature of the universe."

While most manufacturers don't presently copyright their patches, consumers should consider the copyright issue for their own protection. The Library of Congress issues copyrights on patches, and you are liable if you

own stolen sounds, whether or not you realize they're stolen. Many musicians believe they can simply change the name or a few parameters to prevent anyone from proving sounds are stolen. However, unless these slight differences significantly change the quality of the sound, judges will rule in favor of the sounds' owner. As a general rule, companies that sell huge sound libraries for dirt cheap merit closer investigation.

At the moment, one of the only ways to tell if certain sounds are suspiciously similar is to use editor/librarian programs, such as Dr. T's *X-oR*, that offer a compare feature between two patches.

TODAY'S MARKET

Third-party manufacturers continue to produce some of the best sounds in the industry. However, sales are not as strong as they were five years ago. This decline is due to several factors, including the recession, piracy, the increased quality and number of factory presets, and the reluctance of dealers to carry third-party sounds.

Despite this climate, many manufacturers stay in business—some without earning a profit—and new companies continue to appear. In fact, some companies seem extremely upbeat despite the lull in the industry. After a lackluster 1991 NAMM show, Bitetti realized he needed to expand his market to stay in business. So Sound Source looked to the growing multimedia market for answers and developed a now-successful business selling computer sounds. Their *Star Trek* collections allow your computer to produce sounds such as the *Starship Enterprise* doors opening when you insert a disk.

In contrast, other musicians are losing money producing sounds year after year. "This business can be fun, but it also can be a nightmare," comments Mick Seeley. "You have to jump on the latest keyboard and learn it. It's a challenge, a lot of hard work, and sometimes with no payback."

Call it a passion, call it blind determination. Despite lagging sales, many musicians stay in the business, tinkering in their garages late into the night, to produce some of the best sounds money can buy.

EM assistant editor Anne-Marie Praetzel often seeks solace in places with no sounds.

NEW! ADD-ON FULL-FADER & MUTING

FOR THE CR-1604 16-CHANNEL MIXER

ADD AUTOMATION IN MINUTES FOR \$799!

WHAT IT IS. Mackie's new OTTO-1604 is an internal controller board that installs into any CR-1604 mixer.

WHAT IT DOES. The Mackie OTTO-1604 interfaces with hardware or software that "speaks" MIDI to provide full muting and fader control of:

- ▶ All 16 input faders
- ▶ All 4 stereo AUX returns
- ▶ ALT 3/4 buses
- ▶ Master outputs

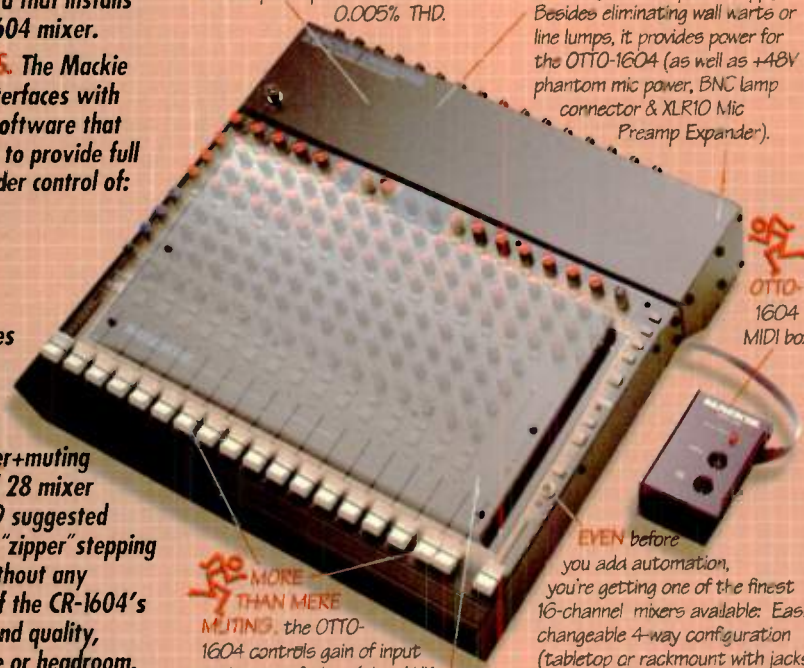
Yes, you read right. Full fader+muting automation of 28 mixer levels for \$799 suggested retail. Free of "zipper" stepping noise. And without any degradation of the CR-1604's legendary sound quality, dynamic range or headroom. Note, however, that this is not "flying faders" automation.

The CR-1604's sliders and pots are set at Unity while OTTO does its work (but can also be used simultaneously).

HOW IT DOES IT. All existing CR-1604s are automation-ready thanks to our modular ribbon cable design and robust internal power supply. The OTTO-1604 mounts inside the main chassis and plugs in between the main board and the CR-1604's pod. MIDI cables connect to a small, external box via ribbon cable. Installation takes about 15 minutes and requires only a screwdriver (other drinks are optional). Do it yourself via illustrated instructions or have your dealer perform the installation for a modest fee.

SO WE couldn't resist a plug for the CR-1604's studio-quality mic preamps with -129 E.I.N. & 0.005% THD.

SO ONE more reason that we designed the CR-1604 with a beefy internal power supply: Besides eliminating wall warts or line lumps, it provides power for the OTTO-1604 (as well as +48V phantom mic power, BNC lamp power connector & XLR10 Mic Preamp Expander).



OTTO-1604 MIDI box

SO MORE THAN MERE MUTING, the OTTO-1604 controls gain of input and output faders (plus AUX returns and ALT 3/4 bus).

SO THE OTTO-1604 mounts inside the main chassis using the mixer's existing ribbon cables. Installation is so simple that a TV game show hostess could do it. We also offer a step-by-step video tape for the even more severely mechanically impaired.

SO METICULOUSLY mouse Mackie CR-1604 mixer mixes via various MIDI Mac, iBM, Amiga or Atari software*.

* Any ad that mentions computer software is bound to have an asterisk or two in it. Ours makes "Consult individual 3rd party sequencing software manufacturers for specific information concerning implementation of features, release dates and availability." Oh, yeah, we almost forgot: All company and/or product names and trademarks and/or registered trademarks of their respective manufacturers. Blah blah blah. Yaaaaa yaaaaa.

SO EVEN before you add automation, you're getting one of the finest 16-channel mixers available. Easily changeable 4-way configuration (tabletop or rackmount with jacks to back, top or on the control surface plane), sealed rotary controls, better-than-digital dynamic range, twice the headroom of conventional mixer designs, stereo in-place soloing, constant power pan pots and boo-coo more.

SO OTTO's external box connects via its own ribbon cable, and includes MIDI IN and THRU DIN sockets plus signal present LED.

SO EXISTING add-on MIDI automaters often suffer from zipper noise and/or sluggish response. OTTO avoids these problems with a proprietary, digitally-controlled gain cell.

WHAT IT DOES IT WITH. Simple hardware controllers can use the OTTO-1604 to



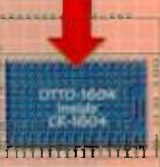
trigger "snapshot" level/mute settings via MIDI commands. Existing

software sequencing programs with MIDI volume control can adjust multiple channels, returns and outputs*.

Mackie is also currently working with major sequencing software developers including Opcode, Mark of the Unicorn, Steinberg/Jones, Twelve-Tone Systems, Ellisonics, Dr. T Music Software, C-Lab, Passport Designs, Avid Technologies and others to provide on-screen "virtual CR-1604 sliders" for their programs*.



software developers including Opcode, Mark of the Unicorn, Steinberg/Jones, Twelve-Tone Systems, Ellisonics, Dr. T Music Software, C-Lab, Passport Designs, Avid Technologies and others to provide on-screen "virtual CR-1604 sliders" for their programs*.



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WIN MACKIE'S NEW 8-BUS CONSOLE!



LANE SMITH

.....
**Ghosts in your
machines? Try a
little cleanliness.**
.....

After collecting thousands of dollars worth of equipment, you'd think musicians would protect their investments. Ha! The average home studio is a shameless den of neglect. I've visited countless personal (and sadly, some professional) studios where poor maintenance crippled the equipment's sound quality and accelerated major overhauls.

But a little foresight can change everything. In professional studios, where equipment often runs around the clock, preventative maintenance schedules ensure that every session runs as smoothly as possible. These "clean routines" are not difficult, and home recordists who spend a few minutes playing audio domestic (maid and butler uniforms are optional) reap the benefits of improved system quality and longevity.

THE CLEAN SCHEME

If more musicians took the following advice, this statement would overstate the obvious: Keeping equipment clean prevents breakdowns. Basic studio hygiene is a relatively painless form of preventative maintenance. Dirt and electrical equipment are sworn enemies, so cover mixing consoles, multitrack decks, keyboards, etc. with pieces of non-porous material (vinyl, plastic, etc.) to prevent dust invasions.

Musicians who use their studio daily and can't be bothered with the constant covering/uncovering of equipment should "clean house" every two weeks. Simply spray Windex (or a similar non-abrasive cleaner) onto a cloth and wipe down all equipment surfaces.

Do *not* spray the cleaner directly onto your gear. Employ an old-fashioned feather duster to gently lift dust from the tiny surface areas between knobs, sliders, and faders.

TAPE-DECK SANITATION

As recording tape runs along the drive mechanisms of an analog deck, magnetic oxide particles are knocked off. If the particles scatter after running across the record head, they often become magnetized and can cause serious problems. In one case, a client who never cleaned his multitrack deck was plagued by frequent tape dropouts. I discovered that an oxide build-up on the pinch roller was "un-recording" certain tracks as the tape ran past.

Oxide deposits also can carve gorges into your record and playback heads. A moving tape that picks up stray particles scratches the heads like fine sandpaper. And believe me, it doesn't take centuries to etch your heads away. While head wear is inevitable, the process can be slowed considerably by making your deck a particle-free zone.



By Neal Brighton

● STUDIO MAINTENANCE

The process of cleaning heads is the same for multitracks, 2-track reel-to-reel decks, and cassette recorders. Alcohol (100 percent pure) is the cleaning solution of choice for metal parts because it cleans and then evaporates. However, alcohol can dry out and crack rubber surfaces, so specialized solutions (such as Intraclean) have evolved that safely clean both rubber and metal parts.

Using a good-quality cotton swab, dip into your cleaning solution and wipe down the front and side surfaces of the heads (see Fig. 1). Then clean the tape guides and idler arms. Check for debris hiding on the top and bottom lips of the tape guides. Next, clean the pinch roller (remember, don't use alcohol), and don't stop scrubbing until all of the oxide particles, which appear as brown residue, are "terminated." Finally, hit the plastic capstan with a few wipes of a clean, damp cloth.

DEMAGNETIZING

Once you've cleaned up, you have another important task: demagnetiz-



FIG. 1: Cleaning the playback head on a Tascam MS-16 16-track recorder.

ing the heads, tape guides, and idler arms. Obviously, if any of these metal parts are magnetized, they could erase your master tape (and possibly, your masterpiece). Compact demagnetizers (see Fig. 2), which can be purchased at most electrical supply shops, are invaluable for ensuring high audio quality

and enacting preventative maintenance.


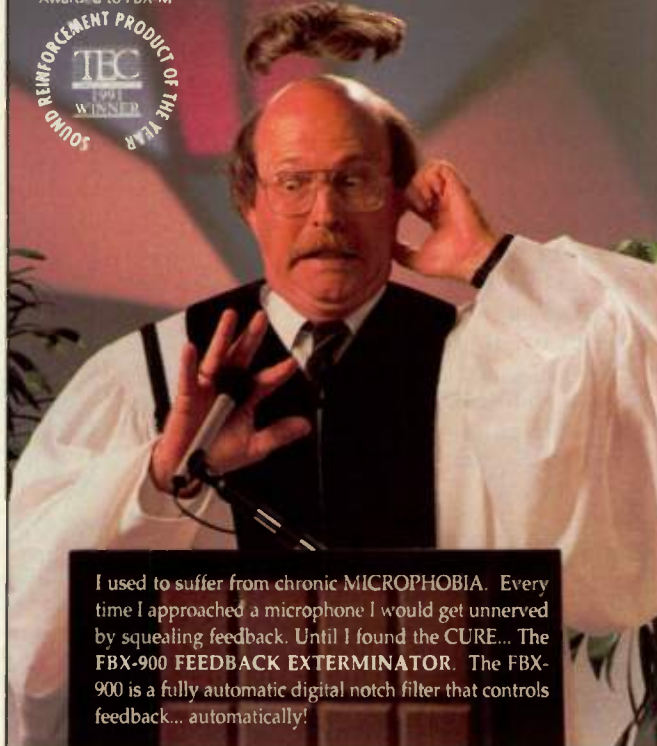
Demagnetizing is easy, but *do not* turn on the tape deck during the procedure. An accidental magnetic field fed into "powered up" heads can damage the tape recorder's internal amplifiers. Also, it should be obvious that any mas-

PETER DIGGS


Microphobia

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

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Terry "T-Bone" McCauley, Sounds Great Enterprises Athens, OH

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!

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MADE IN U.S.A.

THE BASIC TOOL BOX

Boy Scouts and recording engineers know the value of being prepared. Technology is fickle, and sometimes sessions are plagued by equipment malfunctions. Often, the demon is something simple that can be cured with a trip to the trusty tool box. Even if you're far from being a qualified repair tech, the following tools are necessary to undertake the maintenance steps outlined in this article:

1. A set of small- and medium-size screwdrivers; flat and Phillips heads
2. Wire cutters
3. Small- and medium-size needle nose pliers

4. A tone generator (if your board does not have one) with 100 Hz, 1 kHz, and 10 kHz settings
5. Glass cleaner
6. A soft, clean rag (or paper towels)
7. Cleaning alcohol
8. Rubber cleaner
9. Demagnetizer
10. Ohmmeter
11. An assortment of cotton and foam swabs
12. A can of compressed air (make sure propellant is safe for electronic use)
13. Red masking tape
14. A soldering iron and solder

ter tape lying near (or on) the tape deck during demagnetization is risking erasure.

Turn on the demagnetizer an arm's length from your deck, then slowly bring the rubber tip of the demagnetizer towards the right idler arm. Then, working right to left, slowly pass the demagnetizer over each metal part of the tape drive mechanism (see Fig. 3). Reverse the procedure if you're left-handed. Upon completion, draw the demagnetizer back at least an arm's length away from the deck before turning it off. If the demagnetizer is switched off too soon, it will dump the newly collected debris back onto the tape deck.

Get into the habit of cleaning and demagnetizing your decks before each use. In addition, clean the tape heads and tape guards every four hours of use. Repeated cleanings are especially important when using fresh tape because new tape (and very old tape) sheds more oxide.

DAT DETAILING

The maintenance of analog decks—whether a professional multi-track or cassette mini-studio—is pretty much the same. DAT is another story. The inner workings of a DAT deck are closer to those of a

video recorder. The rotary head spins at a high speed, and the DAT tape must be pulled from its casing and wrapped around the head.

Because DAT recorders store digital information on an analog medium (magnetic tape), it's important to keep the heads clean to prevent tape dropouts. If dirt causes the DAT to misread data—so much that error correction is hopelessly embattled—it won't be beautiful music that reaches the signal outputs.

Consumer DAT head cleaners are available and easy to use (just pop in the cassette and push Play), but usually aren't thorough enough to clean the grime produced by heavy studio use. The preferred cleaning method is to manually scrub the head with a long-handled foam swab and any reputable video head-cleaning solution. Cotton

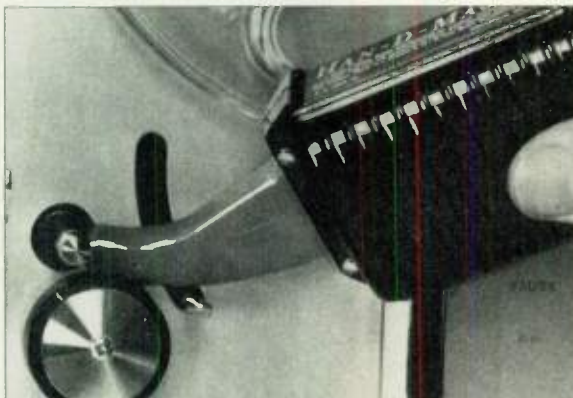


FIG. 2: The Han-D-Mag by R.B. Annis is a typical hand-held head demagnetizer.

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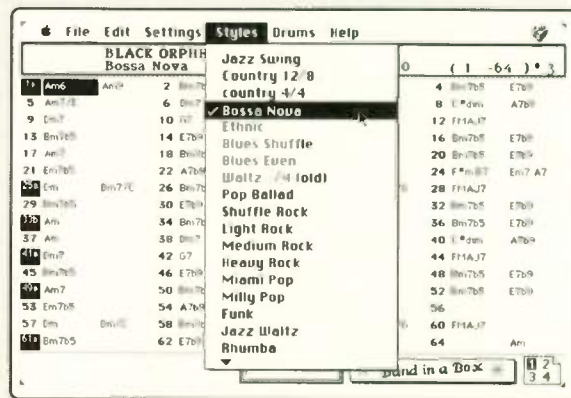
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1990
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PG Music

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

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

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Electronic Musician Magazine

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Start magazine

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Music Paper Magazine

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

PC Journal Sept. 1992

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

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Band-in-a-Box Standard Edition (24 styles)\$59

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(100 songs on disk).....\$29
- NEW! Styles Disk #2 – 25 new styles for Ver. 5.....\$29
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IBM with MIDI – 640K, MIDI (any MPU 401/Midiator/YamahaC1/SoundBlaster/Voyetra/Roland SC-7/Yamaha TG100)

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MACINTOSH version REQUIRES 2 mb RAM (reduced version for 1 mb included)

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- background playback in other programs
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- fully featured Windows interface
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Roland SCC1 card (for IBM) \$389

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FIG. 3: Demagnetizing heads and metal tape guides helps ensure that oxide gremlins won't mess with your master tape.

swabs are dangerous, because loose fibers can attach to the head and cause dropouts.

Open the top panel of the DAT deck (see Fig. 4) and keep a flashlight handy for spot illumination. Just like the procedure for analog recorders, clean the tape guides *and* the heads. Be sure to let the deck stand open for ten minutes to allow ventilation and drying of the cleaning solution.

MIXER MAINTENANCE

Keeping your mixer free of dust and dirt is critical, because noisy pots and faders can produce noisy master tapes. Use a damp cloth to clean dust from the board's surfaces, and wipe away the grease-pencil marks that labeled fader levels from previous mixes. Be careful not to let dust or grease pencil debris fall into the fader slots. Usually, the primary reason for noisy faders is all the human hair, dirt, and lunch crumbs that drop between the channel paths and faders. (Only those who enjoy dancing with tragedy should eat over their mixer.)

To check if your faders are "slimed," run a pure 1 kHz tone through each input module. While the tone is sounding, slide the fader up and down. Listen for crackles and pops. Be sure to do this test with a pure tone, as a conventional music program may disguise noises.

If you hear pops and crackles, a commercial contact cleaner (such as Blue Shield or Cramolin) should restore silence. However, don't just squirt the cleaner blindly into the fader. When you hear a noise, mark the fader level with a grease pencil. Then, peek inside the fader slot to determine if the circuit board is mounted to the right, left, or

bottom of the input module. You must direct the contact cleaner towards the contacts of the circuit board to effect any improvement. Next, turn off the tone and slide the fader up and down a few times. Do a final check with the tone generator to make sure the fader is noiseless. If not, repeat the process. It may take a few squirts to completely clean the fader.

Sometimes hair or

crumbs attach themselves to the metal fader guide, and a blast of compressed air is needed to clear the obstruction (see Fig. 5). Cans of compressed air usually are available at electronics stores. Make sure the nozzle can fit into small places and that the chemical propellant is safe for use with electronic equipment.

Now use the 1 kHz tone to systematically check your board input

by input. Listen carefully for scratchy pan pots, aux sends, mute buttons, etc., and then make a list of all problem components.

While it may not be practical (or within your skills) to replace these parts yourself, it's a good practice to map out your console's "problem geography." For instance, if input five has a scratchy pan pot, you'll know to avoid it when returning a track that requires panning changes during mixdown. If you find a large number of bad pots, call a knowledgeable technician and get them replaced. Don't be lazy; any audible cracks and pops *will* become part of your finished mixes.

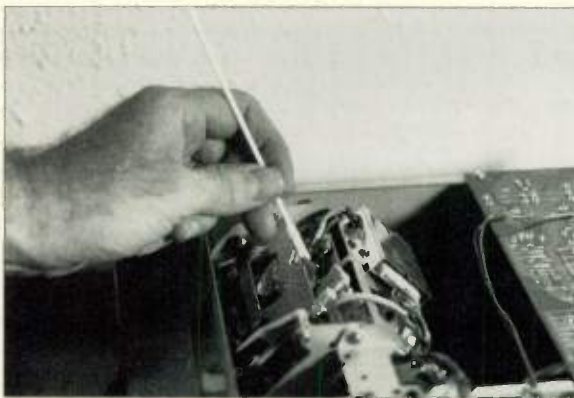


FIG. 4: A long-handled foam swab is recommended for cleaning a DAT recorder's rotary head.

MORE MAINTENANCE TIPS

- If your studio is in constant use, it's advisable to leave your mixer and power amp(s) on. When AC power is switched on, a spike occurs before the power settles down to its normal voltage. While most equipment deals with these spikes just fine, years of constant "ons and offs" can damage power supplies.

- Feedback loops are common in studio environments, and it only takes one mistake to turn an expensive speaker into stir-fry. If you want to protect your monitor speakers, put fuses on them. In-line fuses can be purchased at your local electronics store. Start with a fast-blow one-amp fuse hooked onto the positive side of your speaker. Find a comfortable monitoring level and then increase the volume to see where the

fuse blows. The higher the amperage of the fuse, the higher the volume it allows before self-destructing. Obviously, the fuse should blow long before the speaker shreds.

- To prevent surprises during important sessions, have an ohmmeter available to test cables for shorts. Be sure to label bad cables with red tape, so they don't get thrown back into the "good" pile. In addition, keep some assorted connectors and adapters on hand for cable repairs.

- Knowing the ins and outs of your mixing console is critical during troubleshooting, so keep a signal flow chart handy. Trying to trace mixer problems without this valuable tool is like cruising the Los Angeles freeway system without a map.

When you set out to unearth some strange and startling sounds, start with a tape that's truly out of this world.

That's the philosophy of Mark Mangini who, as the head of Weddington Productions, created the sound effects for major science-fiction thrillers such as *Star Trek*, *Gremlins* and *Poltergeist*, just to name a few.

Mark now relies on Sony Pro DAT

Plus tape for recording and archiving his one-of-a-kind sounds and hauntingly beautiful melodies.

"The low error rate and consistent reliability of Sony Pro DAT Plus is critical in our search to capture and preserve the unusual sounds used in fantasy and horror films," says Mangini.

People like Mark put Sony's engineers in the right spirit to

continually expand the boundaries of our digital audio tape technology. The proof is found in our new Pro DAT Plus.

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output in addition to a superior S/N ratio, while special binders and surface treatments help to achieve error free performance in any natural or supernatural environment.

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two-tape album case to protect your tapes from things that go bump in the night. And an erasure prevention tab to make sure you won't accidentally lose your "voices".

As Mark Mangini knows, a quality tape library is the lifeblood of any post sound company. He also knows that with new Sony Pro DAT Plus, life at Weddington Productions is a lot less scary.

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GETTING ALIGNED

Proper alignment of your tape deck is another important maintenance procedure, and one that few home recordists either understand or practice. Unfortunately, describing a complete alignment procedure would encompass an entire article (and it's not exactly a thrilling read). Instead, here's a quick test that can determine what shape your deck is in.

First, disable any noise reduction (dbx or Dolby) and record 30 seconds of a 1 kHz tone at "0" VU. Be sure to

use Input (or Record) mode. Repeat the procedure with 10 kHz and 100 Hz tones. Then, rewind the tape and put your deck into Repro (or Play) mode. If your deck is properly aligned, all three tones will replay at 0 VU, which is the same level you recorded them. Don't panic if 10 kHz is a little off; semi-pro decks often have a looser tolerance at higher frequencies. However, if all the tones come back completely out of whack, you should call in a technician to align your deck. If you want pristine masters, it's worth the expense.



PETER DIGGS

FIG. 5: A blast of compressed air often cleans grungy fader guides.

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TAPE TENDERNESS

Remember that the care and maintenance of your master tapes is as important as the care you give your equipment. Tape-based masters can last many years, if you take the time to properly store them.

Spool off important masters at normal play speed (or slow rewind, if available) so your hits aren't inadvertently shredded by a demonic full-speed rewind. Store all of your tapes "tails out" (backwards) to prevent print-through (ghost audio images that appear when unstable magnetic bits start vacationing at other tape locations), and secure down the end of the master with splicing tape. Also, you should label the boxes with the names of the songs, tape speed, type of noise reduction, recording date, artist, etc. Believe me, every bit of information comes in handy at one time or another. Lastly, never stack tapes on top of each other (stand them up like toy soldiers), and always make sure the storage area is cool and dry.

MINIMAL DOWNTIME

Good working habits and a bi-monthly routine of preventative maintenance helps your equipment deliver optimum performance. Knowing when you really do need a professional technician, and when you'd be wasting his or her time (and your money), is not an insignificant reward for delving into the maintenance mindset. And even more important, an ounce of preventative maintenance can be worth a pound of your money.

Neal Brighton has saved so many home and professional studios from maintenance melt-down that he's thinking of starting an audio ambulance service. Until then, he engineers and produces at the sonically pristine Sound & Vision recording complex.



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You can layer, split, and cross fade up to four voices at once. Eight control sliders let you modify any parameter you like. It's easy and it's quick, hence the name.

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Would you like more information? Call us. Obediently, we'll send you our brochure.

1-800-952-0001, extension 100. **The SY85**



Robert Cardin

Editors'

Choice

The EM editors' 20 favorite products released during the last year.

Like most people, I'm a sucker for lists. Knowing things like where the top ten highest-paid executives vacation during rainy months in leap years just keeps me going. I'm also a sucker for new products. I love hounding manufacturers about upcoming releases, getting the lowdown on the latest techno gizmo, and keeping track of who's doing what.

The rest of the editorial staff shares my passion for new products. As a group, we're constantly on the lookout for great new instruments, programs, or other gadgets you can use to make better music. Along the way, we inevitably discover personal favorites: products that really excite us because they fulfill a personal need, represent an impressive technological breakthrough, or just seem cool. ►

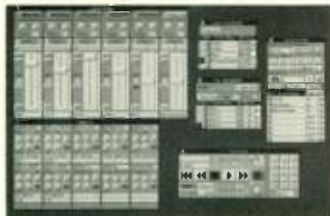
This year we decided to compile a list of these favorites, with each of EM's four editors contributing five products. The only stipulation was that the product had to be shipped between October 1, 1991 and September 30, 1992 (to match our issue calendar year). Inevitably there was discussion on which products would be chosen and who would cover them. Several of us wanted to write up the Kurzweil K2000 and Alesis ADAT, for example, but in the end we decided to each cover different products.

This is not the definitive list of the most important or best products of the year; it's just four guys' opinions on what was cool. Due to space limitations, we are unable to cover many of the great products that came out in 1992. With that caveat in mind, here's what EM editors liked in 1992 and why. Enjoy.—Bob O'Donnell, Editor

Bob O'Donnell
Editor

Digidesign Pro Tools Multitrack Hard-Disk Recording System (\$5,995)

Reviewed April 1992



Yes, the initial release had a lot of problems, and some people are still complaining about it, but Digidesign ventured into the little-explored territory of lower-cost multitrack hard-disk recording and came up with a winner. The Mac-based Pro Tools offers the kind of recording and editing capabilities engineers used to only dream of. It also stands as a testament to the power of today's personal computers. With these kind of developments happening on low-cost machines, the recent demise of Synclavier manufacturer New England Digital becomes much less surprising. Digidesign recently announced its 256-channel TDM Digital Audio Bus, giving Pro Tools a stronger foundation for the future.

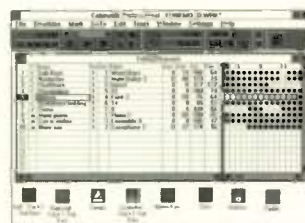
Microsoft Windows 3.1 Operating System (\$149)



Operating systems aren't really that exciting (unless you're a pro-peller-head, like me). But when the world's largest software company officially recognizes MIDI and wholeheartedly supports it, that's big news. For users, 3.1 offers standard MIDI interface and sound-card drivers, which give PCs the convenience Mac, ST, and Amiga owners have enjoyed for years. For developers, *Windows 3.1* means millions of potential buyers are within striking range. Version 3.1 also initiated an enormous growth curve in sound cards; a development that promises to have plenty of positive long-term impact on electronic musicians.

Steinberg Cubase Audio 1.01 MIDI/Digital Audio Sequencer (\$795)

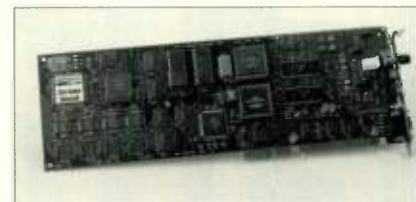
Reviewed December 1992



Programs that combine MIDI sequencing and digital audio recording are the future, but reaching that point hasn't been easy. Opcode paved the way with their groundbreaking *Studio Vision*. Now that the second generation of Mac programs are coming out, they've got some competition. What's nice about *Cubase Audio* is the way it organizes MIDI and audio into easily rearranged parts. All the editing power of a full-blown MIDI sequencer, built-in notation, and clever audio editing functions make this a serious new contender.

Turtle Beach MultiSound Synthesizer/Hard-Disk Recording System (\$995)

Reviewed August 1992



Putting synthesizers on computer plug-in cards always made a lot of sense to me because of the convenience and cost savings (no extra power supplies, etc.). Plus, it gives you an editing interface better than anything we'll ever see on a standard synth. So when Turtle Beach put a popular synth like the Proteus on a PC card, added 16-bit stereo hard-disk recording capability, threw in the necessary software, and put it out at the same price as the Proteus by itself, well, I wanted to know when a Mac version would become available.

Twelve Tone Systems Cakewalk Pro for Windows Sequencer (\$349)



As a decided Mac bigot, I was taking all this *Windows* stuff with a grain of salt. I know Passport had been paving the way with *Master Tracks Pro* for several years, but when I saw a demo of this program at last January's NAMM show, I sensed the winds of change. Here, in one moderately priced, easy-to-use, graphically oriented package was sophisticated sequencing, basic notation, and digital audio playback. On top of that, if something was missing, you could add your own features via its built-in programming language. Suddenly, PCs didn't seem so bad after all. (Besides, it validated the notion of art as icon with Edward Munch's "The Scream.")



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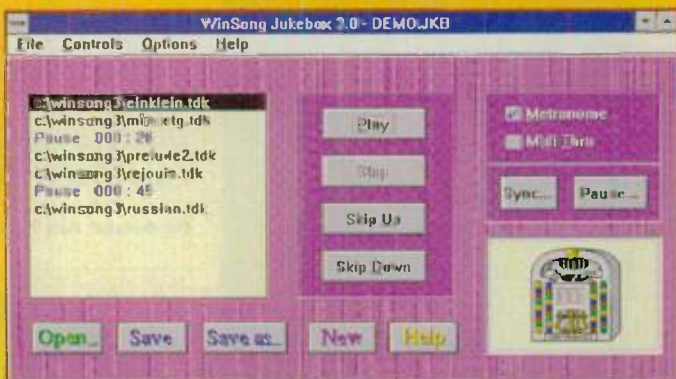
Composer

Look at how easy-to-use and fun WinSong is. Just push the button for the musical symbol you want, and drag-and-drop that symbol on the staff. As WinSong plays back your song, the musical notation horizontally scrolls on the computer display. You see the notes as they are being played.



Sequencer

The Tape Deck is a full-featured 64 track MIDI Sequencer and a complete recording studio. As you can see, arranging music with WinSong is a guided path. You don't have to memorize musical or computer commands. WinSong will not let you make mistakes.



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Just tell the Juke Box what songs - from one to 100, from Jingle Bells to Bach - you want to hear, and it plays your songs for you.



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Editors' Choice

Steve Oppenheimer
Products Editor

*Big Briar Theremin (\$1,800
and up; MIDI option \$275)*



It's hard not to get excited about a Theremin with optional MIDI by veteran synth- and Theremin-maker Bob Moog. Similar in appearance and function to the beautiful 1930s-era RCA Theremins, the new units substitute a digitally controlled, analog synth module (with a 1V/octave pitch-control output) for the traditional tube-based audio circuits. The new Theremin is played in the traditional manner, with a vertical pitch-control antenna and a horizontal volume-control antenna. The MIDI'ed instrument can transmit and receive Note, Pitch Bend, Volume, and Local Control messages.

*DigiTech VHM-5 The Vocalist
Pitch Shifter (\$849)*

Reviewed April 1992



I have a good vocal range, but it didn't extend to *basso profundo* or glass-breaking highs until I sang through this outstanding pitch-shifter/harmony device. The Vocalist generates up to four harmony notes from a mono-

phonic input. You can program it to provide anything from straight parallel harmonies, to harmony notes within a given scale, within a chord, or to match incoming MIDI notes. It can even "sing" a separate custom chord for each note you sing. The Vocalist produces clean, natural-sounding harmonies; can add vibrato, portamento, and detuning; and has a decent MIDI implementation.

*Ensoniq KS-32 Synthesizer
(\$2,195)*

Reviewed November 1992



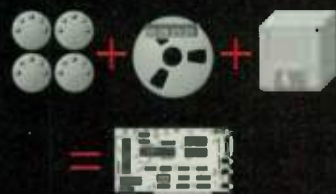
Despite my substantial home setup, I often sneak into the Mix/EM demo studio and abscond with the KS-32. It uses the familiar SQ-series synthesis engine and offers 3 MB of mostly quality sounds. The acoustic pianos are poor, but the pedal steel is terrific, and you'll find some fine basses and electric pianos. The effects processor is so-so, and the sequencer is quite good. But it was the KS-32's excellent 76-key weighted keyboard and friendly user interface that won me over.

*Mark of the Unicorn MIDI Time
Piece II MIDI Patch
Bay/Processor (\$595)*



I loved the original MTP, but it could only be programmed from the computer. If I was on a gig or session without my Mac and wanted to reconfigure, no dice. The new MTP II has complete front-panel control, with a backlit display. Like its predecessor, it includes a Mac or PC interface with an 8 x 8 MIDI patch bay that offers matrix merging and routing and independent MIDI I/O ports. Unlike the original, the MTP II includes a hardware panic button and an internal power supply.

PC MIDI For More



Get the most out of your IBM MIDI system with the industry standard professional interface, the MQX-32M. Outstanding features include dual MIDI ports, SMPTE sync, Windows driver and full MPU-401 compatibility for software support.

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Editors' Choice

Opcode Studio 5 MIDI Patch Bay/Processor with OMS (\$1,295)

Reviewed March 1992



The Studio 5 radically improved my MIDI world. It forced me to treat my entire setup as one integrated instrument, controlled via *Opcode MIDI System* software. The features are great: a Mac interface with 15 x 15 MIDI patch bay (240 channels), SMPTE time-code generator/reader, and a ton of processing. You can route, zone, transpose, and channelize incoming data; remap and scale controllers; send customized sequences of patch changes, volume levels, and All Note Off messages at the beginning and end of each patch change; and define "virtual" con-

trollers and instruments that have pre-programmed custom processing. *Warning: The Studio 5 causes technological dependency.*

Michael Molenda
Managing Editor

AKG Tri-Power Vocal Microphones (\$189-\$319)

Reviewed September 1992



Okay, it's *my* problem. But when you own a professional recording studio, you get spoiled by warm vocal timbres. And, of course, all of that sonic

beauty goes into the dumpster when you play live. In the real world, decaying clubs with pooped-out P.A.s transform silky baritones into Tiny Tims and tenors into screeching Banshees.

Well, AKG's Tri-Power vocal mics helped me beat the (club) system. These are truly studio-quality mics for the stage. I was awed by their great tone, rugged construction, and low handling noise. An added perk is excellent off-axis rejection: Hecklers won't hear tell-tale rushes of air before you bean them with your microphone.

Alesis ADAT 8-Track Digital Audio Recorder (\$3,995)

Reviewed October 1992



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Walter Murch—Film Editor and Music Mixer, LucasArts/Skywalker Sound

"If the phrase *noise floor* is in your vocabulary and you would prefer that it was not, get a Behringer single ended noise reduction unit to the top of your *got to have one* list." **Robert Scovill—Sound Engineer/Mixer, Rush/Def Leppard**

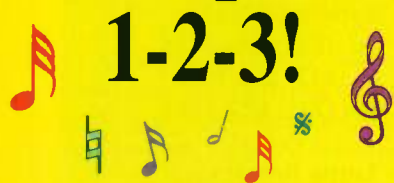
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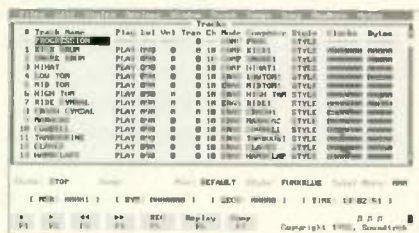
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Editors' Choice

Soundtrek The Jammer Auto-Accompaniment Program (\$175)

Reviewed October 1992



For those of us with less than adequate rhythm-section skills, automatic accompaniment software is a godsend for quick demos. Soundtrek's *The Jammer* for PC-compatibles is an excellent example of this genre. *The Jammer* generates drum, bass, and rhythm parts in a wide variety of styles. It also generates a chord progression if you're fresh out of ideas, and includes a rudimentary sequencer for your own parts. What makes this program different is the fine degree of control available to the user. *The Jammer* lets you take your computer where no computer has gone before.

SynchroVoice MidiVox Pitch-to-MIDI Converter (\$1,595)

Reviewed July 1992



Pitch-to-MIDI converters have always been problematic for singers; audible delays and wrong notes abound due to complicated processing and ambient noise reaching the microphone. SynchroVoice's *MidiVox* solves many of these problems by drawing on their experience in biomedical instrumentation and vocal analysis equipment. The *MidiVox* uses a "biosensor" neckband that positions three electrode sensors near the user's voice box or larynx. The vibrations of the vocal folds are detected electrically, which

allows the rack-mount interface unit to determine the frequency of the sung note after the first cycle of the waveform. This reduces delays, and the biosensor eliminates ambient noise pollution. All in all, an ingenious solution to a tricky problem.

Yamaha TG100 Tone Module (\$449)



As multimedia and "consumer" applications of electronic music become more common, products like Yamaha's TG100 will become increasingly important. This half-rack sound module conforms to the General MIDI program map and channel assignments, which greatly simplifies the

▼

**The Jammer lets
you take your
computer where
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gone before.**

setup and configuration required to play GM sequence files. With 28-note polyphony and 16-part multitimbral capability, the TG100 includes 192 sampled instrumental sounds and eight drum kits. Although these specs are not particularly unusual, the TG100 is unique in one respect: It incorporates a MIDI interface for Macintosh and PC-compatible computers. This makes it ideal for first-time computer musicians and laptop-based MIDI systems.

The past year was a good one for the electronic music industry. The overall attitude at trade shows and other events seemed markedly better than in previous years, fostered in part by the appearance of many excellent products. Hopefully, this trend will continue in 1993, bringing even better products to a hungry market. ☺

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DO ♦ IT YOURSELF

Build the EM Headphone Distribution Amp

This simple circuit rivals commercial headphone amps.

By Jules Ryckebush

Some time ago, a friend asked me if I could build a multiple-headphone amplifier for him. I remembered a circuit idea I wanted to try, so I said yes. After haggling over my payment in beer and pizza, we finally agreed on a suitable quantity and phoned for delivery.

The more I thought about it, the more I realized how much I could use a headphone distribution amp. I do a lot of recording in my home and in friends' homes and apartments. Usually, we have to keep it quiet to avoid disturbing the neighbors, but we still need to monitor previously recorded tracks. In past sessions, there never seemed to be enough headphone jacks available. It was time to put my circuit idea to the test. The result is the **EM Headphone Distribution Amplifier**.

HOW IT WORKS

The circuit is simple (see Fig. 1). It has six identical amplifier stages connected to a common input. With two jacks plugged in, the circuit runs in stereo; with only one jack plugged into the right input, a mono signal feeds both

the right and left output channels.

Let's look at one of the amplifier stages, Level 1. A dual 100 k Ω potentiometer (R1) functions as a variable voltage divider and attenuator for the incoming audio signal. The signal then goes to the amplifier stage composed of an NE5532 dual operational amplifier (U1) and a few resistors. Each IC includes two separate op amps; one is

used for the left channel and the other for the right channel.

The op amps are configured as inverting amplifiers; their gains are determined by the ratio of the feedback resistors (R3 and R6, 100 k Ω) to the input resistors (R2 and R5, 10 k Ω). This results in a gain of ten. The NE5532 is capable of supplying enough current to drive a 10 VRMS signal into 600 Ω . This translates to a power output of 166 mW, or about eight times the power of a Sony Walkman. A 75 Ω resistor (R4 and R7) at the output of the amplifier stage serves as a current-limiting resistor to prevent damage to the op amp, while still providing plenty of voltage to drive headphones down to 8 Ω .

Because separate amplifiers are used, headphones with different impedances can be used without any problems. If you try to connect mismatched headphones to a single amplifier in parallel, the ones with the lowest impedance draw most of the current and are therefore the loudest. The **EM Headphone Amp** will drive six sets of 8 Ω to 600 Ω headphones at the same time.

Now that the amplifiers are covered, let's look at the system as a whole. We must make sure that putting six amplifiers in parallel won't overload the audio source. In other words, we must make sure the input impedance isn't too low. With all volume controls at their maximum, there are six 100 k Ω resistors and six 10 k Ω resistors, in parallel, per channel. (Remember, the op-amp inverting input acts as a virtual ground.) This works out to an input impedance of a little more than 1,500 Ω .





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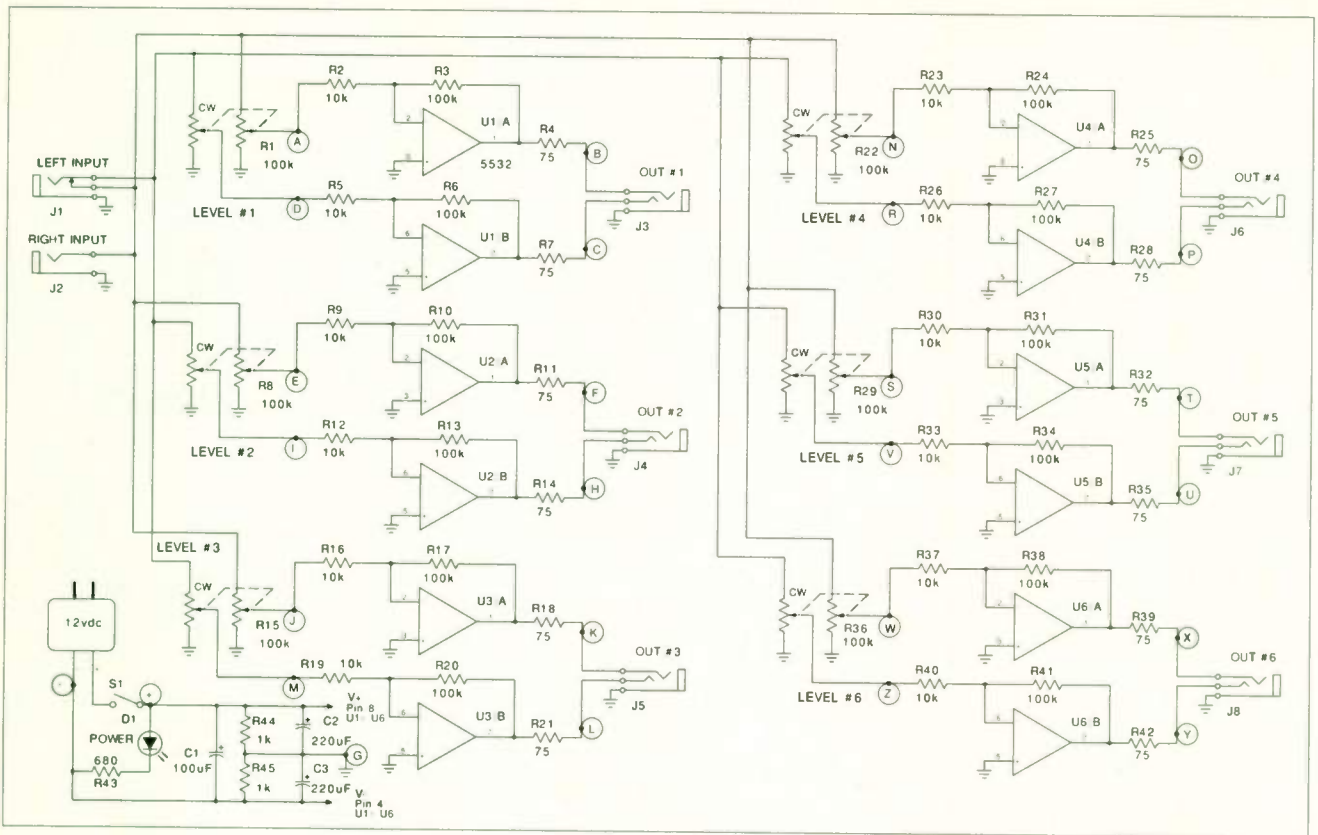


FIG. 1: The schematic for the EM Headphone Distribution Amp is simple, but provides a superior product.

in stereo mode. In mono mode, this figure drops by half to 75Ω. This is fine; everything that provides a line-level output (e.g., CD players, tape decks, and mixers) can drive the EM Headphone Distribution Amp with no problem.

Your final consideration should be the power supply. The op amps are designed for a split supply, but I went with a single supply for simplicity. The two 1 kΩ resistors (R44 and R45) and 220 µF capacitors (C2 and C3) form a ±6V supply that runs the headphone amp just fine. For added headroom, or if you already have a split power supply available, you can use up to ±18V.

CONSTRUCTION

I built my prototype on a Radio Shack experimenter's PC board. The circuit is very flexible; if you want only two or four outputs, build the device accordingly. I wouldn't build more than eight without a buffer stage, though. Six outputs should cover those unexpected moments when everyone wants to listen. (See Figs. 2a and b for the layout of the final printed-circuit board.)

PAiA Electronics (3200 Teakwood Lane, Edmond, OK 73013; tel. [405]

340-6300; fax [405] 340-6378) offers a kit containing everything you need, including a nice case with real walnut end pieces. This is one project you don't want to rack-mount, as its most useful position is in the middle of the studio or stage.

Take care during assembly; use a low-

power soldering iron. The key to successful completion is attention to detail and double-checking your work. Aside from the op amps, the only other polarity-sensitive components are the power-supply capacitors. They are electrolytic and will explode with a loud bang if you apply power after connecting them

PARTS LIST

Capacitors

- C1 100 µF/16V electrolytic capacitor
- C2, C3 220 µF/10V electrolytic capacitor

Potentiometers

- R1, R8, R15, R22, R29, R36 100 kΩ dual potentiometer

Resistors (1/4W, 5%)

- R2, R5, R9, R12, R16, R19 10 kΩ
- R23, R26, R30, R33, R37, R40 10 kΩ
- R3, R6, R10, R13, R17, R20 100 kΩ
- R24, R27, R31, R34, R38, R41 100 kΩ
- R4, R7, R11, R14, R18, R21 75Ω
- R25, R28, R32, R35, R39, R42 75Ω
- R43 680Ω
- R44, R45 1 kΩ

Semiconductors

- U1, U2, U3, U4, U5, U6 NE5532 dual low-noise op amp

Connectors

- J1 1/4-inch C.C. phone jack
- J2 1/4-inch O.C. phone jack
- J3, J4, J5 1/4-inch stereo phone jacks
- J6, J7, J8 1/4-inch stereo phone jacks

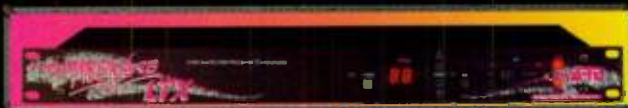
Other Components

- S1 SPST slide switch
- D1 Red LED
- P1 12 VDC 100 mA power supply
- Circuit board
- Case
- Knobs
- Wire
- Grommet

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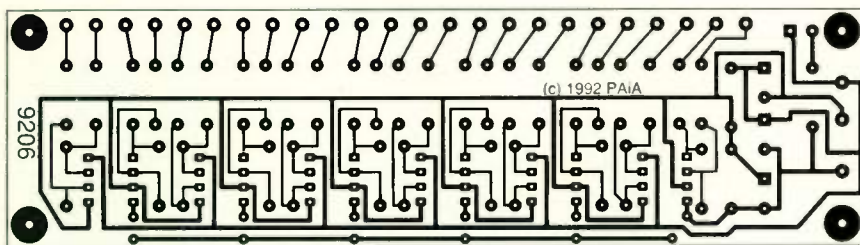


FIG. 2a: The PC board circuit traces.

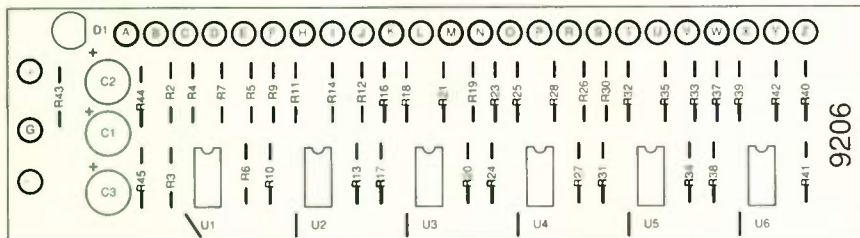


FIG. 2b: The PC board component layout.

in reverse. There is some potential for injury or fire, so be careful.

Care also is advised when wiring the input-level potentiometers. Hold one in front of you, with the control turned down, and notice which terminal the wiper is touching; this is the terminal

you should connect to ground. The control will work backward if you reverse the outer terminal connections.

After you are finished connecting the parts, look over your work. Check for solder bridges on the PC board. Does everything look good? Plug it in and

turn it on. Does the LED light up? If so, it must work. Connect an audio source (CD player etc.) and a set of headphones. Hear anything? Good. Check all the channels, volume controls, and the mono/stereo mode. If you made a mistake, it should be simple to correct.

SUMMARY

The EM Headphone Distribution Amplifier is an extremely useful, high-quality device. It definitely is one of those projects that is cheaper to build than buy, yielding a superior product to boot. My friend compared this homebrew product to available commercial units, and it passed with flying colors, providing more volume, less distortion, more outputs, and no noise. If you have been looking for extra headphone jacks in the studio or on stage only to come up empty-handed, the EM Headphone Distribution Amplifier is for you.

Jules Ryckebush teaches nuclear science at the Naval Nuclear Power School. He freelances as an analog design engineer and sound engineer.



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Musicians' User's Groups

By Mary Cosola

*User's groups let
lost, lonely, and
anguished musicians
know they're
not alone.*



As the electronic music industry continues to mushroom, it is difficult to keep up with new technology, let alone all the upgrades and add-ons for existing products. Just as magazines like *EM* help sort out the many choices and problems facing today's musicians, user's groups give them product support, a forum for the exchange of ideas, and a chance for commiseration with those who really understand.

Music user's groups are as diverse as the musicians they serve. There are local groups, newsletters, manufacturer-specific groups, and international bulletin board services. Despite their varied approaches, these groups strive to fulfill the same need: the continuing education of the electronic musician.

UP CLOSE AND PERSONAL

The rarest type of user's group is the kind that meets in person. MuSIG (Music Special Interest Group) is one such organization. Founded in 1987 as part of the Stanford Macintosh User's Group (SMUG), MuSIG came into its own in 1989. Glenn Spencer, who teaches music both at Stanford University and independently, runs the

group. "I started the group when I bought my Mac and didn't know what to do with it. I thought that all the other musicians buying Macs needed help too," says Spencer.

MuSIG meets once a month at various San Francisco Bay Area locales. Explains Spencer, "We don't have a clubhouse of our own; we don't need one. We have access to wonderfully interesting speakers close by." In the past year, MuSIG has met at Ibis Software, Digital F/X, CCRMA, and Passport Designs. At the monthly meeting, a representative from the host company discusses new products and gives demonstrations. The group occasionally has musical performances at their meetings. In addition, it publishes a quarterly newsletter. One page of the newsletter lists MuSIG volunteers, their phone numbers, instruments played, and area of expertise. MuSIG members can call these volunteers to get advice or to get together to play music. The list includes a remarkable range of specialties, from specific software notation programs to legal matters.

MANUFACTURING HELP

In addition to helping each other,

musicians can get advice from manufacturer-specific groups. Publications such as *Transoniq Hacker* and the *Roland User's Group* magazine reach thousands of musicians world wide.

Transoniq Hacker, which is published monthly and boasts 3,500 readers in 26 countries, is dedicated to reviewing, discussing, and troubleshooting Ensoniq products, as well as third-party support for Ensoniq products. The magazine is not affiliated with Ensoniq in any way.

Jane Talisman launched the publication in 1984 after she bought an Ensoniq Mirage. Like MuSIG's Spencer, she sensed a looming market for product support. She believed Mirage was going to be huge, as would the business of third-party products for the synthesizer.

Other manufacturer-specific publications have not fared as well as the *Hacker*. One reason is the sheer amount of work required to put out a publication. The writing, layout, research, and time involved is staggering. "We haven't had a vacation in six years," says Talisman. "But that's not a complaint. We'd rather spend our time doing this." Both Talisman and her

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husband/publisher Eric Geislinger have full-time jobs in addition to producing *Transoniq Hacker*.

Roland Corporation publishes its own magazine, *Roland User's Group (RUG)*. Established in 1982, *RUG* is published three times a year and is free to Roland users. This year only two editions were published, but a user's video was offered to readers for a small charge.

The magazine usually runs 70 to 75 pages and makes available a variety of information on Roland and Roland-related products. Written by Roland employees, *RUG* has articles on new and future products, a column on understanding technology, and a user's "Question and Answer" (Q & A) section. "We try to run the questions that will help the most users," says Kellie Whitmire, who does advertising and public relations at Roland. "We consider that section a form of technical support."

A regular *RUG* feature is the Power Shopping Directory, which lists third-party products. Says Larry Garcia, senior product specialist, "Even though a listing in the directory is free, we try to screen products before they are included. We want to know that a product is decent and the company is reputable, because our name is on the magazine."

MIDI MONTHLIES

Musicians find more help in the form of general user's group newsletters. Rather than focusing on one manufacturer, these newsletters are good sources of information on a variety of topics.

Gordon G. Gebert founded the *Mirage User's Group (MUG)* in 1985 for pretty much the same reasons that *Talisman* started *Transoniq Hacker*. Gebert was hot on the *Mirage* and wanted to trade samples with other *Mirage*-heads. He ran an ad in *Transoniq Hacker* looking to trade samples and got 500 responses in the first year. He decided to organize a user's group so those 500 people could reach each other.

As the electronic music market grew, Gebert received requests from other musicians who wanted a wider variety of information and samples. So after three years of *Mirage*-only support, the M in *MUG* was changed to stand for *MIDI*. The word "International" popped in

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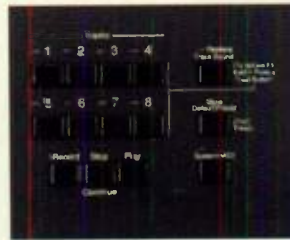
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● FROM THE TOP

front of the name as musicians around the world joined the group. MUG now has 3,000 active members all over the globe.

Members receive MUG's 16-page monthly newsletter. It features a few pages of general electronic music articles, two pages of technical Q & A, reviews of products, and advertising. Gebert also sends out a catalog of sounds, samples, and sequences. A 24-hour hotline for those in need of immediate technical assistance is available.

Even though Gebert tries to answer as many phone and newsletter questions as he can, he sometimes has to put



At a MuSIG meeting, Dr. Marina Bosi demonstrates her *Quadrifoglio* (real-time spatial control of 2-dimensional sound).

members in touch with other people who can help them. Gebert readily admits that he's not an expert on

MUSICIANS' USER'S GROUPS

This is by no means a complete list of user's groups, but it should get you started. The group type is designated in parentheses after the name of the group.

America Online (BBS; music SIG)
8619 Westwood Center Dr.
Vienna, VA 22182
tel. (800) 227-6364 (voice)

CompuServe (BBS; music conference)
PO Box 20212
Columbus, OH 43220-9922
tel. (800) 848-8199 (voice)
tel. (800) 368-3343 (data & voice)
Canadian callers can use both 800 numbers.

GENie (BBS; MIDI and music conferences)
401 NW Washington St.
Rockville, MD 20849
tel. (800) 638-8369 (data)
tel. (800) 638-9636 (voice)
tel. (800) 387-8330 (Canada voice)

International MIDI User's Group (MUG) (Newsletter, hotline)
PO Box 615
Yonkers, NY 10703-0615
tel. (212) 465-3430 (24-hour hotline)
tel. (914) 667-4362 (voice)

MIDILink/Sound Management (BBS)
PO Box 396
Mundelein, IL 60060
tel. (708) 949-MIDI (data)

Music Quest (Manufacturer BBS)
1700 Alma Dr., Suite 330
Plano, TX 75075
tel. (214) 881-7408 (voice)
tel. (214) 881-7311 (data)

MuSIG (Meetings)
1120 College Ave.
Palo Alto, CA 94306
tel. (415) 858-1493

PAN (BBS)
PO Box 162
Skippack, PA 19474
tel. (215) 584-0300 (voice)
tel. (617) 576-0862 (1,200 baud)
tel. (617) 576-2981 (2,400 baud)

Tranoniq Hacker (Ensoniq magazine)
1402 SW Upland Dr.
Portland, OR 97221
tel. (503) 227-6848

The WELL (BBS; music SIG)
27 Gate Five Rd.
Sausalito, CA 94965
tel. (415) 332-4335 (voice)
tel. (415) 332-1606 (1,200 baud)
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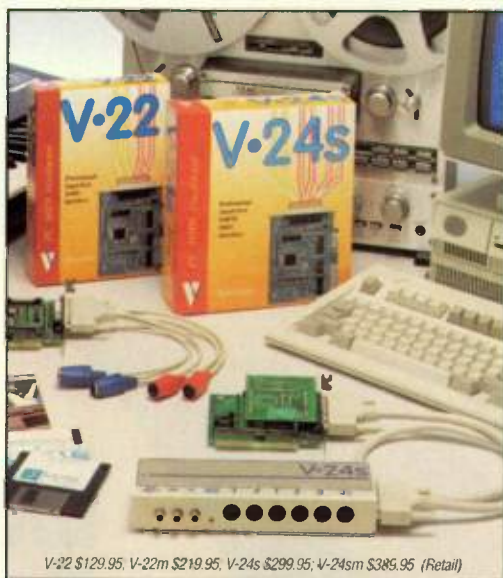
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● FROM THE TOP

everything, "I'm your average musician. I'm not as technical as some of MUG's members. That's why I started this in the first place. I'm a user who understands what other musicians go through, and I know they need to get answers somewhere." MUG members have pestered Gebert for a bulletin board service. He's planning one soon, so members will have a way to contact each other directly.

Like others who have started their own user's groups, MUG is a labor of love for Gebert. Because he's a working musician who spends much of his time in the studio and on the road, consistently publishing newsletters and catalogs can be a real chore. Says Gebert, "It's not really profitable. No one starts a user's group hoping to become a millionaire."

BBS BRIGADE

A bulletin-board service (BBS) is the most pervasive way for musicians to communicate and help each other. Users usually can log on to a BBS 24 hours a day, seven days a week, drop a question or comment online, and check back in a day or so for a response. BBSs range in type from low-

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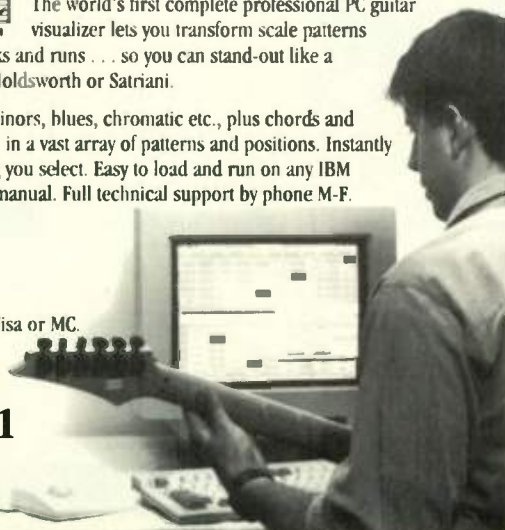
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These groups were started by musicians who needed help and had nowhere to turn.

key, home-spun affairs, to international, multi-forum hubs of information. (For more on electronic bulletin board systems, see "Going Online," in the November 1990 EM.)

Dave Nosek of Sound Management in Illinois runs the MIDILink Network. A friend of Nosek's, Chris Bosshardt, ran two, linked BBSs (one in Washington state and one in Chicago). When Bosshardt moved from Chicago to Los Angeles, he entrusted the care of the BBS to Nosek, who turned it into a huge network of bulletin boards from around the country with 55,000 users.

In addition to general computer, music, and MIDI conferences, MIDILink has several manufacturer

forums. Users can get online technical support from manufacturers directly. Companies participating in these forums include Kurzweil, Voyetra, Temporal Acuity Products, Mackie Designs, KEY Electronics, and others.

For Nosek, the key to MIDILink's success is the universal hunger for information in an often mystifying field. "There are so many different MIDI and recording studio products, it boggles the mind. The sooner musicians learn more about the products they are using, the sooner they can use them for what they originally bought them for, to be creative," says Nosek.

There's no fee for using the MIDILink Network, but users have access to over 43,000 files (sequences, patches, and sounds) that can be downloaded for a small charge. Users can also get the number of local BBSs in order to call them directly.

The Performing Artists Network (PAN) is another valuable online service. Like MIDILink, PAN has over a dozen different forums, or SIGs (Special Interest Groups). Through these SIGs, users can communicate with manufacturers, other users, and publications, including EM. (EM subscribers can get a free PAN membership. For details, send a self-addressed, stamped envelope to EM Online, 6400 Hollis St., #12, Emeryville, CA 94608.)

Founded in 1981 by Perry Leopold, PAN started as a self-help group for self-managed musicians. Leopold had toured incessantly for a few years and was, in his words, "burnt to a crisp." Wanting to take a rest but still have income, he wrote a book entitled *How to Book Your Act*. Soon after the book was published, readers wrote to him looking for help with their music careers. Leopold didn't want to become an advice columnist, so he printed a list of everyone who bought the book, and he mailed it to everyone on the list, encouraging them to help each other. The list became a newsletter and the number of members grew. PAN went online in 1983, and now it boasts 3,000 members world wide.

Starting in the fall of 1992, PAN members can meet each other in person. In addition to its yearly meeting at the NAMM show, several PAN users have volunteered to set up local meetings. The cities set for meetings so far include Los Angeles, Sacramento, Columbus (Ohio), Philadelphia, and

New York City. The NYC group plans to meet at a local nightclub for a PAN open-mike night. Other cities will be added if members show interest.

Leopold says these meetings help emphasize that PAN is a network for performers, not programmers, "It's not just a computer network. In fact, it's not about computers at all. My thought in starting this was, 'Look, we're all in the same boat. Let's help each other.'"


AND IN THE END


Leopold's comment rings true for all

user's groups. All of these organizations were started by musicians who either needed help and had nowhere to turn, or saw an information gap that needed to be filled. And even with all these options, if you still can't get the help you need, just start a group of your own because you're probably not alone.

EM editorial assistant **Mary Cosola**, like Groucho Marx, would never belong to any group that would have her as a member.

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Musicians as Programmers

By Michael Drapkin

Musicians are recognized as a special talent pool in the computer industry.



There's a story floating around the computer industry that during the early days of computers when programmers were scarce, IBM preferred to recruit and train programmers from two different groups: musicians and accountants. This preference made sense at the time; people from both groups were accustomed to performing tasks requiring sequential processing. Musicians played a piece from beginning to end, and accountants added up long columns of numbers from top to bottom (spreadsheet programs hadn't been invented yet).

When I started programming commercially, I was concerned that managers in the business world would look unfavorably upon my music background. I put the University of Rochester on my résumé instead of the Eastman School of Music. Much to my surprise, I learned that the computer industry in general regards a musical background as an asset. Today, managers frequently exclaim, "I see you got a degree in music." My standard reply is, "Yes, I'm a renegade musician." They usually nod in approval and acceptance.

NATURAL-BORN PROGRAMMERS

Musicians seem to have a natural talent for programming computers. Both skills deal with abstract concepts. In addition, musicians and programmers conceptualize their media in a hierarchical organization. When musicians think about Beethoven's Fifth Symphony, they see it as a singular work that is divided into different movements, each of which is further divided into sections, phrases, bars, and single notes.

Programmers think about their programs in a similar manner. Software certainly is hierarchical, starting at the top with a system such as "Accounting." This system is divided by function, such as payables, receivables, G/L, etc. Each function may be divided into subprograms such as data acquisition, which are further divided into loops, blocks, and lines of program code. The words in an individual line of program code correspond to the notes on a page of music. Programs even have repeats and first and second endings in the form of loops and cases.

Many people relate music to right-brain activity and computers to left-

brain activity. According to John Podzius, Ph.D., associate psychologist at the Harlem Valley Psychiatric Center in New York, "Reality is more complex. Musicians and programmers use both left and right cerebral hemispheres when doing their respective activities. Left-brain activities include language and ascribing meaning to symbols. The right brain involves itself in geometric spatial relationships and perception of rhythm. To say that one group or the other only uses one hemisphere is overly simplistic. In reality, bilateral brain activity is involved in the daily activities of both musicians and programmers. As a group, they probably use more of their brain power than people in other fields."

SOLITARY LIVES

Musicians and programmers also spend a lot of time working alone. Musicians spend a large portion of their time practicing or "woodshedding," while programmers work largely by themselves at their terminals writing programs. Even as part of a team, they still perform a solitary role. The musician plays an individual part within an ensemble, and the programmer devel-

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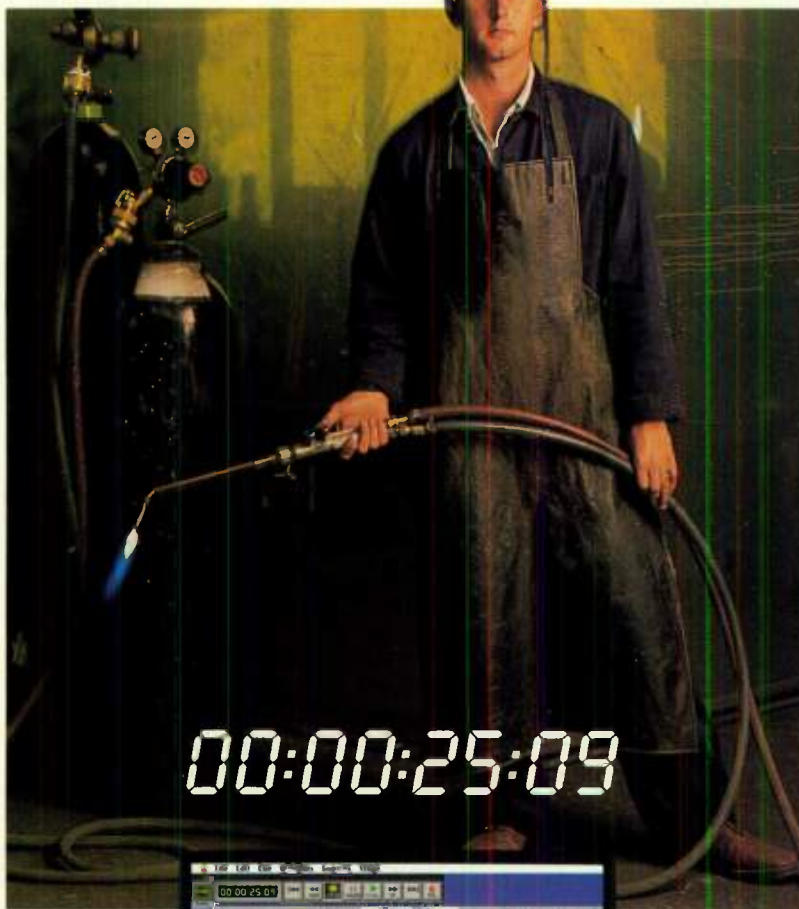
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● COMPUTER MUSICIAN

ops individual parts of a larger project.

"Musicians and programmers have a field-independent cognitive style," says Podzius. "Cognitive styles are individual differences among people in their thinking, problem solving, and approaches to social situations. A field-independent style is characterized by analytic and accurate thinking and by a preference for solitary, non-social activities in career pathways and interpersonal relations. The requirements of music and programming are quite consistent with the cognitive skills and intrinsic preferences of field-independent individuals. Analytical thinking, the capacity to perceive part/whole relationships, and comfort with solitary, self-reliant work are requirements for accomplishment in both fields."

Both musicians and programmers require a tremendous amount of self-discipline. Musicians who become programmers are frequently lauded for their abilities as self-starters who work independently and take initiative to get their jobs done.

THE ULTIMATE PERFORMER

The act of creating computer programs holds a particular fascination for many musicians. No matter how much a musician practices a passage, and no matter how many times he or she gets it right, there is no guarantee that it will go the way it should in the heat of a live performance. Although it's a liability, the element of risk is also a source of great excitement for the performer.

In programming, the computer is the ultimate obedient performance mach-

ine. For a musician, the ability to write a program and then watch the computer perform it unerringly is a strong source of satisfaction. As musician and

▼

Musicians seem to have a natural talent for programming computers.

former programmer Rick Kunis recalls, "With programming, I experienced feelings ranging from severe frustration all the way to the sublime feeling of seeing a program work." Once a program is built, the performance is repeated over and over again as it is fine-tuned until it's absolutely perfect. Programmers call this process debugging.

MUSICIAN TO PROGRAMMER

Although musicians have always constituted a segment of the computer programming community, the flight from performer to programmer reached its zenith in the early 1980s. While some musicians discovered that programming was better than waiting tables, there wasn't a wholesale migration until the Reagan administration began to cut support for the arts in America. This caused the lives of many struggling artists to go from marginal to untenable when funding for performances began to dry up.

"I made up my mind that freelance music was too uncertain. I wanted more choices about my lifestyle, and I wanted to have a certain income," says computer analyst and former musician Katherine Askew. Computer programming was a natural solution because, like the music business, the computer industry only cared about whether you could produce and not whether you had a college degree.

Musicians generally acquire programming skills in one of two ways. Many enroll in a program of coursework offered by a college, university, or trade school. The entire course of

study might span a couple of semesters to a couple of years. At the conclusion of their formal education, they begin to search for a full-time job.

Other musicians-turned-programmers are self-taught. They become fascinated by computers and end up buying some books and software and teaching themselves to program purely for the enjoyment of it. At some point they may or may not realize that they've stumbled upon a marketable, income-earning skill.

If you take the second route, I suggest learning Microsoft *QuickC Compiler* if you're a PC user, or Symantec *Think C* if you own a Mac. (A compiler is a piece of software that turns lines of programming code into computer programs.) C is the premier programming language used today, so pick up a copy of *The C Programming Language* by Kernighan and Ritchie, published by Prentice-Hall. This book is the C programmer's bible and a terrific reference. In addition, many tutorials are available on C programming. Finally, try to find a friend who knows C programming for those times when you get stuck.

GOING COLD TURKEY

Katherine Askew was a Juilliard graduate in viola when she decided to switch to computer programming. "I ran into a violinist going to the NYU computing program, and I heard that another guy already got a job, as well as a bass player from an orchestra I was in. I saw an opportunity to make something happen."

In 1983, Askew enrolled in the NYU Diploma Program in Programming and Technology for three semesters of night classes. She spent a lot of time in the computer lab "practicing." "I approached it like a musician, doing the equivalent of scales and etudes on the computer."

She also found that being a musician was helpful. "When I was nervous, I didn't show it, especially when I didn't know the 'piece' very well. Performing experience really helped me tremendously. I know how to communicate and present to an audience." She is currently working full time for a firm that develops computer imaging systems in Manhattan.

SELF-TAUGHT SKILLS

Rick Kunis did some arrangements on



John Podzius, Ph.D.

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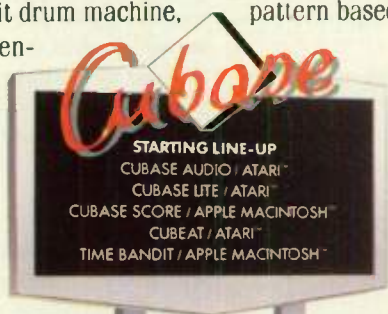
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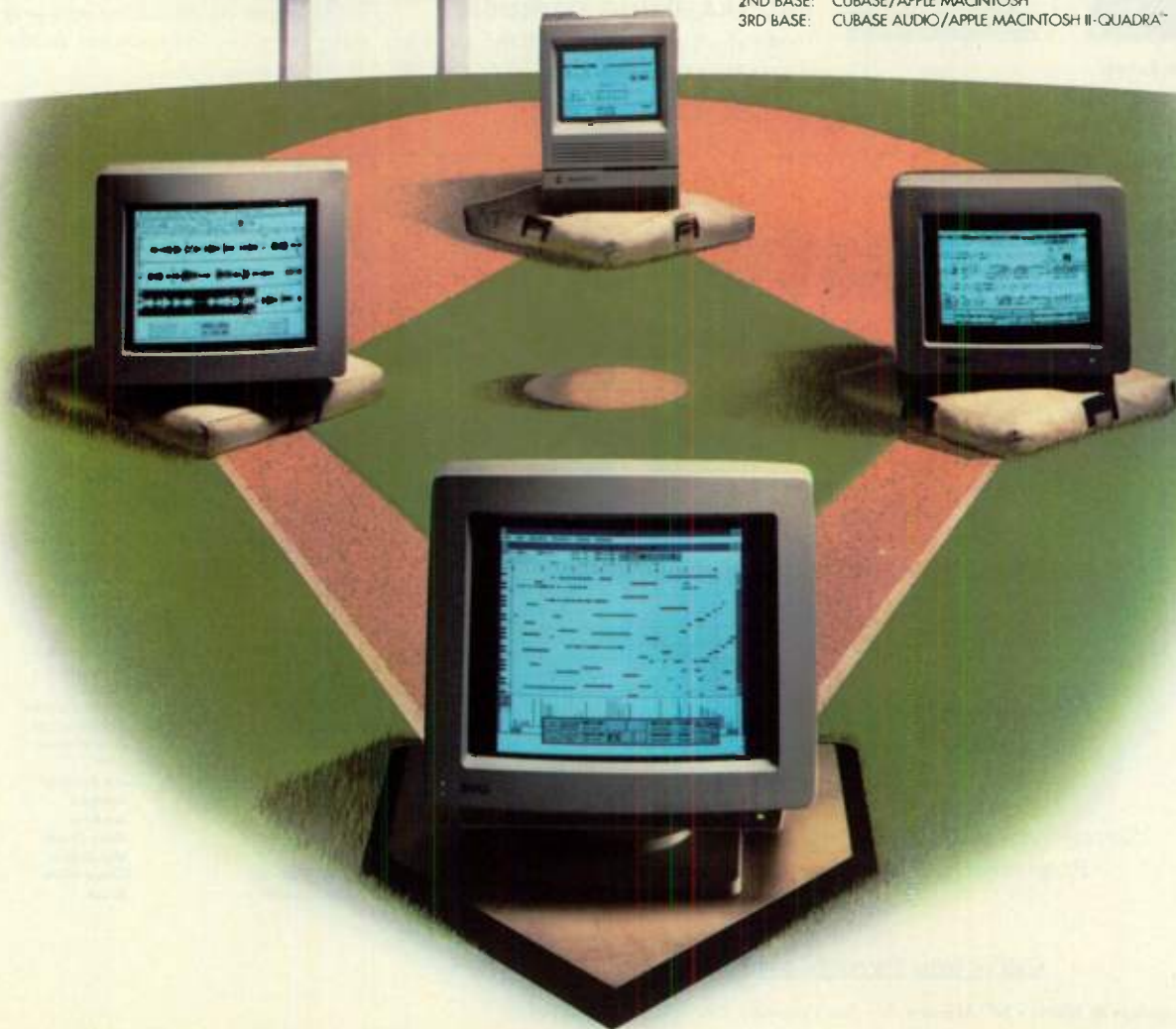


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● COMPUTER MUSICIAN

a few Beatles albums in the 1960s. He was producing and recording for CBS in the late 1970s when he got interested in word processing. "I took a five-week course in word processing and finished the curriculum in two weeks." He accomplished this by going to class



Katherine Askew

early to practice, and he also started learning programming from the textbook on his own.

While supervising a word-processing group at E.F. Hutton, he got involved with a group that was designing forms and learned the basics of programming on the job. Kunis eventually moved to a consulting job at Merrill-Lynch. In computer-industry parlance, consulting is the equivalent of freelance playing in music. However, the projects are measured in months instead of days, and the pay is significantly higher to woo programmers to temporary projects.

Kunis' skills as a pianist manifested themselves at school in unexpected ways. "They had a 'career day' for the industry to meet with students, during which a jury clocked my typing at an average of 130 words per minute." Obviously, the years of scales and exercises paid off in a big way.

PROGRAMMING TO MUSIC

Ironically, computers paved the way for Kunis to return to music. "A friend of

mine showed me MIDI, and I was floored. I started getting involved with music again through the electronic end of things," he explains. He got heavily involved with synths and MIDI, which ultimately led back into music on a full-time basis. He is currently working with composer Alan Menkin.

It is clear that programming and music share many common elements, including discipline as well as conceptual and cognitive skills. While it is safe to say that musicians often make great programmers, programmers don't necessarily make good musicians because music requires the innate talent of artistic and emotional expression. Nevertheless, the link between these two fields is a fascinating one that many electronic musicians may wish to explore further.

Michael Drapkin is a clarinetist and a computer programmer. He has performed with major symphonies and pays his mortgage by consulting and programming for major corporations in the New York City area.

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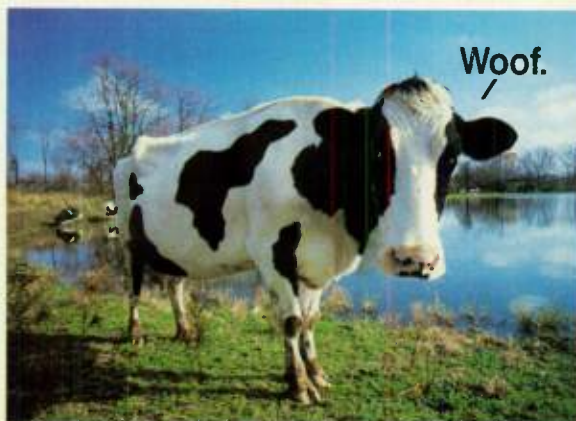
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Mirrored Images

By Michael Molenda

In the commercial music scene, a marketable personality is more valuable than instrumental chops.



James Dean will always and forever be cool. He had the right name, wore the right clothes, and moved with the sullen grace of a fallen angel. Dean also possessed a heroic sense of destiny and became Icarus in a Porsche, rather than face life as an aging teen idol.

So what does a cinematic legend have to do with building a pop music career? One word: Charisma. Want to get a recording deal? Conquer MTV? Sell millions of CDs? Well, forget talent and luck, they're merely the second stage of the rocket. If you don't have a seductive media image, you won't even get launched.

IMAGE CONSCIOUSNESS

Like it or not, pop artists are entertainers first and foremost. Put simply (and bluntly): How long you remain commercially vital is dependent upon how long consumers are attracted to your public persona.

In the 1960s, Motown Records prepared its artists for the spotlight with mandatory deportment and choreography classes. Today, such grooming is as rare as the vinyl

LP. As the current recession devours corporate profits, record executives are loathe to expend artist development funds.

As a result, many record companies have become "patch bays," where market-ready artists are plugged directly into structured promotional systems. A desirable new artist is one who seamlessly fits into existing market niches. For this reason, many A&R executives only have ears for "a Mariah Carey" type, or "the Oakland sound." And coincidentally, as of this writing many labels were just returning from pilgrimages to Seattle to discover "the next Nirvana."

The frustrating Catch-22 of pop music is that if your stylistic genre (music *and* look) fits into a revenue demographic, you're a few sprinkles of luck away from fame and fortune. But if your image confounds predetermined markets, you may never make enough money from your music to exist as a full-time musician.

THE PSYCHOLOGY OF SELL

The intention to *sell* anything—whether it's a musical artist, movie, or automobile—involves creating an aura of

mystique and desire for the target market. It's no secret that corporations often spend millions hiring marketing whizzes to develop and trigger "consumer traps" for their products. Typically, the critical first impression revolves around appearance.

Of course, struggling artists don't have budgets for market surveys, stylists, and promotional advisers. However, it doesn't cost a thing to put yourself into a marketing mindset. Think of yourself as a cereal box. (Don't laugh, I'm trying to be serious.) Would your visual image entice someone to pluck you from the shelf? What, if anything, makes you more desirable (or different) from the countless other cereal boxes stacked in rows?

It's obvious why the Madonna brand screams for attention amidst the virtual sea of entertainer cereals. Likewise for Hammer, k.d. lang, and Nirvana (to name a few). Each of these artists promotes a style and/or stance that transcends the persona of the ordinary. In short, they ooze star appeal.

Unfortunately, charisma can't be bought and worn like sensible shoes. Some people are born to turn heads, while most of us are fated to remain

MICHAEL SLOAN

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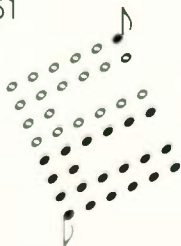
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voyeurs. But if you're not blessed with natural charisma, it doesn't mean you'll never be a commercial success. It just means you'll have to work harder to invent a marketable persona. The trick is to develop an image that enhances your strengths, hides your weaknesses, and screams "look at me."

THE PUBLIC FACE

Okay, at the risk of sounding like some new-age, self-help treatise, a good image requires getting in touch with yourself. For our purposes, this means finding clothes that complement your body type, a hairstyle that accents your face, and so on. It's amazing how many American musicians have no interest in style (in Europe, it's an artform in itself). If you're comfortable being one of the unfashionably disinterested, more power to you. If you want your face on MTV, you'd better get a clue.

As a producer, recording studio owner, and unrepentant busybody, I'm often privy to brutal artist critiques by industry executives. The following paragraphs are my takes on reoccurring image-marketing concerns.

Style. In any artistic discipline, there are those who start trends and those who react to trends. The commercial music business usually rewards the "dedicated followers of fashion" rather than the innovators. Remember, documented success often is more attractive to a major record label than gambling on the next big thing.



Folk-rock artist Chuck Prophet adopts the requisite casual cool for a troubadour of dark streets and lost souls.

The record labels' no-risk approach makes it easy to pinpoint the lowest common denominator of a genre. Simply watch MTV and/or VH-1, check out local clubs, and keep your eyes to the streets. No matter what musical community you belong to, examples of "acceptable" styles are everywhere. No artist should be so oblivious to his or her scene that they wear inappropriate clothes (unless they're attempting to be trendsetters). Fashion helps define and socialize a musical movement. To the untutored record executive, an artist's attire also reveals that all-important market niche.

Face to face. The pop market is Dorian Gray's wasteland. Anything can happen if you're young and beautiful. If you're slouching towards middle age



The press photo for San Francisco's Screaming Bloody Marys is a great example of image promotion. Captured mid-performance, you can't see the musician's faces, but you can feel the sweat and adrenaline of their stage act.



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Today's creative market demands an entirely new level of professionalism, and performance flexibility. The K2000/K2000R, with its inherently flexible and expandable architecture, is the obvious choice. With other keyboards, you'll eventually run into a brick wall when you need better capabilities. With the K2000 Series, you can, at a fraction of the cost of other systems, transform your system from a ROM-based music workstation to a full sampler/audio processor with exceptionally high quality and full bandwidth capabilities.

V.A.S.T. - A new beginning.

The heart of this flexibility is Kurzweil's proprietary V.A.S.T. technology (Variable Architecture Synthesis Technology). While past approaches to synthesis left the artist with a stack of instruments, back problems and MIDI protocol headaches, V.A.S.T. eliminates the mess and unites live performance, digital sampling, sound designing, composing and sequencing, in one compact, portable unit.



Sounds never before imaginable.

Thirty-one powerful sound shaping algorithms, with a multitude of DSP (Digital Signal Processing) functions per voice are available. They encompass almost every synthesis technique ever devised. In fact, V.A.S.T. is the only technology at this price that provides up to three DSP functions per voice. So, if the job calls for a fat, analog bass sound, the K2000 delivers. If the part calls for a bell sound, the K2000 provides crisp, percus-

sive ringing. If a stereo sample needs re-synthesizing, the K2000 can shape, re-shape and layer multiple samples,

Partial list of K2000 Users.

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Wendy Carlos	Fred Mollin
Pat Coil	Patrick Moraz
Michael Dorian	Sammy Nestico
Michael Franklin	Roger Powell
Dominic Frontiere	Freddie Ravel
David Gant	Kenny Rogers
Jerry Goldsmith	David Rosenthal
Tony Guerrero	Frank Serafine
J.J. Johnson	Paul Shaffer
Michael Kamen	Rick Wakeman
Fred Lawrence	Fred Weinberg
Lyle Mays	Stevie Wonder

transforming even the most basic sound samples into thrilling, new experiences.

Eight megabytes of Kurzweil's world-renowned 16-bit ROM samples are on board to start the sonic feast. Two additional 8-megabyte ROM sound blocks will be available for a total of 24 megabytes. Further, samples from many other manufacturers' libraries are compatible and extensive third party software is available.

Limitless sound storage.

For most keyboards, storage of sound files can be a problem. Boxes of floppy disks are certainly smaller than three pianos and a set of drums, but they are slow to load and cannot hold much material. To address this problem, the K2000 system supports the addition of both internal and external SCSI-compatible hard disk drives, as well as readily-available optical, "floptical," SyQuest,® CD ROM readers, etc.

Both units accept up to 64 megabytes of sample memory via standard Macintosh® SIMMs, for holding over 12 minutes of sampled sounds at full bandwidth. The system also supports a program memory upgrade.

Flexible inputs and outputs.

The K2000/K2000R thoroughly covers the ins and outs of sampling and synthesis. The SMP-K/R stereo sampling options (keyboard/rack) offer analog, digital and optical inputs. Digital outputs are also provided, and both are soft-switchable between AES/EBU and SPDIF formats. The K2000 offers six analog outs configured as a stereo master pair and four individual outs (the K2000R offers a stereo master pair and eight individual

outs). Support for MIDI is extensive as the units can transmit on three channels and receive on sixteen. For special effects and sound design use, up to 96 sonic events can be triggered simultaneously, and each MIDI channel supports the stacking of up to nine events.

A price that's astounding.

The K2000/K2000R can do more than a stack of conventional synthesizers and samplers. No other comparable instruments offer so many ways to configure and upgrade for future applications. Yet, they cost no more than most ordinary synthesizers.

So, if today's creative demands are on your mind, join the stars who have found that the Kurzweil K2000 and K2000R offer the solutions through V.A.S.T. technology for infinite possibilities.

Specifications

Keys	61 (K2000 only)
Transmit Pressure	Mono-Pressure (K2000 only)
Receive Pressure	Poly, Mono-Pressure
Tone Generation	16-Bit Sampled ROM Waves Digital Wave Generation Noise Generation Optional User Sampling
Polyphony	24 (96 oscillators)
Dynamic Voice Allocation	Yes
Multi-timbral	16 Channels
Filter/DSP	Up to 3 Configurable Per Voice: Sweepable Resonance ("Q") LP/HP/BP/All Pass/Parametric Notch/Distortion/Shaper
Effects	1-Stereo Processor
Effects Types	Reverb/Chorus/Delay/Flanging
Stereo Sampling	Yes (with Sampling Option)
Analog Sampling Rates	29.4/32/44.1/48 KHz Analog
Digital Sampling Rates	All
Sample Playback Rates	All
ROM Wave Sample Rate	Up to 48 KHz
Stereo Analog/Digital I/Os (with option)	Analog In; Optical In; Digital Ins/Outs, (AES-EBU/SPDIF formats)
Disk Drive	3.5 HD/DD
SCSI	K2000: 1 port K2000R: 2 ports
Internal ROM Wave Memory	8 Megabytes, expandable to 24 Megabytes
Internal RAM Sample Memory	Up to 64 Megabytes (SIMMs)
User Program RAM Memory	128K, expandable to 760K
Display	240 x 64 Backlit
Sequencer	16-Channel Record/Play, Type 0 Play
Audio Outputs	K2000: 6 analog outs configured as a stereo master pair and 4 individual outs. K2000R: stereo master pair and 8 individual outs.
Outs Double as Inserts	Yes
Standard SIMMs RAM Memory	4 Card Slots
#/MIDI Channels/ Simultaneous Transmission	3
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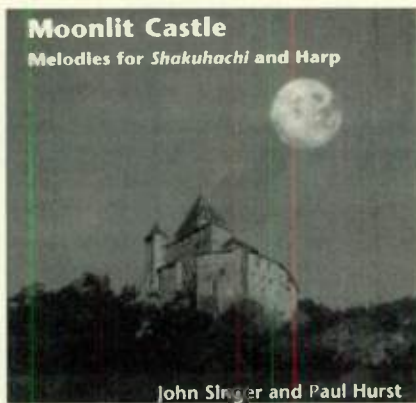
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(which the music biz defines as mid-30s), well, try to look *interesting*.

Physical appearance is a delicate subject, and it's complicated by varied and subjective definitions of beauty. For the most part, thinning hair is problematic (although it didn't hurt Phil Collins' career), as is excessive weight. (Ever notice how fast Janet Jackson slimmed down once the powers that be realized she could sell millions of albums?) My advice is, if you're saddened with a youth culture *faux pas*, either celebrate it or hide it.

Attitude. For all the vacuous hipster facades supposedly running amok in the pop music business, personality is at a premium. Many artists blow prospective record deals because their stage persona is as exciting as a tire iron. If you can't captivate an audience, promotional tours can do more harm than good. (Don't ever forget that Paula Abdul's lame performance at the 1991 MTV Awards effectively scotched her subsequent U.S. tour.)

Boring, nondescript artists usually don't generate significant media coverage. Americans love outlaws and buf-



New age albums, such as this record by Shakuhachi flutist John Singer, typically utilize pastoral scenes to evoke visual images of instrumental moods.

foons, and musicians are pretty good at playing both parts. In his heyday, singer David Lee Roth produced tons of quotable quotes. Talk shows and magazines loved to interview him because he was *entertaining*. The added exposure certainly helped sell a few hundred thousand records. That's the beauty of marketable personalities: What goes around, comes around.

BREAKING THROUGH

Listen, I'm not advocating tossing your instrument aside in favor of acting classes and a personal trainer (so please keep those nasty letters to yourselves). A great song and a passionate voice are still the foundations of pop music. However, it's no secret that American marketing is driven by star power, sex, and style. Don't take my word for it; pick up a magazine, check out billboards, or try to stay awake during TV ads.

As I've consistently warned in other articles, the unbountiful 1990s challenge artists to be smarter and more aggressive about their careers. Developing a seductive image acknowledges the demands of modern marketing. A good image is a saleable commodity, and in the pop market "sales" is the altar of success. So, make your persona as hot as your music, and start hounding those A&R executives!

Like Dracula, EM managing editor Michael Molenda fears his reflection. To paraphrase Jean Cocteau, peering into a mirror shows old age at work like bees in a hive.

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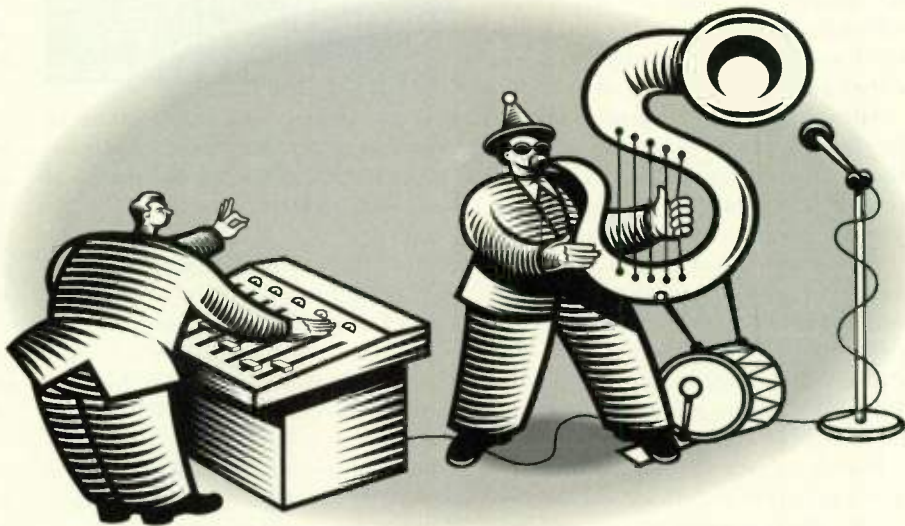


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INFORMATION RESOURCES FOR MUSIC PROFESSIONALS

Tracking the Bizarre

By Neal Brighton

Recording unfamiliar instruments is easy if you keep your head and trust your ears.



There was a knock at the studio door and a dozen Balkan-Slavic folk musicians walked in carrying the strangest instruments I had ever seen. Fighting panic, I could only think of two things: "How do they play these bizarre instruments, and where do I put the microphones?"

No, this wasn't a nightmare. Every recording engineer has a story about having to deal (often unexpectedly) with an unfamiliar or non-traditional instrument. The growing diversity of American music continues to introduce folk, ethnic, and even classical instruments into the cultural mainstream. For recording engineers, this enlarged musical vocabulary can be intimidating. But in almost every situation, capturing the sound of an unfamiliar instrument is simply a case of getting back to basics.

DON'T PANIC; LISTEN!

Guidelines for good engineering don't change just because an instrument is foreign. Listening carefully to the sound source is still the best way to determine an instrument's personality. So before you concern yourself with

microphone selection and placement, have the musician play a section of the composition you plan to record. Listen closely to the instrument's tonal range, and identify any harmonics or sympathetic notes. Don't forget to seek out extraneous noises that may hamper recording a good sound.

When you're more familiar with the instrument's "voice," put your ear at the spot where you plan to position the microphone. This procedure should help you decide which mic best translates the sound you want. It's important to match the right mic to the instrument to avoid over-equalizing from the console (which may sabotage the natural timbre of the instrument).

Also, don't forget to consider *what* is making the sound. For example, most stringed instruments utilize resonating soundboards that may or may not have a sound hole. Critical listening is essential because the "sweet spot" (for mic positioning) can be anywhere along the board.

STRANGE STRINGS

The instruments with which my Balkan-Slavic friends surprised me are called the prima, the bug, the brac, and the

bugaria (Fig. 1). Luckily, most stringed instruments—regardless of their cultural origin—are broken up into sections that cover specific octave ranges. Since these sections are similar, in concept, to Western groupings of violins, violas, cellos, basses, etc., I could start my critical listening on familiar ground.

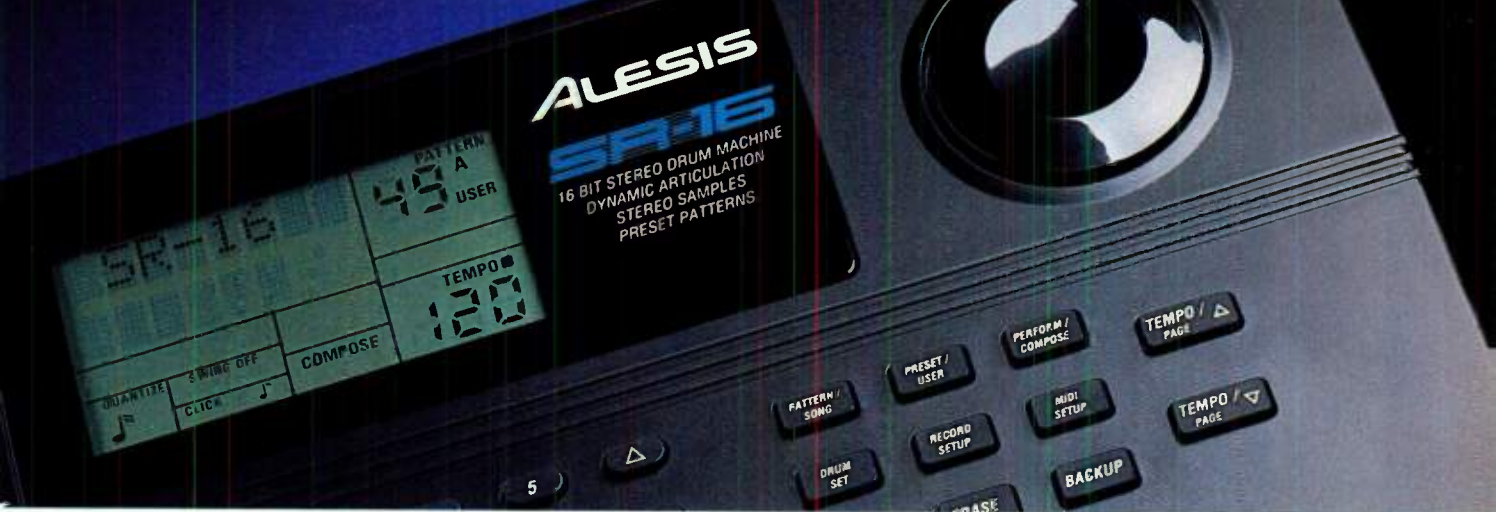
Once the bizarre factor had been dealt with, even the prima began to sound comfortably familiar. I used condenser mics to enhance the quality of the upper-octave instruments and employed dynamic mics on the low-bass instruments.

Certain guidelines that work for Western stringed instruments also applied to the prima and bugaria. I made sure the mics weren't too close to the musician's hands, because percussive sounds would be too aggressive. Outboard compression was discreetly employed to even out the irregular attacks between strings.

Believe it or not, one of the most difficult instruments I've recorded is the harp. Besides being large and unwieldy (all harp players drive minivans), harps produce complex overtones, have tremendous melodic and dynamic ranges, and utilize pedals that often

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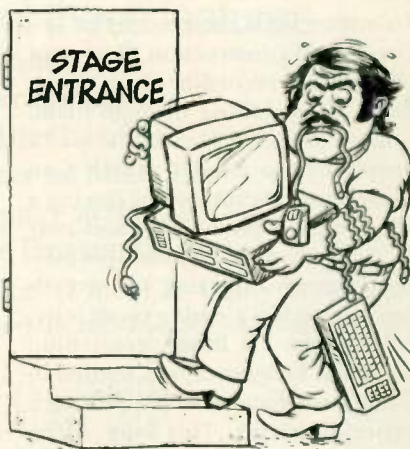
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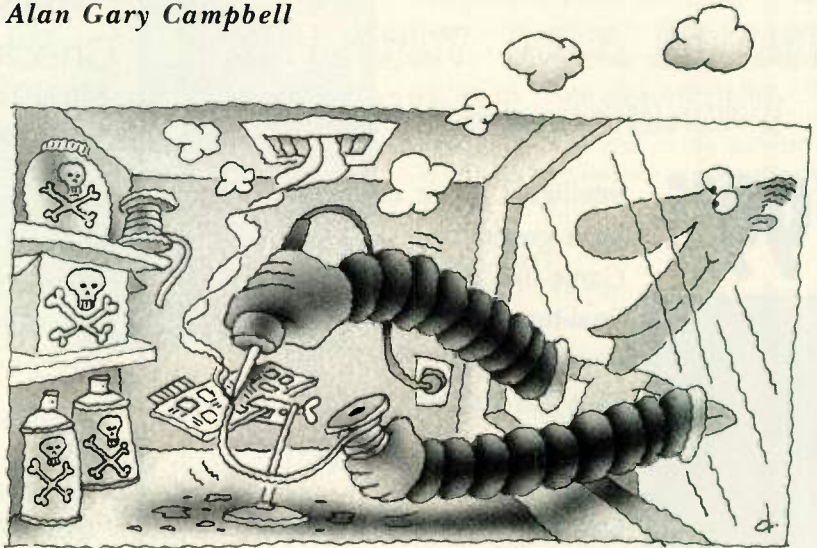
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Q. I want to get the SQX Sequencer Expander upgrade for my Ensoniq SQ-2 synth. Is this a user-installable upgrade, does it change the operating system, and how much should it cost? Is this the same upgrade that goes in the SD-1?

Q. Can the weighted-action keyboard of the KS-32 be installed in an SQ-2? Is there a modification to give this keyboard Poly Aftertouch?

A. Several recent Ensoniq synthesizers were designed to allow future memory expansion as larger memory ICs became available (read: affordable). The SQX-70 Sequencer Memory Expansion kit accomplishes this and may be installed in the VFX^{SD}, SD-1, SQ-1, SQ-2, or KS-32. It increases the total sequencer memory to 75,000 notes in the VFX^{SD} and 58,000 notes in the later products. The SD-1 32-voice model comes with the upgrade installed.

The upgrade replaces the existing 28-pin, 256 KB, CMOS static RAMs with 32-pin, 1 MB chips (the maximum allowed with the 32-pin DIP-socket configuration used). The operating system is not affected. This is a plug 'n' go mod, but it is a service-center job: The chips are static-sensitive and expensive (\$249 list, installation included), and user-installation will void the kit warranty (and instrument warranty, if applicable). The upgrade is available from Ensoniq Authorized Repair Centers; for more information, call Ensoniq at (215) 647-3930.

The guts of the two instruments are similar, but the KS-32 keyboard is dimensionally and structurally incompatible with the SQ-2 case and cannot be retrofitted. Trading in the SQ-2—a popular instrument—is probably your best bet.

Some think the weighted-action KS-32 keyboard is technologically related to the Poly Key (Polyphonic Pressure-sensitive) keyboards of the EPS, VFX, and SD-1, but it is another animal entirely. Also, there is no practical way to modify the KS-32 for Poly Pressure operation. Ensoniq reports there are no current plans to develop a 76-key

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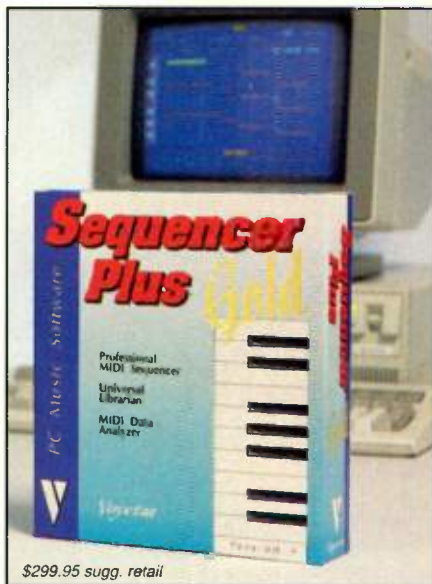
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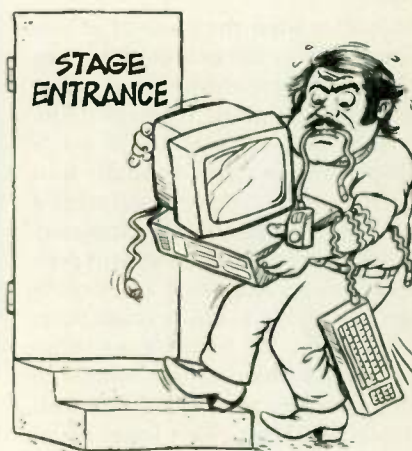
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strangest reed instruments I've recorded is the bass sax (Fig. 2). This instrument often is as big as the person blowing into it. It also produces a tremendous amount of air. I selected an AKG C414 condenser mic to enhance the saxophone's low tones. The majority of a reed instrument's sound is from the bell; I had to pad the mic and use a windscreen to keep the C414 safe from the instrument's elephant-like bellow.

No matter what the country of origin or type of construction, flutes can be difficult to record because of the amount of air rushing through them. I've never found it pleasing to put a microphone too close. I usually find the best sound is captured by placing a condenser microphone a few feet away from the performer. This ambient position minimizes fingering and breath noises and adds a pleasing room tone.

I'd thought I'd heard everything until a local ballet company wanted to record a performance soundtrack with a didjeridu player. This long, often beautifully carved wooden tube developed by Australian aborigines is the



FIG. 2: The bass sax is a mammoth beast, and so is the air pressure it unleashes.

Tasmanian devil of musical instruments. The didjeridu explodes with sonic vortexes of grunts, howls, rum-

bles, whistles, and just about everything else you'd hear in the Australian wilderness.

It was obvious that this wild beast would obliterate any microphone crazy enough to get close. Fine. I positioned the player in our tile hallway and placed our trusty AKG C414 on the stairway above her. Then, to accentuate the didjeridu's chaotic rumbles, I placed a pressure zone microphone on the tile floor, approximately three feet from the end of the instrument. The combination of the microphones, the live recording environment, and the omnidirectional caterwaul of the didjeridu combined to produce a magnificent effect.

TAILS OUT

Hopefully I've proven that unfamiliar instruments don't have to jerk a recording session into high-stress mode. Just about every instrument, no matter how alien, has a timbral similarity to a more familiar sound. So if my Balkan-Slavic friends knock at your door, just relax and follow your ears. You'll do just fine. ●

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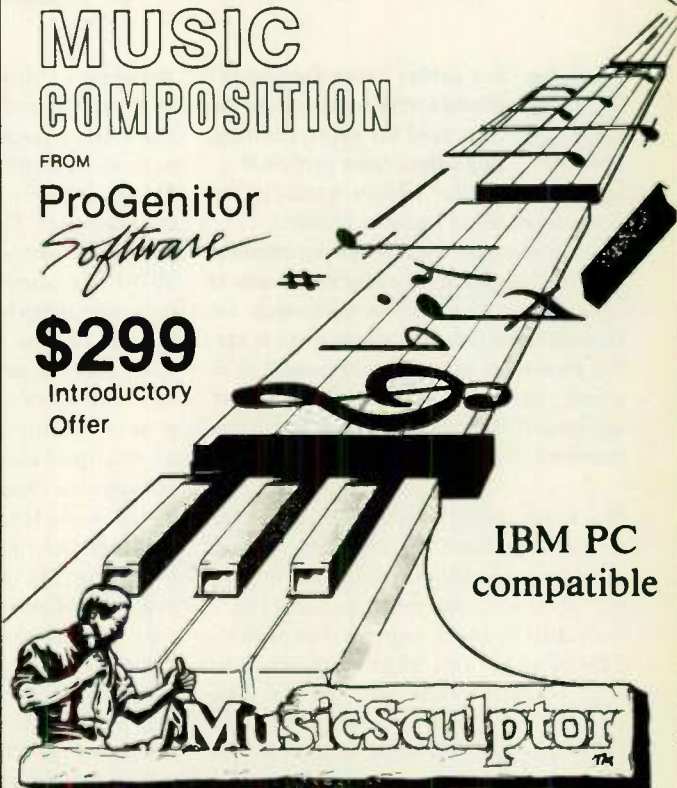
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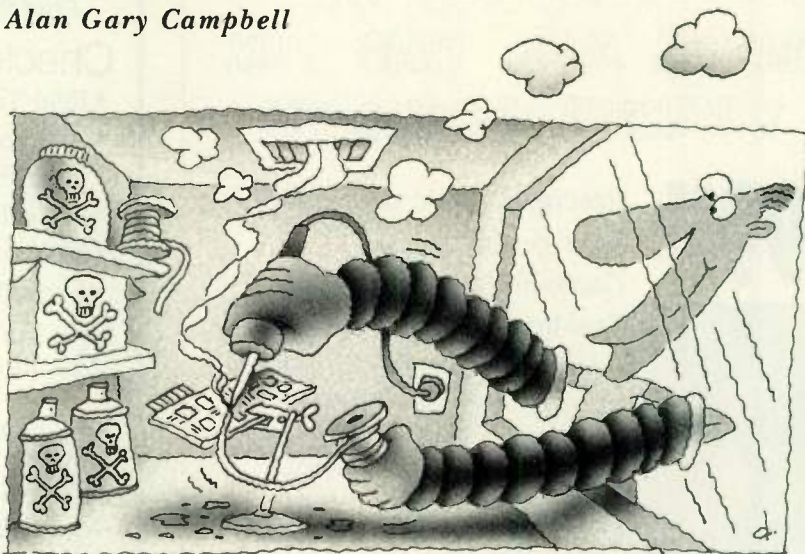
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Poly Key keyboard.

Q. A front-panel button (number 1/33) on my Yamaha DX7S is sticking. Can this button be cleaned, or should it be replaced? The service technician at the music store informed me he has a switch removed from a used DX7II panel board that he'll put in for just the labor charge. Would this be reliable?

A. The switches activated by the panel buttons on a DX7S are sealed units, as are those on many Yamaha products. These switches should be replaced when defective. But they are so reliable that it is worth checking to determine if a drop of spilled soft drink or some other contaminant is causing them to stick. Disassembling and cleaning the DX7S is a fairly complicated procedure, though, and is best referred to a service center.

The DX7S and DX7II use the same panel switches; the used part is fully compatible. But it is impossible to evaluate the comparative reliability of the used switch without knowing the number of hours it has been in service before removal, the nature of the defect in the original unit, the level of care the unit received, and the type and quality of desoldering technique applied to remove the used part. In general, this seems a false economy, since panel switches are inexpensive and readily available from Yamaha. In a "rush" situation, a used part presents the advantage of availability, but it is always better to try to avoid rush service.

Q. I have an old, but sturdy, Fender Polaris synth that I still enjoy using. But the flexible "membrane ribbons" that interconnect several of the boards of the unit have become brittle and fragile with age, and one is cracked across a row of contacts, causing several panel buttons to fail. This seems to be a recurring defect, as I've already had the panel-switch "assembly" (actually, a big membrane thing) replaced once, and it was very expensive. Is there any other way to fix this problem without replacing the whole thing?

A. The membrane cables used in the Fender Polaris and many other synths are, by definition, fragile. Nonetheless, the Polaris membrane cables seem more sensitive to bending and kinking than most cables, even when new, and

I have often wondered if this is related to the rather extreme course they are expected to navigate in the area of the panel boards. I have practiced some "colorful" language over the years, when these mercurial interconnects would, despite the most delicate handling, break off during reassembly.

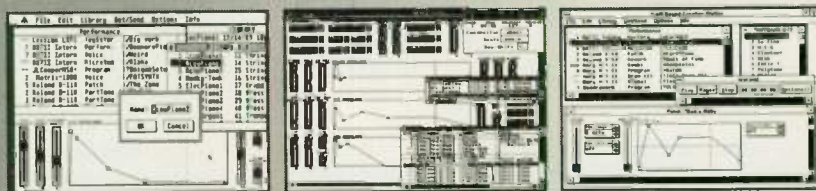
Fortunately, if the crack or break is near the end of one of the membrane cables, you may be able to simply trim the broken end, using sharp scissors, and plug it back in. Be sure to get it

right the first time, and don't cut off even a millimeter more of material than is necessary to make a straight cut, or the trimmed cable may be too short. This procedure is applicable only with Polaris-type cables and only in some cases, but it is a lot cheaper than buying a new panel-switch assembly.

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

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Steinberg Cubase Audio 1.01 (Mac)

By Peter Freeman

A feature-packed sequencer evolves into an integrated MIDI/digital-audio recording program.

It has been two years since Opcode's *Vision* sequencer for the Macintosh grew into *Studio Vision*, turning the music software world on its ear. A year-and-a-half later, Mark of the Unicorn became the second Mac software developer to brave the dark, turbulent programming waters, turning *Performer* into *Digital Performer*. Even with these alternatives, however, many musicians would welcome an even greater selection.

Steinberg's *Cubase* sequencer, with its myriad editing features and graphical interface, has long been popular on the Atari ST and has more recently gained favor on the Macintosh. It also is available in *Windows* version (previewed in "Windows Shootout" in the November 1992 *EM*). So the German firm's release of *Cubase Audio* MIDI sequencing/hard-disk recording software for the Mac is sure to pique interest.

The new program combines with any of Digidesign's digital-audio NuBus cards (e.g., Audiomedia II, Sound Tools II, or Pro Tools) to support up to four digital-audio channels.

Cubase Audio is fully System 7.0-savvy and supports all standard Macintosh

MIDI interfaces, including Mark of the Unicorn's MIDI Time Piece and Opcode's Studio 4 and 5 (in MTP Emulation mode). The program does not support the *Opcode MIDI System*, but Steinberg plans to support *OMS* in the future. *Cubase* does offer direct support for Digidesign's SampleCell.

OVERVIEW

Cubase Audio's MIDI recording and editing capabilities easily rival those of its competitors, and in some cases far surpasses them. Playback, recording, looping (called Cycling), and related functions are controlled by the movable Transport Bar, which contains the familiar tape-machine-style controls. Left and right Locators determine where playback or recording begins and ends. Locators also are the program's loop boundaries and can be changed "on the fly" while playing or recording. This makes it easy to jump quickly from one section of a piece of music to another without stopping.

Cubase Audio primarily is a track-based, linear sequencer (i.e., a music data is treated in a left-to-right manner analogous to tape tracks). There are six Track Classes, or types. MIDI Tracks record and play back MIDI data of all kinds. Drum Tracks are similar to regular MIDI tracks, but are routed through drum maps. Mix Tracks record events generated by the MIDI Mixer page. Group Tracks contain collections of Parts (explained shortly). Tape Tracks are a bit different, as they store machine-control data for a variety of MIDI-controllable tape machines and do not use Parts. Finally, there are Audio Tracks, which store the digital audio.

The all-important Arrange window (see Fig. 1) provides a graphic overview of the MIDI and Audio Tracks and their events, so it is the focal point of many operations. A Song—a global data structure that includes all instrument lists, maps, note data, etc.—can contain up to sixteen Arrangements.

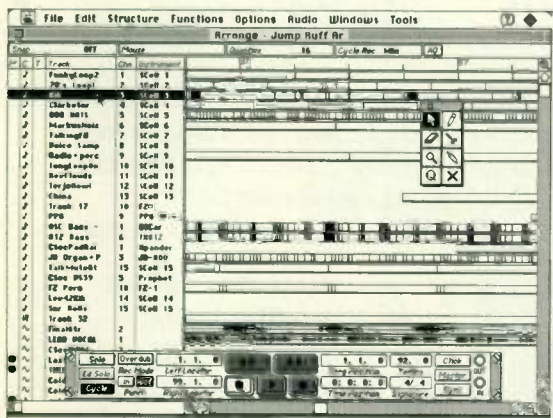


FIG. 1: *Cubase Audio*'s Arrange window provides a graphic overview of MIDI and Audio Tracks and their events. Each Part appears as a rectangle in the window's Parts display (center), and Audio Parts sport images of their component waveforms. The icons at far left of the Track List display the Track type (in this case, MIDI, Drum, and Audio).



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Note, however, that you can't play multiple Arrangements at once. Each Arrangement contains up to 64 Tracks of mixed Classes.

Whenever you record on a Track (except for Tape and Mixer Tracks), a Part containing the recorded data is created on the designated Track. Each Part appears as a rectangle in the Arrange window's Parts display. Its length in the display reflects the length of the recording, and its position defines its Start and End points.

As soon as a Part is created, you can use the mouse to move it horizontally and vertically within the Arrange window. This makes it easy to quickly adjust a Part's position in time, or move it to another Track. Parts can be copied, cut into pieces, or joined together, even while the program is playing or recording.

TOOLS OF THE TRADE

Parts are manipulated with a Toolbox that can be "torn off" and repositioned anywhere onscreen. The eight tools available at a given time depend on which window is active. For instance, in the Arrange window, the tools include the Pencil (for changing the Part length), the Scissors (for cutting Parts into pieces), the Eraser, the Glue Tube (joins Parts), and the Mute Cross (mutes Parts you touch with it).

At the top of the Arrange window are the Snap, Mouse, and Quantize displays, which show the current Snap value, Mouse position relative to the data in the Arrange window, and Quantize resolution. The Snap value is the musical increment by which Parts move when repositioned in the Arrange window. When using Snap, which is similar to a grid in a drawing or page layout program, parts always move relative to their original position. Consequently, if a particular part starts fifteen ticks after a bar line, moving it forward by one "Snap" with the Snap value set to eighth notes will place it at a point one eighth-note plus fifteen ticks into the bar. This allows the "feel" of each Part to be retained. If Snap is off, Parts can be moved by single clock ticks.

Although *Cubase Audio's* primary power lies in its linear handling of music,

there is a provision for creating pattern-like sections of MIDI Parts called "Groups." You select the Parts you want to have in the Group, name it, and it appears in the Group List of all Arrange windows. (Groups are shared by all the Arrange windows in a Song.) Groups can be placed end-to-end on a Group Track, in any order desired. This feature is great for auditioning different versions of a Song; you just create Groups for the Verse, Intro, Chorus, etc., and shuffle them around.

THE EDITORS

Cubase Audio's powerful Editors provide an extraordinary variety of ways to edit a Part's events in great detail, without stopping the music. Notes can be moved around in time, resized, copied, transposed, or deleted. Continuous Controller events, which can be cut, copied, pasted, redrawn, or drawn in from scratch, are displayed in real time as they are being recorded. Small magnifying-glass icons control zoom in and out.

The Kicker tools are a novel feature; they "kick" notes forward or backward in time by the current Snap value. In addition, the program provides the ability to move to the next or previous note in most of the Editors by using the left and right cursor keys. No sequencer should be without this useful feature.

The Follow Song feature simultaneously scrolls all open Editors and the Arrange window (if active), in real time. This is a great feature, especially on a large monitor, as it can provide multiple, real-time views at a glance. Remarkably, up to fifteen Editors can be open simultaneously.

The Key Edit window is the program's main graphic editor. Notes are displayed as bars of varying lengths in the familiar piano-roll style format. A

Start/End	Length	Vel 1	Vel 2	Vel 3	Event Type	Chp	Comment
31. 1. 0	144	122	64	0	Note Inval	1	
31. 1. 13	---	0	64	---	Pitchbend	1	
31. 1. 28	14	120	127	---	Note Inval	5	
31. 1. 36	---	64	47	---	Pitchbend	1	
31. 1. 38	---	0	32	---	Pitchbend	1	
31. 2. 0	707	83	64	---	Note Inval	1	
31. 2. 27	---	0	46	---	Pitchbend	1	
31. 2. 48	---	0	64	---	Pitchbend	1	
31. 3. 98	---	64	63	---	Pitchbend	1	
31. 3. 120	---	64	50	---	Pitchbend	1	
31. 3. 159	---	0	55	---	Pitchbend	1	
31. 3. 200	---	64	51	---	Pitchbend	1	
31. 3. 240	---	64	46	---	Pitchbend	1	
31. 3. 272	---	0	42	---	Pitchbend	1	

FIG. 2: In the List Edit window's graphic display, time flows horizontally, while events are displayed vertically, corresponding to the event list.

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● CUBASE AUDIO

vertical graphic of a piano keyboard runs up the left side of the window, with its "keys" blinking whenever a note in the window sounds, or in response to incoming MIDI notes.

The List Edit window (see Fig. 2) is primarily intended for MIDI event-list editing, although it also has a graphic display. Time flows horizontally, while events are displayed vertically, corresponding to the event list, so a series of eighth notes is represented as a line of *diagonal* boxes. A Comments area displays a portion of System Exclusive messages, which can be edited via a popup box. I'm accustomed to standard piano-roll displays, so I found the List Editor somewhat confusing at first.

The Drum Editor is reminiscent of Intelligent Music's *UpBeat* and *Real-Time*. Notes are shown as diamonds from left to right, with small boxes inside the diamonds giving a rough indication of Velocity. A Drum Map feature allows you to remap drum parts so you can play them back on a different drum machine or sampler than what you used when recording them. Drum Maps can be saved to disk for later recall, making it possible to create a library of maps for different drum machines.

Score Edit displays the selected Part in standard music notation. If multiple parts are selected, they appear on separate staves. The interpretation of musical parts is quite good. As in the other Editors, notes in Score Edit can be moved around on the staff, cut, copied, and pasted, and new ones can be painted in manually. A Part can be divided among two staves (like a piano grand staff) at a user-defined Split point. Key and clef (bass or treble) are individually selectable for each staff, and there is an optional Auto Quantize function.

The program's only non-graphic Editor, Logical Edit, is designed to handle complex transformations of specific kinds of MIDI information. This is *Cubase Audio's* most sophisticated and powerful Editor, and its least intuitive. Editing operations are presented in the form of a mathematical operation, where conditions are set up to achieve a specific result. It took some head-scratching before I grasped how Log-

ical Edit works. But when I did, its power became obvious. Fortunately, Steinberg intends to improve the user-interface aspect of Logical Edit.

QUANTIZATION

One of the most innovative and exciting areas of the program, the quantization options simply blow the competition out of the water. In addition to all of the usual stuff, Steinberg has added some completely new features that deserve a closer look.

Over Quantize analyzes whether you consistently played ahead of or behind the beat and accounts for this factor when moving notes within a selected range to the closest Quantize value. It also looks for closely grouped notes that may represent a chord and tries to keep them together during quantizing. In practice, it pulls things into line, but not completely, leaving some of the original feel intact.

Iterative Quantize is a variation of Over Quantize that moves notes closer to the Quantize value by a user-determined percentage each time you select it. This allows you to "nudge" notes closer into line until the desired feel is obtained. If you don't wish to quantize notes that already fall within a certain distance from the Quantize value, you can specify this distance with a parameter called "Don't Q."

Analytic Quantize uses more rules than the other options and is intended for complex input, such as solos. The program looks at small groups of consecutive notes and, using the user-selected Quantize value as a loose guideline, decides on an appropriate Quantize value for that group. But it also considers previous quantization and anticipates how the feature would be applied in the next group before it moves any notes. In practice, I found this method of quantizing surprisingly musical. Although it would be impossible for the program to automatically

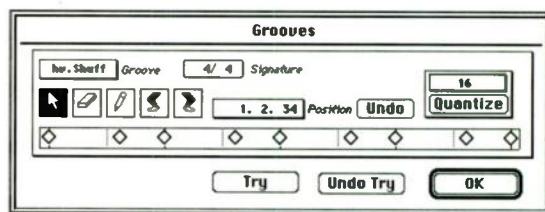


FIG. 3: *Cubase Audio's* Grooves function allows you to create a one-measure groove that can be applied as quantization to any MIDI data.

handle every type of input exactly the way I would like, the Analytic Quantize option goes a long way toward achieving its goal.

My favorite quantization options are Match and Groove Quantize; they take the process of quantizing to new heights of sophistication and musicality. Match Quantize allows you to apply the feel and accents (rhythmic relationships and velocity values) of a Part to any other Part, simply by dragging the "feel" Part onto the "destination" Part. I've been waiting for this since I started using sequencers.

Groove Quantize allows you to quickly create rhythmic feels. You are presented with a Grooves dialog box containing a graphic representation of one bar in the form of a row of diamonds ("notes") similar to those in Drum Edit (see Fig. 3). Using the Pencil, Eraser, and Kicker tools, you can add or subtract "notes" and position them precisely to create the feel you want. When you quantize, the rhythmic relationships you defined in the Setup Grooves dialog are repeatedly applied to each successive bar of the selected Part(s). This is a very cool feature. Grooves can be loaded and saved to disk, so that if you come up with the perfect swing feel, for example, you can recall and apply it.

THE MIDI MIXER

Cubase Audio's impressive MIDI Mixer page employs onscreen sliders, dials, and knobs to send out virtually any kind of MIDI message. These control objects can be arranged in any desired fashion, labeled, and "played" into a Mixer Track in real or step time.

"Snapshots" representing the instantaneous state of all the controls in the Mixer can be taken and recalled with a mouse click. Mixer objects move during playback, indicating their respective activity, and can be grouped together and controlled from "master" objects for easy control of multiple devices.

A useful "Learn" feature can capture the SysEx messages sent by a particular device and automatically assign them to a Mixer object. This feature doesn't work exactly as expected in all cases, but it's a definite time-saver when you are setting up SysEx destination objects. Each Mixer object can be controlled from a different external MIDI controller.

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AUDIO PARTS

Cubase Audio handles digital audio in much the same way it handles MIDI data. Steinberg claims that the program will work with up to four simultaneous channels of audio using Digidesign's Pro Tools or two Digidesign Audiomedia cards. Unfortunately, I was unable to obtain a 4-channel system while evaluating the program. However, I achieved excellent 2-channel results using Audiomedia II hardware.

Recording audio is easy. After you've set the inputs levels, you just choose a file name and hit Record (or "Ⓜ" on the Mac keyboard). If you use a Pre-count, the Mac beeps (and/or sends out a MIDI click) for the defined number of bars, then starts the music. After playing/singing/yodeling, you can go out of Record while continuing playback, or stop completely.

Cubase Audio creates a soundfile in Digidesign's *Sound Designer II* format whenever you make a new recording. Successive recordings that use the same filename are saved as "takes" of that file.

Immediately after finishing an audio recording, a Part appears on the selected Track, at the appropriate place in the Arrange window. If you select the Use Waveforms option from the Audio menu, *Cubase* displays the waveform within the Part.

Double-clicking on an audio Part

Product Summary

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● CUBASE AUDIO

opens the Audio Editor, where the waveform is displayed full-size. The Audio Editor features a Q Point, or Quantize point, which is a movable "handle" that defines the exact point in the audio material that will align to the nearest Quantize or Snap value. This feature allows individual pieces of audio to be Quantized in exactly the desired manner.

As with MIDI, working with audio in *Cubase Audio* proved easy and amazingly flexible due to the open-ended Parts concept. This became vividly clear when I recorded a lead vocal. Although I only had two simultaneous audio channels available, I recorded many different versions of the song's various sections. Using the Arrange window's overview, I assembled a composite lead-vocal track by simply cutting pieces from various Parts and Gluing them onto a new Track. The process was fast, and almost every aspect was intuitive.

THE AUDIO POOL

All audio files and their related Segments in the current Song are listed in the Audio Pool (see Fig. 4). The Pool allows several audio functions to be performed. For example, Banish Silence lets you define a "silence threshold" and deletes all data whose amplitude falls below it. Erase Unused gets rid of unwanted audio outtakes, freeing up disk space. Normalize Segment increases the selected audio's amplitude by a specified percentage.

I found the Pool window a little difficult at times, due to the density of information squeezed into each entry's line. In addition, the Pool doesn't tell you where in the Song each piece of audio is being used, only how many times it's used.

COPY PROTECTION

According to Steinberg, the need for copy protection is undeniable, especially in Europe, where some dealers refuse to sell unprotected software. *Cubase Audio* is copy-protected using a small, red, plastic hardware key (also called a "dongle"), which comes with the program. The hardware key connects to the Mac via the Apple Desktop Bus port and can be placed anywhere in the ADB chain.

According to Steinberg, it is completely transparent to other programs.

Hardware keys have long been accepted on the Atari ST, where Steinberg is an established developer. But it's new in the Mac world. I was initially concerned about this method of copy protection, but I encountered no problems with the key. You can make as many backups of the program as necessary, without worrying about losing a hard-disk install or ruining the master disk. In addition, no deinstallation is necessary when optimizing the hard disk. On the minus side, the key is small and easily lost if transported.

SMALL INSECTS

I only found one possible bug in *Cubase Audio* 1.0.1 (after using it solidly for a month). The "Edit Audio in Sound Designer II" command opens *Sound Designer II* and whichever Part you select in *Cubase Audio*, allowing access to *Sound Designer's* extensive waveform-editing capabilities. After completing your edit, you quit *Sound Designer* and are returned to *Cubase Audio*.

This worked fine the first time I tried it. But every time thereafter, *Cubase* refused to release the Audiomedia II card. As a result, *Sound Designer* was unable to find the card and quit (but didn't crash). Thereafter, *Cubase Audio* wouldn't go into Play or Record. The only solutions were to restart the Macintosh, or manually release both programs' control of the Audiomedia II card before returning to *Cubase*. Although I could repeat this consistently, Steinberg was unable to do so.

CONCLUSIONS

I believe *Cubase Audio's* approach to working with music represents the next step in sequencer design. The sheer flexibility of Parts and the overall layout and handling of music is excellent. The

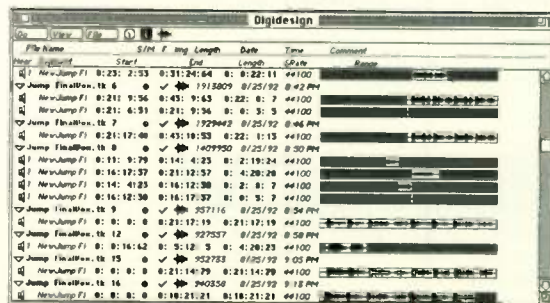


FIG. 4: The Audio Pool stores all audio files used in the current song.

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● CUBASE AUDIO

ability to cut pieces of musical sections and attach them to pieces of other sections, in real time, while always having an overview of the whole piece provides an unparalleled degree of freedom in rearranging musical ideas on the fly.

The program has a ton of special features. For instance, the Interactive Phrase Synthesizer algorithmically generates sequences in response to the composer's musical ideas. The algorithm-control parameters are accessed with a synth-like onscreen interface. This section alone deserves more description than space permits.



The quantization options simply blow the competition out of the water.

Nonetheless, there still are a few more features I'd like to see. For instance, at present, *Cubase Audio* can't put audio Parts in Groups. Also, in Opcode's *Studio Vision 1.4*, you can name sequences with letters (a to z) and trigger them by hitting the appropriate letter on the Mac keyboard, which would be great in the Steinberg program.

The documentation is easily the best I have seen for a program of this complexity. The two manuals are attractively presented and typeset in an easy-to-read format, making the whole process of learning the program a pleasure. In addition, *Cubase Audio* implements Macintosh keyboard equivalents more extensively than most other programs I've seen. Its various single-key command equivalents make using the program extremely fast, once learned.

The program's best aspect is the graphic overview of an entire piece provided by the Arrange window. After working this way, I was hooked. Overall, if you like to work primarily in a linear fashion and having a constant graphic overview is important, *Cubase Audio* is the way to go.

Peter Freeman is a freelance bassist/synthesist and composer living in New York City. He has worked such artists as John Cale, Chris Spedding, and Richard Horowitz.



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Digidesign Audiomedia II

By Peter Freeman

Affordable hard-disk recording for the Macintosh.

Digidesign's original Sound Tools system was the vanguard of a revolution in affordable hard-disk recording systems. It gave Macintosh users digital recording and editing capabilities previously available only at high-end studios. Sound Tools made it possible for musicians to edit DAT recordings in the digital domain and prepare albums for mastering entirely in a desktop environment.

With the first Audiomedia system, Digidesign attempted to address the consumer and multimedia segments of the hard-disk recording market, providing a stripped-down, semi-professional version of Sound Tools at a lower price. Audiomedia II for the Macintosh is the second generation of this product and is aimed at the home/project studio market. It includes *Sound*

Designer II software (the original Audiomedia system had a very stripped-down version), faster hardware, and digital inputs and outputs. The Audiomedia II system allows two tracks of 16-bit audio to be recorded at either 44.1 or 48 kHz.

OVERVIEW

The Audiomedia II hardware consists of a NuBus card that features a 33 MHz Motorola 56001 DSP chip and 16-bit D-to-A and A-to-D converters.

The card has stereo analog inputs and outputs, with unbalanced RCA jacks that accept line-level (nominally -10 dBV) signals. A third pair of RCA jacks provides digital input and output in S/PDIF format, a feature that was conspicuously absent from the original Audiomedia card. The addition of S/PDIF multiplies the potential usefulness of the system, allowing digital audio to be imported from DAT or other sources.

The NuBus card is compatible with Opcode's *Studio Vision*, Steinberg's *Cubase Audio*, and Mark of the Unicorn's *Digital Performer*, three MIDI sequencers that record digital audio. With these systems, Audiomedia II current-

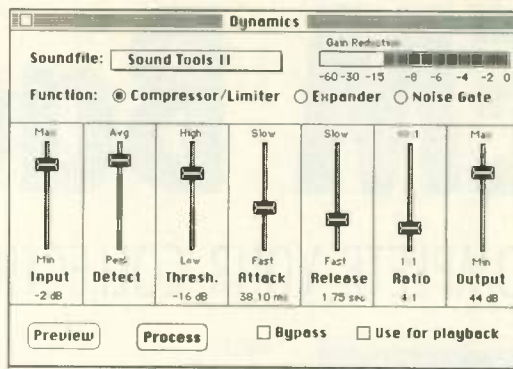


FIG. 1: *Sound Designer II*'s waveform-editing features include digital compression and limiting.

ly records and plays back two independent audio tracks. However, Audiomedia II is expected to support four tracks, internally mixed down to the two outputs, with future versions of *Studio Vision* and Digidesign's *DECK* digital audio recording software.

The *Sound Designer II* 2.3 recording and editing software is virtually identical to the software included with Sound Tools II. The January 1991 review of Sound Tools for the Atari ST discussed some of the upgraded software's new features, so I won't go into detail here. Some of the product's new DSP features include pitch-shifting, real-time EQ, and compression/limiting (see Fig. 1).

WORKING WITH AUDIOMEDIA

I tested Audiomedia II as a DAT editor and as the audio front-end of Steinberg's *Cubase Audio* 1.01 (reviewed on p. 86), and it performed quite well. The *Sound Designer II* software made it easy to perform a variety of edits and adjustments on a final mix that I brought in from a Panasonic SV-3700 DAT machine.

The edits were performed in the now-familiar Sound Tools style. I defined Regions for the various sections of the song (verse, chorus, bridge, etc.) and juggled them around using the Playlist. I assembled several reordered versions of the song, performing a bit of corrective equalizing with the graphic and parametric digital EQ options and setting up different fade lengths for the different versions. Then I transferred them back to a DAT tape in the SV-3700, again using the S/PDIF port. Every stage of the process went smoothly, and I was pleased with the sonic results. I didn't notice any difference between the original



Digidesign's Audiomedia II hard-disk recording system includes *Sound Designer II* software and the Audiomedia II NuBus card, which has a Motorola DSP56001 processor, A-to-D and D-to-A converters, and digital inputs and outputs.

Sound Tools and Audiomedia II.

Within *Cubase Audio*, I used the card to record vocals and guitars, and it performed equally well. Audiomedia II was virtually transparent; recording and playback proceeded effortlessly. The only drawback was being limited to two channels, but considering the \$1,295 price, I really can't complain.

The combination of Audiomedia II and *Cubase Audio* made it possible to capture rough guitar and vocal ideas quickly—at the moment of inspiration—without having to bother with making a mix to my DAT machine. The advantages of this are obvious. The "why doesn't it sound as good as the demo?" scenario can be neatly avoided, as the quality of the Audiomedia II's sound makes it possible to use your original, inspired performances in the final version.

CONCLUSION

I heartily recommend the Audiomedia II system. It's simple to learn and use, works well, and sounds good. The system will find favor among musicians who need the basic editing capabilities of Sound Tools, but don't want to spring for a full-blown Sound Tools II system. It's also well-suited to those who want a solid, inexpensive audio front-end for *Studio Vision*, *Digital Performer*, or *Cubase Audio*.

I can also see it as a very attractive option for multimedia types who need

Product Summary

PRODUCT:

Audiomedia II hard-disk recording system

PRICE:

\$1,295

SYSTEM REQUIREMENTS:

Macintosh II or Quadra with 5 MB RAM; System 6.0.7 or later (System 7.0-savvy); hard disk

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● AUDIOMEDIA II

sound capability for presentations, but don't want to get involved in a costly, elaborate "pro" system with lots of features they don't need. Sure, pros may gripe that the system only offers two channels of audio and doesn't have AES/EBU format or balanced analog in/outs. But just five years ago, a system with these capabilities at this price would have been unheard of. Good job, Digidesign.

Sony DPS-R7, DPS-D7, and DPS-M7

By Peter Freeman

A troika of dedicated signal processors demonstrate that less really can be more.

Once upon a time, signal processors were one-trick ponies: Digital delays performed delay-related tasks, flangers added swoosh, and reverbs created ambient magic. In recent years, however, most manufacturers have focused on multi-effects processors that perform several tricks simultaneously.

In that context, Sony's specialized processors—the DPS-R7, DPS-D7, and DPS-M7—are throwbacks. Although each provides some additional effects, the R7 is a reverb unit, the D7 is a delay, and the M7 performs pitch-shifting and other modulation tasks such as chorusing and flanging.

Sony uses similar, single-rackspace boxes for the R7, D7, and M7; the primary difference is the firmware. All three devices operate in true stereo (two discrete mono processors), but also can accept mono input via channel 1. They include both unbalanced 1/4-inch and balanced XLR input and output jacks. The front panels include dry and wet level controls and a dual-concentric input-level control. In addition to their 100 preset programs, the R7, D7, and M7 have enough battery-backed RAM for a whopping 256 user memories.

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handheld, wired remote control (the RM-DPS7) that connects via a rear-panel, 9-pin connector and can control up to fifteen units.

R7 ARCHITECTURE

The R7 is designed primarily for reverb and related effects. It contains five software Blocks—the Input Block, Pre-effect Block, Reverb Block, Post-effect Block, and Output Block—each of which represents an internal element through which a signal passes on its journey through the unit.

The Input Block receives signals from the R7's A-to-D converter and handles level, phase, and panning. The Pre-effect Block applies one of six different effects to the input signal before feeding the Reverb Block. The six algorithms available in the Pre-effect Block are Phase Shifter, Flanger, Stereo Exciter + Stereo EQ (2-band bass and treble control), Mono Exciter + Mono EQ, and Gate.

The real action takes place in the Reverberation Block, which operates in either of two configurations: Stereo In/Stereo Out or Mono In/Stereo Out. The former produces true stereo processing for inputs 1 and 2, while the latter uses the two processors to produce different effects for each channel. The Reverb algorithms are Hall, Room, Plate, Gate, Early Reflection, and two different types of Delay. Also included are Mono In/Stereo Out versions of the Plate, Gate, and Early Reflection algorithms, for use in dual-mono effects programs.

The Post-effect Block processes the signal from the Reverberation Block. It is identical to the Pre-effect Block, except for the addition of an Autopan algorithm.

The final stop in the R7's internal audio chain (before the D-to-A converters) is the Output Block, which

offers further control over the phase, panning, and signal output level.

R7 OPERATION

Using the R7 can be simple or fairly tedious, depending on the degree of control exercised. Loading the factory presets is easy: Just press Load, turn the dial to scroll through the presets, and they are loaded automatically. (This, along with other user-interface parameters, can be changed, as I'll discuss later.)

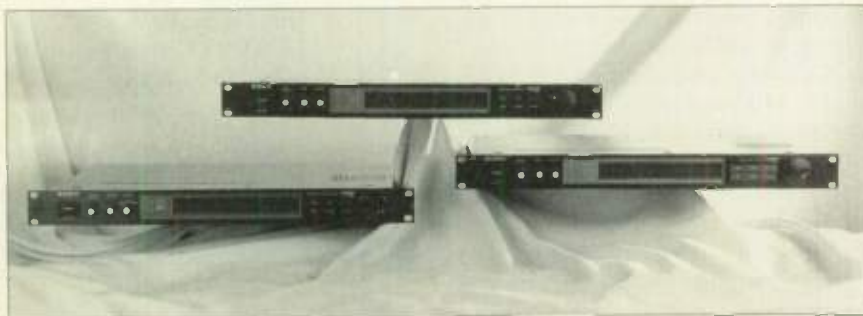
The fun begins with the editing process. Each DSP Block can be edited by pressing Edit, dialing in the desired Block, and then pressing Enter. Parameter selection also is accomplished with the dial and Enter keys.

One nice aspect of this unit is the Block Load function, in which specific Block settings from any other program can be loaded into the program currently being edited. For example, if you discovered a particularly nice flanger setting in another program, you can apply it to your new program.

However, a major problem with single-parameter-style editing (a method shared by many contemporary devices) is that it is difficult to get an overview of the many parameters existing within a program. On a unit of the R7's complexity, it's a serious disadvantage.

For instance, the R7's Early Reflections algorithm provides individual time, phase, and level control over 48 discrete delay taps. Needless to say, individually tweaking each of 48 taps is a ridiculous proposition, especially in a high-pressure studio situation. The most practical solution would be a computer-based front panel/editing program that could address the R7 using MIDI System Exclusive (which is supported).

Despite the occasionally awkward and time-consuming methodology,



Sony's DPS-R7 specializes in reverb, the DPS-D7 provides delay effects, and the DPS-M7 performs pitch-shifting and other modulation effects, such as chorusing and flanging.

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● R7/D7/M7

parameter-editing is fairly easy once you are familiar with the layout of parameters within the various Blocks. After a couple of days of poking around, I could create effects programs quite comfortably.

Convenient, context-sensitive, online help is accessed by pressing the Help key repeatedly. Although it doesn't provide in-depth help with effects parameters, the Help text is useful as a reminder of basic R7 procedures, such as storing and recalling patches. The feature can be disabled.

At the left of the LCD, various animated displays appear, depending on the current page. For example, when in Edit mode, a pair of scissors appears, and when actually varying a parameter with the dial, the scissors "snip" open and closed. If you change a program's parameters and try to load a new program without first saving the changes, a small, amusing, cartoon face appears, along with text asking what you wish to do. This, coupled with the online help, gives the unit a decidedly friendly feel. It would be nice if other manufacturers implemented this sort of feature. (Although notably absent from the R7 user interface is an LCD contrast control; I often had to strain to read the display.)

A few other nice user-interface features are worth mentioning. For starters, the R7 has in-depth program-handling capabilities: Programs can be copied, moved, deleted, exchanged with programs in other memory locations, and individually memory-protected. Also noteworthy is the Time Scale parameter. Designed for quick, global adjustment of reverb parameters, this allows macro control of settings for situations when in-depth editing is not practical or desirable.

The R7 also provides unusual, even excessive, control over the units used to express the parameter values. For example, predelay time could be displayed in words (number of samples); milliseconds; feet; meters, where 1 second = 340 meters; or quarter-notes, where the delay time equals the duration of a quarter note at a given tempo.

The time taken to load a program into memory is adjustable from 200 to 1,000 ms. This lets you change programs at a timed rate so the new program doesn't cut off the reverb in a previous program.

Finally, one rather unusual feature

is the R7's onboard clock. This allows you to date-stamp your presets so you know which is the most recent edit, which is very cool. On the amusing side, if you fill in your name and birth date, at the appropriate time the device wishes you a happy birthday.

MIDI

The R7 employs a fairly standard MIDI implementation. Up to four MIDI continuous controllers can be assigned to any parameter in any of the signal-processing Blocks. User memories can be dumped and loaded via MIDI System Exclusive messages, and a Program Change table allows access to both the Preset and User memories.

THE MANUAL

Owner's manuals for musical equipment, particularly equipment of foreign manufacture, have never had reputations as shining examples of clarity. The R7's manual is particularly lame. Written in what can only be a poor literal translation from Japanese, it sports such obtuse gems as "Properly raising the Feedback gives the tone a manner" (hopefully a good one), and "a strongly applied effect may be found well fitted in the later rendering." It's certainly not the helpful documentation you'd expect for a unit costing \$1,295.

R7 SOUND

The R7's factory presets don't do justice to its processing power, because the unit's extensive parameters can create a range of impressive-sounding and

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Product Summary

PRODUCT:

DPS-R7 digital reverb
DPS-D7 digital delay
DPS-M7 sonic modulator

PRICE :

DPS-R7 \$1,295
DPS-D7 \$1,100
DPS-M7 \$1,500

MANUFACTURER:

Sony Corporation
3 Paragon Dr.
Montvale, NJ 07645
tel. (201) 358-4197

EM METERS RATING PRODUCTS FROM 1 TO 5

FEATURES	●	●	●	●
EASE OF USE	●	●	●	●
SOUND QUALITY	●	●	●	●
VALUE	●	●	●	●

unusual effects and reverbs. I found that after delving into the presets and altering them (subtly and drastically), the unit proved capable of a respectable range of reverb effects, from bright, clear halls and small plates to bizarre early reflections programs.

One especially nice combination is phase-shifting, concert hall, and flanging, in that order. This combination sparkles and shifts, producing pleasing results on a variety of sources, from piano and guitar to percussion. In fact, the R7 worked quite well on almost any type of percussive sound. Its clean, transparent sound often added an extra dimension to mixes.

The only disappointing application is the R7's vocal embellishment. To my ears, this is not the greatest box to use as your main vocal reverb. Its algorithms can have audible "ringing" artifacts that tend to show up clearly on vocal tracks.

D7 OVERVIEW

The D7 focuses on delay-related effects and contains Delay, Input, Output, EQ, and Autopan Blocks. Packaged in identical hardware to the R7, it offers the same MIDI implementation, and its functions are accessed in a similar manner. The process of operating the D7 differs primarily in the software pages resident in the unit. For instance, unlike the R7, Blocks cannot be loaded from other programs when creating a new program.

The seven delay algorithms—Stereo Delay, Feedback Delay, and Double Delay—are fairly straightforward. Tap Delay contains 38 taps, while Long Tap Delay contains two 29-tap delay lines and a 3-band EQ. Panpot Tap delay provides two channels of Pre-delay plus five taps with individual pan controls. Multi Delay is a complex array of pre-delay and main delay lines, where various taps feed each other.

The maximum delay time depends on the algorithm. For example, the Long Tap Delay algorithm provides a maximum of 2,730.42 ms per tap, while Panpot Tap Delay allows 682.6 ms per tap. Generally, the various algorithms provide sufficient delay time for their respective sounds, so I never found myself up against the wall with a specific application.

However, there is one glaring omission from all of the D7's delay algorithms: an LFO for pitch-modulation

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● R7/D7/M7

of the delayed signal. This is surprising, as it is an important feature commonly found on less expensive units. (Perhaps Sony doesn't want the D7 to compete with the M7.)

D7 SOUND

The first immediately obvious D7 characteristic is the quality of the delayed signal. It's extremely clean, which is essential for a delay-only unit.

The unit's versatility is immediately apparent upon delving into its programs and parameters. The D7 produces just about any type of delay-derived effect I could want, with the exception of modulated-delay sounds. In addition, unlike some other units in its price range, the D7 cannot sample and trigger sounds.

D7 DECISIONS

The clarity and flexibility of the D7 is impressive. Although it would be nice to see some pitch-modulation capabilities, the D7 is a powerful delay processor as is.

Since it only handles delay effects, the D7 may not find the widespread popularity of a less-expensive (the D7 costs \$1,100), true multi-effects unit. However, the D7's pristine sonic quality makes it an excellent tool for the professional.

M7 SONIC MODULATOR

The third in Sony's new trio of digital processors, the M7 Sonic Modulator focuses on pitch-modulation and pitch-change effects. It is capable of both fixed and "intelligent" (input-dependent) pitch-shifting, as well as a variety of chorus, flanging, vibrato/tremolo, phasing, and Doppler effects. It also has a Rotary Speaker algorithm for Leslie-type effects and a Ring Modulation algorithm that contains two independent oscillators whose pitch can be adjusted individually.

Following the now-familiar Block structure of the R7 and D7, the M7 contains an Input Block; two Pre-Effect Blocks that can produce Stereo EQ, Exciter, Gate and Compression effects; a Modulation Block, where the majority of the M7's effects are created; a Post-effect Block; and an Output Block. As with the R7, Blocks from pre-existing M7 programs can be loaded at any time when creating new programs. Like the R7 and D7, the M7 provides macro control over its modulation

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The Modulation algorithms contained in the M7 are fairly extensive, a brief sampling includes: Deca Chorus (5-channel independent chorusing), Band Chorus (the input signal is split three ways, each equalized and chorused separately), Reverse Pitch Shift (the input is reversed before pitch shifting is applied), Multi Phaser (a complex affair which provides two independent phase shifters for each input channel, each containing up to sixteen phase-shift "stages" that can be arranged in series or parallel), and Multi Flanger.

M7 SOUND

One of the M7's main strengths is its chorusing. Sony obviously is aware of this, as the factory presets are crammed with different variations of chorus and chorus-like effects. Most striking are the Deca Chorus and Multi Chorus algorithms. These chorusing algorithms, and many of the M7's programs, tend to shine the most when used with clear, mid- to high-frequency input sources, such as guitar and piano.

The ring modulator does wonderfully bizarre things to almost any input source. The M7's real-time MIDI control facility (which are identical to those found on the R7 and D7) makes it possible to create repeatable, automatable ring-mod effects, with the aid of a sequencer.

I was happy to see an Envelope Block containing an Envelope Follower algorithm and two independent Envelope Generators. This powerful feature can be used to tailor and shape the contour of modulation effects, which makes them less predictable and more dynamic.

M7 CONCLUSIONS

Like the R7 and D7, the M7 is unusual amidst the current fascination with multi-effects devices. Its specialized, narrowly focused approach has advantages and disadvantages. On the plus side, it covers pitch-based modulation effects better than many similarly priced devices and should become a big hit with guitarists and keyboardists. Having said that, asking struggling musicians to plunk down \$1,500 for a dedicated modulation device is expecting a lot in today's economic climate.

Peavey Midibase Digital Bass Guitar System

By Glenn Letsch

The electric bass guitar and MIDI announce their long overdue second marriage.

Too often, we bassists have to suffer through the retelling of the studio joke, "How many bass players does it take to change a light bulb?" The answer: "None; the keyboardist does it with his left hand." The joke is cruel, but fair. Like many bassists, I've awaited a good MIDI bass guitar controller so I won't have to put up with such jokes.

In response to bassists' frustrations, Peavey produced the Midibase, a bass-guitar MIDI controller that also functions as an electric bass guitar. Separate volume controls on the bass allow you to listen to regular bass, MIDI instruments (using MIDI Volume messages), or a blend of the two.

A special 8-pin cable connects the Midibase to a 1U rack-mount interface that offers MIDI In and Out jacks and a 1/4-inch audio output jack for the regular bass guitar pickups. The MIDI In port allows the Midibase to receive Program Changes and load patches using SysEx. A 1/4-inch Select jack on the front of the interface accepts a momentary switch. The interface is tiny and could be mounted in a half-rackspace box except for one detail: Peavey doesn't make any half-racks. They should.

TRACKING ISSUES

Past attempts to create MIDI bass guitars were disappointing. The pitch-to-voltage method of tracking is too slow; the delay time between playing a note and hearing it is not acceptable. For MIDI guitar systems, pitch-to-voltage tracking also is a problem, but it's far worse with MIDI bass. To operate properly, most pitch-to-voltage systems must read two full cycles of the vibrating string. It takes 8 ms to read the lowest note on a guitar (160 Hz), which is enough to cause a perceptible delay. But it takes 20 ms to read two cycles of the lowest note on a bass (41 Hz).



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You can improve the tracking on a MIDI guitar by playing the notes an octave higher on the instrument and transposing down an octave in the synth. With a bass, transposing an octave isn't enough. Until a completely new approach solved the tracking problem, electric bass guitarists could not join the world of MIDI unless they also played another MIDI instrument.

A NEW SOLUTION

Peavey utilizes an alternative tracking method that uses a combination of wired frets, four special transducers mounted in front of the bridge, and tension-sensors built into the bridge saddles (where the strings cross the bridge). A synthetic (Lexan) fretboard surface is laminated to a rosewood fingerboard, serving the dual purposes of covering the circuits in the fretboard and providing a tough, natural playing surface.

The neck is routed to accommodate the truss rod and a wiring system that connects the fret circuits to the Midibase controller circuitry. The latter is housed in a cavity in the body of the bass guitar.

The wired frets work somewhat like the key contacts of a synth keyboard: When a string touches a fret, contact is made, and the transducers identify the note. Each fret is split into four "minifrets," separated by insulators, providing independent note-identifi-

cation for each string at each fret.

The four transducers in front of the bridge sense string motion and use it to generate Note On, Off, and Velocity messages. Each transducer's height can be adjusted individually to match the player's touch, as triggering sensitivity is directly affected by minute height adjustment. The (picking) Style patch parameter changes the sensitivity of the transducers to the string orbit. This allows you to play with your fingers or a pick for any given patch.

The sensors in the four bridge saddles measure the amount of stress on the bridge as the tension increases during a string bend. The resulting data is translated into Pitch Bend messages for each string. String-bend sensitivity is easily calibrated using the instrument's global parameters.

The Peavey tracking system is marvelous. I don't have any complaints about the Midibase's responsiveness, and the instrument senses string bends quite well.

PATCHES

The Midibase has memory for 24 onboard performance patches, which can be saved and loaded via System Exclusive. The patches are called up with sensors on frets 1 through 12 of the G and D strings. To call up a specific patch, hold down the string as you normally would fret a note with your left hand. With your right hand, flick a

data switch mounted next to traditional volume and tone controls, and the requested patch is called up. This patch-selection method is convenient, but sometimes 24 patches just aren't enough.

Individual patch parameters are selected in the same manner as patches using sensors on the A string, frets 1 to 16. To change a parameter, hold the string to the fret and toggle the data switch. All parameters are displayed on an LED display that is conveniently mounted next to the instrument's left shoulder-strap clip.

The patch parameters include most basic control features, although the Midibase certainly doesn't have the extensive options found in a master keyboard controller. Different patches can be mapped to each string, complete with MIDI channel assignment, Transposition (± 2 octaves), Velocity Sensitivity, Pitch Bend range for string bends (+2 semitones), and picking Style (Finger or Pick). The instrument can send a Program Change for each patch, and even lets you scroll through the programs in your sound module, but it does not send MIDI Bank Select messages.

You can select one of two modes for sustain. When this parameter is set to 0, a note sustains as long as the string is vibrating. (Of course, the sustain also ends if the synth sound reaches the release part of its amplitude envelope before the string stops vibrating.) When set to 1, a note sustains as long as you hold the fret down.

The optional footswitch can be assigned to send Sustain or Modulation Wheel messages. The unit accepts a momentary switch, but not a sweep pedal, so Mod Wheel is either 0 or 127. This design is curious; I would rather see two inputs, one for a fully programmable footswitch and one for a programmable pedal.

One critical performance patch parameter is pitch-wheel calibration, as the Midibase sends Pitch Bend messages when you slide your fingers up and down the fretboard. This parameter can be set to 8 or 24 semitones, and your sound module should be set to match. Otherwise, the sound module will sound out of tune.

A few synths (such as the Peavey Spectrum Bass, Roland D-110, and Oberheim Matrix-1000) respond to Pitch Bend messages up to 24 semitones,



The Peavey Midibase bass-guitar controller uses a combination of wired frets, tension sensors in the bridge saddles, and transducers in front of the bridge to achieve exceptionally fast and accurate tracking and string bends.

which allows you to slide the entire length of the Midibase fretboard. But according to Peavey, the lowest common denominator for pitch bend in synths is eight semitones, or a minor sixth. Synths with 8-semitone pitch bend cannot respond to the Midibase's full 2-octave pitch-bend potential, but otherwise they work fine.

Peavey is preparing a new 4-part multitimbral Midibase synth module with 24-semitone pitch bend. The Midibase synth will have a similar sound engine to the DPM-V2, which is a rack-mount version of the DPM-2. It will carry the same \$799 price tag, but it will have all new sounds.

GLOBAL PARAMETERS

The global settings (memory lock, MIDI input channel, mode, pitch bend, etc.) are accessed on the E string, frets 1 to 11, in a manner similar to the A-string performance patch parameters. The Midibase operates in any of two monophonic or three polyphonic modes. As you might expect, the Mono modes play only one note at a time, while the Poly modes can play chords. Mono 2 and Poly 2 don't play any notes above the sixteenth fret.

However, there's more to these modes than simply determining the polyphony of the instrument. If the pitch-wheel calibration is set to eight semitones, Mono 1 allows 8-note slides. Mono 2 allows 16-note slides by sliding eight semitones, then sending a new Note On and sliding another eight semitones; fret transitions during a slide disguise the new note. Poly 1 and Poly 2 work exactly the same way on chords, while Poly 3 allows no sliding at

Product Summary

PRODUCT:

Midibase Digital Bass
Guitar

PRICE:

\$1,799 (including case)

MANUFACTURER:

Peavey Electronics
711 A St.
Meridian, MS 39302-2898
tel. (601) 483-5365

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all. If the pitch-bend calibration is set to 24 semitones, all modes except Poly 3 allow 24-semitone sliding.

The Mono modes are best-suited for bass lines, while Poly 3 seems best for strings, piano, and more ethereal patches that would be a bit strange sounding if you were to slide notes.

PLAYING TECHNIQUE

The Midibase is your ticket into the MIDI race; it doesn't mean you've won, or won't encounter any technical difficulties. You have to learn how to drive this specialty car. It has its own unique set of eccentricities that must be understood and mastered, so be prepared to make some playing adjustments.

The manual states that "When playing the Midibase...the key hints are *accuracy* and *commitment* to the note that you are playing." While this is true, methods you use to attain this on the electric bass guitar will thwart you in triggering a clean MIDI note. String dampening, right- and left-hand muting of unwanted notes, ghost notes—all the subtle nuances you've developed to give your bass playing a unique and intimate personality—have to be adjusted when using MIDI sound sources. The Midibase is really another instrument to be mastered, so be prepared to spend some time for an effective transition. It's the same kind of adjustment sax players face when adjusting to a MIDI wind controller.

BASS-IC EVALUATION

When the Midibase arrived for review, it required some setup and tweaking. Notes were buzzing everywhere on the neck. I was dismayed at first, but after I reset the truss rod, adjusted the bridge, and calibrated the MIDI pickups, the instrument was ready to be played. A Peavey technician explained that the neck may have bowed in transit, but it has stayed true since I set it up.

The manual implies the user's main interest is mixing real bass sounds and synthesizer sounds together, and I found that playing adjustments are lessened by mixing the two. The combination permits a more "natural technique." This does not mean you can be sloppy; it's just that when blending sounds, you can use your already-developed sense of nuance, so the real bass guitar sounds better. The MIDI patch is not as prominent and is used more as enhancement.

As I see it, there are more important reasons for using the Midibase. Thanks to the instrument's amazingly fast tracking, you can play synth bass patches, eliminating the "left hand of the keyboardist replaces the bass player" joke. More to the point, you can create completed works, using the same variety of synth sounds as you would with a keyboard or guitar controller, but you get the performance advantages of a bass.

Let's not forget the Midibase also is a traditional bass guitar. I'm not convinced of its sonic qualities in this capacity, though. The neck and body have more wood removed than other basses, and, as a result, the Midibase definitely is less punchy, with less articulation. Peavey should compensate for this by improving the response of the pickups, or adding an onboard preamp to give the bass more natural kick.

I thoroughly enjoyed playing the Midibase. Peavey has done a good job of solving the string-tracking problems when nobody else could. The user interface is a bit unusual, but editing didn't present any significant problems. As with most products, this one could be improved, but all in all, the Midibase is the only really usable MIDI bass guitar system.

Glenn Letsch, *electric bass guitarist, instructor, and author, has been recording and touring worldwide with such artists as Robin Trower, Montrose, Gamma, and New Frontier.*

**MIDIconcepts
EZ MIDI Pro (PC)**



By Allan Metts

This appropriately named sequencer combines solid features and ease-of-use.

In the formative years of software sequencers, powerful features and ease of use seemed mutually exclusive. This hampered creativity in a big way. Happily, many software sequencers have matured into powerful MIDI manipulators that encourage the creative process with an intuitive user interface and consistent

operating procedures.

EZ MIDI Pro, by MIDIconcepts, is a relatively new sequencer for PC-compatibles that provides an excellent example of this trend. Its friendlier-than-usual user interface offers easy access to a set of powerful features not often found in such an inexpensive program. Of course, this combination of power and easy operation demands a suitable computer. The program requires an 80286, 80386, or 80486 computer with at least 384 KB of EMS, XMS, or extended memory, which can be expanded to 16 MB to accommodate immense amounts of song data.

FIRST GLANCE

Let's start with a quick look at the specs. *EZ MIDI Pro* provides 128 tracks, each of which can record data on all sixteen MIDI channels. The timing resolution is 768 ppqn. The program supports many single- and multi-port MIDI interfaces as well as the Sound Blaster sound card.

There are no less than six synchronization modes. The three internal sync modes are MIDI (which sends Start, Stop, Continue, Clock, and Song Position Pointer messages), Pattern (which sends Start, Stop, and Clock messages only for older drum machines), and Remote (which waits for external Start and Stop messages, but synchronizes the actual performance to the internal clock). External sync modes include MIDI Sync (which responds to Start, Stop, Continue, Clock, and Song Position Pointer), Chase-Lock Sync (used with Music Quest MQX-16S and MQX-32 MIDI interfaces), and SMPTE/MTC (which responds to frame rates of 24, 25, 30, or 30-drop).

Installation went smoothly using a standard installer. Unfortunately, the installer doesn't let you select subdirectory locations for the program, and it automatically puts the program startup batch file in the root directory of the hard drive. Configuration of the MIDI interface was no problem.

EZ MIDI Pro operates in text mode, so you don't see all the icons and graphics to which *Windows* users are accustomed. The program is said to support EGA and VGA monitors, displaying 43 or 50 lines of text on the screen, respectively. However, I couldn't get EGA or VGA mode to work with my VGA gray-scale monitor; I had to use

25-line DOS text mode. Although it's a bit unexpected in a text-based program, support for a mouse is a welcome addition.

Like most sequencers, *EZ MIDI Pro* displays MIDI data in a variety of ways. The Track View displays the parameters associated with each track, and the Song View is used to manipulate the song on a measure-by-measure basis. The Pitch, Controller, and Event List Views display the details of an individual track (see Fig. 1).

A set of drop-down menus, buttons, and status indicators let you record, edit, and play back your music. These menus, buttons, and indicators appear in all five Views, which results in a clean, consistent user interface. If a menu selection is not appropriate for the current View, it appears without highlighting.

EZ RECORDING

Recording is easy: Simply press the record button on the screen and play. I recorded multiple parts on different channels to one track, after which I split each channel onto a separate track, using the Extract function. You also can record those tricky passages using a capable step-record function.

Punch-in and punch-out can be manual or automatic, and incoming data

Product Summary

PRODUCT:

EZ MIDI Pro 1.08g

SYSTEM REQUIREMENTS:

12 MHz or better 80286, 80386, or 80486 PC with 640 KB RAM; 384 KB EMS or extended memory; hard disk; mouse recommended; supports most displays and MIDI interfaces

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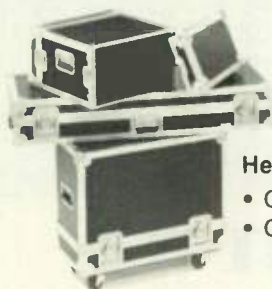
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MANUFACTURER:

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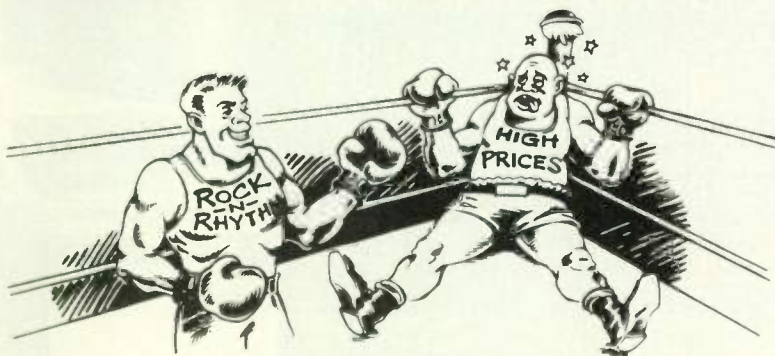
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• EZ MIDI PRO

can be merged with the data already in the track, using the Layer function. This feature is handy in a variety of applications such as drum-part programming; simply limit recording to a range of measures, turn on Layer and Looping, and record drum tracks or other parts an instrument at a time, much like a conventional drum machine. Regrettably, there is a slight pause between loops.

A Record Filter eliminates incoming note, Aftertouch, System Exclusive, Continuous Controller, or Velocity messages (all note velocities are set to 64). Unfortunately, the Controller Filter is not specific; it removes all controllers, or none of them. A particular controller message can be removed from a track after recording, but it would be better to filter specific controller messages from the input data stream.

Any track can record tempo changes, which are entered in real time from an external MIDI Clock source, or manually from the computer keyboard. A special calculator determines the tempo with four presses of the space bar or mouse button. While many tracks can hold different tempo maps, the user selects one track to follow for tempo. This scheme allows you to easily audition different tempo maps. In addition, tempo is treated like any other event; it appears in the Controller View and can be scaled, offset, and otherwise manipulated. I was disappointed to learn that it isn't possible to record a "free-form" performance and tap in the tempo later. Also missing is the ability to preprogram a smooth tempo change over a range of measures, although it is easy to do manually in real time while the song is playing.

Each track can be associated with one of eight user-defined time-signature maps. This is an excellent way to allow polyrhythms, while minimizing the confusion when each track has its own set of independent time signatures. These time-signature maps can be defined and associated with a track after recording, and they are saved with each song.

EDITING YOUR MASTERPIECE

Once your song is recorded, there are many ways to move around. You can go to any part of the song by clicking on the scroll bar with the mouse, or

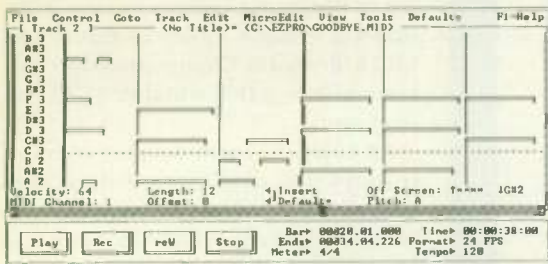


FIG. 1: The Pitch View shows a track in greater detail.

by entering a SMPTE time or bar/beat/clock value directly. In addition, there are several more options in the GoTo menu. However, I wish the program included markers that allowed you to instantly jump to important points in the song.

EZ MIDI Pro has three editing menus. The functions in the Track menu operate on entire tracks that are tagged for editing; those in the Edit menu work on specified portions of tagged tracks; and the items in the MicroEdit menu operate on individual elements within a track. Sixteen edit markers let you specify and name regions to edit within tracks. Each edit marker can be associated with one of six edit buffer that hold data to be copied or moved.

The relationship between the edit menus, edit markers, edit buffers, track tagging, and the current View (Track, Song, Pitch, etc.) is complex. However, the combination of these elements provides considerable editing power that is surprisingly simple to use. And if you make a mistake, an Undo feature is close at hand.

EZ MIDI Pro provides a versatile palette of editing commands, including quantization, time offset, harmonic transposition, and note-velocity adjustment. However, the editing options are not as extensive as some other programs on the market. Missing features include time compression and expansion; pitch, time, and velocity randomization (for less-mechanical sequences); MIDI controller remapping; and partial quantization (moving a note only part of the way to the beat). *EZ MIDI Pro* is text-based and does not support graphic controller editing, which seems to be the rage these days.

FEATURES TO GO

EZ MIDI Pro is well-suited

for live-performance applications. Songs can be played one after another from a user-specified song list, or loaded individually in response to external Program Change messages. The Remote synchronization mode uses the computer's internal clock during playback, but waits for external Start and

Stop commands. Along with the Program Change song-select feature, this mode is intended to let you leave the computer offstage for "hands-free" operation. Unfortunately, this potentially useful feature is crippled by the fact that the onscreen Play button must be pressed after each new song is loaded before the program begins waiting for an external Start message. Once the Remote sync mode is activated, it should automatically wait for a Start after each song is loaded.

A System Exclusive librarian stores SysEx data for up to 32 devices and transmits it automatically before the current song begins. The librarian saves and loads data in MIDIEX format, which is compatible with patch data found on many electronic bulletin boards. Dump Request messages for over twenty MIDI devices are built-in, but additional Request messages cannot be added to this list.

The program provides a number of features that make it easier to see as well as hear your music. "VU meters" move with the music in the Track View, and the Song View displays measures according to the density of their data. When tracks contain data on more than one MIDI channel, the display can be restricted to avoid confusion. Five zoom levels adjust the amount of information that appears on the screen at once. And changing the patch number in the Track View automatically

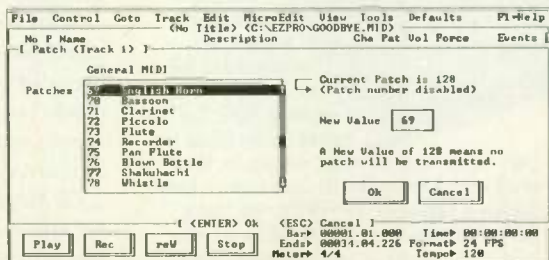


FIG. 2: Dialog windows are large, with plenty of detail and descriptions.

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● EZ MIDI PRO

sends Program Changes to your gear, making it much easier to figure out which Program Change message corresponds to patch number "C30" on your synth.

EZ MIDI Pro has a number of other features that simplify recording, editing, and file maintenance. Four on-screen faders are used to transmit and record controller information in real time (according to MIDIconcepts, sixteen faders will be available in version 1.2). The faders are independent tools that can be assigned to any message, track, or MIDI Out port at any time. Unfortunately, this design prevents the onscreen fader movements from being recorded, which is a drag if you want to tweak the recorded data with a fader. Other features include DOS access, a SMPTE calculator/locator, automatic timed backup, and common file-maintenance operations.

THE BIG PICTURE

This program's user interface is excellent. The use of drop-down menus throughout the program shortens the learning curve. *EZ MIDI Pro* asks for information in large dialog boxes that use non-cryptic descriptions (see Fig. 2). The scrolling list of General MIDI patch names that appears in the Patch Change Window is a nice touch. Keyboard shortcuts also are provided where appropriate.

My computer is a few feet away from my MIDI gear, so I like to put the computer's mouse pad on my keyboard controller and operate programs from a distance. *EZ MIDI Pro* works well in this configuration; the program can be operated almost entirely with a mouse. However, two common operations require the computer keyboard: entering song locations and tagging tracks for editing. According to the manual, tracks can be tagged with a mouse, but I found this to be untrue.

The program is easy to customize. The user decides if tagging should remain after an editing operation, how often the song is automatically backed up, and even if dialog windows "explode" or not. Mouse tracking speed, repeat rate, and double-click interval also are configurable.

EZ MIDI Pro's online help is context-sensitive and provides an adequate, though not extensive, description of the program's operation. The manual is complete and well-organized, with

good explanations of the program's features (except the error noted earlier). However, the manual has no illustrations, few examples, and little explanation of the basics of MIDI and sequencing. Those who are new to MIDI will have a hard time getting up to speed using this manual.

Most initial program releases are not bug-free, and *EZ MIDI Pro* is no exception. I found several minor bugs in the program, most of which were easy to work around. The program did crash once, but I was unable to replicate the events that led to the crash. The program's automatic backup feature should minimize any heartaches. By the time you read this, version 1.2 will be shipping, which should correct these problems.

BOTTOM LINE

I tested the product in a relatively complex MIDI studio, recording mostly jazz and popular material. *EZ MIDI Pro* performed admirably in almost every situation. Those already familiar with MIDI will quickly learn to take advantage of the power offered by this program. Seasoned professionals may decide to use *EZ MIDI Pro* as their sequencer of choice, provided they can live without some of the more esoteric editing functions. Either way, this program is a great buy.

Allan Metts is an Atlanta-based musician, electrical engineer, and MIDI consultant. He is wondering what one does with a Yamaha CP35 piano, once all the good sounds are sampled from it.

MIDITEMP MIDI Player MP-44

By Geary Yelton

**A combination SMF player
and MIDI patch
bay/processor integrates
onstage MIDI systems.**

In the studio, computer-based systems provide the sequencing functions and integrated control of an elaborate MIDI orchestra. But most musicians who use sequences

in live performance don't want to haul a big, expensive, fragile computer to the gig. They need easy, no-questions-asked sequencing, integration, and control.

Hardware sequencers can play sequences onstage, but provide relatively few MIDI data-processing and routing features. A superior solution might seem to be a laptop computer with a multi-port MIDI interface to run music software onstage. But right now, such systems are still somewhat expensive and relatively fragile. Until these drawbacks are overcome, devices such as the German-built MIDITEMP MIDI Player MP-44 (distributed in the U.S. by Corrigan Marketing) can help musicians survive electronic live performances.

OVERVIEW

The MIDI Player is a multi-purpose black box that serves as a sequence player, rudimentary sequence recorder, SysEx filer, data processor, and 4 x 4 MIDI patch bay. Its 64-track sequencer can store up to 256 sequences (in two banks of 128), sync to external MIDI Clock with Song Position Pointer, and record patch dumps and other System Exclusive data. The processor section, called the "Matrix," can split a master keyboard into zones, transpose pitch, renumber patch changes, and much more.

The MP-44's construction is rock-solid—so solid that it's surprisingly heavy for a single-rackspace unit, weighing more than 5 1/2 pounds. On the front panel are sixteen buttons, a 3.5-inch floppy-disk drive, a backlit LCD, and a power switch. The back panel has ports for MIDI, power, and a footswitch. An optional (\$206) external power supply includes a self-recharging battery to preserve the memory's contents when the MIDI Player is switched off. The MP-44 comes standard with a megabyte of memory, upgradable to 8 MB with the optional EXM expansion board (\$113), which uses standard SIPPs.

BASIC OPERATION

The user interface is not intuitive; in fact, without the manual, you would never figure out how to operate the MP-44. There are two keys that both display functions and switch between Sequencer and Matrix modes. Most of the functions are selected by double-

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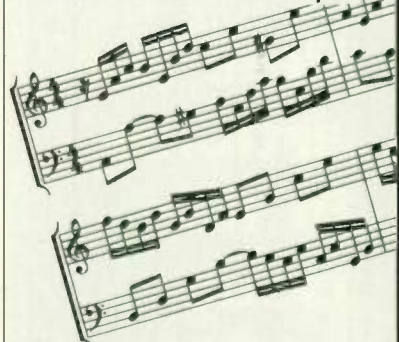
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● **EZ MIDI PRO**



PETER DIGGS

MIDITEMP's MIDI Player MP-44 integrates an entire MIDI stage setup, combining a Standard MIDI File player, 64-track sequencer, SysEx data filer, and 4 x 4 MIDI patch bay/processor.

clicking a mode key, then entering a number on the numeric keys. Double-clicking requires that you press a key twice in succession, more quickly than double-clicking a computer mouse button. The up and down keys are used to step through lists of parameters or change parameter values. The two remaining keys are used to enter and exit function displays, load and save files, and start and stop the sequencer.

The numeric keys also are used to change the internal program. Of course, you can change programs by sending MIDI commands from a remote instrument or controller. Because most MIDI controllers only send 128 Program Change numbers over MIDI, you can set up the MP-44 so that one bank responds to Program Change messages and the other bank responds to Song Select messages. This provides remote access to all 256 sequences in memory.

Programming such a complex device with only a 40-character LCD is irritating. It's often difficult to keep track of where you are and what you're doing. Someone should write an editor/librarian program that lets you graphically program the MIDI Player on a full-size screen.

MIDI processors are such complex devices that good documentation is essential. The MIDI Player's manual is thorough, and in general it's fairly clear. Most of the illustrations are small flowcharts that show how to access function windows. I wish there were a master map that showed all the windows and the paths leading to them. And the manual could use some graphics to illustrate certain functions.

THE MATRIX AND REAL-TIME PROCESSOR

The Matrix MIDI patch bay functions separately from the sequencer. Changing Matrix programs only affects data

entering the MIDI In ports and has absolutely no effect on sequencer functions. Up to 256 Matrix programs can be loaded and saved from floppy disk or via SysEx, either individually or all at once. Matrix programs in memory are selected in the same way as sequences.

The Matrix's primary use is to route signals from the four MIDI inputs to the four MIDI outputs. Any input can be sent to any combination of outputs with full merging capability. Signals sent on any channel can be filtered, merged, and rechannelized. Reassigning MIDI channels is referred to as "multi converting." Data on a single channel can be sent out on multiple channels through a function called "Manifold."

The MIDI processor is used to alter and filter MIDI messages. Events that can be filtered out include notes, Program Changes, Pitch Bend, any or all continuous controllers, both kinds of Aftertouch, Active Sensing, System Common, System Real Time, and System Exclusive.

The MP-44 splits any MIDI keyboard into as many as four zones. Each of these zones can send to any MIDI channel

Product Summary

PRODUCT:
MIDITEMP MIDI Player MP-44
PRICE:
\$1,099
DISTRIBUTOR:
Corrigan Marketing
114 Lakewood Circle
Smyrna, TN 37167
tel. (615) 355-8756

EM METERS	RATING PRODUCTS FROM 1 TO 5		
FEATURES	●	●	●
EASE OF USE	●	●	●
DOCUMENTATION	●	●	●
VALUE	●	●	●

or combination of channels, each with independent pitch bend and controller response. Pitch can be transposed up or down in any zone or over the entire keyboard.

Velocity can be scaled by a fixed amount, limited so it never exceeds a specified value, or compressed so it never falls below a certain value. You even can reverse data so that playing harder produces less velocity and playing softer produces more; this allows you to use Velocity to switch or cross-fade between two MIDI channels.

Perhaps the most useful function is sending a Program Change on each channel from each MIDI Out with a preset MIDI Volume level when you change Matrix programs. This lets you configure your whole system (up to 64 devices!) for each song you perform. The Send Data function sends patch dump requests, changes receive modes on the remote instrument, turns local control on and off on the remote instrument, and even transmits user-entered hexadecimal and decimal MIDI commands.

The "0" key serves as a "transparent panic" button. This returns all controllers to their default values (using the Reset All Controller command), sends All Notes Off on all channels,



The sequencer is comparable to the low-end sequencers found on some synths.

and sends Note Off messages for every note on every channel, without affecting the incoming flow of MIDI data.

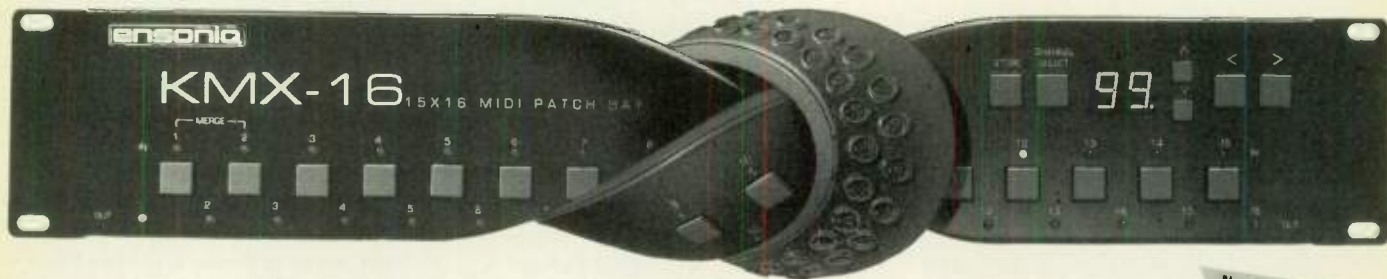
SEQUENCING

The MIDI Player saves and loads sequences in Standard MIDI File format. Sequences can be loaded one at a

time, or if they're all assigned to one file, up to 256 at a time. A song can be played as soon as it's loaded, or the player will wait until you tell it to start from the front panel, footswitch, or a remote Start command.

Sequencing functions are pretty basic. Certain keys serve as "transport" buttons. There's a bar-counter display that shows the measure, quarter-note beat, and 96th of a beat, along with play status and tempo. Beat resolution is 384 pulses per quarter note. When you record a new sequence, the tracks are numbered sequentially: The first pass becomes track 1, the next is track 2, and so forth. Separate tracks can be recorded simultaneously through separate MIDI inputs. Once recorded, track numbers can't be reassigned.

The disk drive reads MIDI files from Atari ST and IBM-compatible floppies. To transfer files from another sequencer, you must sync the two machines and play the sequence straight into the MP-44's inputs. You can record four separate tracks simultaneously through the four MIDI inputs, but



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changes. For more power, the KMX-16 lets you to handle up to 99 presets with the same programming flexibility. And both offer a selectable MIDI merger for combining the outputs of any two MIDI devices simultaneously.

With either patch bay, programming and editing are as simple as selecting an output with one switch and assigning an input with another. And for Mac or Atari computer users, there are optional graphic editing programs that give you "hands off" control of either unit.

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unfortunately, tempo changes are not recorded. Each track can be individually assigned to play back through any one of the four MIDI outputs.

Once a sequence is recorded, you can enter tempo changes, extend the length of the song, or change any of the time signatures in the song. When you save a song, it can be assigned a title of up to eight characters, with a 3-character extension (usually ".MID"). There are no other editing functions.

To store System Exclusive data and other individual MIDI messages, you simply record them as if they were sequences. Patch dumps and the like are treated exactly like songs.

Sequences and Matrix programs can be chained together in preprogrammed supersequence files called "Jobs," which can be called up with Program Change commands. A Job resembles a playlist, letting you play songs sequentially or trigger them from a footswitch. Unlike a playlist, though, entire Matrix setups also can be changed automatically. Jobs play from RAM, so you can instantly start, stop, or jump to sequences within a Job for a tight stage presentation.

CONCLUSION

As a sequencer, the MP-44 is comparable to the low-end sequencers found in some synthesizers, but falls far short of a full-fledged hardware or computer-based sequencer. With enough memory, it has the advantage of making 256 sequences immediately available.

But the best thing about the MIDI Player is that even if you don't use its sequencer to play songs, you can use its MIDI patch bay/processor features to easily reconfigure all your instruments for each song in a live performance. The MP-44 probably does everything you need from a 4 x 4 MIDI patch bay and processor, and possibly even more.

For those who need a MIDI file player/SysEx filer/patch bay/processor with more inputs and outputs, MIDITEMP also manufactures the 16 x 16 MT-16Xpandable (\$1,499) and 8 x 8 MP-88 (\$1,440). These devices are not yet available in the U.S., but are expected soon.

Unfortunately, at \$1,099 (not including options), the MP-44 is a bit overpriced. Most of its functions (except Jobs, which could prove quite useful) can be achieved for less money by com-

binning inexpensive components such as an Alesis Datadisk and a patch bay/processor from any of several manufacturers. In addition, laptop computers soon will be hardy and inexpensive enough to handle onstage sequencing and MIDI processing.

But the convenience of a multi-function unit should not be overlooked. If you want a single multi-function, rack-mount nerve center for your onstage MIDI system, and you have plenty of time to learn to operate it, the MP-44 will get the job done.

Musical futurist Geary Yelton lives in a hole in the ground surrounded by lush vegetation. His hobbies include procrastination and avoiding life-threatening situations.

The Blue Ribbon SoundWorks SuperJAM!

By Bob Lindstrom

Your new backup band might reside in your Amiga.

It's midnight. Everyone else has gone to bed. You've got the headphones hooked up to the mixer, and you're ready to practice your guitar or keyboard chops.

Why is there never a backup band around when you need one?

Using a MIDI sequencer to crank out accompaniments is more trouble than a little late-night inspiration is worth. If you're desperate, you could play along with the roar of the Amiga 2000's ventilation fan, or you could try to get down to the visual beat of interlace flicker. But they have lousy beats, and I can't dance to them.

The solution is The Blue Ribbon SoundWorks' *SuperJAM!*, an upscale, music-minus-one Amiga program for the 1990s.

ONE-PERSON JAM

If you take a courageous

step out of Amiga country from time to time, you may have heard of PG Music's *Band-in-a-Box*, a solid, algorithmic accompaniment program available for Mac, PC-compatible, and Atari ST computers. This ingenious piece of software permits you to select a musical style (e.g., jazz, swing, hip-hop, bossa nova, rock), type in chord changes from a chosen song, and play along as the computer automatically generates a piano-bass-drums accompaniment.

SuperJAM! performs a similar service for Amiga owners (Blue Ribbon also is developing a version for the IRIS Indigo computer). *SuperJAM!* offers more flexibility than *Band-in-a-Box* in exchange for an increased personal effort. *BIAB* is very much an electronic fake book, with its several prefab data disks of well-known tunes. *SuperJAM!* is more a composer's tool. It largely gives you the responsibility for entering chord progressions and backup patterns. As such, it is more versatile, but it is also less convenient when you just want a no-brainer accompaniment to "Feelings" (a redundant concept, I admit).

If you only want to play along with the Amiga, go to *SuperJAM!*'s Style menu (see Fig. 1) and make a choice from the 30 musical styles included with the program (metal, Motown, new age, jazz, country, etc.). Chords and progressions may be selected by loading one of over 40 progressions provided with *SuperJAM!* Alternatively, you can build your own progressions from the library of individual chords available in the program, or use a chord-creation window to define and save your own chords.

Then pick a key, pick a tempo, and

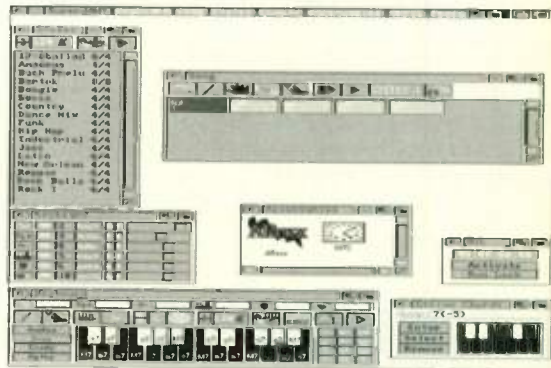


FIG. 1: *SuperJAM!*'s main window. The program's windowing environment provides instant access to chord definition, accessories, SMPTE sync, chord entry, band setup, style choice, song creation, and keyboard data entry.

start playing. Based on the style and harmonies you've chosen, *SuperJAM!* can generate a surprisingly hip accompaniment, with up to six parts of strings, rhythm guitar, drums, bass, keyboard, and lead. The program works by randomly selecting from a database



SuperJAM!

isn't as stylish as
Band-in-a-Box,
but its versatility
and configurability
outstrips anything
else on the market.

of short pre-existing patterns and making on-the-fly adjustments according to the chord changes and other requirements (i.e., is it an intro, fill-in, ending, etc.) *SuperJAM!* keeps cranking out new accompaniments until you Snapshot a variation section you particularly like.

If you only want to keep some of the measures, you can instruct *SuperJAM!* to save only selected measures and recompose the rest. Through a trial-and-error, save-and-recompose process, you can produce precisely the accompaniment you want for a particular song.

The backup "band" can be routed through outboard MIDI instruments (the program has built-in patch-change and drumset selections for the Roland MT-32 and a few other synths). Or you can crank out the changes with internal Amiga sound samples, using Blue Ribbon's breakthrough, multiimbral TurboSound technology. You can combine MIDI and Amiga samples in any combination, subject to the computing limits of your system.

SuperJAM! works as a stand-alone, jammin' monster, or as a *Bars&Pipes Professional* accessory that integrates all of its groove-on-your-own features into that thoroughly Amiga MIDI sequencer. The program installs as an accessory in *Bars&Pipes Professional* if you have at least 2 MB of RAM; *SuperJAM!* output is routed directly into the sequencer. When you save a *B&P Pro*

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● SUPERJAM

song, the *SuperJAM!* song is automatically saved as part of the sequence. If you should take a shine to one of those constantly changing improvisations, and you aren't using *SuperJAM!* with *Bars&Pipes Professional*, you can save the parts as a Standard MIDI File for later fine-tuning in the sequencer of your choice.

THE SECRET

Here's the trick: Each of *SuperJAM!*'s styles is a matrix of harmony-independent bass lines, percussion patterns, guitar riffs, and keyboard fills. When you type in the chords, *SuperJAM!* mixes and matches those musical building blocks to create constantly changing accompaniments.

When you tire of the built-in styles, or just want to dredge the groove a little deeper, you can create your own Styles or edit the existing ones. A Style consists of an unlimited number of multi-measure patterns for as many as six instruments. Within each Style, you create patterns for each instrument. You can enter a pattern with the built-in graphic step editor, or play it directly from a MIDI instrument.

Within each single-instrument pattern, you can program up to sixteen independent variations (which you can think of as subpatterns). Using the program's default setting, when you create a pattern, it is recorded identically into all sixteen variations. Then *SuperJAM!* easily allows you to tweak the variations individually to your ear's content. But you also can elect to custom-record each variation separately.

This interface is relatively easy to grasp, and if the process sounds complicated, it won't be after a few hands-on minutes with the style-generating tools. (Composing really cool patterns takes a lot of experience, however.)

A set of logical conditions also can be linked to patterns to help *SuperJAM!* understand when and when not to use them. For instance, patterns may be designated as ending patterns, breaks, fills, or intros only. Or you can compose patterns to be played back only when the chord occurs at the beginning of the measure, or on half notes or quarter notes. An impos-

ing, but accessible, Variation Choice window (see Fig. 2) permits you to assign patterns only to specific chords and chord types.

SuperJAM! lacks a bit of the stylishness of *Band-in-a-Box* on the IBM PC, particularly when it comes to automatically filling out harmonies with elevenths and thirteenthths. However, its versatility and configurability outstrips anything else on the market. *SuperJAM!* allows you to customize virtually every one of its features from its MIDI instrument setup to its degree of time and duration randomization.

TURBOSOUND TRICKERY

The Amiga's four built-in digital-to-analog converters (DACs) generally limit its audio output to only four independent, simultaneous voices, regardless of whether the voices are samples or internally synthesized sounds. Blue Ribbon has overcome that 4-voice limit with the TurboSound technology included with *SuperJAM!*

This ingenious achievement permits the independent use of up to sixteen separate digital samples, all sounding at once. It's a remarkable programming stunt and useful, perhaps, if you want to get started with *SuperJAM!* without purchasing an outboard MIDI synthesizer. But I suspect that few serious *SuperJAM!* users will spend more than a few "ear-ritating" minutes with these sounds.

The concept behind TurboSound is simple. Rather than sending samples directly to the DACs, Blue Ribbon uses the Amiga's computing muscle to analyze the entire score that *SuperJAM!* intends to play and then preprocesses a single, long sample that tries to include all of those notes. Instead of spooling out four single-voice samples

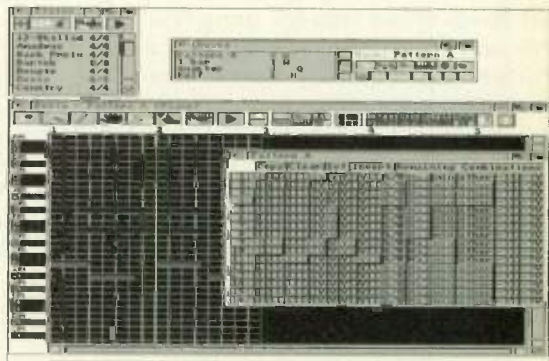


FIG. 2: Style patterns may be edited graphically in the step editor, then assigned logical attributes in the Variation Choice window.

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to four DACs, TurboSound spools out a single sample to one DAC with up to sixteen notes.

TurboSounds require prodigious computing power and copious expansion RAM, so unaccelerated, unexpanded Amigas (500, 1000, 2000) won't be able to play the full sixteen voices. And because TurboSound creates only one sample with up to sixteen voices, its output is generated in monaural sound. To Blue Ribbon's credit, the *SuperJAM!* manual clearly states: "Although TurboSound technology offers you the opportunity to create multitimbral arrangements on your Amiga, it can't compete in sound quality with even the least expensive MIDI instruments."

JAMMIN' IT HOME

A hallmark of Blue Ribbon is solid, sincere customer support. The original version of *SuperJAM!* had a few problems, but within weeks of its release, they were up to a reasonably stable version 1.0c. Even so, there are still several cosmetic bugs, as with many Amiga

programs. None of them, however, significantly detract from the product.

Overall, the *SuperJAM!* interface is brilliant, if occasionally complex, and it is superior to the IBM-based competition. Typically for Blue Ribbon, the interface is a trifle mouse-bound at times. When mouse-dragging becomes a drag, I'd like to start typing in chords, but *SuperJAM!* doesn't want me to do it. On the up side, the interface makes creating your own styles not only possible, but downright inviting.

This is a great musical Tinker Toy. On a casual afternoon, I sat down and started stacking up the riffs in a light jazz style. Instead of the agonized anxiety that usually comes with composing, creating a style was like patching up a spontaneous quilt of possible bass, drum, and accompaniment lines. Yet when *SuperJAM!* coordinated these chunklets, they seemed to have more breadth and continuity than I gave them.

Without more built-in styles, though, *SuperJAM!* really is a product for composers and improvisers. If you don't

have control of a style, it's virtually impossible to develop a *SuperJAM!* version of it. (Trust me, you don't want to hear my rap style.) As a result, my wish list would include more styles, hipper styles (some bring to mind Lawrence Welk), and lots of data disks with chord changes for well-known songs. Fortunately, Blue Ribbon is now shipping classical, "cutting edge," and pop-rock styles, and more are planned.

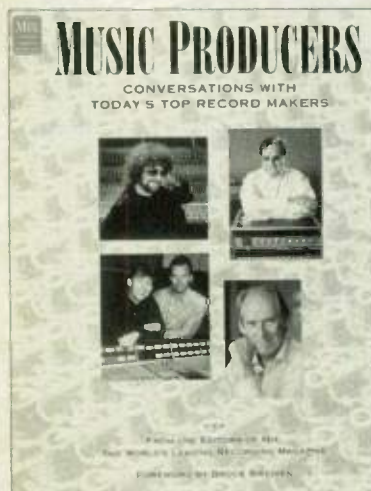
If you're an after-midnight musical loner or just want to woodshed in private, *SuperJAM!* is a great alternative to public humiliation. Ignore the TurboSounds, hook up a MIDI synth, and start pumping out those cool backup sounds. Whether you need to spontaneously commune with the inner muse, or just shove out a lot of music fast and cheap, *SuperJAM!* is a terrific enhancement for your improvisational inspirations.

Bob Lindstrom is creative director of Dynamix, Inc. and was named best software reviewer by the Software Publishers Association.

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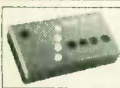
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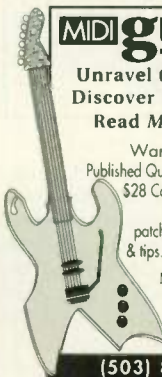
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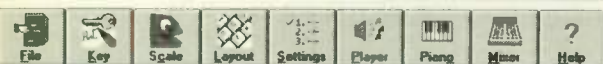
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PRO FILE

Elements of Humanity

Kitaro's non-sequenced dreamscapes

By Michael Molenda

In the current vernacular, "electronic musician" implies a specific breed of creator. And, of course, the simplest definition harvests the widest acceptance: a MIDI keyboardist or composer utilizing computer technology to painstakingly construct flawless musical entities.

But what about a down-home blues guitarist plugging into a Fender Twin? Nothing computerized here, but Reddy Kilowatt is an essential partner in each and every lick. In a literal sense, anyone tapping into America's power grid to perform or record music is an electronic musician. The priests and priestesses of high technology are just another subculture within a large and artistically rich society. And regardless of one's stylistic "clubhouse," true visionaries harness technology to enhance creativity, not control it.

Sometimes that means taking a few steps backward.

"My technique is still analog," laughs internationally renowned recording artist (and electronic musician) Kitaro. "I use ancient synthe-

sizers, and all my music is played by hand. I don't use sequencers. Yes, my music is sometimes not on the beat, but I am a human artist. I am not a machine."

The ancient analog instruments that comprise Kitaro's unique cross-cultural style include a Korg Poly-800, a Roland SH-01, and a Roland 330 vocoder. Even the environmental sounds of waterfalls and wind on Kitaro's latest album, *Dream* (Geffen Records), are generated by analog synthesis. (Most artists rely on digital samples for these audio milieus.)

"Analog synths have a special sound," explains Kitaro. "Even though the instrument is electronic, the sound has an organic timbre. These synths feel very natural and complement the way I program sounds. Every day is different, so the tones vary depending on my ears and physical condition. Sometimes this is a problem when recording. Today's beautiful sound may appear very harsh tomorrow. But this uncertainty does not inhibit me. I like the way things are constantly developing."

On *Dream*, Kitaro combines his trademark electronic textures with acoustic instruments such as taiko drums, flute, tabla, and the distinctive voice of Yes crooner Jon Anderson. For Kitaro, arranging a sonic landscape invokes yet another human characteristic: intuition.

"I want to use all sounds: digital, analog, and classical," he says. "But I must be careful to make each sound serve the music. I usually compose a piece entirely on synthesizers, then I listen and decide what instruments should make the sounds. For this, I become one of the audience. You see, I have both sides. I am the composer, and I am a listener. If I feel good about a sound, then perhaps someone else will share that good feeling."

The organic, "human performance" ethic of Kitaro's music—and his reliance on battered analog synths—does not mean he shuns modern technology. It's simply a matter of putting the artist first.

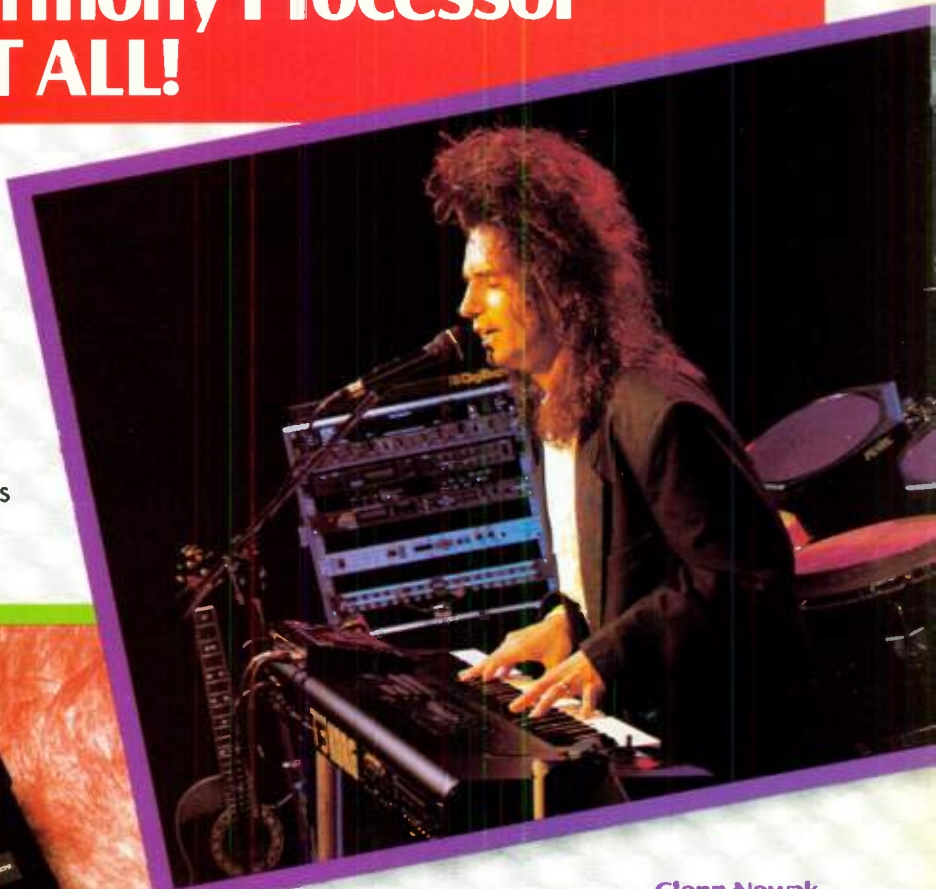
"I'm learning to use computers, and I want to use new technology," Kitaro admits. "If I can put my spirit into a sequence or digital sound, if I can feel my spirit *through* the technology, then I have been true to my heart."



Kitaro

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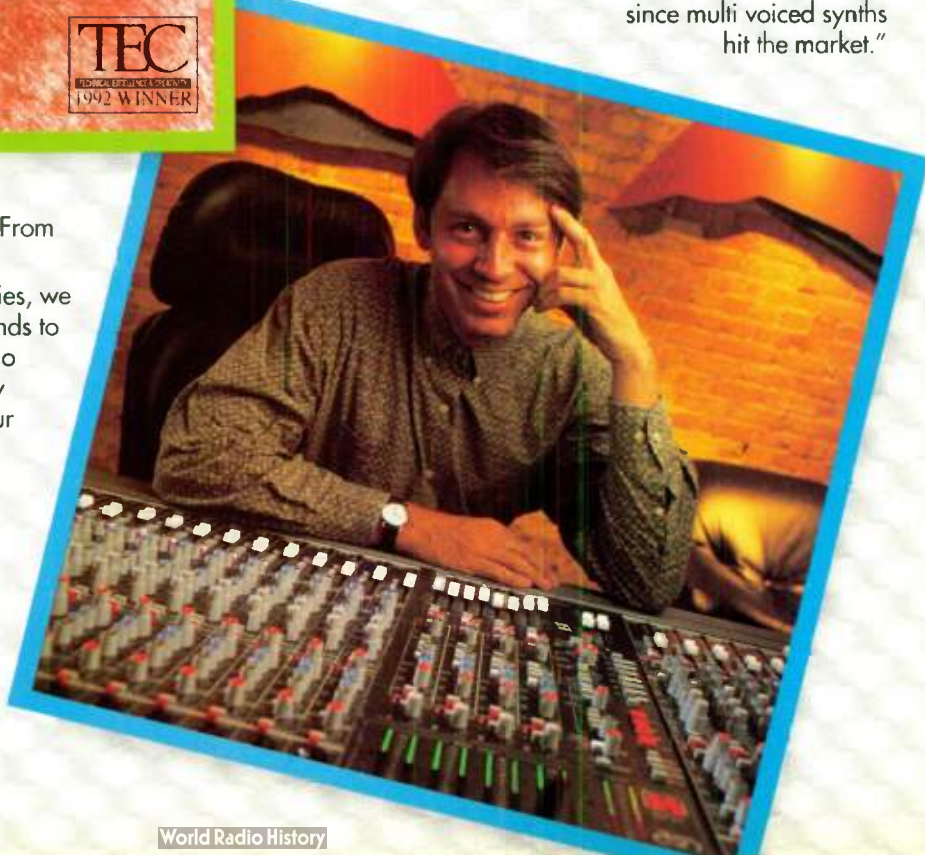
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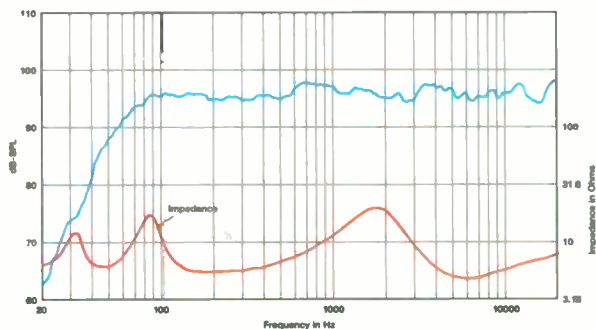
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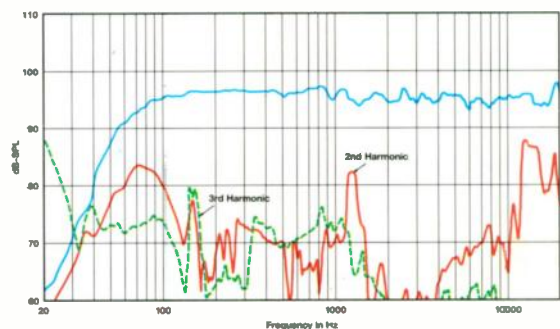
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