Digital Workstations

Electronic MUSICIAN

JANUARY 1988 A MIX PUBLICATION U.S. $2.50/CANADA $3.50

25 Hot MIDI Products Under $500

FREE! Xpander Patch Sheet

Updating "Dinosaur" Synths

REVIEWS: *E-mu SP1200 • Korg DS-8 • Suzuki MIDI Guitar • Sound Ideas CD Sampling Library • Casio MG-500/510 MIDI Guitars • Valhala ESQ-1 Librarian/Patches (C-64/128) • Korg SRV-2000 • Triangle DX/TX and CZ Librarians (C-64) • Yamaha REV5 • Realistic Minimus-7 Speakers • Fellows JiffyDOS/64*

0 76956 14050 3

Our Specs Are More Importantly, So

At Korg, one premise guides digital engineering: technology doesn't really achieve anything unless it brings you closer to your music. No matter how innovative a design appears on paper, the specs don't add up to anything unless they produce an instrument with superior sound and feel.

The DSM-1 Digital Sampling Module

Our new rack mount DSM-1 Digital Sampling Module is a case in point. To take Korg sampling a step further, our engineers used the latest technology to set new standards of sampling accuracy and realism. The DSM-1 has extended memory (a full Megaword) and sampling rates of 16, 24, 32 and 48 kHz. With 16 fully independent voices, 16 individual outputs and a mix out. Plus multi-timbral, multi-MIDI channel operation for total flexibility.

With all of this, the DSM-1 is one of the easiest samplers to learn and use. The control format is thoughtfully designed to use familiar synthesis parameters, so you can edit sounds quickly and easily. Yet the logical design will take you as deep into the sample recording/editing process as you want to go. There's even a high speed RS 422 data port to give computer software quicker access to internal memory.

The DSM-1 stands out from the crowd of current samplers as a truly advanced sound creation tool, one that will strengthen any MIDI system. The perfect complement for the DSS-1, it can use any sounds from the already extensive DSS-1 sound library, as well as its own high capacity library disks. There are over 70 DSS-1 and

Impressive. Are The Sounds.

DSM-1 disks available now, with hundreds of sampled sounds and synth waveforms.

The DSS-1 Digital Sampling Synthesizer

The DSS-1 has been making giant strides of its own. New options let you double, quadruple or multiply internal memory up to eight times (as much as 2 Megawords of sample storage). You can access hundreds of sounds instantly, with a touch of a button.

Performance improvements include new, enhanced disk operating software that cuts the internal disk's loading time in half. And there's an SCSI (Small Computer Systems Interface) port that communicates with one to seven external hard disk drives. It lets you store up to 99 Systems per drive, then load any one in a few seconds.

The SG Sampling Grands

The name, the look and the crisp, positive weighted actions are the same; the sound is more realistic than ever. The *new* SG Sampling Grands have four times the memory of their highly regarded predecessors. That lets us use longer samples and more of them to create a sound that recreates the original acoustic and electric pianos with startling accuracy. The new SG sound is also available as a retrofit to your SG-1 or SG-1D. And there are now ten new SG voice cards available (many with split keyboard sounds) to expand your creative expression.

Korg sampling is for players who delight in the complexity of acoustic sounds — and in the unusual variations that conventional instruments can't produce. Only the DSS-1 and DSM-1 deliver the unique combination of advanced sampling and additive synthesis. So if you'd like to shorten the step from inspiration to expression, investigate the new high-performance DSS-1, the newly expanded SG-1D and the new DSM-1 at your Korg Sampling Products dealer. When it comes to creative sampling, studio efficiency and on-stage flexibility, there have never been digital instruments more musical than these.

KORG® Sampling Products Division

SAMPLING IS ONLY THE BEGINNING

DSM-1 features

- Memory: 1 Megaword (1.5 Megabyte)
- 16 voices assignable to 16 separate outputs + Mix out
- 64 split points
- Multiple Zones, Multiple Layers, 4-Way Velocity Switches and Cross-fades
- High Speed RS 422 port (SCSI interface option available soon)
- Linear and Equal Power Cross-fade looping
- Additive synthesis
- Media: High Speed, High Density 2 Megabyte 3½" disks. Reads DSS-1 disks

DSS-1 features

- Memory: 256 Kword standard
- 61 note velocity- and pressure-sensitive keyboard
- 8 voices, 2 oscillators per voice
- 2 programmable DDLs
- 32 Programs in memory, 128 on disk
- Velocity Switching
- Sample Editing: Mixing, Linking, Reversing, Truncating, Sample Address editing
- Autolooping with Normal and Back-and-Forth modes
- Program Parameters include Octave setting, LFO's, Noise generator sync, 12 and 24 dB/octave filters, Resonance, two Envelope Generators per voice, Unison, programmable EQ, extensive pressure and velocity routing

New DSS-1 Memory Update

- Optional Memory Expansions: 512K (2X), 1 Meg (4X), 2 Meg (8X)
- SCSI Data Port for communication with external hard disks (up to 120 Meg drives)

New SG Sampling Grand Features

- 1 Meg memory
- 10 SG ROM sound cards available
- Superior audio performance with new, improved piano and electric piano samples
- MIDI Pitch/Mod wheels
- Local On/Off
- Retrofits available for SG-1 (76 note) and SG-1D (88 note) pianos

For a free catalog of Korg products, send your name and address, plus $1.00 for postage and handling, to: Korg USA, 89 Frost St., Westbury, NY 11590 or to Korg USA West, 7886 Deering Ave., Canoga Park, CA 91304

Exclusively distributed in Canada by: Erikson Music, 378 Isabey Street, St. Laurent, Quebec H4T 1W1

® Korg U.S.A. 1987

THE IEQ WITH Smartcurve™

Not Just Another Programmable Equalizer With MIDI™

The IEQ with Smartcurve™ is a programmable, high performance graphic equalizer that includes a video output. For those who wish to enjoy the video output of the IEQ, ART makes the IEQ Video Monitor.* Smartcurve™, proprietary software developed by ART gives you instant actual frequency response as easy as the push of a button.

The IEQ Family consists of both the 2/3 octave and the 1/3 octave graphic equalizers. Both types come in two varieties, Controllers and Satellites. A Controller is a self-contained programmable intelligent graphic equalizer capable of controlling 15 satellites at once. IEQ Satellites are exactly the same unit except the front panel controls are eliminated.

IEQ Model Specifications:
Controller & Satellite

- 128 battery backed presets
- MIDI
- Frequency Response 20Hz-20kHz ± 0.5dB
- THD - ≤ .009% @ 1kHz, 0dBM typical
- Dynamic Range - ≥ 100dB typical
- Balanced inputs and outputs

***IEQ Video Monitor Features**

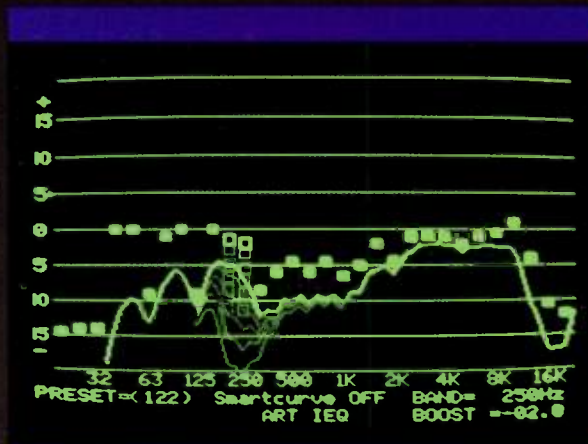
- 19" rack mountable
- NTSC compatible monochrome monitor
- 4 Selectable inputs
- Standard RCA jacks for easy connections

It Has To Be A Work Of . . .

ART

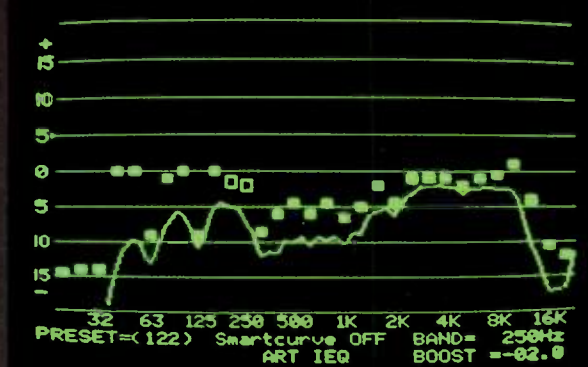
Applied Research & Technology
215 Tremont Street
Rochester, NY 14608
(716) 436-2720
TELEX 4949793 ARTROC
FAX (716) 436-3942

For more information see your local dealer.



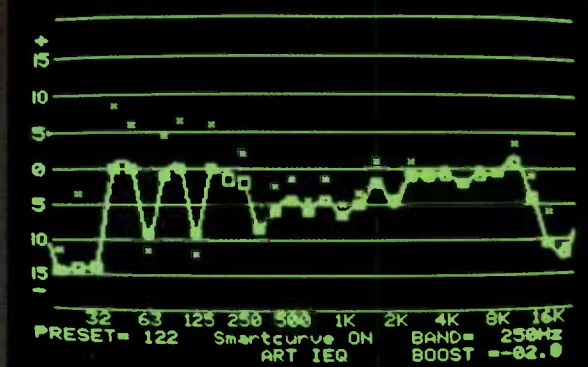
1 See the Sound

This is a video output of the IEQ as the unit is being adjusted. The sliders can be moved ± 15dB in 1/2dB steps to get the exact response you need. With the simple push of a button, complex equalization can be done in seconds with incredible accuracy.



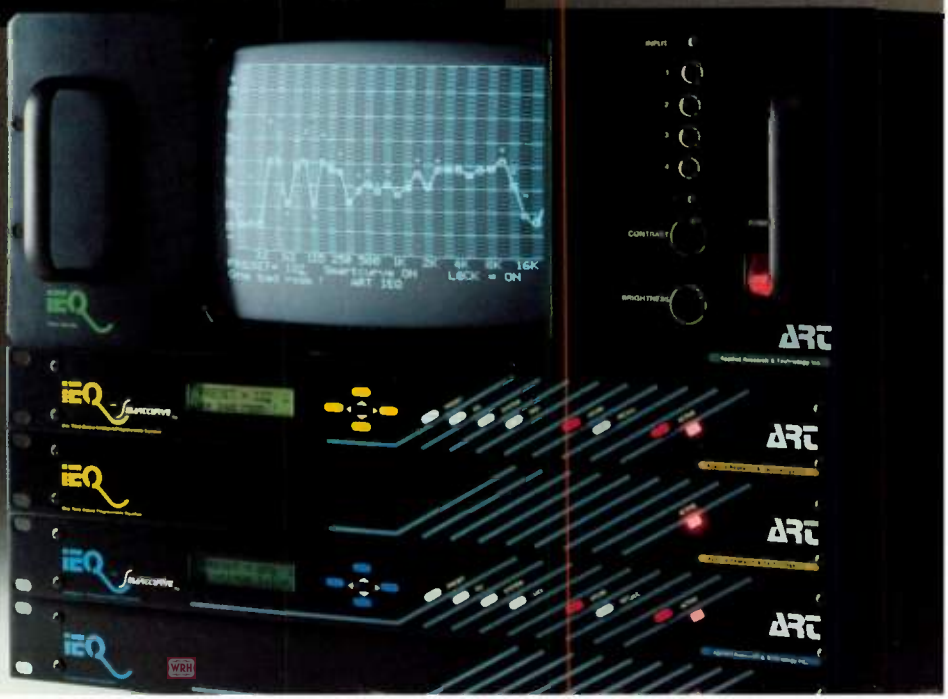
2 Hear the Sound

The power of the IEQ readily becomes apparent as the video display plots the frequency response due to the slider settings. The IEQ offers high quality constant "Q" equalization. The video graphic display shows the correlation between the sliders and the frequency response.



3 Perfect Sound

Turn Smartcurve™ on and perfect equalization is at your fingertips. Note the difference between the second frame, (Smartcurve™ OFF) and this frame. The position of the sliders represent the actual frequency response of the EQ. Interaction between bands is virtually eliminated. Incredible! Just think, now when you adjust the EQ you get exactly what you need. The "perfect" EQ? Let your eyes and ears decide.



VOL. 4, NO. 1 JANUARY 1988

Electronic MUSICIAN

A MIX PUBLICATION

DEPARTMENTS

6 Editor's Note
8 Letters
14 What's New
19 Operation Help
102 Released and Reviewed
104 Advertiser Index

COVER

Like the rest of the computerized world, MIDI toys are costing less and doing more. San Francisco photographer Tony Carlson shot this array of hot MIDI items—all retailing at under $500 and highlighted in our cover story. Featured are the Akai ME25S Note Separator; the Alesis MMT-8 sequencer; AMR's MIDI Director; the Atari 520ST computer; the Casio DG-20 digital guitar; Kawai's R-50 digital drum machine; Peavey's RMC 4512 footswitch and a Yamaha DX100 FM keyboard. Every one of these units can be a step on the road to building a MIDI setup for performance or recording.

Electronic Musician is published at 2608 Ninth Street, Berkeley, CA 94710 and is © 1988 by Mix Publications, Inc. This is Volume Four, Number One, January 1988. *Electronic Musician* (ISSN: 0884-4720) is published monthly. Second Class postage paid at Berkeley, CA and additional mailing offices. All rights reserved. This publication may not be reproduced, quoted in whole or in part by mimeograph or any other manner without written permission of the publishers.

Subscriptions are available for $22.00 per year (12 issues). Single or back issue price is $3.50. Subscription rates outside the U.S. are $34.00 per year.

Send subscription applications, subscription inquiries and changes of address to *Electronic Musician*, PO Box 3747, Escondido, CA 92025 or call one of these toll-free numbers: in CA, 1-(800) 255-3302; outside CA, 1-(800) 334-8152.

Address all other correspondence to *Electronic Musician*, 2608 Ninth Street, Berkeley, CA 94710, (415) 843-7901, FAX: (415) 843-9540.

We are interested in receiving unsolicited manuscripts but cannot be responsible for them and cannot return them unless they are accompanied by a stamped, self-addressed envelope. We urge you to send for our "How to Write for EM" guidelines.

Display advertising rates, specs and closing dates are available upon request.

To the best of our knowledge the information contained herein is correct. However, Mix Publications, Inc., its editors and writers cannot be held responsible for the use of the information or any damages which may result.

ARTICLES

SPECIAL REPORT: AES 83RD CONVENTION

Digital Workstations Highlight AES by Craig Anderton **20**
Our editor gives a full report on his yearly pilgrimage to the Temple of High-Tech Audio.

MIDI

25 Hot MIDI Products for Under $500 by Craig Anderton **52**
EM picks some of today's best MIDI values: you'd be surprised what $500 (and less!) can buy.

DO-IT-YOURSELF

Updating Your Dinosaur by C.R. Fischer **32**
Unearth that old synthesizer and dress it up in some new clothes.

Synthetica Exotica: New Jobs for Old Dinosaurs by David Kempton **39**
Can't keep up with the state-of-the-art? Then apply your imagination to extracting the hidden creative potential in older gear.

APPLICATIONS

Better Music Through Chemistry by Jack Orman **42**
Miracle sprays and additives can help keep your gear in tip-top shape.

Xpander Patch Sheet by Craig Anderton **48**
Finally—a patch sheet that shows all Xpander parameters at once.

Solving Power Problems for the Electronic Musician by Valerie Hrabsky **58**
Power: how to get it; how to use it. But mostly how to filter and condition it so it doesn't melt your gear when you least expect it.

Master The Yamaha TX81Z by Bill Thompson **64**
Behind the deceptively unassuming front panel lie powers and abilities only hinted at in the manual. Go for it!

REVIEWS

First Take **78**
Casio MG-500 and MG-510 MIDI Guitars; Valhala ES1 Librarian for Ensoniq ESQ-1 and C-64/128; Valhala ESQ-1 80-voice patch collections; Korg DRV-2000 Digital Reverb; Triangle Audio DX/TX and CZ Patch Librarians for the C-64; Fellows Inc. JiffyDOS/64 for the C-64 and SX-64; Realistic Minimus-7 Stereo Speakers; Yamaha REV5 Digital Reverb

Sound Ideas Sampler Library on Compact Disc by Geary Yelton **84**

Suzuki XG1m MIDI Guitar Controller by Craig Anderton **88**

E-mu SP1200 Sampling Drum Machine by Jim Johnson **92**

Korg DS-8 Synthesizer by Alan Gary Campbell **94**

Editor's Note

One of the most important things you can do when evaluating a piece of gear is to read the spec sheet, especially the MIDI implementation chart. But it's equally important to remember that specs should be guides, not gods—especially if you're not too sure about how to *interpret* specs.

For example, back in the '70s I remember analog delays that quoted a 90 dB dynamic range spec. Those who thought this meant the same thing as signal-to-noise ratio, though, were in for a disappointment. These delays were generally companding devices, and while it was true enough that the noise was 90 dB below the maximum signal, that condition only occurred when there was no signal going through the unit! As soon as you stuffed a signal in there, the signal-to-noise ratio became more like 40 to 50 dB. In this case, your ears could tell you a lot more than the specs.

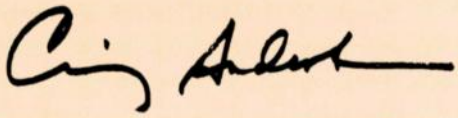
These days, it seems that the first question people ask about a digital device is "how many bits does it have?" They assume that more is better, which is often true. Yet, consider the Emulator II and the Mirage. Technically speaking, both are 8-bit systems. Put the two side-by-side, though, and there's no question that due to its use of data compression techniques, the E-II sounds a lot better than the Mirage (as you might expect anyway, given their respective price tags). Want to be more confused? Then dig up a Fairlight Series II, another 8-bit system that doesn't sound like either the E-II *or* the Mirage.

Now we have a flood of 16-bit sampling devices, which is all well and good. Yet some sound better than others. Others sound better than others under *some*, but not all, conditions. It's also important to remember that just because a device has a 16-bit A/D converter doesn't mean that the rest of the circuitry will have sufficient accuracy to make full use of those 16 bits. And don't forget that there are some 12-bit and 13-bit machines that sound just great.

It's understandable that in the confusing world of musical electronics, musicians are desperate for some means to compare devices intelligently and objectively (that's probably why reviews scored so high on our reader's survey). Yet musical instruments stubbornly refuse to be quantified. A guitar amp can measure 30% distortion in its "clean" mode, and still be considered a good-sounding amp. But if your sampler had 30% distortion, you'd be pretty upset. Even in the world of audio, where the specs for devices like power amps are pretty cut-and-dried, people will argue endlessly about the "sound" associated with pieces of gear that have virtually identical specs.

So if you can't just go by the specs to determine if one machine is better than the others, what can you do? First, use your ears; a musical instrument has to sound good. Second, if two instruments have similar sound quality, check which instrument has the kind of features you need. Next, consider support—whether the manufacturer is attentive to service problems and the like, and whether anyone offers products like accessory voicing software or sample libraries. And don't forget to consider the "feel" of the instrument's operating system: is accessing functions a simple, logical process, or something arcane and strange?

So next time you're talking with someone about a new piece of gear, before getting into the techno stuff, first ask if the device sounds good, is affordable, and whether it does what you want it to do. Those, after all, are the specs that *really* mean something.



Electronic MUSICIAN

Editor-in-Chief Craig Anderton
Senior Editor Vanessa Else
Associate Editor Tim Tully
Managing Editor George Petersen

Art Director Kathy Marty
Design and Production Deborah Villa
Production Anita Wong
Computer Illustrator Chuck Dahmer

Director of Advertising and Marketing Peter Hirschfeld
S. California/Southwest Advertising Manager Ken Rose
Advertising Representative Dennis Gray
Northwest/North Central Advertising Manager Harton Firmin

Publisher Penny Riker Jacob
Asociate Publisher David Schwartz
Associate Publisher/Corporate Marketing Director Hillel Resner
General Manager Mark Gunther

MIX PUBLICATIONS STAFF

Editorial Assistants
Karen Dunn
Linda Jacobson Josh Gressel
Sales Administrator
Neil McKamey
Marketing Assistant
Jane Byer
Sales Assistants
Randy Alberts Carol McMurray
Production Director
Anne Letsch
Production Assistant
Kathy Badertscher
Advertising Traffic Coordinator
Donna Burriston
Typesetting
Connie Wiggins Linda Dierking
Circulation Manager
Nick Clements
Circulation Assistant
Cindy Lukk
Controller
Craig Kennedy
Credit Manager
Ann Cuadra
Accounting Staff
Linda Looper
Cathy Boyum Lisa Jensen
Mix Bookshelf
Craig Wingate Camille Coyne
George Keres Brad Smith Todd Souvignier
Office Manager
Rachel McBeth
Receptionist
Lea Lewis

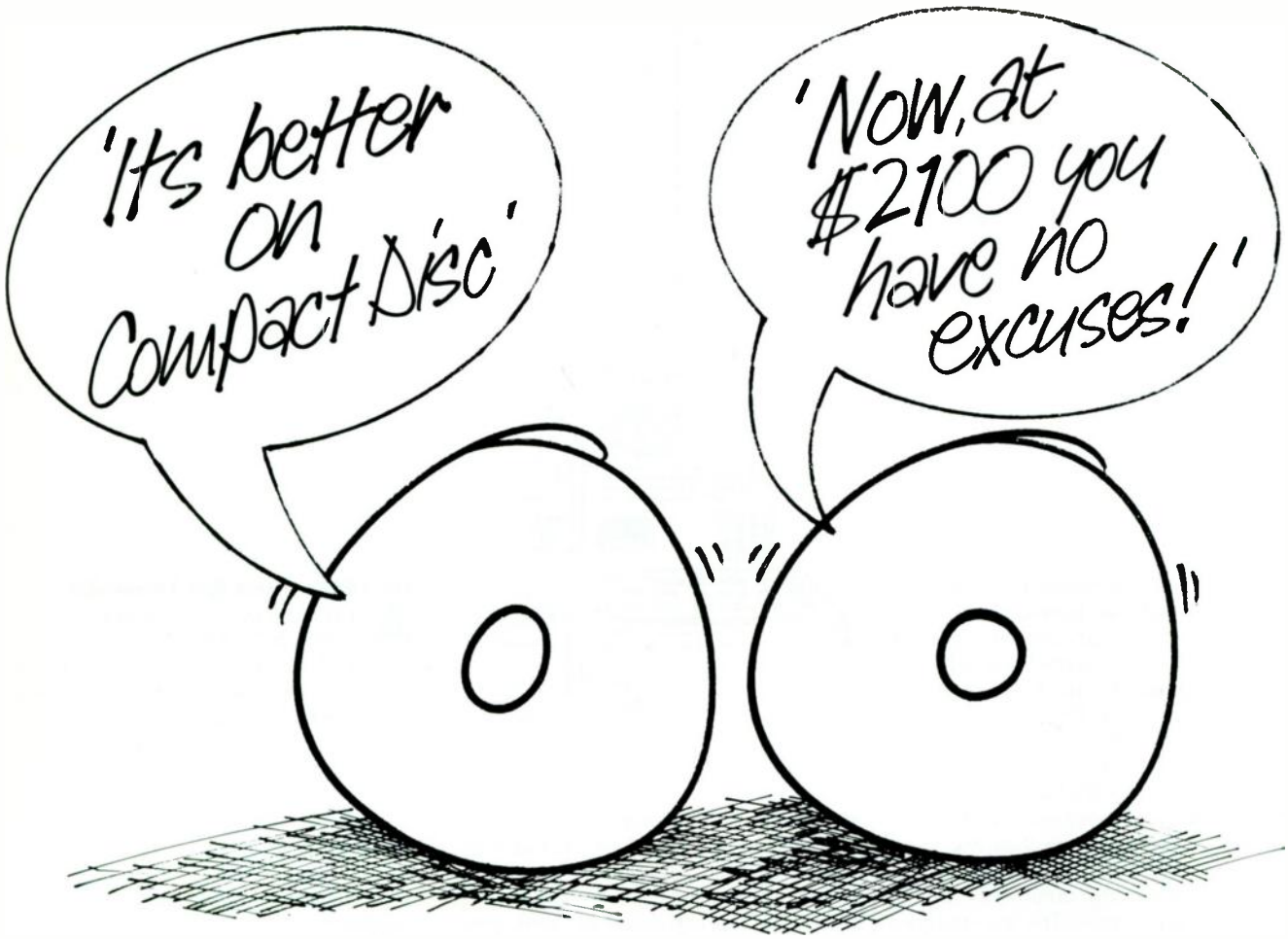
MIX PUBLICATIONS INC.

Chairman/CEO	Rudy Hurwich
President	Penny Riker Jacob
Executive Vice-President	David M. Schwartz
Vice-President Marketing	Hillel Resner
Treasurer	Mark Gunther

NATIONAL EDITORIAL, ADVERTISING and BUSINESS OFFICES
2608 Ninth St., Berkeley, CA 94710
(415) 843-7901, FAX: (415) 843-9540

SOUTHERN CALIFORNIA ADVERTISING OFFICES
(818) 709-4662/4

Have you heard ?



Call Nimbus Records Now!
1·800·782·0778

Nimbus Records

Quality, Excellence and Leadership in Sound Technology.

Special Price based on 1,000 CDs, Laser Mastering and Label Printing from artwork supplied.

Feel Factor Follow-Up

(Editor's Note: We received a huge, unanimously favorable response to Michael Stewart's article "The Feel Factor" [Oct. '87]. Many wrote in to say thanks; several wrote in either to confirm what Michael said, or offer a few tips of their own. The following three letters are representative of the type of response we received. By the way, we have some good news for EM *readers: Michael will be writing more articles for us in the future, and he certainly seems to have a few more tricks up his sleeve.)*

Although good musicians have always known, either intuitively or intellectually, that placing notes properly in relation to the main beat is critical to proper style, I have rarely seen this concept documented as well as it was in Michael Stewart's article on "The Feel Factor." His point is particularly important as new technologies are applied to music, expanding our musical horizons but, sometimes, blinding us to the basic elements of good music.

Congratulations to EM and Mr. Stewart for a significant article; I hope, for the sake of today's popular music, that it is widely read.

Tom Jeffries
California

Thanks to Michael Stewart for an extremely useful and fun-to-read article, "The Feel Factor." The article arrived at just the right time for me to experiment with the ideas presented therein, as I was mixing tracks for an album I'm producing. Hey, guess what—this stuff really works! I reprogrammed some drum parts and the feel was much better (thanks Michael).

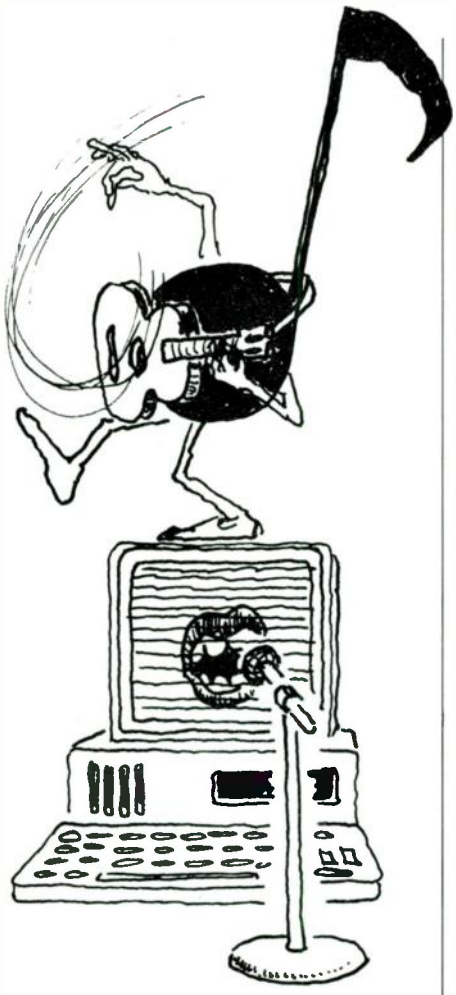
With the spiraling advancement of technology, we can't be more than two years away from drum machines with buttons that allow you to put any drum track slightly ahead or behind a beat. (The first machines will be costly, but then Alesis will make one for $400.) Two years from that will be a machine that has a feel control with interchangeable chips that read "Gadd," "Porcaro," etc.

Just like the joke about the drum machine that is so realistic it shows up late, rushes, and sometimes sends in a sub.

Thanks for the "feel"...

Robert Aguayo
California

Having followed and enjoyed your contributions to the music world for several years, I finally feel compelled to write. Michael Stewart's "The Feel Factor" could not be more applicable than to someone like myself. God played a rather odd joke on me; first, regardless of how hard or long I practice an instrument, I can not get above mediocre in ability. I believe this has now been accepted as the 11th Commandment. Next He gave me an undying love of music and some ability in music composition... and finally, the voice of a wounded rhino and according to military hearing testimony many years ago, a rather unique receptiveness to tone and timing separation as well as exceptional velocity sensitivity. I'm the guy who gets chills at exceptionally well-executed and emotional passages, and queasy if I detect someone has unintentionally pulled a note off enough cents for me to detect it. I can't play, I can't sing, but I can write and discuss emotion in music. Until MIDI there was no hope of expression for me short of hiring my own band! (Looking at the cost of my equipment, it might have been cheaper.) I like my Mirage, FB-01, Tascam multi-track, SPX90, MIDIverb, and Roland TR-505, but for me they are all useless without my Hybrid Arts Step Editor/Sequencer.



I must enter each note individually, so it takes about one day per minute of music. That gives me the "mechanical" version, the one everybody says "sounds like a machine." Now the fun begins. I get to go back through it all, modifying it for timing to get that "feel." I could not agree more with Mr. Stewart concerning the importance of timing, but I've also investigated some aspects not mentioned in the article. As an example, I believe (this is strictly my opinion) that keyboardists tend to play a three-note chord with a finger roll effect, even if they intend to hit all the keys at the same time. Roll your fingers on the table; it's a lot easier for most of us to roll in one direction than the other, so the delay of a chord should be set up from left to right or right to left. The delay is longer for the little fingers (they're not as strong); so if you play a chord with forefinger, middle finger, and ring finger, delay the ring the most and the fore the least.

I also feel that variations in velocity (dynamics) are extremely important. Once again, little fingers are not as strong as forefingers, so modify velocity left to right or right to left. Also, make the right-hand parts relatively louder than the left-hand ones, since most people are right-handed and therefore the right hand is stronger. Accented phrases, of course, require individual attention.

Ray Hoh
California

The Pickup with a Split Personality

After reading James Chandler's article in the March '87 EM, I built a very nice piezo pickup for my seven-string classical guitar. However, I would like to go one step further and have a separate pickup for each string. I know companies build such pickups but since I play seven-string I am always faced with the problem of having things custom made. Do you know how I can obtain some very small piezo crystals for this purpose? Also I would like to try this idea on my seven-string solid body guitar. Any suggestions?

Steve Masakowski
Address not given

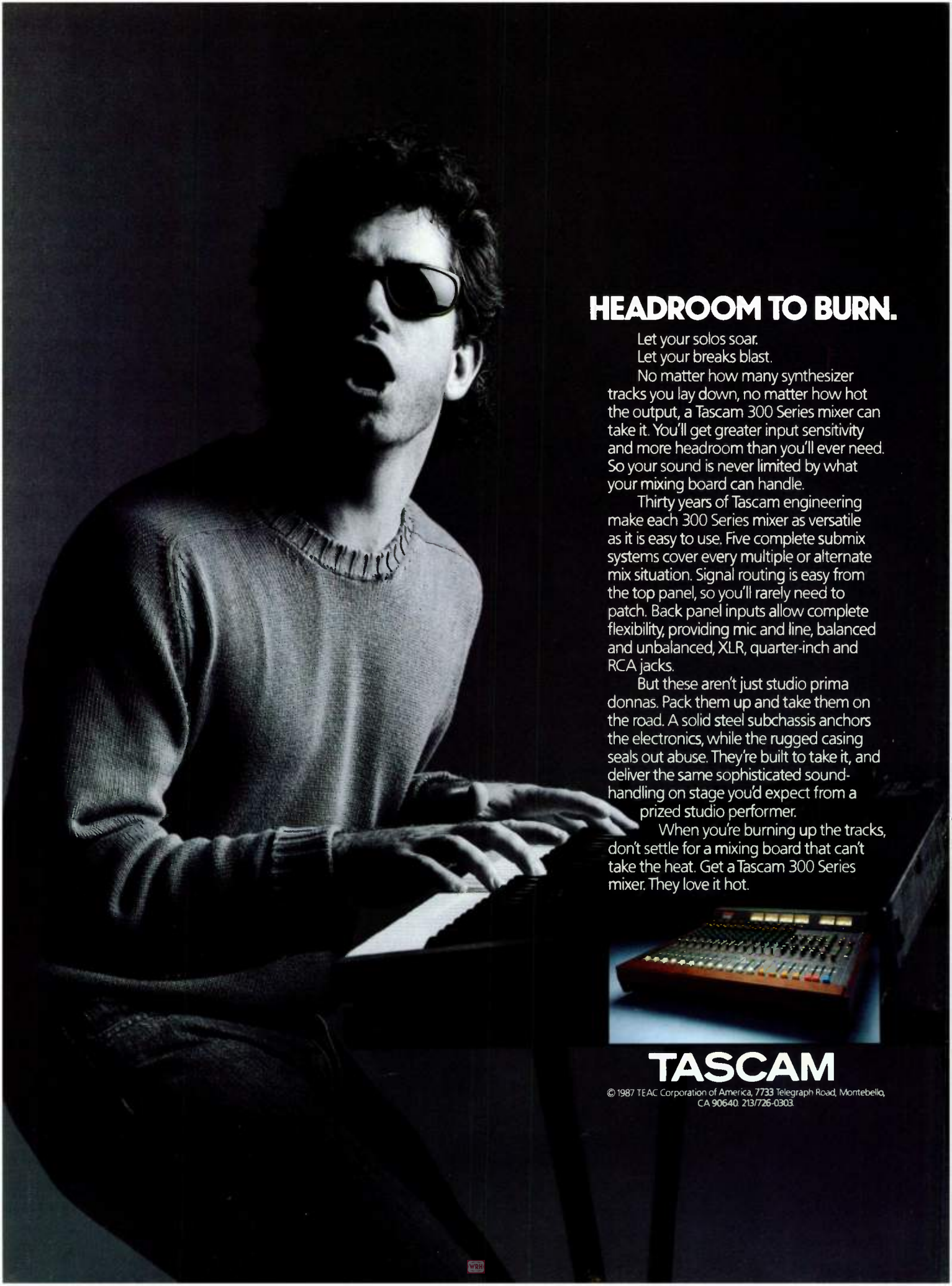
Steve—James offers the following advice:

"An advantage of the 'two buck pickup' is that it is very sensitive to vibration modes perpendicular to the surface, but insensitive to parallel vibration modes. When mounted as shown in the article, this would tend to minimize handling and fingering noise since these noises are frequently parallel vibrations, whereas most of the guitar's musical sound is the piston-like motion of the bridge and top plate.

"In the 'stock' guitar installations I have heard, volume balance between strings seems to already be quite good. Considering this, I would wonder what advantages separate crystals for each string would give, aside from the opportunity to try a variety of stereo effects.

"By carefully cutting the piezo disks, small strips of piezo material can be derived. To get

ILLUSTRATION BY DOUG BOONE



HEADROOM TO BURN.

Let your solos soar.
Let your breaks blast.

No matter how many synthesizer tracks you lay down, no matter how hot the output, a Tascam 300 Series mixer can take it. You'll get greater input sensitivity and more headroom than you'll ever need. So your sound is never limited by what your mixing board can handle.

Thirty years of Tascam engineering make each 300 Series mixer as versatile as it is easy to use. Five complete submix systems cover every multiple or alternate mix situation. Signal routing is easy from the top panel, so you'll rarely need to patch. Back panel inputs allow complete flexibility, providing mic and line, balanced and unbalanced, XLR, quarter-inch and RCA jacks.

But these aren't just studio prima donnas. Pack them up and take them on the road. A solid steel subchassis anchors the electronics, while the rugged casing seals out abuse. They're built to take it, and deliver the same sophisticated sound-handling on stage you'd expect from a prized studio performer.

When you're burning up the tracks, don't settle for a mixing board that can't take the heat. Get a Tascam 300 Series mixer. They love it hot.

TASCAM

© 1987 TEAC Corporation of America, 7733 Telegraph Road, Montebello, CA 90640. 213/726-0303.

good string separation, you would need to make a custom bridge which has a separate saddle for each pickup. You would then have to hope that your design still rejects handling and string noise while picking up the 'meat' of the string sound. The piezo crystals in cheap ceramic phono cartridges and in piezo tweeters are smaller than the buzzer disks mentioned in the article, and may be better for this type of application. I rejected them for general duty pickup applications because the buzzer disk was cheaper and performed better.

"One could probably wire all the pickups in parallel without loading them down, but that is another unknown. Resistor networks could possibly be used to mix the pickups, and the strings could be balanced by adjusting the resistors. A two-way split for stereo (or an even bigger split) could be done for interesting recording effects. Another stereo option could be alternate strings to left and right channels. You may realize separation benefits by wiring alternate pickups out of phase.

"The main difficulty in doing all this is your first model may sound terrible (or you may get lucky the first time). Pickup design is much like speaker design: you do a design on paper, then retire to the wood shop. Many wasted sheets of plywood later, you have a speaker that actually performs as intended. That is why factories make the best truly high-performance pickups, and why they cost so much for being made of relatively inexpensive materials.

"Gibson has a plastic piezo pickup which is bonded to the bridge insert. This pickup, with its associated preamp electronics, is supposed to be "indistinguishable" from fine studio miking when factory-installed on their guitars. Though the plastic pickup sheet is one piece, it is custom-molded to give the effect of a six-crystal pickup with body-noise rejection. I have experimented with the Kynar film this pickup is made of, and for various reasons the raw film is almost useless to a home experimenter. But Gibson has a lot of engineering in this design, and you may want to contact them to see if they can put their special bridge and electronics on your seven-string."

Pitchrider 7000 Update

Thank you for your review of IVL's Pitchrider 7000 Mark II in your October issue. We were, for the most part, quite pleased with the article, and would like to thank Jim Betts for his fair review and analysis of the Pitchrider's features.

However, there was one piece of information which has changed since the article was written. In discussing software upgrades for the Pitchrider, Mr. Betts stated that the "version 4.3" upgrade is offered free by IVL. Unfortunately, IVL can no longer offer this due to price increases in electronic components (such as ROM chips), which has reluctantly forced us to charge a nominal amount for software upgrades for our products. We are attempting to keep the cost of upgrades to an absolute minimum to ensure that all Pitchrider users (including owners of the earlier Kramer Pitchrider 7000) have the opportunity to take advantage of the latest available performance improvements and features. The current costs of software upgrades are as follows: Version 4.3 software upgrade for Digitech Pitchrider 7000 Mark II, $39 (U.S.); Version 4.3 software upgrade for Kramer Pitchrider 7000 (upgrades to Mark II performance and provides compatibility with IVLS's MFS-40 Remote Footswitch Controller), $69 (U.S.).

As an added note, the IVL pickup pictured in the article is an older model. IVL's new model pickup is far sturdier, and is encapsulated in an attractive molded plastic shell.

T.W. (Terry) Tobin
IVL Technologies Ltd.
#3 - 3318 Oak Street
Victoria, BC, Canada, V8X 1R2
☎ 604 / 383-4320

Son of the Restrung MIDIfied Guitar

I recently read Michael Poeschl's tip on "Faster Guitar-to-MIDI Tracking" (Sept. '87) where he strings his guitar with all high "E" strings to speed up response. As he states, "The disadvantage is that you no longer have a guitar, but a dedicated MIDI controller." However, there is at least a partial solution to this problem.

I have altered my stringing arrangement by stringing the top three strings normally, and repeating the same arrangement of strings on the bottom three strings. In other words, I use the same gauge strings for strings 1 and 4, 2 and 5, and 3 and 6. The tuning (and gauge) of the first, second, and third strings remain unchanged, but the lower strings are tuned exactly one octave above standard pitch. The following chart correlates tuning, string number, string gauge used, and the amount of MIDI transposition needed to produce a standard guitar tuning from the MIDI sound generator:

Tuning	String	MIDI Transpose	String Gauge
Standard	E 1st	0	0.009
Standard	B 2nd	0	0.011
Standard	G 3rd	0	0.016
+ 1 Octave	D 4th	-12	0.009
+ 1 Octave	A 5th	-12	0.011
+ 1 Octave	E 6th	-12	0.016

This lets me mix the "real" guitar sound with the MIDIfied sounds. Although the pitch is altered on the lower strings, the effect is quite interesting.

What led me to the above tuning instead of using all high "E" strings is that even though high "E" strings respond faster than the lower strings because of the pitch conversion time, the pickup on my Roland GK-1 synthesizer driver is not linear in its output voltage level from the first to the sixth string (I assume Roland designed it this way to compensate for the higher output generated by thicker strings). Even if I increase the individual string gain controls on the GK-1 unit to maximum, I cannot achieve a voltage level high enough to drive my Roland GM-70 interface consistently, especially on the sixth string.

I think this modification is a slight improvement over using all "E" strings, and may prove helpful to some of your readers that face the same problems I have had with the Roland system.

James S. Romanow
Connecticut

Solving Those Computer Down-Time Blues

Referring to your Oct. '87 "Questions and Answers" column by Alan Gary Campbell, we would like to point out that our company Digital Solutions, Inc., also has an answer to the question "Where can I get my C-64 fixed?"

Typical prices are as follows: C-64 repair, $38.95; C-128 repair, $60; 1541 repair, $69.95; 1571 repair $74.95 (add $5 return shipping as well for all of these). We normally have a 48-hour turn around, are an authorized Commodore repair service, and have been repairing computers for five years.

Regarding the question "Why are Commodore 64 power supplies so unreliable?"—we offer improved replacements for the Commodore power supplies for $24.95. We also service various other computer brands, monitors, printers, and most other computer products as well.

I personally would like to thank you for the articles you publish that relate to Commodore computers. I am a computer technician who constantly dreams up ideas for uses of Commodore products in the world of music. Thank you so much!

Mark B. Glunt
Commodore Service Manager
Digital Solutions, Inc.
1122 9th St.
Altoona, PA 16601
☎ 814 / 944-0405

Processing External Signal Sources

While reading a book on synthesis using modular synthesizers, I ran into a chapter called "Processing External Signal Sources." This describes how one can feed in an audio signal from guitar, microphone, bass, etc. in place of the synth's existing oscillators in order to use the filters and VCAs. However, the article states that the problem with processing

THE DRUM MACHINE WITH TODAY'S SOUNDS, TOMORROW'S FEATURES AND YESTERDAY'S PRICE

Assuming you haven't already heard its incredibly low price, the first thing that will impress you about the new Roland TR-626 Rhythm Composer is the sound. We went back to the studio to create all-new high-resolution PCM samples of the finest percussion instruments to give you the latest in today's sounds. And that's just what you'll find on the TR-626: round woody-sounding basses, tight full snares (even including a gated-reverb snare) toms deep enough to please a Phil Collins, clear, vibrant cymbals, and the most complete selection of latin percussion instruments that'll really add some spice to those dance tracks. Thirty digital samples altogether, and each one is tunable as well as level programmable.

Then, since we'd come up with all-pro sounds, we just had to balance it out with the state-of-the-art in pro-performance features: like the most musically-natural and accurate programming software anywhere — combining the best of real-time and step programming with visual accuracy through its sophisticated LCD Display Window. To make the rhythms sound as real as the samples, we've included shuffle, flam and accent features.

On the TR-626 you'll also find songs up to 999 measures, eight assignable outputs for separate processing of the instrument samples, stereo mix, tape sync, MIDI sync and trigger out. Finally, in a fit of nostalgia, we threw in a price so low it sounds like the good old days: just $495.00.* But probably the most important performance feature is one you won't find anywhere else — and it's an idea that makes the TR-626 the first drum machine that's really usable in live performance. We've added a Memory Card Interface that allows you to load-in stored songs and patterns as fast as you can push a button. Up to 18 songs worth of drum data can be saved and loaded in a flash from the credit-card sized M-128D Memory Card.

If you think all this sounds like the most exciting drum machine to come down the pike in a long while, you're right. Because while the idea of a drum machine isn't new, the idea of a drum machine with some really new ideas of sounds, features and price is positively revolutionary. See and hear the TR-626 today at your Roland Dealer. *RolandCorp US 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141.*

Roland®
WE DESIGN THE FUTURE

© 1987 Roland Corporation US

*Suggested Retail Price.

YOUR BEST VALUE IN 4-TRACK

Today's best buy in a 4-track cassette recorder/mixer is this third generation of the very format we invented.

With an X-30, you'll be recording tighter tracks and mixing better sounding tapes faster and easier than ever.

What you see, hear and touch are so completely integrated, so beautifully engineered, you won't have to work a puzzle.

Left, right, up, down, you'll always know where you are: right on the money.

Dolby B* NR gives you true compatibility with your existing tapes, and Dolby C NR will help you make outstanding live recordings. Unlike full bandwidth processors, which can interfere with kick drums and bass lines, Dolby C circuits ignore these low frequencies and eliminate tape hiss, which is only present in the mid and high frequencies.

So you can combine and bounce tracks freely, MIDI around like crazy -- until heart's content and soul's satisfaction.

What's more, when you punch-in/out with our optional Remote Foot Control, you can even switch between 'rehearsal' and 'take' modes, just as you would in an automated Fostex studio.

Call the **Fostex X-30** technology high, hip or hot -- it's your best 4-track value today by far --because it's all yours for just **$499.00**†.

*Dolby is a registered trademark of Dolby Labs Licensing Corp.
†Actual retail prices are determined by individual Fostex Dealers.

FOSTEX®

© 1987 Fostex Corporation of America

15431 Blackburn Avenue • Norwalk, CA 90650 • (213) 921-1112

external sources is the difference in the signal levels involved.

Suppose I feed my bass guitar through a preamp and into the modular synthesizer; will I end up with a non-MIDI "Bass Guitar Synthesizer?"

Hector Pina
Georgia

Hector—Well, sort of. The problem is that it is the envelope generators (EGs) that dynamically control the filter and VCA but the EGs are normally triggered by playing a key on the keyboard. You could tape down a key on the synth, set the filter envelope to full sustain, and play with the filter frequency control; but all this provides is a glorified tone control. What you will need to do is construct a circuit that derives a gate and/or trigger from the bass signal so that each note you play will drive the envelope generator. This will allow a variety of useful attack/delay effects that will give your bass sound a synthesized flavor.

It's impossible to specify a particular circuit, as older modular synthesizers had a variety of gate/trigger protocols, so different synths require different designs. However, the basic idea is to feed the signal through an envelope follower, *a device that converts the AC signal into a varying DC voltage. This then feeds a* comparator *to detect whether a voltage is present. If there is an output from the envelope follower, the comparator in turn produces an output suitable for turning on an envelope generator. When the string decays and the envelope follower output drops to zero, the comparator output likewise drops to zero and the envelope goes into its release phase. It is not easy to make this work reliably, but using bass should be easier than using guitar since most of your playing will involve single notes. Good luck!*

Well Gosh, Thanks!

I have received your magazine since January '86 and am constantly impressed with your desire to focus on the needs of the average working musician (*Well, we figure the millionaires can take care of themselves—Ed.*). I am glad you work with, but do not dwell on, the "big names."

This is especially true with your music review section. Robert Carlberg covers a wide range of electronic music that is never reviewed by the "other magazines." For me his reviews have attracted new clients and given me opportunities to use my electronic music skills in ways I would have never known about otherwise.

One feature I hope you will consider doing in the future is a section of patches each month for the most common synthesizers. I am sure readers would enjoy providing some good, new sounds.

Here's to a long life for EM! Thanks again for a great magazine.

Daniel Emmanuel
Texas

Daniel—Thanks for the kind words, it takes a lot of work to put this baby out every month and letters like yours remind us why we do it! Regarding patches, Polyphony (EM's *predecessor) used to run patches, but there are certain problems. First, someone has to evaluate the sounds before we can publish them, and this is not always easy or possible. Second, there are a lot of synths out there—trying to pick the most common ones would be difficult. Besides, there are a ton of patch books and patch software out for best-sellers like the DX7, CZ-101, etc.; we don't want to re-invent the wheel.*

What we prefer to do is run articles on how to program so that people can come up with their own patches. It's the same philosophy expressed in the proverb "give a man a fish and he won't be hungry tonight, but teach a man to fish and he'll never go hungry again." Although we do run patches from time to time as part of an article, for the moment we don't have a patch page planned. We will, however, continue to feature articles on programming tips. You might want to refer to the Nov. '87 issue, which has articles on DX7 and analog synthesizer programming.

MIDI In Buenos Aires

We want to congratulate you on the quality of your magazine, which is very useful for us as a tool for our work, and as a way to be informed in the changing world of electronic music.

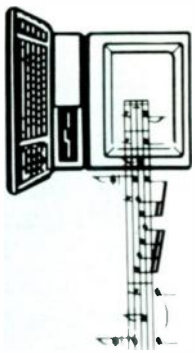
We have a MIDI users group which has been in existence for the past two years; we exchange patches and information between MIDI users. Last year we produced our first two seminars, one on FM synthesis and the other on MIDI and computers. We maintain a library with magazines and of course, yours has a place of honor.

We are anxious to exchange information and tips with people in other countries, so we thought **Electronic Musician** could be an ideal place to reach other people with the same interest. Please contact us at the address below.

Daniel Sneiro (Coordinator)
MIDISOFT User's Group
J.D. Peron 1686 1' 7
(1037) Buenos Aires
Republica Argentina

Additions and corrections

David Pakman from Pennsylvania writes: "In your Sept. 1987 issue, Alan Gary Campbell incorrectly stated that Geddy Lee of Rush still uses the original Moog Taurus I Bass Pedals. Actually, Geddy, as well as Alex Lifeson, used to have their Taurus I's configured as an auxiliary controller for an Oberheim OB-8, and a 120 program Oberheim OBX-A, respectively. In 1985, Geddy and Alex switched to the Korg MPK-130 MIDI pedals. They now control each artist's separate keyboard configurations, which include E-mu Emulator IIs and Yamaha DX7s." EM



Sound Quest Inc.

- D-50 Master Editor/Librarian
- DXII Master Editor/Librarian
- DX Master Editor/Librarian
- MT-32 Master Editor/Librarian
- CZ Master Editor/Librarian
- TX 81Z Master Editor/Librarian
- Generic Master Librarian

All Packages Are "Musician Friendly"
And Are Exclusively Designed
For **The Commodore AMIGA.**

For More Information Contact:
5 Glenaden Ave. East
Toronto, Canada M8Y 2L2
(416) 234-0347

Kaigio TLP-2

ACCESSORIES

▶The **Model TLP-2** telephone-line/modem voltage surge protector ($39.95) plugs into any standard three-prong AC outlet and provides convenient modular phone jacks and appropriate cables to connect to your phone or modem. The TLP-2 will protect your modem (and with internal modems, your computer), or your telephone system from voltage surges and lightning spikes on the phone line by discharging high-energy surges safely to the ground wire of your electrical system. Reaction time is one nanosecond. The device has two stages; stage one is MOV-based, and stage two uses gas discharge tubes. The unit can be installed in five minutes or less.

Kaigo Electronics Co., Inc.
6584 Ruch Road—East Allen Township
Bethlehem, PA 18017-9359
☎ 800 / 524-0400 or 215 / 837-0700

COMPUTERS

▶Atari Corporation will market its **ST** personal computers through the nation's 5,500 music stores where music software is already being sold. Atari has been signing up retailers since June. The ST's onboard MIDI port helps make the unit attractive to musicians by allowing both the Atari 520ST and 1040ST to communicate with synthesizers and other electronic musical devices. Both computers are supported by a broad line of peripherals and growing line of software.

Atari Corporation
1196 Borregas Ave.
Sunnyvale, CA 94086
☎ 408 / 745-2000

▶The **Commodore Amiga 2000** ($1,995), a multi-tasking, open-architecture personal computer with the option for MS-DOS compatibility is now available. Multi-tasking permits users to address different applications —even MS-DOS and AmigaDOS—simultaneously with little effort. For example, word processing and database applications can run at the same time, and the user can cut and paste (or transport) files from one running application to another. The bus contains eight expansion slots to accommodate additional memory, accelerators, and alternate operating systems. Video genlock and digitizers, hard disk controllers, network interfaces, and co-processors can also be built in.

Commodore
1200 Wilson Drive
West Chester, PA 19380
☎ 215 / 431-9100

GUITARS AND BASSES

▶The **Professional Series Wireless Guitar System** ($699) features a rugged, lightweight built-in transmitter and antenna plus a separate receiver unit. Use of a quartz-locked oscillator and companding circuitry minimizes interference and dropouts. The unit is controlled by a three-way on/standby/off switch with LED indicator, and is powered by two 9-volt batteries. The system has a range of 100 feet and can also use a standard guitar cord.

The guitar itself has a solid Pacific Coast maple body, a Michigan maple neck with a 22-fret, rosewood fingerboard, EMG *Select* pickups, and the *Precision Tune* locking tremolo (vibrato) system with fine tuners and a locking nut.

J.B. Player USA
21115 Devonshire, Suite 143
Chatsworth CA 91311
☎ 818 / 706-3111 or 800 / 423-5960

▶The **XL2T TransTrem™** transposing bass ($2,350) allows instant key transposition, in-tune chord and harmonic bends, slide effects, 24 open notes, and variable string tension. Like the Guitar TransTrem, the bass model changes all strings at a controlled rate, keeping chords and intervals in tune while applying vibrato or pitch bend. Notes can be bent down a fourth and up a minor third; the player can shift into six different tunings, and can reach from low B to high B-flat, four octaves up. Available from authorized Steinberger dealers.

Steinberger Sound Corporation
122 South Robinson Avenue
Newburgh, NY 12550
☎ 914 / 565-4005

LIBRARIANS

▶**Mirage-Aid** Version 2.0 ($65 for Apple, $40 for Commodore) is a visual editing program for the Apple II+, IIe and the Commodore 64/128. It will store and allow you to view entire wavesamples up to 64 pages long. An Overview screen shows the whole sample, and other screens allow you to zoom in on the loop points and the loop splice. The screens indicate both loop point addresses and levels, and a waveform can be dumped to a printer (Grappler interface required on Apple version). The package also includes a Karplus-Strong algorithm for creating plucked string effects. All MASOS functions are supported, and Mirage rack mounts can be played from the computer keyboard.

Neo-Sync Labs
PO Box 522
Chenango Bridge, NY 13745
☎ 607 / 722-8885

▶**SynthView** ($52.95 incl. s/h) is a patch librarian for the Korg DW-8000/EX-8000 and the Atari ST. It is fully GEM-based for point-and-click operation and easily creates custom banks (up to 180 per disk) for the synthesizers. All editing is done on a single screen, including naming patches, printing out banks, and sending banks and patches to and from the synth. The package is hard disk-compatible and includes a desk accessory that allows transferring custom banks within other GEM programs and sequencers. The program works in both medium-resolution color and high-resolution monochrome.

Synergy Resources
754 N. Bolton Avenue
Indianapolis, IN 46219
☎ 317 / 356-6946 or 267-3179

LIBRARIES

▶A new library of sounds for the Roland D-50 has been released. **D-50 Sounds** ($40) includes 256 new sounds on disk that work with any D-50 librarian/editor running on the Atari ST, Macintosh, or Commodore 64. A demo tape ($5) is available that includes free samples.

Leister Productions
14 Hill Blvd.
Mechanicsburgh, PA 17055
☎ 717 / 697-1378

Phi Tech Translator 2

PERCUSSION

▶The **Translator 2** MIDI Drum Controller ($269.50 with 12 Volt power supply) accepts line-level audio, MIDI, drum pad or acoustic

AFTERTOUCH™
OFFICIAL NEWS FROM THE YAMAHA USERS GROUP JANUARY, 1988.

And now, a MIDI instrument for woodwind players.

THE WX7 IS YAMAHA'S NEW WIND MIDI controller. Used to trigger a synthesizer or tone generator, it gives woodwind players an extraordinary range of creative options.

Like a traditional saxophone, the WX7 features a standard Böehm key layout. However, its MIDI implementation allows you to play notes over 7 octaves. Its action is light and precise, and you can adjust the playing height of each of its 14 keys to suit your own technique.

The mouthpiece is also sax-like, and gives you command over almost any MIDI sound source—synthesizers, tone generators, even drum machines.

In conjunction with a TX81Z tone module, breath pressure can be assigned to control tremolo, vibrato, tone and articulation, as well as volume. Two separate "Wind Curves" provide two modes of response to breath pressure. The Wind Zero setting defines the breath threshold at which a note will sound, while Wind Gain determines just how much it will respond.

Note bending is controlled by lower lip pressure (unlike a normal sax, this control extends even to the lowest register). As with breath pressure, lip pressure is adjustable with Lip Zero and Lip Gain controls.

Other interesting features of the WX7 include a Hold Key (for playing one note while you're holding another); two trill keys for half-note and whole-note trills; a Pitch Bend Wheel; and a Program Change Key for selecting new programs directly from the instrument.

The WX7 weighs less than a pound, and is powered by a MIDI/power pack that can be hooked onto a belt.

You can try one at an authorized Yamaha Digital Musical Instruments dealer now. And take one home for a suggested USA retail price of $995.00.

YAMAHA WX7 WIND MIDI CONTROLLER.

Hot Tips

Assorted concepts for DX7 voicing.

1. Getting the "bright" tonal quality of a sound to remain strong while keys are depressed: Adjust Level 3 ("sustain" in ADSR terms), which governs the breadth of the overall tone quality (brightness) of the sound.
2. Getting a higher-pitched "tine" in an electric piano sound: Check the algorithm used, often #5 or #6, then adjust the Frequency Coarse of the operator responsible for the tine sound (either operator 2, 4 or 6). You may also have to adjust the operator's level scaling and/or output level.
3. Cleaning up the "splat" at the low end of the keyboard in a thick synth sound: Find out which operators are responsible for the timbre of the sound. Then use *negative linear scaling* on them to eliminate the problem. Pick whatever break point sounds best.

Questions

When I switch to dual mode on my DX21, sometimes I find that one voice has an LFO effect that isn't part of the original voice program. What's happening?

It's all in the architecture. The DX21 has only one LFO, which is shared by the two tone modules. Therefore, when you go into Dual or Split modes, the LFO can only operate one way on the two chosen voices. If one of the voices chosen is assigned to LFO modulation, then both voices will have it, even if the settings for the other voice specify no modulation.

The best way to deal with this is to reprogram the LFO for voices you plan on using in Split and Dual modes, so the settings will operate equally well for both voices.

AFTERTOUCH is a monthly newsletter filled with the latest on Yamaha products. Get a year's subscription free by writing to: AFTERTOUCH, P.O. Box 7938, Northridge, CA 91327-7938.

YAMAHA

Yamaha Music Corporation, USA, Digital Musical Instrument Division, P.O. Box 6600, Buena Park, CA 90622.

drum trigger signals, and converts them to drum pad, line-level, or MIDI output. These can be used to trigger MIDI and non-MIDI drum, percussion, and pitched sounds. The Translator 2 lets non-MIDI electronic drumsets and drum machines send and receive MIDI triggering information. It can translate the output of up to six standard drum pads—such as Pearl Drum-X, Simmons SDS5, 7 and 8, Tama Techstar, Dynacord Percuter and others—into MIDI messages. The Translator 2 has internally adjustable parameter controls for pad sensitivity, MIDI In and Out channel assignment, velocity tracking, and eight preprogrammed note assignment options. The presets have been set up for use with MIDI drum machines such as the Yamaha RX-11, Oberheim DX and DX MIDI, E-mu Drumulator, and Sequential Circuits Tom and Drumtraks. It also has note assignment programs for the C Major and C# Pentatonic scales.

PhiTech, Inc.
4605 North Stiles
Oklahoma City, OK 73105-3328
☎ 405 / 521-9000

SEQUENCERS

▶The **Monster Dan Plan** ($60 for three sequenced songs; subscription discounts available) allows you to play along with a variety of pre-programmed Top-40 sequences for the Ensoniq ESQ-1's sequencer and any MIDI drum machine. Each program includes song sequences, patches, drum patterns, and a MIDI-programmed mix. The accurately programmed sequences feature full instrumentation, without solos. Each track can be individually muted to adjust for additional "human" performers. Data is available on cassette tape, Mirage disk, or on several personal computer library management formats (computer disk). The library includes over 100 Top-40 titles and more are added each week.

Danlar Music
PO Box 973
Tualatin, OR 97602
☎ 503 / 692-3663

SIGNAL PROCESSORS

▶Four models of **Compact Pedals** have been released: Volume ($69.95), Wah ($89.95), Stereo Volume ($79.95) and Wah Volume ($119.95). The new all-steel compacts measure 6⅝ by 4 by 2⅜ inches, have a baked-on black epoxy finish, fit into most pedal boards, and have a centered pivot so pedals can be rotated for reverse response. All pedals come with a one-year warranty.

Morley
PO Box 16116
North Hollywood, CA 91516-6116
☎ 818 / 764-9000

AKG ADR 68K

SOFTWARE

▶The **ADR 68K Digital Reverb and Effects Unit** ($4,995) now comes with Version 3.0 software that provides dual digital delay lines (with feedback, two-band EQ and modulation); multi-tap stereo processing (with five processing modes and controls for image and depth); multi-effects (two independent delay lines feed a two-band EQ which feeds three parallel effects: four-voice stereo chorus, multi-tap delay lines with stereo output, and multi-tap delay line driving a stereo reverberator); poly-chorus (six-voice stereo chorus); and stereo sampling (four seconds, or two seconds when used concurrently with other processing programs). Several other improvements include more factory presets (100), faster and quieter program changes, and a utility for computing delay in terms of beats per minute and note value.

AKG Acoustics, Inc.
77 Selleck Street
Stamford, CT 06902
☎ 203 / 348-2121

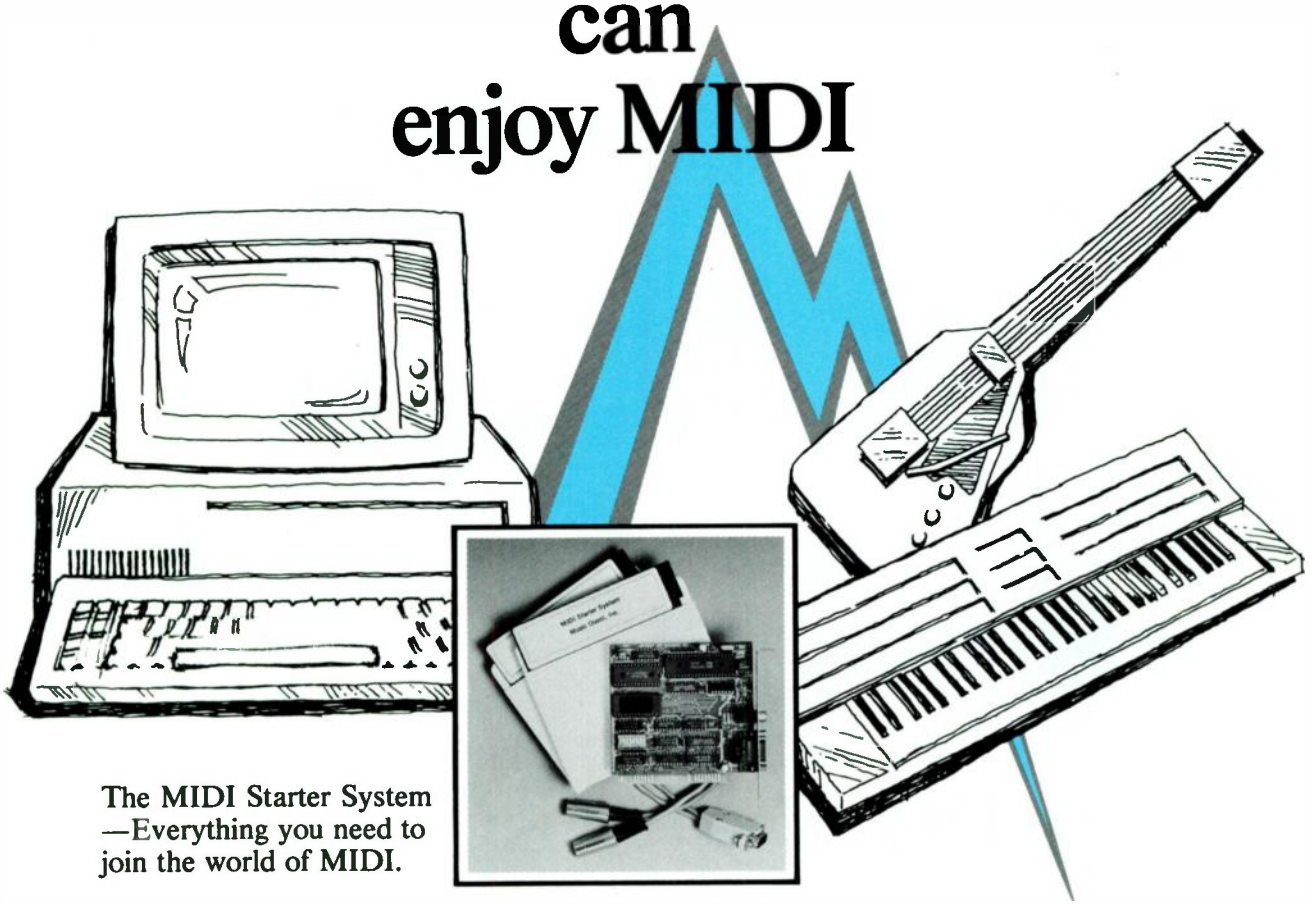
▶A version of **Sound Lab** ($299.95), the sound editing system for the Ensoniq Mirage, is now available for the Commodore Amiga computer (minimum 512K memory required). The program allows the user to view, edit, and combine existing sound samples or create unique samples from scratch. With Sound Lab, all the Mirage's MASOS functions can be controlled from the Amiga, and complex tasks such as looping, keyboard assignment, memory allocation, and voice program editing can be accomplished visually. Sound Lab also offers sound compression/interpolation.

Blank Software
1034 Natoma Street
San Francisco, CA 94103
☎ 415 / 863-9224

▶Two new packages are available for the Roland S-50 sampler: **SYS-502** ($15 for registered S-50 owners), a new operating system (version 2.0); and **SYS-503** ($199.95), a polyphonic, multi-channel sequencer. The new operating system makes the S-50 ideal for sequencing, thanks to polyphonic multi-timbral control, where four different patches or tones are controlled by a sequencer, assigned to four independent MIDI channels, and routed to four separate output jacks. Version 2.0 also takes full advantage of the S-50's 16 voices for using 32 onboard samples. It also allows use of "Sub-Tones"—sounds "borrowed" from other sounds that require no additional memory—and new viewing and auto-loop functions enhance the onboard editing software.

The SYS-503 turns the S-50 into a se-

Now everyone can enjoy MIDI



The MIDI Starter System —Everything you need to join the world of MIDI.

The Complete System

- MIDI Interface Co-processor Card
- Easy-8 Sequencer
- Casio CZ Editor/Librarian
- Yamaha DX 21/27/100 Editor/Librarian

Just Add

- Your IBM PC or compatible
- MIDI Keyboard or MIDI Guitar

Designed for You

- Novice and Amateur Musician
- Computer/Music Hobbyist

Ready to Grow When You Are

- Roland MPU-401 compatible
- Supports many popular Software packages

Introductory Price **$199.00** 30 Day Money Back Guarantee

See your local computer or music dealer or contact:

Music Quest, Inc.

Music Quest,Inc. • 1700 Alma Drive, Suite 260 • Plano, Texas 75075

(214) 881-7408

IBM PC is a trademark of IBM Corp. Yamaha DX 21, Yamaha DX 27, and Yamaha DX 100 are trademarks of Yamaha International Corp. Roland MPU-401 is a trademark of Roland Corp. Casio CZ is a trademark of Casio, Inc.

Of its 90 digital effects, these three are the most amazing: $495.

You can count the price in hundreds on one hand. Yet you'd need the hands of eight more people to add up all the effects you get with the Yamaha REX50 Digital Multi-Effects Processor.

At about $5.50 per effect, amazing is quite an understatement. Add to that not only the number, but the quality of the effects. Then remember you can have them all in your own home studio. In one compact, sleek unit.

First we borrowed 20 preset effects from the SPX90. Like reverb, early reflections, delay/echo, pitch change and modulation effect.

Then we added the world's first digital distortion. Ten of the hottest distortion effects preset in the REX50. That you can use alone, one right after another, or in combination with another effect.

Any of those preset 30 effects can be changed, modified, customized, perfected and stored in 60 user-programmable slots that you can call your own on an LCD display.

And recall instantly via MIDI, remote or footswitch.

Yamaha's REX50 Digital Multi-Effects Processor. Just think what you could do once you get your ten digits on it. There's one waiting for a nice home at your Yamaha Professional Audio Dealer. See him today.

Yamaha Music Corporation, Professional Audio Division, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1.

YAMAHA®
Engineering Imagination™

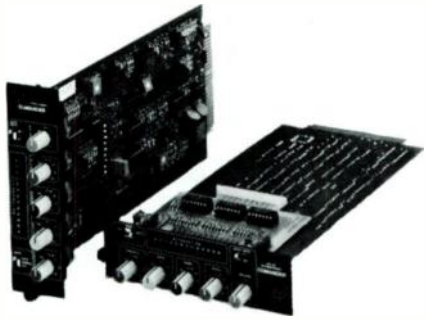
quencer for internal voices as well as for external MIDI units. It remembers up to 200 16-measure patterns for a song of up to 400 measures. Six songs can be stored in internal memory. Editing functions include Overdub, Quantize, Erase, Punch In and Out, Insert, Copy and Delete. The *Microscope* function allows editing of performance information down to a single event. All note information appears on the CRT screen for easy input and editing. SYS-503 also receives Song Position Pointer.

RolandCorp US
7200 Dominion Circle
Los Angeles, CA 90040
☎ 213 / 685-5141

▶**Q-Sheet** ($495), a new Macintosh program (also Mac II-compatible), will automate any MIDI device while synchronized to SMPTE time code. Q-Sheet can also automate every aspect of an audio mixdown or generate video soundtracks. Faders, knobs, and buttons can be drawn on the screen (in various sizes and configurations) and assigned to any function of a MIDI device. Sequences from *any* source (hardware or software sequencers) can be loaded into Q-Sheet on the Mac, then played and mixed down simultaneously.

In post-production, Q-Sheet's editing capabilities allow the creation of sound effects cue lists with quarter-frame accuracy, which can then trigger samplers and effects units *and* mix the entire soundtrack to 2-track. Complete SMPTE offset capabilities are included.

Digidesign Inc.
1360 Willow Road, Suite 101
Menlo Park, CA 94025
☎ 415 / 327-8811



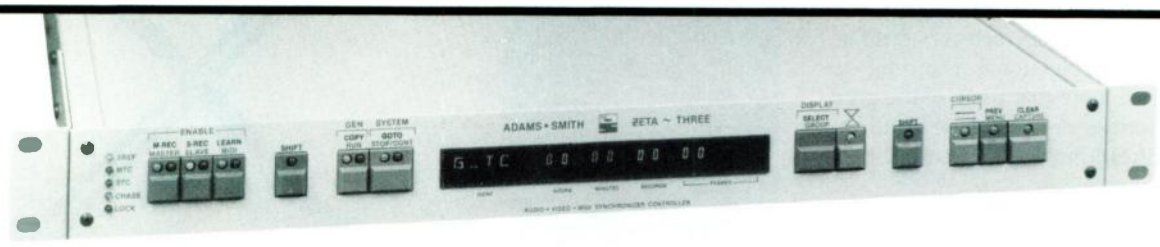
Valley Commander

▶The **Commander** ($420) is the latest addition to Valley International's modular audio signal processing line. It compresses the audio signal for precise dynamic range control, and its interactive expander provides freedom from noise level recovery. The unit's detector uses *Linear Integration Detection* to emulate the response of the human ear and maintain correct musical relationships in the processed material. *Peak Reversion Correction* circuitry compensates for discrimination against low frequencies to eliminate pumping and breathing, and ensures accurate processing of the entire audio spectrum.

The Commander is effective for multiple microphone processing applications as well as for compressing mixed program material for increased loudness, tightening or altering drum sounds, and controlling electric guitar/bass dynamics. It is available in both 817 H and V versions to accommodate the PR 10 and PR 2 rack mount systems.

Valley International, Inc.
PO Box 40306
2817 Erica Place
Nashville, TN 37204
☎ 615 / 383-4737

All prices are suggested retail prices, as supplied by the manufacturers. All prices and specifications are subject to change without notice. Inclusion of product information and manufacturers in this magazine does not necessarily constitute a recommendation by Electronic Musician *magazine or its staff; we suggest that all mail order purchases be COD. Contact manufacturers for further information.* EM



"More for less . . . the ZETA~THREE audio-video-MIDI synchronizer"

All in one small, neat package—

- **Audio/video tape synchronizer**
  Slave chase, offset, resolve
  Master/slave GO-TO, loop, rehearse, record
  Menu-driven set-up and transport selection
  Factory cables for most transports
- **MIDI-SMPTE synchronizer**
  Outputs MIDI sync, song pointer, time code
- **Two full-range time code readers**
  1/10 - 100 x play speed
  Auto CTL/tach pulse updating
- **SMPTE/EBU time code generator**
  Int/ext reference, drop/non-drop frame
  Jam, copy, video sync TC and UB
- **RS-232/422/MIDI communications**
  PC control of recorders and MIDI devices
  Serial control of professional recorders
  MIDI merge capability

—All for less than $3,000.

Write or call for details.
Tel: 617-562-3801 • NYC: 516-365-6664
TWX: 710-347-0096 • FAX 617-568-0404
LA Rep: 213-876-9164 • UK: 0223-410104

ADAMS•SMITH
34 Tower St., Hudson, MA 01749 USA

★ ★ ★ ★ EXTRA! ★ ★ ★ ★

THE AUDIO ENGINEERING SOCIETY holds one major yearly convention in the United States, alternating between New York and Los Angeles. Unlike NAMM shows, the public is invited to attend and take in technical seminars as well as manufacturers' exhibits. The 83rd AES Convention was held October 16-19, 1987 in New York; while there was no radically new technology, what has changed is the typical convention attendee, as well as the AES itself.

DIGITAL WORKSTATIONS HIGHLIGHT AES '87

BY CRAIG ANDERTON

New Product Blitz

Products evolutionary, not revolutionary; digital audio, MIDI shine

TOO MANY PRODUCTS, not enough time . . . so here are some of the highlights we saw at the show. Also check out the January '88 issue of *Mix*, our sister publication; their AES report concentrates on gear for professional recording studios. Please note that some of the products described are prototypes, and that all specifications are subject to change without notice.

The Top Three products of the show, at least in terms of people saying "you gotta see this," were Akai's digital 12-track recorder, WaveFrame's Digital Audio Workstation, and Eventide's new Ultra-Harmonizer. Following is a rundown of the various products that we thought you'd like to know about.

ANALOG TAPE RECORDING

Otari's *MX-55* series consists of a family of ¼-inch tape-based recorders. These include standard 2-track models, 2-track with center time code, DIN format 2-track, 4-track, etc. . . . **Tascam**'s *ATR 60* 16-track recorder and *ATR 80* 24-track recorder are designed for studios that need "workhorse" multi-trackers at a reasonable price. Add in their *ES-50* synchronizer, *ES-51* controller, one of the *ATR 60* mastering recorders, and the mixer of your choice, and you have a complete tape-based audio production system. Note that the ES-50 can read time

—*continued on page 22*

Synclavier celebrated their 10th anniversary by offering numerous software enhancements and throwing a great party.

Analysis

DAW: Wave of the Future?

Digital Audio Workstations shaping up as audio's big story of the late '80s

THE COMING OF AGE of the Digital Audio Workstation (DAW) has implications that go far beyond being simply another item of interest to electronic musicians. The DAW represents a plateau of maturity for the digital music revolution launched well over a decade ago (and accelerated through the widespread acceptance of MIDI). The DAW will change the way we make music by giving the composer more power than ever over how a composition will be realized.

When modular synthesizers were first described by Robert Moog at the 1964 New York AES, they represented new and uncharted territory. The modular nature of these machines encouraged experimentation and creative approaches—anything could be plugged into anything else, thanks to a standardized control voltage system. In those early machines, even the filters were broken down into modular components. There was no such

—*continued on page 26*

THE GREATEST THING THAT'S HAPPENED TO MUSIC SINCE A BROKEN HEART.

M. The Interactive Composing & Performing System from Intelligent Music. Midi Software for the Macintosh, Atari ST, and The Amiga. To really understand what M can do for you, experience it first hand. Visit your local dealer for a demonstration or send us $5 for a demonstration disk and specify your computer.

Intelligent Music
P.O. Box 8748
Albany, NY 12208
518-434-4110

Macintosh is a trademark licensed to Apple Computer, Inc. Atari and ST are trademarks of Atari Corp. Amiga is a registered trademark of Commodore-Amiga Inc. M and Intelligent Music are trademarks of Intelligent Computer Music Systems, Inc.

VIDEO MANUAL
FOR THE 'NEW'
DX7 - II
THE EASIEST, MOST EFFICIENT WAY TO LEARN THE WORLD'S MOST AMAZING NEW SYNTHESIZER THIS 2½ HOUR VIDEO EXPLAINS EVERY SINGLE PARAMETER OF **YAMAHA'S** NEW **DX7-II**, INCLUDING ALL VOICE EDITING PARAMETERS.
- IN DEPTH EXPLANATIONS
- CLOSE-UP DEMONSTRATIONS
- HI-FI STEREO SOUND

THE NEW **DX7-II** VIDEO WAS PRODUCED UNDER THE AUSPICES OF THE **N.Y. SCHOOL OF SYNTHESIS,** N.Y.'S LARGEST SYNTHESIZER SCHOOL, AND IS PRESENTED BY ITS DIRECTOR, **DEAN FRIEDMAN** AUTHOR OF THE BEST SELLING BOOKS, 'THE COMPLETE GUIDE TO SYNTHESIZERS . . .' AND 'SYNTHESIZER BASICS'.
TO ORDER SEND $59.00 TO:
DX7-II VIDEO, N.Y. SCHOOL OF SYNTHESIS
P.O. BOX 878, ANSONIA STATION
NEW YORK, N.Y. 10023
AVAILABLE ONLY ON VHS

SERIOUS SAMPLE EDITING for ATARI ST
SOUNDFILER™
Digital EQ
Digital Enveloping
Visual Looping
Crossfade Looping
Digital Splicing
Waveform Drawing
Keymapping
For AKAI Samplers
S612 $199.00
X7000/S700 $249.00
S900 $299.00
coming soon GenWave for Emax, P-2002, FZ-1, Roland, Korg and more!
DRUMWARE, Inc.
12077 Wilshire Blvd. #515
Los Angeles, CA 90025
213.478.3956

—from page 20, NEW PRODUCT BLITZ

code from 1/30th to 100 times normal tape speed.

DIGITAL AUDIO TAPE

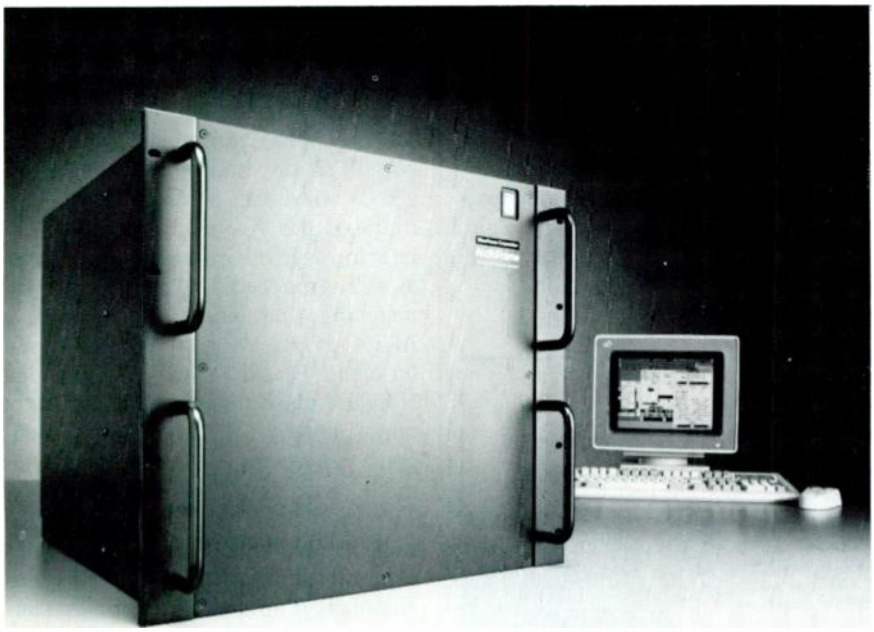
Professional, not consumer, DAT was the buzzword at AES. **Fostex** showed a DAT with direct digital inputs, parallel/serial interfaces, and SMPTE synchronization. Suitable for editing, Fostex expects the unit to be available in mid-'88. . . **Nakamichi** said it would be introducing pro DATs in the first half of '88. . . **Sony** showed the *PCM-2500* DAT for studio use, and the *PCM-2000* for field work. The latter can also record and playback SMPTE time code.

DIGITAL AUDIO WORKSTATIONS (DAWs)

DAR's *Soundstation II* definitely wins my award for best packaging design, but under that sexy-looking wedge lies an all-digital production center with splicing, crossfading, digital "reel-rocking" for finding splice points, track-slipping (for control over timing), and cut-and-paste editing. Additional features include 18-bit A/D conversion and a touch screen for selecting options. . . **Fairlight**, who helped kick off the idea of the DAW in the first place, introduced the *MFX* (Music and Effects) hardware/software upgrade for the Series III. With MFX, the Series III becomes a control console designed specifically for audio post-production sweetening. Expect a 40-voice upgrade and 50 Meg RAM add-on within the next few months. . . **Hybrid Arts**' *ADAP* System continues to be updated; Version 1.1 software provides SMPTE triggering from a Cue List page, pitch bend, velocity crossfade and velocity switch, Mono (Mode 4) operation, auto looping, and many other features. The *ADAP II* Direct to Hard Disk system provides 44.1 kHz stereo recording (33.7 minutes worth with a 360 Meg hard disk) and is slated for introduction in early '88. . . **Lexicon**'s *Opus* looks more like a traditional mixer than something out of the bridge of the Enterprise, but like other DAWs, represents a complete production-oriented package (including music editing and copying). Lexicon is opening a demo facility for the Opus so clients can check out its attributes in a realistic work environment. . . **New England Digital** celebrated its tenth anniversary by throwing a party at the Palladium (a New York nightclub), complete with a press conference and concert appearance by Sting, one of their better-known customers. Enhancements for the *Synclavier* (pronounced sing'-kluh-veer) include new software for automated editing, and optical disc storage/retrieval systems (providing two *gigabytes—and that's pronounced jig'-a-bites*—of on-line memory). With hundreds of systems out in the field, recent additional financing, and

PHOTO BY GEORGE PETERSEN

D.A.R.'s Soundstation II



The AudioFrame Digital Audio Workstation comes in 16-, 32-, and 48-voice versions. Its design allows system upgrades via plug-in modules.

customers who seem quite pleased with both the product and support, NED is a company on the move. . . **WaveFrame** has based its *AudioFrame* system on IBM's Personal System/2 Model 60 computer. (Why not let IBM do the drudge work?) WaveFrame hits hard on standardization—the use of MS-DOS, Microsoft Windows, MIDI, SMPTE (LTC or VITC), IBM Token Ring Network, etc. The sound quality of the sampling is excellent, due to fixed-rate sampling techniques; a cymbal transposed down five octaves still sounds absolutely great. WaveFrame has received a lot of hype, but they seem intent on living up to it. At $45,000 for the basic system, this could end up being one of the more cost-effective DAWs.

DIGITAL MULTI-TRACK

Akai's *DR 1200* records up to 17 minutes of 12 tracks of digitized audio (plus a 13th analog track for sync signals, SMPTE, etc.) on to a standard 8 mm videocassette. The machine is reasonably compact, uses 16-bit conversion at 44.1 or 48 kHz sampling rates, and has a number of "why didn't they think of this before" features (like your choice of eight different crossfade times for punch-in and punch-out). A locator unit can control three decks for 38-channel operation (36 digital plus two analog tracks). The exact price had not been set, but expect something in the $35,000 range.

MISCELLANEOUS

Sennheiser is using an Amiga 1000 computer as the heart of a wireless microphone system monitor that shows up to 54 individual channels of microphones on one CRT. This will definitely make life easier for those involved in Broadway shows and theatrical productions . . . **Southworth Music Systems** announced a family of digital audio NuBus boards for the Apple Macintosh II computer. Thanks to proprietary data compression techniques, the system can record nearly 27 minutes of music (which can also be divided among multiple tracks) on a Mac II 40 Meg hard disk, using 20-bit PCM recording at 192 kHz. Boards will initially be available only to OEMs and developers.

MUSICAL INSTRUMENTS

Korg showed memory expansion and SCSI interface options for the *DSS-1* sampling keyboard . . . **Kurzweil**'s *1000 Series* consists of rack mount, 2U sound modules. The *1000 PX* features the K250's "greatest hits" (piano, strings, choir, etc.);

—continued on page 24

Watch for
ELECTRONIC MUSICIAN
in
FEBRUARY

MAKE YOUR OWN CD!

■ **EM** gives you complete step-by-step details on getting your master tape made into CDs for less than you'd expect! Plus, a guide to CD pressing plants.

RECORDING WITH MIDI!

■ An electronic musician outlines how he uses MIDI to produce a record.

GET YOUR HEADS STRAIGHT!

■ A unique guide to proper alignment and care of tape heads.

■ And, of course, many other exclusive **EM** articles designed to educate, amuse, enlighten and stimulate your creativity.

—from page 23, NEW PRODUCT BLITZ

other modules include the *1000 SX* (string expander), *1000 HX* (horn expander), and *1000 GX* (guitar expander). A keyboard based on the 1000 PX, the *K1000* ($2,495), is slated for introduction shortly after the modules are introduced... While there was definite interest in **Roland**'s *D-550*, the rack mount version of the D-50, it felt like the *MT-32*—a relatively inexpensive expander module using Roland's L/A synthesis process—grabbed much of the attention. Roland techs had put together a demo sequence, complete with signal processing and drum sounds, that used *only* the MT-32—no outboard processors or other goodies. In sampling news, the *S-550* , a rack mount descendant of the S-50 keyboard sampler, now features an increased memory capacity of 1.5 Megabytes... Speaking of samplers, Yamaha's was nowhere to be found. I guess we'll have to wait until the winter NAMM show.

Get Serious.

You're a serious musician. You wouldn't use 6 single voice keyboards, so why bother with an awkward computer setup?

The new ***bandwagon*** LCD portable computer is the serious choice for MIDI control. One small, lightweight, easy to use package, instead of individual components and cables.

And ***bandwagon's*** technology, including a revolutionary back lit flat panel display, makes it the most advanced machine available today. At a price even a weekend musician can afford.

So if you're serious about your music, get serious about your computer.

Get on the ***bandwagon.***

8088, 286 & 386 MODELS

bandwagon by PMI MICRO Incorporated

Computers by musicians, for musicians.
400 Main Street
Hickory, PA 15340

See your local dealer or call **412-356-4000**

SIGNAL PROCESSORS

AKG's *ADR 68K* 16-bit digital reverb/digital signal processor/sampler is one of those "do-all" boxes that speaks MIDI, records eight seconds of 16-bit audio with a 15 kHz bandwidth (expandable to 32 seconds), can process those samples internally, and can be easily triggered via switches or MIDI... **Aphex** introduced the *Type E* low-cost aural exciter for stage or personal recording use, as well as the *Model 114* interface box for matching -10 dB and +4 dB systems... **ART** showed a 1/3-octave version of their *Intelligent Equalizer* (IEQ)... **Eventide**'s *H3000 Ultra-Harmonizer* ($2,395) not only sounds great, but includes intelligent transposing—enter the key and mode, and the H3000 does the rest. There's also a truly exceptional MIDI implementation... **Howe Technologies** showed the *Phasechaser*, which provides automatic time base correction for stereo signals. Intended for broadcast use, this might be the ticket for stereo samplers whose outputs are not phase-locked ... **Lexicon** introduced an expander board for the *480L Digital Effects System* that provides ten seconds of phase-locked stereo digital recording (or 20 seconds mono) at a 48 kHz sampling rate. This lets you record vocals and "fly" them in, but samples can also be processed within the 480L for even more unusual effects... **Publison** announced hard disk recording (up to seven minutes, along with tape back-up for same) for their *Infernal Machine 90* (good product, terrible name), a digital delay/harmony synthesizer. A *SMPTE interface* is also now available... **Roland** has become a major player in the digital signal processing game, going from cost-effective little guitar boxes to pro-level studio devices. The *E-*

Lexicon's memory expansion board for their 480L digital effects system

Yamaha's DEQ7 rack mount digital equalizer

660 Digital Parametric Equalizer offers two channels of four-band parametric EQ along with an LCD that displays frequency curves and numerical values; digital I/O ports that follow the AES/EBU standard (another very hot item at the show) are also included. The *R-880 Digital Reverb* includes four independent lines, superb fidelity, and the same AES/EBU interface found on the E-660. But the device that intrigued me the most was the *DSP-2000*, which promises to be a very flexible and high-fidelity digital reverb. All of these products were prototypes, but looked like they weren't too far away from completion... **Spatial Sound**'s *SP-1 Sound Spatializer* provides sound localization, spatial pattern generation, sound movement simulation, and many special effects. As Sun Ra said, "space is the place"... **Yamaha**'s *DEQ7* ($1,295) is a dual-channel digital equalizer with 30 factory presets and 60 user-programmable presets. Features include 16-bit conversion with a 44.1 kHz sampling rate.

VIDEO/SYNCHRONIZATION

Adams-Smith, in addition to showing their *Zeta Three* MIDI/SMPTE synchronizer, showed the *2600 A/V*—a video editing system with audio graphic editing, still frame, and slow motion editing. Edit points can be located with sub-frame accuracy ... **Fostex** introduced a video character inserter and a VITC generator/reader... **Opcode**'s SMPTE-to-MIDI converter, the *Timecode Machine*, reads and writes all common varieties of SMPTE and is optimized for synching MIDI devices to tape. Opcode also tantalized us with a glimpse at *Sequencer 3.0*, but it won't be ready to ship for a while... **TimeLine** entered into an agreement with SSL, NED, CMX, Triconcept, and Alpha Audio involving a standard serial communications protocol that allows for sophisticated machine control functions. The adoption of this standard will allow for easier development, less duplication of effort, and greater operator convenience. ■

Commentary

AES: The Changing of the Guard

Music and MIDI make inroads

AT THE LOS ANGELES AES show in 1986, there was definitely some resistance towards the increased amount of MIDI/music activity. Apparently, some felt that the AES was the proper home for mixing consoles, tape decks, signal processors, and so on, but not "toys" like musical instruments and $400 digital reverbs. Also, as indicated in my April 1987 editorial, some of the same old guard had a hard time handling the fact that women were getting involved in what had traditionally been the "man's world" of audio engineering.

What a difference a year makes! At this year's New York show, the integration of MIDI into the studio was a *fait accompli*. And technically oriented females were no longer a rarity, but a significant part of the crowd. It seems to me that the AES is starting to feel a new vitality; the same shot of MIDI that has made such a difference in the music business seems to be spreading its magic in the world of high-end audio as well.

What accounts for this turnaround? First, AES was wise in limiting their U.S.

—continued on page 26

SONICFLIGHT™ SOFTWARE

ATARI ST **D-50 EDITOR/ LIBRARIAN** NEW!
State-of-the-art program including a Random patch generator & 64 sounds. $99.95

ATARI ST **MT-32 EDITOR/ LIBRARIAN** NEW!
An elegant new program including a Random patch generator & 64 sounds. $99.95

ATARI ST **FAST TRACKS ST** VERSION 2.0
An easy to use, full featured, user friendly sequencer. Featuring exclusive Performance Song Mode™ $129.95

ATARI ST **MATRIX 12/XPANDER LIBRARIAN** $49.95
including 100 sounds

ATARI ST **CZ/CZ-1 EDITOR/ LIBRARIAN** NEW!
A comprehensive new program supporting the CZ-1 including a Random patch generator and 96 sounds. $99.95

ATARI ST C-64, 128 **FB-01 VOICE MASTER** NEW! ST VERSION
Superb Editor/Librarian supporting all FB-01 features plus a random patch generator and 96 sounds. $99.95

C-64,128 **K-3 EDITOR/ LIBRARIAN** NEW!
A unique new program including a Random patch generator & 100 sounds. $99.95

NEW SOUNDS!

D-50 NEW!
ROM Card #1, 2 w/64 sounds in each $99.95 ea.
RAM Card w/64 sounds $149.95
RAM Card Blank $129.95

ESQ-1 NEW!
CASSETTE #1, 2, 3, 4 w/40 sounds in each $24.95 ea.
ROM #1, 2 w/80 sounds in each $59.95 ea.
ROM 80/RAM 80 Combo w/160 sounds $129.95
RAM w/160 sounds $149.95
RAM 160 blank $109.95

FB-01
• DATA SHEETS OR DISK (C-64, ATARI ST) NO LIBRARIAN NEEDED. Volume 1 96 sounds $24.95

TX81Z
• CASSETTE Volume 1, 2 64 sounds/volume $24.95 ea.

MATRIX 6/6R
• CASSETTE 100 sounds $24.95

MATRIX 12/EXPANDER
• CASSETTE 100 sounds $24.95

CASIO
CZ-101 • 1000 • 3000 • 5000 • CZ-1
Cartridge #1, #2: 64 Pro-sounds in each. $69.95 ea.
Blank 64 RAM cart. $48.95
CZ DEMO $5.00 (post. included)

DIGITAL HORIZON™ SAMPLES
MIRAGE • PROPHET 2000 • E II • EMAX • AKAI S900 • S-50
NEW! SAMPLES OF THE MONTH™
#11 Vibraphone, Marimba, Percussion
#12 Acoustic Guitar
#13 Techno Percussion, New Age
#14 Hot Brass
#15 Female Voices
#16 Male Voices
#17 Special Movie Effects
#18 Party Time
#19 Organ

DIGITAL/SAMPLING SOUND CASSETTE
16 BIT PCM DIGITALLY MASTERED! FOR ANY SAMPLER
• #1 SYNTHESIZER COMPLETE. Dynamic collection of 125 synthesized sounds.

STUDIO MASTER SERIES
ACOUSTIC MULTI-SAMPLED PRO SOUND LIBRARIES
• #2 ORCHESTRAL INSTRUMENTS
• #3 PIANOS & CLASSICAL KEYBOARDS
Digitally mastered chrome cassettes. $24.95 ea.

• Write or call:
Complete sound lists, information (specify item).
Software catalog for all computers.
Shipping: U.S. & Canada $3.00. Foreign $10.00
Order by check or M.O. Call for MC/VISA, COD
Mon–Fri 9–5 PM PST (503) 622-4034
Dealer Inquiries Welcome!

MIDIMOUSE™ MUSIC
Box 272-EB
Rhododendron, OR 97049

CALL THE MOUSE (503) 622-4034

—from page 25, AES COMMENTARY

convention activity to one major show a year. The topic of whether to hold one or two shows per year was hotly debated, but I think the current situation is a good one. Manufacturers don't have to spread themselves so thin, and showgoers can plan on one concentrated show. Second, I'm sure the AES must have noticed the solid response to their Fifth International Conference on Music and Digital Technology, put together by John Strawn, and held last May in Los Angeles. At that conference, it became clear that the MIDI/computer connection was as equally suited to broadcast and studio applications as it was to making musician's lives easier. Third, let's face facts—MIDI, computers, alternate controllers, and so on are *fun*. Why sit around trying to prove how many angels can dance on the head of a phone plug, when you could be sculpting sound?

Of course, there were still the high-end consoles, disc-cutting machines, CD production devices, and other machines traditionally associated with the upper echelons of the "serious" pro audio industry. In fact, it was precisely this combination of the traditional AES fare and new MIDI devices that made this year's AES show such a well-rounded experience.

AES shows are open to the public, at a variety of price levels (you can check out the exhibits only for $20; attending the technical seminars will deplete your bank account considerably more). The 1988 show will be held in Los Angeles, and if you're in the area, you'd do well to stop by. As far as AES is concerned, all I can say is—keep going in the direction you're doing. ■

INDUSTRY HONORED

3rd Annual TEC Awards Raises Money for Charity

The Third Annual TEC Awards, sponsored by *Mix* magazine and coordinated by Penny Jacob (**EM**'s publisher), serves two purposes. One is to have the readers of *Mix* magazine cast their votes for what they feel are outstanding achievements in the field of professional audio. The other is to raise money for three causes: the House Ear Institute, AES Educational Foundation, and a scholarship for the winner of the Outstanding Recording School/Program category (which went to the Berklee School of Music). This year's awards show proceeded smoothly, had excellent presenters (including Les Paul), and a good time was had by all. The winners in those categories of the greatest interest to **EM** readers are:

- **Ancillary equipment technology:** Monster Cable Prolink Series 1 cable
- **Automation and control systems:** Solid State Logic Advanced Total Recall with Autoscan
- **Console technology:** Rupert Neve V Series console
- **Musical technology:** Yamaha DX7II-FD FM synthesizer
- **Computer hardware/software:** Mark of the Unicorn's Performer
- **Recording devices/storage technology:** New England Digital Direct-to-Disk system
- **Signal processing technology:** Yamaha SPX90.

—from page 20, DAW ANALYSIS

thing as a bandpass filter in early Moog synthesizers; you coupled together a high-pass and low-pass filter to filter out everything except a particular band of frequencies.

The downside of modularity was the excessive amount of time it took to create patches. Since every single timbral element had to be specified and interconnected, and many dials and switches needed to be set, the first synthesizers were anything but rapid production tools.

Over the years, it was discovered that certain configurations of modules seemed to cover most musical needs. To this day, the chain of signal elements included in the minimoog (oscillator—filter—VCA, with envelope generators to add dynamic timbral and level variations) remains the most popular normalization scheme for analog and hybrid synthesis. Although creative options were sacrificed, thanks to the fixed configuration, synthesizers could be used in a repeatable way and set up in much less time than the modular monsters. This integration into a single package also reduced manufacturing costs; when the minimoog hit the market, the days of the $15,000 modular synthesizer were numbered.

Now we've seen a similar situation happen with MIDI and digitally oriented electronic music devices. When MIDI first appeared, several people (myself included) felt that the days of modularity were back. For example, rack mount MIDI modules could be driven from guitar, keyboard, or drum controllers. Various modular accessory boxes—mergers, thru boxes, switchers, and so on—helped re-configure these modules into new variations. Computers were brought in as additional modules, and furthermore, *the computers themselves* were modular: you could swap boards, use a hard disk instead of a floppy disk, add on a modem, etc.

As with modular synthesizers, these modular MIDI systems offered extensive creative options, but at the expense of time and efficiency. Channels needed to be set, MIDI reception modes needed to be adjusted, interconnections had to be occasionally debugged, and boxes like channelizers and switchers had to be properly set up. All of this took time, as did trying to convince a computer designed for general-purpose business applications that it was a musical instrument.

Once again, it's time to consolidate. The DAW integrates various digitally based music-making elements into a single, efficient, time-saving package. What elements make up a DAW? Although that question is subject to debate, I pretty much agree with WaveFrame's definition that such a system should be principally based in the digital domain and include synthesis facilities (sound generation, typically through sampling), storage and editing, signal processing, and mixing. Of course, this definition covers a lot of territory. Some sampling keyboards, for example, could be considered DAWs since they allow for synthesis, storage, editing, signal processing, sequencing (sometimes), and mixing. However, when compared to systems like the Fairlight, Synclavier, WaveFrame, etc., it becomes clear that there are different levels of power. A sampling keyboard may have sufficient sampling time to store numerous waveforms and sounds, but it would be hard to pull off a complete project that needed a lot of acoustic recording solely with a sampler. Therefore I think it's important to differentiate between a DAW,

—continued on page 28

Introducing...

Concepts: One

Beyond State of the Art!

For IBM PC/XTs, PC/ATs, '386 machines and most compatibles
and a MPU-401 compatible interface

Concepts: One represents the beginning of our new line of professional MIDI software and hardware products. The Concepts: One sequencing system is designed for performers, musicians, audio/film production, and studio applications, with features that you, the serious professional DEMAND from your MIDI sequencing software!

The Concepts: One (version 1.5) sequencing system is the result of more than two and a half years of intense research and development. We asked professionals what they needed in high performance MIDI software. Their answers led us to incorporate many features including:

- Support for up to 15 megabytes of extended memory on AT models
- The ability to record and play 16 MIDI channels simultaneously on each track
- Facilities for recording, playback, and editing of System Exclusive messages
- Real time muting, tempo, and All Notes Off commands
- Quantization available in three types: Note on, Note Off, or both. The quantize value may range from two clock ticks to a quarter note!
- Scrolling of note and controller displays in playback
- Automatic downloading of up to 16 sets of Bulk data (patches, etc.) before sequence playback
- Track lengths of up to 206,400 bytes each
- Full Song Position Pointer implementation
- Mix, Unmix, Split, Load, Save, and Copy individual tracks
- Cut, Paste, Copy, Remove, Replace, Delete, Transpose, Quantize, or change MIDI channels in a phrase of music
- Scaling, modification, or replacement of Note Velocity, controllers, Pitch bend, etc. within a phrase
- Loading of sequences automatically from a song list. Load any sequence within the list via MIDI Program changes from your MIDI master keyboard.
- Saving each Punch In to a different track while looping

In order to find out more about the unique features of Concepts: One, and order your **Free demo diskette,** call toll free **1-800-451-7973,** or in California **1-800-227-8218.**

See for yourself how Concepts: One is "Beyond State of the Art," the MIDI sequencing software professionals prefer.

midi
CONCEPTS, INC.

7657 Winnetka Ave., Suite 327, Canoga Park, CA 91306
Pan ID: MIDICONCEPTS

—from page 26, DAW ANALYSIS

where it is possible to take an audio project from conception to completion, and a sampling keyboard, which—although capable of being used for some stand-alone projects—is more typically part of a modular system consisting of other synthesizers, a computer running sequencer programs, etc.

One of the most significant aspects of a quality DAW is the speed with which tasks can be accomplished. As with synthesizers, system integration results in faster operation and a more focused approach on the part of the operator. Defaults don't have to be set for a variety of instruments, because all "instruments" are part of a single system. There's no need to interface a computer with sound generators; they're already integrated in the DAW package. Controls and the user interface can be optimized for musical applications, as opposed to being part of a general-purpose machine. This means a lot to the composer, who is constantly fighting to get ideas out of the imagination and into some form of audio with the least amount of creative interference. Those who have watched ideas dissipate while waiting for a disk to boot, or a program to re-start after a crash, know all too well what creative interference can mean. For now, the fastest route between imagination and reality is the DAW.

Another advantage relates to archiving. Ideas can be seized as soon as they appear and be stored in the DAW for later use. As Sting said in a press conference on behalf of New England Digital, every musical idea he has had over the past few years is digitally stored and ready to be pulled out at a moment's notice. Even without a Synclavier, I've been able to do much the same thing with my E-II and Mac sequencer. Sometimes, a hook composed two years ago will all of a sudden mesh with a chorus written yesterday. All of these musical fragments are captured with a spontaneity that greatly improves the overall quality of the music, yet can be edited and refined in a totally premeditated way at any point after the initial creative impulse.

At the moment, a true DAW is still quite expensive. The WaveFrame starts at about $45,000, a typical Synclavier system runs about $100,000, and the Fairlight Series III falls into the same general price range. But there are alternatives. The Emulator III mates a very capable sampler with a very capable sequencer, and provides many of the functions of larger DAWs. The ADAP system from Hybrid Arts piggybacks on the Atari ST to provide hard disk recording with reasonably good editing, all for a few thousand dollars. PPGs' hard disk recording system is already being used for jingles and to "fly in" sampled sounds for multi-track recordings. And it is always possible to assemble a modular DAW; if you're willing to cheat a bit and use analog multi-track recorders to handle high-density storage needs (i.e. acoustic signals that would require a prohibitive amount of memory if recorded digitally), combining a sampler, sequencer, tape recorder, and some means to synchronize all these system elements will enable you to do much of what the "big guys" can do at a fraction of the cost. We can also look forward to prices ramping down in the years ahead. Already, hard disks have plummeted in price, and economical optical storage technology is just around the corner. Someday these technological advancements will make today's $100,000 DAW seem just as financially outrageous as the $20,000 modular synthesizer of the mid-'60s.

Every musician wants to be able to create music as painlessly and efficiently as possible. The DAW is bringing us closer to that ideal than ever before. ■

Late-Breaking News

Ensoniq's 2nd Generation Debuts

New instruments combine features, cost-effectiveness

SEVERAL MONTHS AGO, Ensoniq offered to show me around their plant if I was ever in the area. After the AES show, I took them up on that invitation —and couldn't have done so at a better time. The company was getting ready to roll out two new products, the Ensoniq Performance Sampler (EPS) and SQ-80 Cross Wave synthesizer (the latter of which was already in production, even though it had yet to be officially announced).

Although both machines will be reviewed in depth in an upcoming issue of EM, I was able to play with the new products for some time, and was very excited with what I heard and saw. Following are thumbnail sketches of both instruments.

Ensoniq's EPS and SQ-80 synthesizers

THE ENSONIQ PERFORMANCE SAMPLER

At $1,995 the EPS could still be considered a "budget" sampler, yet it represents a quantum improvement over the Mirage DSK (which will still be manufactured and hold down the low end of Ensoniq's sampling keyboard line). The most dramatic feature is that you can continue to play the keyboard while loading sounds from disk, which validates Ensoniq's claim that this sampler is optimized for live performance. But of equal importance to me is the inclusion of polyphonic aftertouch. Those who have played Sequential's T-8 know how powerful a feature this is; there's nothing like holding down a chord and modulating *individual notes* according to how hard you press the keys. Thanks to clever interpolation techniques, the aftertouch response is *extremely* smooth. Polyphonic aftertouch has always been difficult and expensive to implement, but Ensoniq's patented Poly-Key process makes it affordable.

Other features include 20 dynamically assigned voices (capable of being as-

Imagine a sequencing environment with these features...

Easy to use Mouse controlled user interface.

An intuitive and incredibly interative tape recorder environment.

More powerful editing than the Dr. T's KCS V1.5.

User-programmable variations generator built into the sequencer.

Completely integrated with the most powerful scoring/transcription program, patch editor/librarians, and MIDI performance programs available.

TURN THE PAGE

WRH

LOW HYPE
SMALL ADS
Fabulous Software Engineering

48 Track PC. A solid software sequencer three quiet years in the making. Here are the results:

Keyboard, Aug '87: "Elegant, unintimidating... laden with features, many of which make life easier.

Music Technology, July '87: "Easy to understand...uncluttered...easy to use. A number of fascinating new editing features and a host of tools for film and video scoring.

MCS Magazine, August '87: "Flexible, slick ...the best note/event editor I've seen on a sequencer to date...a champ.

Now! Version 2.0

Full graphic editing: see five octaves, zoom between 1 beat and 53 measures. Move, stretch or compress notes, and graph continuous data, including velocity. 600 pulses per quarternote for timing distortion less than 1 ms. And more. For the PC or AT and MPU 401 or clones.

The 48 Track. We've paid our dues. If you're ready for a solid professional software tool, then get the 48 Track today!

The 48 Track PC

Robert Keller
2920 Jefferson
Eugene, OR 97405
503/485-3481

48 Track, $259
16 Track, $100

We've got the SOUNDS

MT32 SOUNDS — A new package of sounds for Roland's LA module. Call or write for details.

D50 SOUNDS — 256 new sounds on data disk for only $40

TX81Z SOUNDS — 288 new sounds plus 24 performance memories on data cassette for only $30

K3 SOUNDS — 100 new sounds for the Kawai K3 on data disk or data sheets for $30

CZ SOUNDS — 320 patches on data disk or data sheets for $30

ESQ1 SOUNDS — 240 progressive voices on data cassette for only $30

DX100/21/27 SOUNDS — 288 new sounds on data cassette for $30

FB01 SOUNDS — 96 new sounds plus 16 new configurations on data disk for only $25

DX7 SOUNDS — 288 voices on data cassette (TX), data sheets (DX) or data disk (DX & TX) just $30

POLY 800 SOUNDS — 64 new programs on data cassette for $20

Data disks work with any D50, K3, FB01, CZ, DX7 or MT32 librarian editor for the ST, Mac or C64/128. Most sysex librarians also supported.

Visa and MC orders welcome. Shipping $2 per package, overseas $5. Performance notes included. Demo tapes are $4 each and include free samples.

LEISTER PRODUCTIONS

The Music Software Source
14 Hill Blvd.
Mechanicsburg, PA 17055
717-697-1378

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

signed in multi-timbral fashion to eight channels), separate outputs for the eight channels, programmable stereo panning, two patch select switches located right by the modulation wheels so you can instantly access various programs (try bringing in harmonics over an electric guitar sample!), 8-track polyphonic sequencer with quantization and storage of up to 80,000 notes, six-stage envelopes, and several sampling rates up to 52.1 kHz (which yields 4.95 seconds of sampling time). With optional memory expansion, this extends to 19.8 seconds at the same rate; lowering the sampling rate to 6.25 kHz provides a whopping 167 seconds of sampling time. Using 13-bit A/D conversion, 16-bit data storage and 24-bit internal processing, the fidelity is definitely there. Sound quality is further aided by interpolation techniques that "fill in" the gaps between samples when transposing downwards. Even substantial downward pitch shifts are remarkably free of "grit" and noise.

Mirage and DSK disks can be loaded into the EPS and converted to EPS format, which, incidentally, improves the fidelity of the sample. Furthermore, you can modify the samples using the EPS's generous arsenal of signal-processing options.

There's a lot more to cover—the digital filters, multi-sampling options, and so on—but we'll save that for the review.

THE SQ-80 CROSS WAVE SYNTHESIZER

While the ESQ-1 will continue to be manufactured, the SQ-80 ($1,895) seems destined to eventually eclipse its older brother. While similar to the ESQ-1, the SQ-80 has some important improvements. As with the EPS, the keyboard features polyphonic aftertouch. Regarding voice storage, the SQ-80 holds 40 programs onboard; an additional cartridge port allows for 80 more programs (and compatibility is maintained with ESQ-1 cartridges). Best of all, a built-in disk drive holds up to an additional 1,728(!) programs, organized as 128 single programs (which can be recalled individually) and 40 blocks of 40 programs (which are recalled as a block). The disk can also hold ten blocks of sequence or System Exclusive data, divided up as desired between the ten available blocks. Since both the SQ-80 and EPS can store Sys Ex data, and include the aforementioned polyphonic aftertouch (which can be set to channel aftertouch if desired), either model would make a pretty good candidate for the master keyboard controller in a MIDI system.

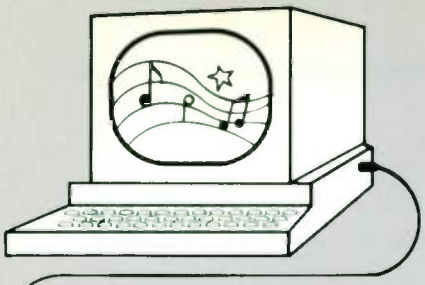
In a manner similar to the D-50, the SQ-80 includes 75 multi-sampled and synthesized waveforms onboard (along with five multi-sampled drum sets) where sampled attacks can be "spliced" on to looped sustains, or other sounds for that matter. Some of the sampled attacks include bow, pick, mallet, and hammer sounds. And of course, an Ensoniq product wouldn't be an Ensoniq product without a built-in sequencer; the SQ-80's is very complete, and includes auto-location, automated mixdown, and sync-to-tape.

Both the EPS and SQ-80 have easy-to-read multi-character fluorescent displays for easy readability, and the cosmetics are consistent with Ensoniq's typically understated style.

Regarding sound quality, the EPS is definitely a quantum improvement over the Mirage (maybe two quantum levels). Judging a synthesizer like the SQ-80 is a more subjective process; for synths, I look at sound quality as being a function of purity of sound coupled with expressiveness. Concerning expressiveness, the SQ-80 gets very high marks. Concerning signal purity, the sound is somewhat "fuller" than the ESQ-1, but the difference is not as dramatic as the difference betwen the EPS and Mirage. Still, if you like the ESQ-1, you'll love the SQ-80. What with the sequencer, drum kit sounds, and wide range of available waveforms, you essentially have a complete MIDI studio at your fingertips for under $2,000...if that doesn't represent value received, I don't know what does.

The above represents just the highlights of these extremely interesting new products—read the upcoming reviews for the full story.

If you would like to contact the manufacturers for more information look in the "Advertiser Index" in the back of this issue, which will lead you to their advertisement and thus their address and phone number. If a manufacturer is not listed there, send a self-addressed stamped envelope to: "EM AES Report Listing," c/o Electronic Musician, *2608 Ninth St., Berkeley, CA 94710. We will send a list of addresses and phone numbers (if available) for those manufacturers mentioned.* EM

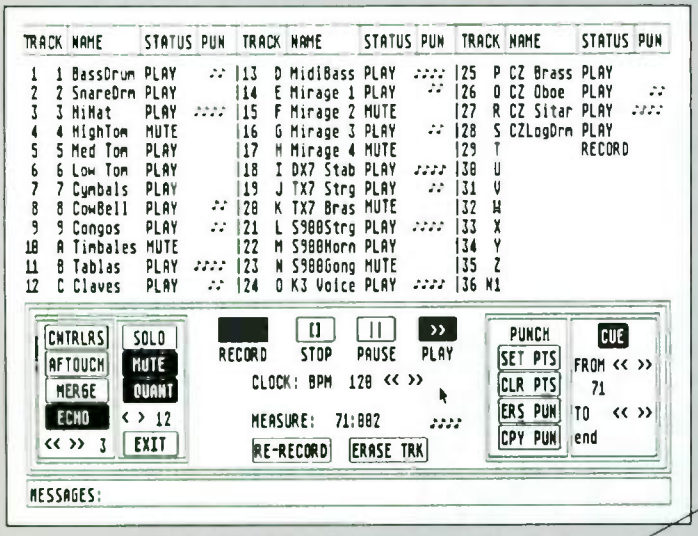


SERIOUS SOFTWARE FOR THE THINKING MUSICIAN

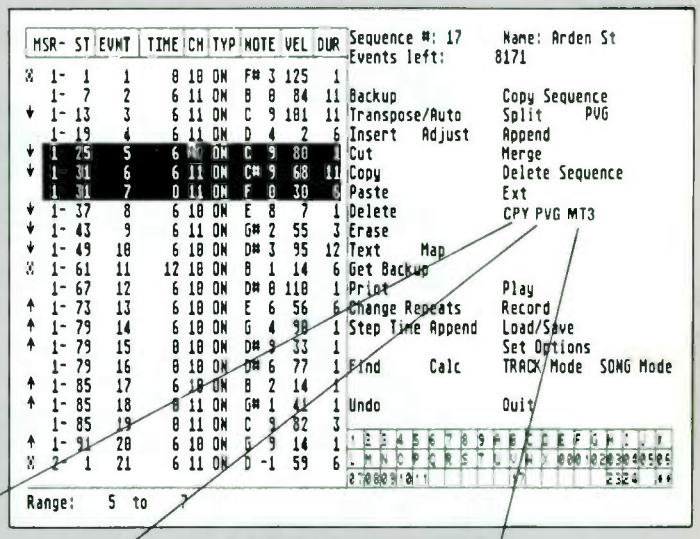
Dr. T's™ MUSIC SOFTWARE

220 BOYLSTON STREET, SUITE 306, CHESTNUT HILL, MA 02167 (617) 244-6954 FAX (617) 244-5243

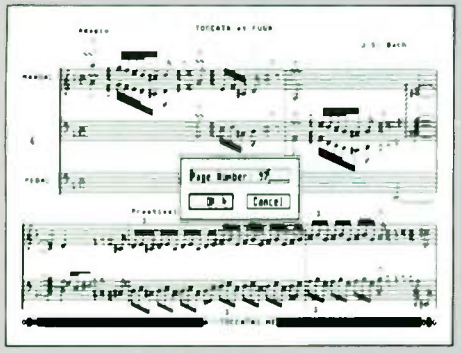
LEVEL II



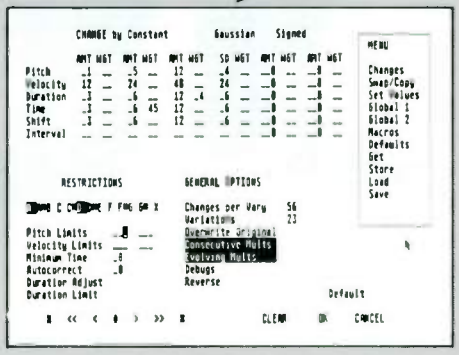
TRACK-MODE RECORD/PLAY



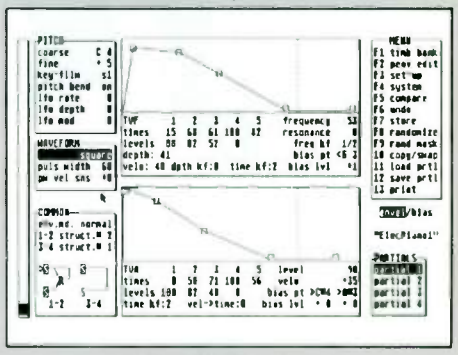
OPEN-MODE EDIT



COPYIST V1.4



PVG



ROLAND MT-32

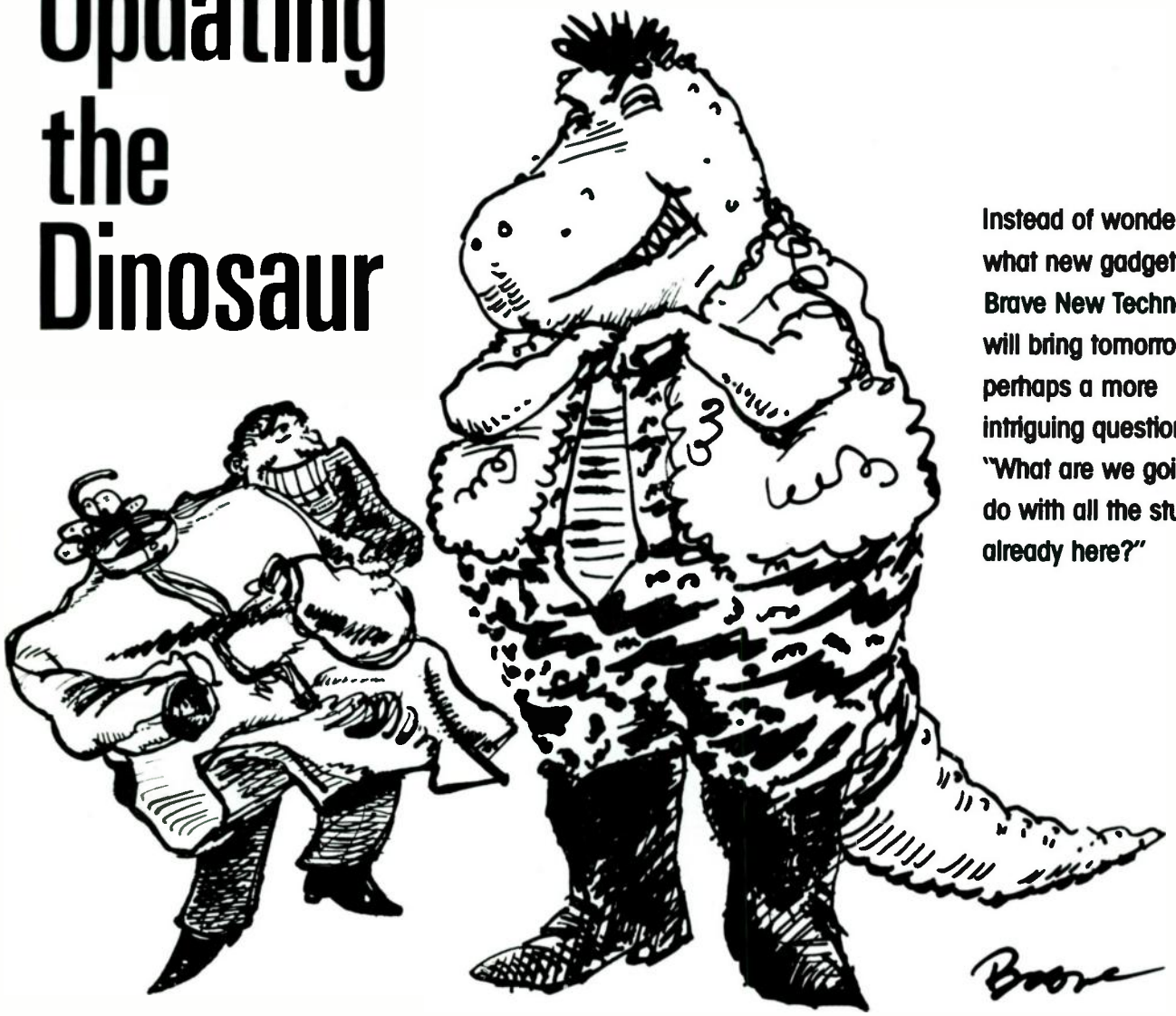
PROGRAMMABLE VARIATIONS GENERATOR and MASTER EDITOR

The PVG was written to allow the user to computer to generate variations from any previously recorded musical part. It can produce changes or permutations in pitch, dynamics, controller values, rhythm and expression, according to instructions that can be entered in detail by the user. For example, the beginning of a part can be given small pitch changes, while the end of the part is given large velocity changes. The program can produce a single variation on a part or a series of variations that evolve over time. The variations produced can contain some randomness or be fully determined.

Integrated with the PVG is the Master Editor, an editing and orchestrating tool of unprecedented power and flexibility. It allows the selection of notes for editing operations by a wide range of criteria, including pitch, velocity, interval from next or last note and position in pattern.

ONLY FROM THE DR!

Updating the Dinosaur



Instead of wondering what new gadgets our Brave New Technology will bring tomorrow, perhaps a more intriguing question is, "What are we going to do with all the stuff already here?"

BY C.R. FISCHER

Synthesizers have been available commercially for 20 years. Their capabilities have grown exponentially, and their prices have dropped in proportion. By using new, store-bought gear, one can get rolling for under $2,600 (see "Maximum MIDI for Minimum Money," April '87 EM, and "25 Hot MIDI Products for Under $500" in this issue).

But there's a way to cut costs even further for beginners, amateurs, and the just plain broke: check out the amazing variety of older instruments sitting around and available for a pittance. Just the other day I saw an old ARP going for $75 in the classifieds, and while the ARP and its contemporaries lack programmability and can only play one note at a time, they're still instruments you can use to make music and they sometimes sound "cleaner" than today's digital wonder boxes. Going one step further, a simple MIDI-to-CV (Control Voltage) converter like the Roland MPU-101 (See the Feb. '87 EM) can often integrate many of these seemingly obsolete creatures into a state-of-the-art MIDI system.

However, some of these older machines have problems that can cause difficulty. The most troublesome headaches are tuning and stability problems, but even these problems can be fixed.

ILLUSTRATION BY DOUG BOONE

MAKE IT BIG

Band: Gypsy Blue

With an Aphex Aural Exciter®

Brighter. Better. More Punch. Only a genuine Aphex Aural Exciter can do all that. An Aural Exciter adds new musically related harmonics that make instruments or vocals, recorded or live, sound bigger... brighter...just plain better with more impact and detail!

Thousands of recording studios, broadcasters and venues around the world use Aphex signal processing equipment. Now you can use an Aural Exciter Type E with your instrument, mic or sampler. It's designed so you can plug in your instrument directly, or it can be used for line level in, and it is also a quality direct box and preamp in one half rack width unit.

Don't be fooled by other so called "enhancers". They are either equalizers or phase shifters, or combinations of both. They can't add harmonics, which is part of the patented Aural Exciter process. If all you want is brightness, you can get it with a $50 EQ. When you want brightness, plus detail ... air ... definition ... clarity ... edge ... and impact, you have to use a genuine Aural Exciter.

Audition the versatile Type E at your favorite dealer today. You'll hear how it can help you make it big in a cut-throat world.

Rack mount and foot pedal control available. Also available in line level stereo version Type C Aural Exciter.

Aural Exciter Type E Under $200

APHEX SYSTEMS LTD.

Dept. EMT, 13340 Saticoy St.
North Hollywood, CA 91605 (818) 765-2212

Designed and manufactured in U.S.A.

Types Of Oscillator Pitch Drift

Let's get the scary part out of the way first: there are many different ways for the pitch-generating circuitry of a voltage-controlled oscillator (VCO) to go out of tune (Fig. 1). For example, an instrument might slowly go flat over a period of months or years, until it has drifted so far that its tuning knob cannot bring it back into tune. Or it might suffer from a scaling problem and be in tune at one end of its keyboard, but be completely out of tune at the other end. Or the instrument might start out in tune, but drift after a while.

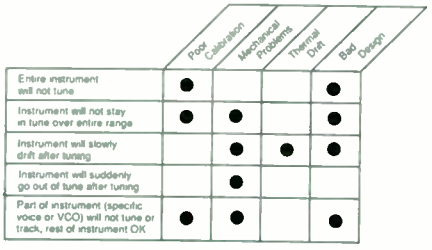


FIG. 1: A chart of various tuning problems and causes; obviously there is more than one cause for many symptoms.

Any of these problems can affect the entire instrument, just one voice, or just one oscillator. Each symptom has its own causes and cures, and we'll discuss each solution individually. There are four categories of problems:

1. Poor calibration or maintenance of VCOs, keyboard electronics, and/or power supplies;
2. Mechanical problems (such as dirty or worn keys or connectors, and worn or loose potentiometers);
3. Thermal problems;
4. Bad or obsolete designs.

Let's roll up our sleeves and see how to fix these various maladies.

Poor Calibration

Prior to the mid-'70s, synthesizer designers were forced into using parts never intended for musical purposes. This was a special problem in VCO designs. The human ear is much more sensitive to pitch than to parameters such as amplitude or timbre. Unfortunately, asking an oscillator to stay in perfect tune over a 10-octave range put a lot of demands on the technology of the time. To stay in the ballpark tuning-wise, these instruments require at least periodic maintenance: yearly at best—if the instrument is kept in a nice, stable studio—or between songs at worst, if the thing is being dragged along on tour.

While any competent repair shop can keep your instruments in shape, you can probably do it yourself if you're patient and careful. The procedure consists of tweaking several internal adjustments in a prescribed order until the tuning is satisfactory, and it requires no great assortment of tools or skills. I know several musicians who are not into electronics, but manage these projects successfully.

The Hard Part

If you are tempted to try your own synth rejuvenation, read a book or two on basic electronics, get the service manual for your instrument, and *follow the instructions*—don't tweak the left pot first on your Oberheim just 'cause that's how your friend tweaked a Roland. Fortunately, because tuning was such a problem, most service manuals go into fairly detailed tuning procedures. Often, there will be LEDs mounted directly on various circuit boards to indicate tuning accuracy, further simplifying the calibration process.

Since you are only turning pots, you really can't screw up anything permanently. However, you *can* mess things up sufficiently that you might end up having to pay a repair tech to bring the instrument back to where it was in the first place. Remember these points:

✓ Don't ignore the power supply. Some VCOs are incredibly sensitive to tiny variations in the supply voltages, and an error of a hundredth of a volt can affect tuning. Don't be tempted to use a ten-dollar el cheapo meter when measuring supply voltages—a good (i.e. at least 3½ digit) digital voltmeter (DVM) is a necessity.
✓ If you don't know someone with a quality meter, you might consider asking a local TV shop if you could use their meter for a few minutes for a small fee. Alternately, try the electronics instructor at a local high school or community college. Catch your target during a lunch

Exponential vs. Linear VCOs

Before you invest time and money converting your favorite dinosaur so it can be used with a MIDI system, there's an important point to consider: does the instrument in question use *exponential* or *linear* response VCOs?

The human ear interprets frequency in a non-linear fashion—that is, the pitch of a note that is one octave above another is *twice* as high as the first. To duplicate this phenomenon with a control voltage requires that the oscillator respond in an *exponential* fashion.

Most manufacturers of CV style synthesizers followed a standard that used exponential-response VCOs; these doubled in frequency for each Volt applied to a control input. This de facto standard is commonly known as "1 Volt/octave," and was adopted by a majority of manufacturers, including ARP, Moog, Oberheim, Roland, and others.

For reasons of economy or simplicity, some manufacturers—Korg, PAiA, Yamaha, and a few others—chose to use linear VCOs. These provide a constant frequency change for a given change in input voltage, rather than the exponential response described above. If you were to hook one of these instruments to a MIDI-to-CV converter, it would become immediately obvious that the two systems are not compatible. In fact, none of the available MIDI-to-CV boxes will work with linear-based systems, and there is nothing on the market to interface the two. At one time Korg made an exponential/linear interface, but it never gained much popularity and was discontinued years ago.

What all this adds up to is that you must be sure the dinosaur in question adheres to the 1V/octave standard (the manufacturer, or a manufacturer's authorized repair center, should be able to tell you this). A linear synth might still be great for bass lines or special effects—but no MIDI-to-CV converter currently on the market will make it act like a MIDI synth.

break; if you're polite and don't take too much time (buying someone a pizza after work wouldn't hurt either), these people are very often happy to help beginners.

✓ To keep your power supplies contented, use a surge protector/line filter designed for personal computers. These devices clean up the AC line voltage, and are necessary if you work in small clubs where stage lights and air conditioning can play havoc with the line voltage.

✓ A big source of tuning problems comes from faults introduced not by the electronics, but by mechanical factors. Dirt and crud works its way into controls; contacts in keys or solderless connectors oxidize, causing voltage drops and intermittents. Cleaning contacts on keyswitches and connectors has been covered in a number of articles (see Alan Gary Campbell's columns in the Jan., Feb. and June '87 EM). It also seems that equipment used in the vicinity of smokers suffers more often.

Trimming Your Pots

A problem that has received *less* attention in print is the effect of mediocre trimpots in critical circuitry. It seems that many inexpensive trimpots change their value

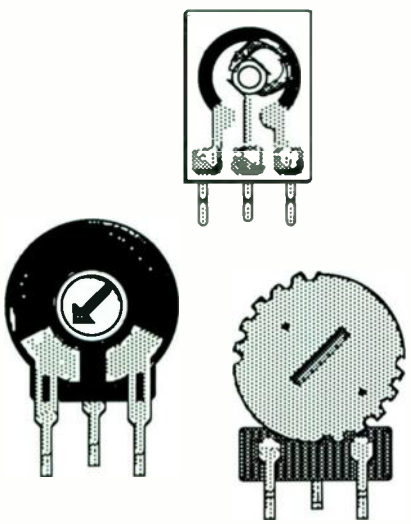
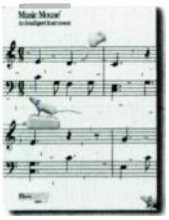


FIG. 2: Low-quality trimpots such as these can degrade tuning stability in synthesizer VCOs.

when subjected to vibration or shock. Fig. 2 illustrates some of the types of pots to avoid. If your instrument suffers tuning changes after being moved around, check and see if any of these trimpots are used in its VCO circuitry (several of the pots in

You don't have to wait till you get here

to make great music.



The critically acclaimed Music Mouse™ software program turns your Macintosh or Amiga computer into a phenomenal musical instrument. And turns the performer in you loose.

"The computer can now be a live performance instrument that is totally unique... Music Mouse might qualify as my choice for Music Product of the Year."

—MACazine

The program doesn't rely on keyboard skills or knowledge of musical notation, but on your desire to make music. All you do is push the music around using the computer's keyboard and mouse. Your musical intuition guides you through richly structured melody, harmony, transposition, counterpoint, articulation and rhythmic patterning.

"Music Mouse charts a unique course in music software and cannot be compared with anything currently available."

—EAR Magazine

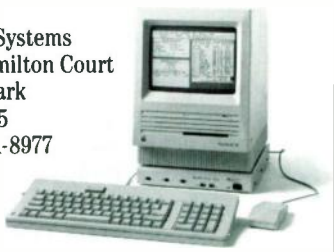
Don't wait till your next big event. To find out why so many music professionals rely on Music Mouse for concerts, recordings and soundtracks, pick up your copy today.

Sequencers, Editors, Librarians and more from Opcode Systems.

Ask your music dealer about Opcode's Sequencer 2.5, a MIDI recording studio environment with transcription abilities; Editors and Librarians for storing and editing synthesizer sounds; Cue—The Film Music System for professional film composers and editors; and Studio Plus Two and Professional Plus MIDI interfaces for the Macintosh. Also ask about OvalTune, a new innovation for the Mac that generates both music and images.

Look for Opcode Musicware at your music store or software dealer. For more information, call Opcode Systems.

Opcode Systems
1024 Hamilton Court
Menlo Park
CA 94025
(415) 321-8977



Music Mouse is a trademark of Laurie Spiegel licensed to Opcode Systems. Macintosh and Amiga are trademarks of Apple Computer Inc. and Commodore Business Machines, respectively. Sequencer 2.5, Editors, Librarians, Cue and OvalTune are trademarks of Opcode Systems.

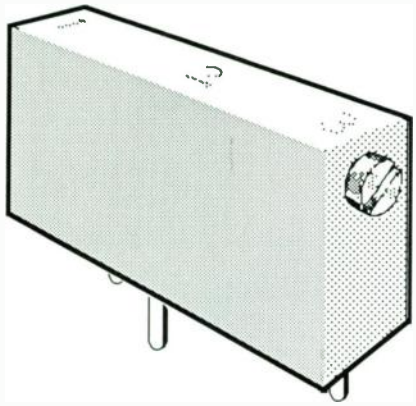


FIG. 3: Cermet trimpots give your synth increased resolution and stability.

Fig. 2 were removed from commercial synthesizers).

Replace these with a multi-turn cermet trimpot like the kind made by Bourns or Beckman; these usually come in a rectangular case, and have a screw head adjustment (Fig. 3). Cermet pots are much higher quality, and using multi-turn trimmers gives your synth increased resolution and stability. A problem that arose in one of my own instruments points out how simple the cure can be, so let's look at this particular case study.

The Case Of The Wandering Trimpot

One of my favorite dinosaurs is my old Roland JP-4. While it lacks auto-tune circuitry, it does have a very sturdy VCO design using some very expensive temperature-compensating transistors that served to keep it as stable as any other polyphonic synthesizer of its time (1979).

However, after a few years I noticed the global keyboard scaling tended to wander after the synth was moved from gig to gig. It would spend months on end at a single location without problems, but once it was moved a few times the trouble returned. It was time to get out the magnifying glass and start looking.

Since the octave width shift affected the entire instrument, I assumed that the VCOs themselves were okay and looked elsewhere for the culprit. The keyboard circuitry that generated the gate and CV voltages was fine. Finally, using a very accurate voltmeter, I found that the negative power supply was a couple hundredths of a volt off from its proper value. I adjusted the supply with a trimpot, and the tuning was perfect again.

Several weeks later, the synth travelled to a couple of gigs, and once again the tuning was off. Sure enough, a few moments with the DVM confirmed that the supply had drifted again. I removed the original trimpot and replaced it with a high-quality, ten-turn cermet trimmer (Bourns series #3299). Since the replacement, tuning stability has been excellent. The total cost was $1.49.

Temperature changes inside the instrument are also a major cause of tuning problems in VCO-based instruments. All synthesizers that use exponential (1 Volt/octave) VCOs are sensitive to temperature changes; the difference between a good design and a bad one is the method used to compensate for this problem. The better designs included tricks such as special compensating resistors designed to drift in the opposite direction and cancel out drift, carefully matched transistor pairs, and ICs with built-in heating elements to keep the circuitry at a certain temperature.

Lacking these design compensations,

There are cases where trying to cure tuning problems will prove futile, simply because the instrument is a lemon.

there is one simple trick that cures many thermal problems: turn the instrument on and let it warm up for a half-hour or so before playing. Once the synth's electronics have come up to their playing temperature, they'll stabilize, and any subsequent changes will be small. As a musician, I found this to be the simplest and cheapest cure in the book, and as a technician,

Parts List

Resistors

All resistors marked with an asterisk (*) *must* use 1% metal film resistors for reasonable performance. Using carbon type resistors for the remaining parts is fine, but using them in place of precision resistors will degrade operation of the VCO.

R1	20k multi-turn trimpot
R2	91k* (or use 100k and 1 Meg in parallel)
R3, R4	200 Ohms* (or use two 100-Ohm resistors in series)
R5	3.01 Meg* (or use three 1-Meg resistors in series)
R6, R7	100k*
R8	1.3k
R9	470 Ohms
R10	33k
R11	15k

Capacitors *(25 or more Working Volts DC. C1 must be polystyrene for best temperature stability.)*

C1	1 nF (0.001 μF) polystyrene
C2	220 pF ceramic disc
C3	1 nF (0.001 μF) disc
C4, C5	1 μF electrolytic or tantalum
C6	100 pF

Semiconductors

IC1	SSM 2038 Voltage-Controlled Oscillator
IC2	741 or equivalent general purpose op amp

Mechanical parts

Misc.	Perfboard or PC board, solder, hookup wire, input resistors as necessary for CV summing amplifier (see text).

Note: *Radio Shack sells an assortment of 50 1% metal film resistors (part No. 271-309). This assortment usually contains enough resistors to assemble the odd resistance values (as explained above).*

I've seen this trick cure problems for dozens of synthesizer players. Even instruments that have automatic tuning circuitry will benefit from a short warm-up.

A Generic VCO Replacement Module

Finally, there are cases where trying to cure tuning problems will prove futile, simply because the instrument is a lemon. As we mentioned, designing a VCO with excellent performance used to be extremely difficult, and some manufacturers produced instruments that simply were not capable of staying in tune for any length of time. The white-faced ARP Odysseys, and the synths from Electronic Music Labs (EML 100 et al), had some of the shakiest early VCOs.

In this situation, you can (1) sell the synth to someone who can't recognize bad pitch, (2) relegate the synth to work in a thermally stable environment, or (3) replace the VCOs with something better. While designing a VCO with excellent specifications was once a difficult and arduous task, IC manufacturers (particularly SSM and Curtis) have made the job considerably easier by designing chips specifically dedicated to musical instruments.

Fig. 4 presents a design for a VCO that uses one of these chips, the SSM 2038, and a supporting 741 op amp. By including most of the oscillator components on a single IC, temperature stability and performance is maximized while construction hassles are minimized.

In our circuit, the op amp serves as a control voltage summing amplifier. The inputs can include a keyboard, pitch bend wheel, LFO, or any combination of CV sources to control the frequency over a range of ten octaves. The sum of these voltages feeds the VCO (IC1) via R1/R2/R3, which form an attenuator that allows us to set the scaling of the VCO with a single trimpot (R1). The 2038 has excellent exponential conformity (i.e., it stays in tune over a wide frequency range), good high-frequency tracking (it doesn't go as flat at higher frequencies as older designs did), and it has great temperature stability without the need for external compensating circuitry.

Since this generic VCO will work with a variety of instruments, you'll have to make substitutions as necessary for each design. For example, a synthesizer might use a number of CV inputs as in **Fig. 5**. The keyboard CV is summed via R6, while the pitch bender is summed via RB. RC sets the VCO to a specific frequency when no other CVs are present at the inputs. To get the VCO module working properly with a synthesizer, you must add these resistors, as shown in the instrument's schematics. Similarly, you might have to adjust the value of the input resistors in the synth's audio mixer if the original oscillators had a different output level. For example, if the new VCO sounds too soft when cranked up, lower the mixer's input resistor to match the previous signal levels.

In most cases, this circuit will greatly improve the stability and performance of the synthesizer with which it is used. To calibrate the VCO, let the instrument warm up for a half-hour, then, using another pitch generator for reference (DX7s are always in tune; or even a simple tuning fork will do), play the highest note and adjust the instrument's tuning knob until the two are in tune. Next, play the lowest note available and adjust R1 until you're in tune again ("zero beats" is your goal). Go back and forth between the high-end and low-end adjustments until there are no more deviations from proper pitch. I was able to get my prototypes tracking in less than five minutes.

If you absolutely *cannot* make things work this way, try starting with the low end and bringing the top into tune relative to that. Some of these synths use a particular type of circuit design that demands this.

The parts used in this circuit are fairly easy to find. The SSM 2038 is available from Mescal Music (PO Box 5372, Herc-

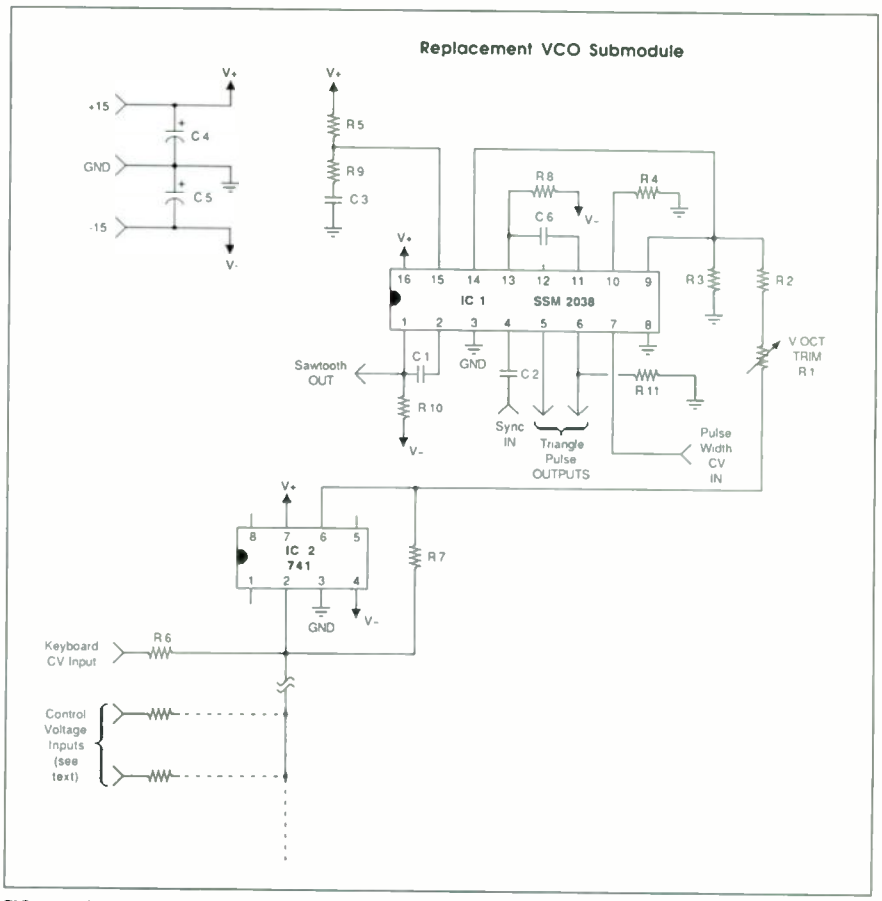


FIG. 4: This simple VCO circuit offers good performance with a minimum of parts.

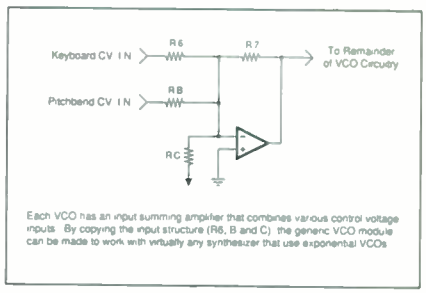


FIG. 5: Typical VCO input circuit.

Cakewalk

IBM SEQUENCER

We could tell you about Cakewalk's 256 tracks, ease of use, editing power, or $150 price tag. But the critics are doing a better job!

"Even the usual editing commands have a surprising degree of depth... here is where this program really shines... Documentation, both on-line and in the manual, is among the best I've encountered *anywhere*, including non-music applications—at once, it handily serves both novice and advanced computer users. Best of all, Cakewalk comes in at a price which almost earns it a rating of 'cheap'... One *hell* of a sequencer...."
—Matt Isaacson, *Music Technology*, November 1987.

"Cakewalk has a fast, efficient response time and a clean, uncluttered look. More important, it has lots of useful commands...and with 256 tracks you'll never run short of places to park various bits of musical material... It's very reasonably priced considering how powerful it is... We can recommend Cakewalk with complete confidence."
—Jim Aikin, *Keyboard*, December 1987.

Twelve Tone
S Y S T E M S
P.O. Box 226, Watertown, MA 02272. (617) 924-7937

☐ **COMPLETE MIDI IMPLEMENTATION**
Generates and stores any command string, up to 255 bytes, allowed by the MIDI specification, providing foot operated control over any MIDI compatible device.

☐ **LARGE 16 CHARACTER ALPHA-NUMERIC DISPLAY**
Allows you to organize your MIDI system by song titles instead of bank numbers, and simplifies operation by prompting for all MIDI values in plain English.

☐ **640 'LOGICAL' FOOTSWITCHES**
Each of 5 footswitches access a different command string for each of 128 songs.

Other features include: A pedal input assignable to a different controller in each command string, chaining of songs into 3 sets, external control and backup, and more. List Price $395.00.
For complete information on the RFC-1 contact:
Lake Butler Sound Co., Inc.
5331 W. Lake Butler Rd., Windermere, FL 32786 (305) 656-5515

ules, CA 94547) for $10 postpaid (California residents add appropriate sales tax); allow six to eight weeks for delivery. All other parts are available from many mail order houses. I've had good luck with Dick Smith Electronics, 173 E. Broadway, PO Box 468, Greenwood, IN 46142. Since precision resistors with values greater than 1 MegOhm are not easy to find unless you are buying 10,000 or so at a time, simply use three 1 Meg precision resistors in series for R5. Similarly,

While any competent repair shop can keep your instruments in shape, you can probably do it yourself if you're patient and careful.

use two 100 Ohm resistors in series for R3 and R4. Be sure to use metal film resistors where specified. In addition, use a good quality multi-turn trimpot for R1, and use a polystyrene cap for C1. While this circuit is much less sensitive to power supply drift than many older designs, it should be used with a regulated supply bipolar supply of ±12 to ±15 volts (see the Nov. '87 issue for an article on how to build your own).

There are many more improvements that can be done to a dinosaur, like upgrading the VCF and VCA modules, and adding CV and gate inputs to older synthesizers...but that's another story for another time. Meanwhile, if you have an unhappy brontosaurus or pterodactyl hanging around, see if the above-mentioned techniques can help bring it back from the brink of extinction.

EM

C.R. Fischer runs Mescal Music, an electronic music consulting firm. He is a professional musician, synthesizer programmer, electronics consultant, and freelance writer.

SYNTHETICA EXOTICA:

New Jobs For Old Dinosaurs

BY DAVID KEMPTON

STATE-OF-THE-ART. . . the phrase carries a certain glow, a special sheen that expresses "the best," like no other words can. There is just one fatal flaw: time. In six months, the glow has faded, state-of-the-art has become mundane, and the best has become routine. The new *state-of-the-art* has arrived.

Even though keeping up with the state-of-the-art is next to impossible (short of a budget the size of the national debt), many still tend to adhere to the myth that *to get the latest sounds, you need the latest goodies.* While it's natural to crave the latest toys, even the most ancient synthesizers (circa 1972) have creative potential far beyond their perceived limits. The fact is that the real limits of what you already own are not in the equipment, but in the mind. Even without a MIDI-to-Control-Voltage converter, you can do a lot with that old Putney VCS, ARP 2600, Roland System 100, or even that home-built PAiA gear you have stashed in the attic. Here are a few ideas for getting more out of your outdated (last year's), exotic (pre-MIDI), and just plain weird (antique acoustic) technology.

Dynamic Signal Processing: Most old analog synths have an input for an external signal. Run any signal source (one track, or a complete mix) into the old analog machine and just have fun. Try dynamic filter sweeps, analog vibrato (try modulating the filter or the VCA gain with a 50 Hz or higher audio tone, or even with the signal itself), ring modulation with one side patched to a slow (1 to 15 Hz) sine wave, synth-style envelopes on lead or background vocals, etc. You may need to amplify the input signal, as most console outputs deliver only 1 to 3 Volts RMS, and most synths want to see 10 Volts.

MIDI-to-CV Converter: The fun really begins with this great investment for those on a limited budget. I use the Roland MPU-101 (reviewed Feb. '87 EM) because it does a lot for the money, but several manufacturers produce similar devices. Old patch-cord style gear can be had for next to nothing if you are willing to do a little legwork, and keep your ears open. The gear has to offer patch cord access to most functions, and follow the 1V per octave exponential control voltage standard. The ARP 2600, Korg 3300, and Roland System 100 are perfect for this. (Old PAiA gear can also be used; however, its frequency tracking is linear. This necessitates some form of linear-to-exponential converter.)

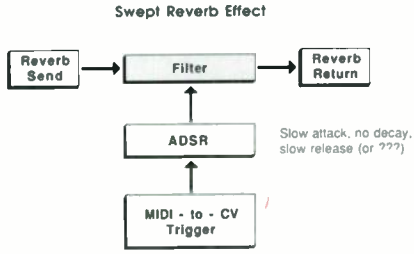


FIG.1: Swept reverb effects are easy to do if your synth has an external audio input.

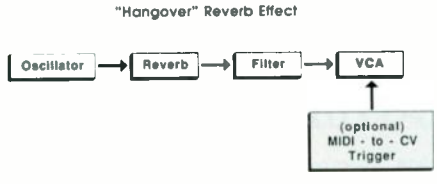


FIG. 2: "Hangover reverb" is another unique effect.

Swept Reverb: Try routing your reverb output into a slowly swept filter (resonance optional) triggered every bar or so (**Fig. 1**). It's a sound that makes gated reverb pale by comparison.

Hangover Reverb: This is similar to gated reverb. Patch the reverb in the signal path between the signal generator and the synth's filter/VCA modules (**Fig. 2**). When you play a new note, the previous note will still be exciting the reverb and will be heard fading out under the new note. This makes for a great solo effect.

If you have an old analog sequencer, you can trigger it with the MIDI converter to modify the filter frequency on any of the above patches, either note by note, at moderate speeds to change timbre during the note, or at speeds greater than 40 Hz for wild tonal effects. You can also create fast arpeggios or other multi-event happenings with a single MIDI trigger, to conserve MIDI data.

Mammoth Delay, or ***The World's Largest Echo Unit:*** If you have two old reel-to-reel stereo recorders, here's a trick from the early electronic studios for creating extremely long delays (see **Fig. 3a** and **Fig.**

EXPLORE THE NEW TECHNOLOGY...

• Computer Music Systems
• Midi Software & Interfaces

For: Music Printing • Recording
Audio/Video Workstation
Education Software
Midi Synthesizers • Midi Guitars

• Weekly Seminars & Demos
• Customer Support

FOR A FREE CATALOGUE,
CALL, WRITE OR VISIT

MUSICATION®

1600 Broadway (48th St.)
N.Y., NY 10019, Suite 1000A
(212) 957-9100

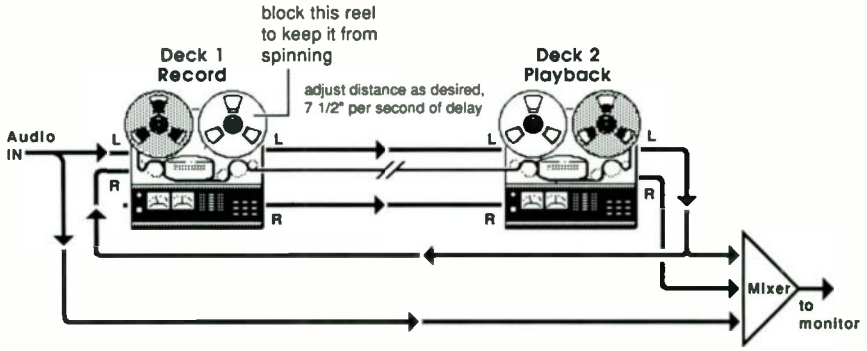


FIG. 3a: Using two reel-to-reel tape recorders to create extremely long delay effects.

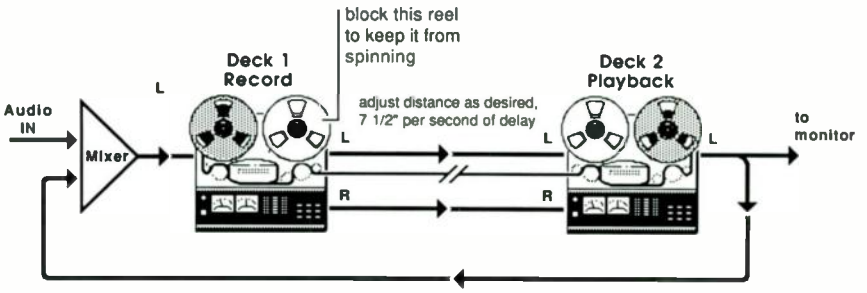


FIG. 3b: Using two reel-to-reel tape recorders to create multiple long delay effects.

New Version 3.0

MidiBasic™

"...MIDIBASIC is both simple to use and quite powerful."
- KEYBOARD, Aug '87

"...MIDIBASIC is an excellent programming inhancement to the BASIC language..."
- Macazine, June '87

"(♦♦♦♦) ...for those who would like to get into MIDI programming...it could be considered an achievement on a level with MIDI itself."
- MacUser, Aug '87

• MIDIBASIC 3.0	$99.95	• 1 in-3 out Mac Interface	$79.95
• w/MS-Basic Compiler	$249.95	• 2 in-6 out Mac Interface	$119.95
• MidiPascal 3.0	$99.95	• Mac AB Switch w/cable	$49.95
• w/MacExpress	$249.95	• Mac ABCD Switch w/cable	$59.95
• MIDIBASIC 2.2	$49.95	• 6ft. MIDI Cable	$4.95
• MidiExpress bundle	$349.95	• MIDI Cable Splice/Adapter	$3.95

ALTECH SYSTEMS
831 Kings Hwy Suite 200 Shreveport, LA 71104
(318)226-1702

LA residents add 7.5% sales tax. US orders add $2.50 S&H. Foreign orders add $10.00 US funds only.

3b). Set Deck 1 at one end of a long room or hall. Set the other deck down the hall (7½ inches away for each second of delay, assuming the decks are running at 7½ ips). Put the tape supply reel on Deck 1 and the take-up reel on Deck 2. Patch the audio into the left input of Deck 1, and recover the delayed audio from the left output of Deck 2. Now record on Deck 1, and play back on Deck 2. Spacing the machines 37½ feet apart yields a full minute of delay. Optional techniques include connecting the output back to the input for repeat echoes, cross-connecting the left and right channels to effectively double the delay length, or running several of these two-machine setups simultaneously at different lengths for incredible multi-tapped delay-effect rhythms. These recorders do not have to be expensive machines; garage sale specials abound for $20 or so that will do the job just fine. The one catch is that no two decks will run at exactly the same speed. Gradually, either the tape will droop to the floor, or get so tight it could pull one of your machines off the table. I recommend starting with the machines on the floor, selecting the faster machine as the playback machine (Deck 2), and using old tape that you don't mind stretching.

Sympathetic Aeolian Reverb: There are instruments from the zither family built in the 1920s and '30s that look like autoharps without the chord bars. They have a wide variety of string configurations and names (like the Aeolian harp, the Rose harp, and the Strum-a-Song), and are usually virtual giveaway items at garage sales. Tune the strings to a reasonably in-tune chromatic scale (or some enharmonic scale, if you prefer). Then, depending on what you have in your junk drawer, and the shape and size of the instrument, there are two ways to build the complete device.

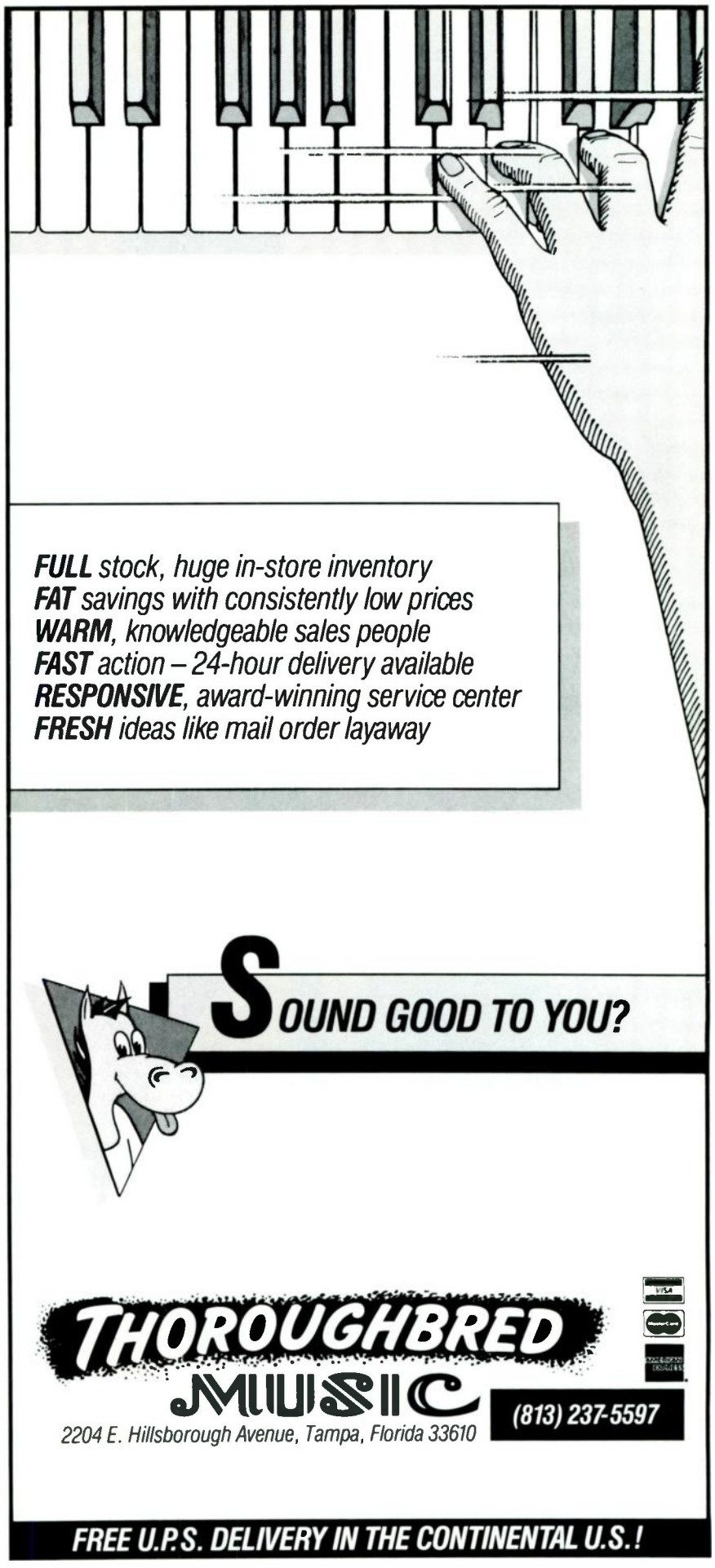
Method 1: Attach one-inch wide foam rubber strips or other vibration-isolation material to the bottom outside edge. Affix a contact microphone to the top of the instrument. Lay an old *bookshelf-sized* loudspeaker on its back, and set the harp on it so the speaker is aimed at its back. Now crank up the speaker to a moderate level, and carefully turn up the gain on the contact mic. You should hear the sympathetic resonance of the strings, and probably a little of the original signal. If too much of the original is present, try turning down the speaker and turning up the mic, or moving the mic to a different location on the soundboard.

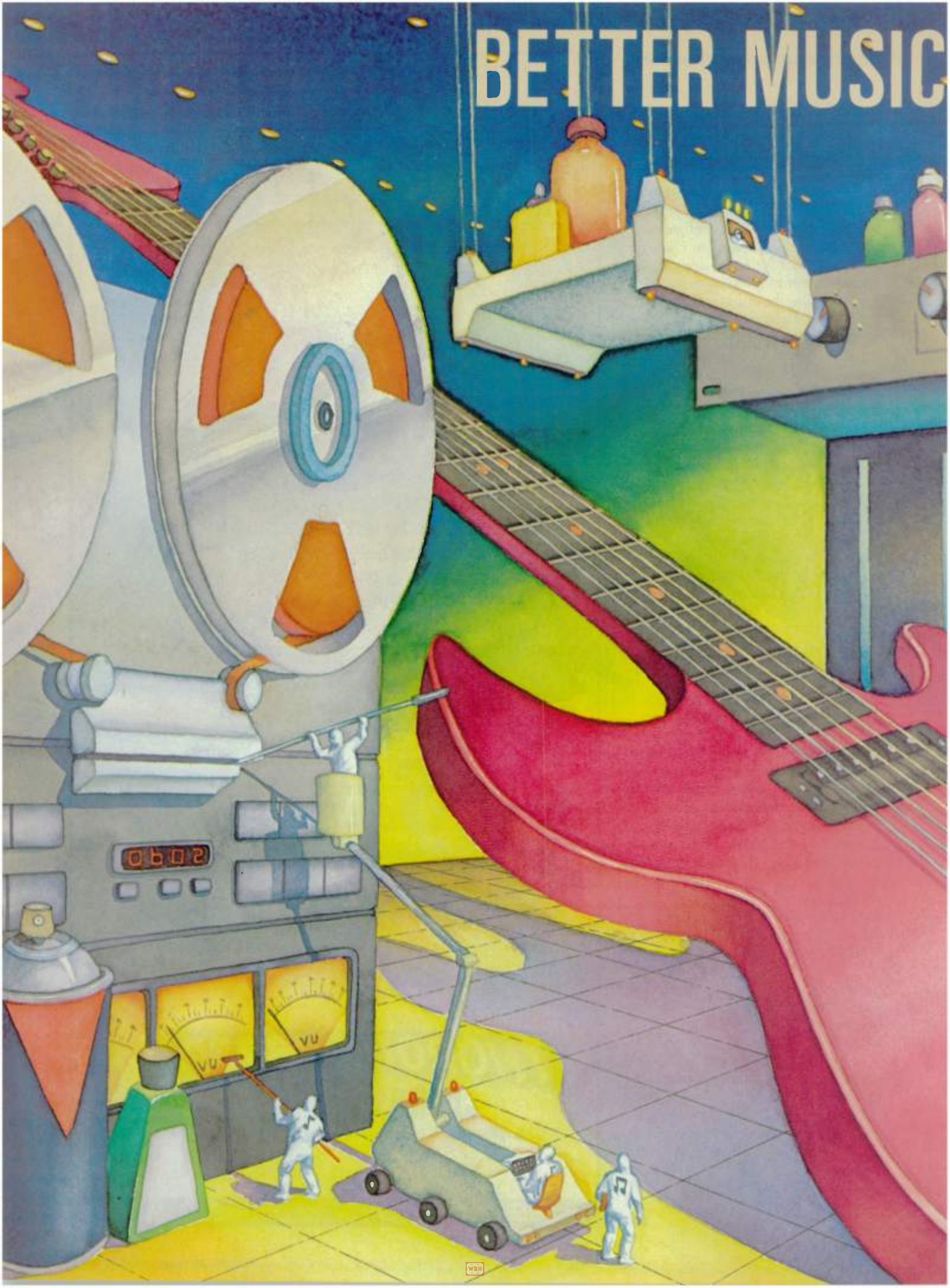
Method 2: If you can find a "Poly-Planar" speaker (one of those flat, rectangular styrofoam speakers sold cheaply back in the late '60s), carefully remove the driver (the metal device in the middle). Epoxy this to the soundboard. Close-mic the soundhole and apply moderate power to the driver, or attach a contact mic as above, and use fairly low levels to drive the device. Alternatively, you could make drivers from old PA horns, but these are usually more expensive.

Either way, the result is an eerie, ethereal sound that makes a great *tuned* reverb like nothing in the synthesist's usual bag of tricks.

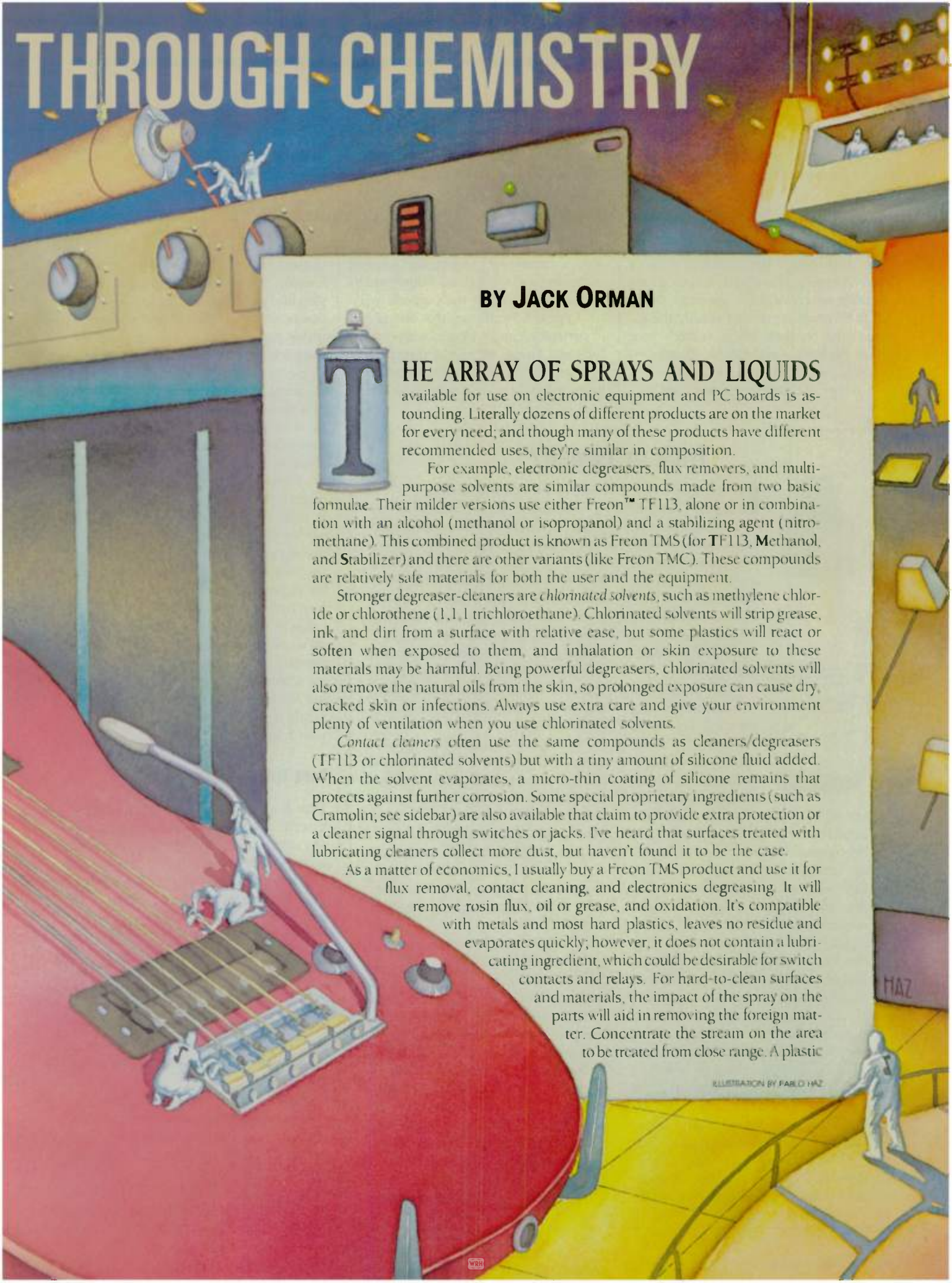
Experiment with these ideas, and you're bound to come up with your own variations. If you think your old gear is dead, you're probably just suffering brain cell atrophy due to spending too much time around dollars-to-MIDI converters . . . all it takes is a little creativity to make that gear come alive once more.

EM




BETTER MUSIC

THROUGH CHEMISTRY



BY JACK ORMAN

THE ARRAY OF SPRAYS AND LIQUIDS available for use on electronic equipment and PC boards is astounding. Literally dozens of different products are on the market for every need; and though many of these products have different recommended uses, they're similar in composition.

For example, electronic degreasers, flux removers, and multipurpose solvents are similar compounds made from two basic formulae. Their milder versions use either Freon™ TF113, alone or in combination with an alcohol (methanol or isopropanol) and a stabilizing agent (nitromethane). This combined product is known as Freon TMS (for **T**F113, **M**ethanol, and **S**tabilizer) and there are other variants (like Freon TMC). These compounds are relatively safe materials for both the user and the equipment.

Stronger degreaser-cleaners are *chlorinated solvents*, such as methylene chloride or chlorothene (1,1,1 trichloroethane). Chlorinated solvents will strip grease, ink, and dirt from a surface with relative ease, but some plastics will react or soften when exposed to them, and inhalation or skin exposure to these materials may be harmful. Being powerful degreasers, chlorinated solvents will also remove the natural oils from the skin, so prolonged exposure can cause dry, cracked skin or infections. Always use extra care and give your environment plenty of ventilation when you use chlorinated solvents.

Contact cleaners often use the same compounds as cleaners/degreasers (TF113 or chlorinated solvents) but with a tiny amount of silicone fluid added. When the solvent evaporates, a micro-thin coating of silicone remains that protects against further corrosion. Some special proprietary ingredients (such as Cramolin; see sidebar) are also available that claim to provide extra protection or a cleaner signal through switches or jacks. I've heard that surfaces treated with lubricating cleaners collect more dust, but haven't found it to be the case.

As a matter of economics, I usually buy a Freon TMS product and use it for flux removal, contact cleaning, and electronics degreasing. It will remove rosin flux, oil or grease, and oxidation. It's compatible with metals and most hard plastics, leaves no residue and evaporates quickly; however, it does not contain a lubricating ingredient, which could be desirable for switch contacts and relays. For hard-to-clean surfaces and materials, the impact of the spray on the parts will aid in removing the foreign matter. Concentrate the stream on the area to be treated from close range. A plastic

ILLUSTRATION BY PABLO HAZ

extension tube is often included so the spray stream can be directed into tight areas.

GC Electronics and Chemtronics are two manufacturers that supply a full line of chemicals and cleaners for electronics use, and though Radio Shack is also a convenient and inexpensive source for a smaller variety of these materials, many of their products do not specify the ingredients on their labels. (Check your local electronics supplier for Chemtronics and GC Electronics products.)

A type of cleaner used mostly on television tuners goes on as a thick foam spray and incorporates a very fine abrasive (like jeweler's rouge) in the concentrate. A thin layer of the material clings to the metal parts and as contacts rub together, the abrasive polishes them. This type of cleaner has limited uses around computers and synths but for dirty switches and jacks it serves the purpose well.

Exposed metal parts that are subject to corrosion can be treated with rust inhibitors. These are made primarily of lightweight oil with added inhibitors, petroleum distillates, or silicone fluid. Sometimes Teflon™ is added for extra lubrication and wear reduction.

Don't Give Me Any Static

Anti-static spray is usually a water-based quaternary ammonium compound—sometimes blended with a silicone emulsion and cleaning or polishing agents—that protects equipment from static electricity such as that which builds up in your body as you walk across a carpet. These compounds are sprayed on synths, electronics, or computers, and the carpets around them. If static discharges in the wrong place, that static can wipe out the entire memory of a valuable chip, or possibly damage components.

Furthermore, even if you keep your mixer or synth covered, dust will normally collect on and in the equipment. A weekly cleaning with anti-stat will keep that expensive electronic device working properly, and probably prolong its useful life expectancy by preventing the overheating that heavy dust accumulation can cause. A short spray of static neutralizer on a soft cotton cloth and a quick wipe-down of the equipment, especially monitor screens, is all that's required. I often use Alberto-Culver's Static Guard since it is safe to use on carpets, clothes or even your hair.

Tape Tune-Up Time

Most home recording enthusiasts know that the heads, rollers, and tape guides of any tape recorder need periodic cleaning to remove the accumulated oxide and dust particles. For this application, Freon TF113 or alcohol are used alone or in combination as solvents in head cleaners. Once again, silicone can be added to the formula to lubricate the metal parts that contact the recording tape. For the rubber rollers, alcohol is *not* usually used because it could possibly remove some of the solvents in the rubber. Instead, methyl ethyl ketone or acetone are needed since they evaporate quickly without harming the rubber.

Basic tape recorder cleaning goes like this: saturate a cotton swab with cleaning solution and rub the heads and tape guides vigorously with the tip. The brown substance that collects on the end of the swab is ferric oxide that has flaked off of the recording tape. Watch the end of the swab carefully to make sure that none of

Trick or Tweek?

I'm basically a cynical guy. I tend to ignore products that claim low-cost miracle improvements in sound quality or the performance of electronics—but here's a "miracle product" that works, and works extremely well.

The "miracle" is a contact-improving chemical known as *Stabilant 22a*, developed by D.W. Electrochemicals of Ontario, Canada, and sold in the U.S. by Sumiko Inc. under the brand name *Tweek*. Tweek has already been praised by many credible sources, including *Byte* magazine's Jerry Pournelle, and several reviewers in *The Absolute Sound* (a very enjoyable audio magazine that I recommend), so my comments are hardly groundbreaking. But, hey, maybe you're cynical like me and need further convincing from our favorite magazine.

The theory is simple: two metal surfaces in contact only conduct at a few microscopic points. Even soft metals, such as gold, have a far less than optimum contact area. Stabilant 22a is a conductive chemical that forms the near equivalent of a soldered connection. The entire application procedure consists of brushing Tweek onto both sides of a contact point, such as an RCA phono plug and jack, or an EPROM chip and its socket.

The sonic improvement in my home stereo system was surprising. After applying Tweek to the Monster Reference A Interlink cables and the Kimber 4TC speaker cables, there was a noticeable improvement in several areas. The bass tightened (allowing kick drums to gain more snap), the imaging of the speakers improved, and the overall transient response increased. These improvements were not subtle, either; as I said, this stuff is recommended.

I'd expect similar sonic improvements in the studio—if there's ever a few spare hours to coat all the connections. I also wish I'd used Tweek on my computer's 256K RAM chips—I'm sure I would have avoided the early memory-loss problems the computer had until I cleaned all its contacts extensively. In the future, all the connections in *this* house are going to get the trick of Tweek.

The Stabilant 22a, as well as a more concentrated form known as Stabilant 22, is available in 15 milliliter (ml) bottles from D.W. for about $36 and $54.50 respectively. Tweek is also available from many audio dealers or Sumiko for about $20 for 7ml. For further information, contact D.W. Electrochemicals, 9005 Leslie St., Unit 106, Richmond Hill, Ontario L4B 1G7, Canada ☎ 416 / 889-1522. Or contact Sumiko Inc., PO Box 5046, Berkeley, CA 94705 ☎ 415 / 843-4500.

—Peter Hirschfeld

One good thing deserves another...

Sequencer Plus Mk III

$495

and another...

Sequencer Plus Mark II

$295

and another.

Sequencer Plus Mark I

$99

PC MAGAZINE EDITOR'S CHOICE

After three years of refinements, **Sequencer Plus** has become the most **powerful**, most **professional** and most **versatile** MIDI sequencing software available in the world today.

So how could we improve it? By making it both **more powerful** and **more accessible.**

Introducing, the **Sequencer Plus Series: Three new versions**, each with differing levels of sophistication offering a system that will *grow with you* instead of being outgrown.

Sequencer Plus Mark III (Sp3) is a *"No Compromise" powerhouse!* 64 music tracks with independent offsets, tempo track, song position pointer, chase mode, extensive and selectable MIDI Filtering, 17 transform functions, block editing of multiple tracks, 11 memory buffers and a list of additional features that reads like a computer musician's wish list!

Sp3 also transmits patch files created with **Patch Master**, our unique *MIDI network organizer/universal librarian* program that supports virtually every major synthesizer.

Sequencer Plus Mark II (Sp2) is the perfect production tool for just about all of your most demanding musical creations. 32 music tracks, tempo track, 6 memory buffers, programmable play range, Song position pointer, intricate MIDI data editor, individual track load/save, and more!

Sequencer Plus Mark I (Sp1), at $99.00, is the *least expensive PC sequencer on the market* and is the perfect way to ease into computer music. 16 tracks, each with cut and paste operations, merging, looping, quantizing, transposition, independent MIDI channel, MIDI program and solo/muting! Complete freedom of time signatures and polyrhythms, 3 memory buffers, extensive punch-in capabilities and more! *Enough music-making power to satisfy even a seasoned pro!*

The **new Sequencer Plus series** is the choice of demanding musicians, composers, producers, and recording studios around the world- backed by a company with over a decade of experience in producing quality electronic music products. Best of all, it doesn't demand that you be a computer programmer, just a musician...and isn't *that* a relief!

For a free catalog and the name of your nearest Voyetra dealer, please call or write.

VOYETRA *Computer Music Products for the IBM PC/AT and Compatibles*

Voyetra Technologies, Dept M, 426 Mt. Pleasant Ave, Mamaroneck, NY 10543 (914)-698-3377

IBM PC/AT is a registered trademark of International Business Machines Corporation.

Cramolin: Contact Cleaner and Preservative for the Electronic Musician

CAIG Labs, in beautiful downtown Escondido, California, manufactures industrial solvents and such. There you can pick up a quart container of Freon-TF fluid (the same solvent as TEAC Head Cleaner) for a lot less than you would pay for tiny little cans at your local audio store. The spray can version of this stuff is similar to the "Tuner Cleaner" we all know and love.

CAIG's gift to the world is "Cramolin," available in liquid or spray cans of "Cramolin Red," and liquid "Cramolin Blue." Red is a solvent-cleaner-deoxidizer that is absolutely the most amazing stuff I have ever used. It quiets things that had resisted all the Radio Shack "Tuner Cleaner" or straight TF I could apply. I've used it to lubricate locks and hinges, a typewriter, and even to defrost a frozen car door lock.

Case Study

I once cleaned a ridiculous eight-pole, ten-throw switch, a monstrosity that controlled a studio's control room monitor sends. It crunched, crackled, and sounded awful. The garbage didn't go to tape since this was a monitor source switch, but it unnerved clients and engineers alike, probably caused excess woofer wear, and of course degraded overall monitor sound quality.

To make things even more fun, the switch's feed wires had maybe a half-inch of slack, so when you unscrewed the mixer module to clean the switch, there was zero leeway. Worse, the switch could not be replaced without disassembling the console and shutting the whole studio down. They'd tried the usual solvents, but *nothing* would clean this switch.

I followed the CAIG recommendation for such situations: the Red Cramolin bath, rinsing with TF spray, and then applying a light coat of Blue. About an hour of steady scrubbing with a lint-free swab removed amazing amounts of oxide crud from the switch's various contacts. I applied a small amount of Cramolin Blue fluid, an antioxidant preservative with a high surface tension that seals the contact surfaces and keeps them from scaling up again. The switch lasted more than 18 crunchless months before it started to become a little scratchy again.

The Crunch

"Crunching" is an extreme case of dirty pot or slider contacts. Short of replacing parts, getting Red cleaner in there and rotating the pot will often do the job.

Fender tube amps are notorious for crunching and crackling. Clean the tube pins with Red, insert in the sockets (the Red will spread) and clean with TF spray. Repeat several times. This should do a good job of fixing your vacuum tube trauma.

CAIG points out that the layer of oxide on a contact is around one molecule thick, making it a perfect semiconductor—in fact a diode. And what does the infamous Craig Anderton use in his Quadrafuzz circuit to clip the audio? Diodes. An oxide-coated signal chain is playing fuzztone by clipping the transients in your audio. The more contact points you have, the worse the potential for clipping.

I have one last example. Using ¼-inch connectors recycled from the odd parts bin, I installed a Biamp quad limiter that had sat in its box for a year or so. Everything went according to plan, but when the third channel was patched into the mixer for testing, a radio station came over the monitors. Bad ground? Bad shield?

It turned out that the dirty plugs and jacks were operating like a crystal radio receiver with the length of connecting wire as an antenna (the problem was not shielding). Cleaning the connectors thoroughly eliminated the problem.

CAIG will happily ship orders to you. The minimum order is $50; otherwise there's a $5 service charge. If you need smaller quantities, contact CAIG and they'll tell you where to find the nearest distributor. Recommended products are:

- ✓ Cramolin Red "R2" Spray
- ✓ Cramolin Blue (bottled liquid)
- ✓ TF Spray (general cleaner and Cramolin rinse)
- ✓ TF Fluid (an everlasting quart of head cleaner)
- ✓ The *Electronic Maintenance Kit* that costs $16.95.

Write to CAIG Laboratories, 1175-0 Industrial Avenue, Escondido, CA 92025, for a catalog and price list, or call ☎ 619 / 743-7143.

—Craig O'Donnell

the cotton fiber is pulled loose from the stick, especially when working around the roller and capstan. When working in the sensitive areas of a tape recorder, a little cleaning fluid goes a long way, so use it judiciously and don't saturate the cotton swab or let cleaner drip onto the machine.

Cleaning and Cooling Is A Gas

Photographers and electronic technicians often use pressurized cans to blow dust from hard-to-reach or sensitive areas. This is not usually compressed air, as you might think, but more likely Freon 12. This inert gas is in liquid form when it's in the can. When suddenly released through the spray button, it escapes at high speed as a gas. This blast will blow dust, debris, metal shavings or other foreign matter out of even the most hidden corners.

A variation of this product consists of the same compound, but the can has a diptube that extends to the bottom of the can. The tube picks up liquid Freon and allows it to escape through the valve. A narrow extension tube fits into the spray button of this product to direct the spray—great for reaching small areas. The liquid Freon vaporizes rapidly as it emerges from the extension tube, thus producing an intense cooling effect on whatever it contacts. Heat-sensitive or overheated components can be quickly cooled by this -60 degree spray. Caution should be exercised in the use of this product since the chilling effect of the spray is so strong that it can freeze exposed skin.

For the ecology-conscious (*hopefully all of you—Ed.*), note that only Freon 12 is suspected of causing ozone layer depletion. Freon TF113, TMS, and TMC among others are *not* believed to be harmful to the atmosphere. The use of Freon 12 is restricted by federal regulation and is no longer packaged as a propellent in consumer items.

Tips For Guitarists

Contact cleaners and such can be very helpful in fixing scratchy pots, pickup switches, or volume/wah pedals. However, there are other chemicals designed specifically for guitar applications, such as *string lubricant/cleaners*. These lubes claim to provide faster fingering and reduced finger soreness by leaving a layer of lubricant on the guitar strings, thus cutting down on the friction between the strings and the player's fingertips. A further benefit of this spray is that it slows down the inevitable corrosion of the metal strings and makes them last longer. Most string lubes can be sprayed onto the wooden parts of the guitar without harming the wood, and when used on the back of the guitar neck, add a slickness that reduces friction between the neck and your hand.

Guitar polishes are virtually the same as furniture polish, since most guitars are finished with the same varnish or shellac used on wooden furniture. You can buy a good spray-on furniture wax on sale for less than the specialized guitar waxes, and they'll do an equally good job.

TEAC's SP-2

One of my favorite chemicals is TEAC's SP-2. Disguised as a mild-mannered stainless steel polisher, this product seems to prolong tape recorder head life and greatly reduce tape wear.

Although TEAC doesn't officially recognize SP-2 as a "miracle additive," it was nonetheless a TEAC representative who first turned me on to the fact that SP-2, if applied to the tape machine's heads, helped to fill in any tiny scratches, as well as form a magnetically transparent layer that reduces friction. I applied SP-2 to the heads, tape guides, and rollers (but most definitely not to the capstan and pinch roller!) on my Otari 8-track for as long as I owned it. Compared to head wear I'd encountered on previous machines that hadn't been treated with SP-2, the head wear seemed greatly reduced. Also, tape shuttling was much smoother. Consistent use of the product has not seemed to affect any part of the machine, or the tapes, negatively at all. I'm continuing to use the product with my present multi-track (a Tascam Model 58), and the effects of SP-2 appear equally beneficial in this case.

Application is simple: use SP-2 once for about every four or five times you clean the heads. After cleaning the heads in the normal fashion, dip a cotton swab in the SP-2 and scrub the heads, rollers, and guides as if you were using regular head cleaner. Be sparing; you don't have to wash anything, just clean it a little bit and coat it. Let the SP-2 dry thoroughly (several minutes) before putting on the tape, and you're ready to go. For more information, contact TEAC Corporation of America, 7733 Telegraph Road, Montebello, CA 90640 ☎ 213 / 726-0303.

—Craig Anderton

The Safety Factor

The many sprays and liquids that modern chemistry has given us can be an asset in the studio. However, they also must be used with care, so pay attention to the following tips.

- ✓ Thoroughly read *all* information, especially warning statements, on the product's container, packaging, or label.
- ✓ Always have adequate ventilation in an area where chemicals are used.
- ✓ Use a respirator and other protective clothing if you are going to be exposed to chemicals that are even remotely toxic.
- ✓ Always keep all these products—or any dangerous chemicals, for that matter—out of reach of children.
- ✓ Check for unusual storage requirements (e.g. temperature limitations).
- ✓ Dispose of any toxic products in strict accordance with local laws.

For further information on chemical safety, see the article "Safety in the Electronic Music Workplace" by Alan Gary Campbell in the June '87 issue of EM. If you are uncertain about the ingredients in a product or have questions about safe handling and use of the material, the manufacturer is required by law to provide a Material Safety Data Sheet on each hazardous component. This data is available to anyone upon request.

Take care of your equipment, and it will take care of you. The right chemicals can help keep your gear in good shape; just remember to use common sense and caution when working with any chemicals. EM

***Jack Orman**—when not writing articles for* EM *and other publications—plays guitar, directs local television programs in Memphis, Tennessee, and writes IBM PC programs for profit. He has an overwhelming desire to make solid state electronics sound like tubes.*

XPANDER PATCH SHEET

BY CRAIG ANDERTON

The Xpander is an analog synth programmer's dream come true. Its matrix modulation capabilities allow for a greater degree of expressiveness than most other analog synthesizers, and its multi-mode filter does a lot more than the standard four-pole lowpass. However, all that capability makes it difficult to keep track of the precise setup for a patch and what is modulating what. With the Xpander, a patch sheet isn't a luxury; it's a necessity.

The patch sheet on the facing page allows you to notate Xpander patches in a relatively painless fashion, but a few words of explanation are in order if you want to get the most out of this sheet. Parameters for the main modules (OSC, VCF/VCA, LFO, etc.) are grouped as blocks into which you write values; underneath these parameters are the Page 2 options. Since most Page 2 options are on/off, these are shown as dots—fill in the dot to indicate "on." However, in the Envelope modules, note that LFO Trig has several different options, so a box is available to indicate the flavor of LFO Trig you're using.

The Modulation Routings "map" shows all of the Xpander's modulatable parameters in the left-hand column. To the right of each parameter are a series of five groups of two boxes; these boxes are for entering the modulation source and modulation amount. For example, if OSC 1 FREQ is being modulated by LFO 1 by an amount of +56, you would write LFO 1 and +56 in the first group of two boxes. Additional modulation sources and amounts can be listed in the remaining groups of boxes. By the way, the boxes are fairly small so I recommend using a 0.5 mm lead mechanical pencil.

You are welcome to photocopy this patch sheet for your personal, non-commercial use as long as you leave in the credit line to *Electronic Musician*.

Incidentally, in case you wonder what "filename" stands for, I'm assuming that most Xpander owners probably have some kind of patch librarian, so this is where you would indicate the filename you're using for a particular collection of patches.

I've found that using this patch sheet has really helped de-mystify the Xpander for me and led to more creative programming. Have fun!

Make Your Atari ST Sing!!

LET'S TALK QUALITY
- Top of the line components!
- Superior design!
- Scrupulous testing!

LET'S TALK FEATURES
- 36" cables let you place unit conveniently!
- Single AC powercord replaces separate power supply and two powercords!
- Lighted switch and busy lights!
- Small footprint (5¼" x 12")

LET'S TALK FREEBIES
- Format and partition software!
- Complete back-up and restore software! ($39.95 value)

LET'S TALK WARRANTY
- Extreme steps to insure quality allow us to offer **a one year limited warranty.**

LET'S TALK FUN

Until you have experienced the fun and convenience of using a hard disk, you have missed much of what you expected from your computer.

20.8 MEG. HARD DISK

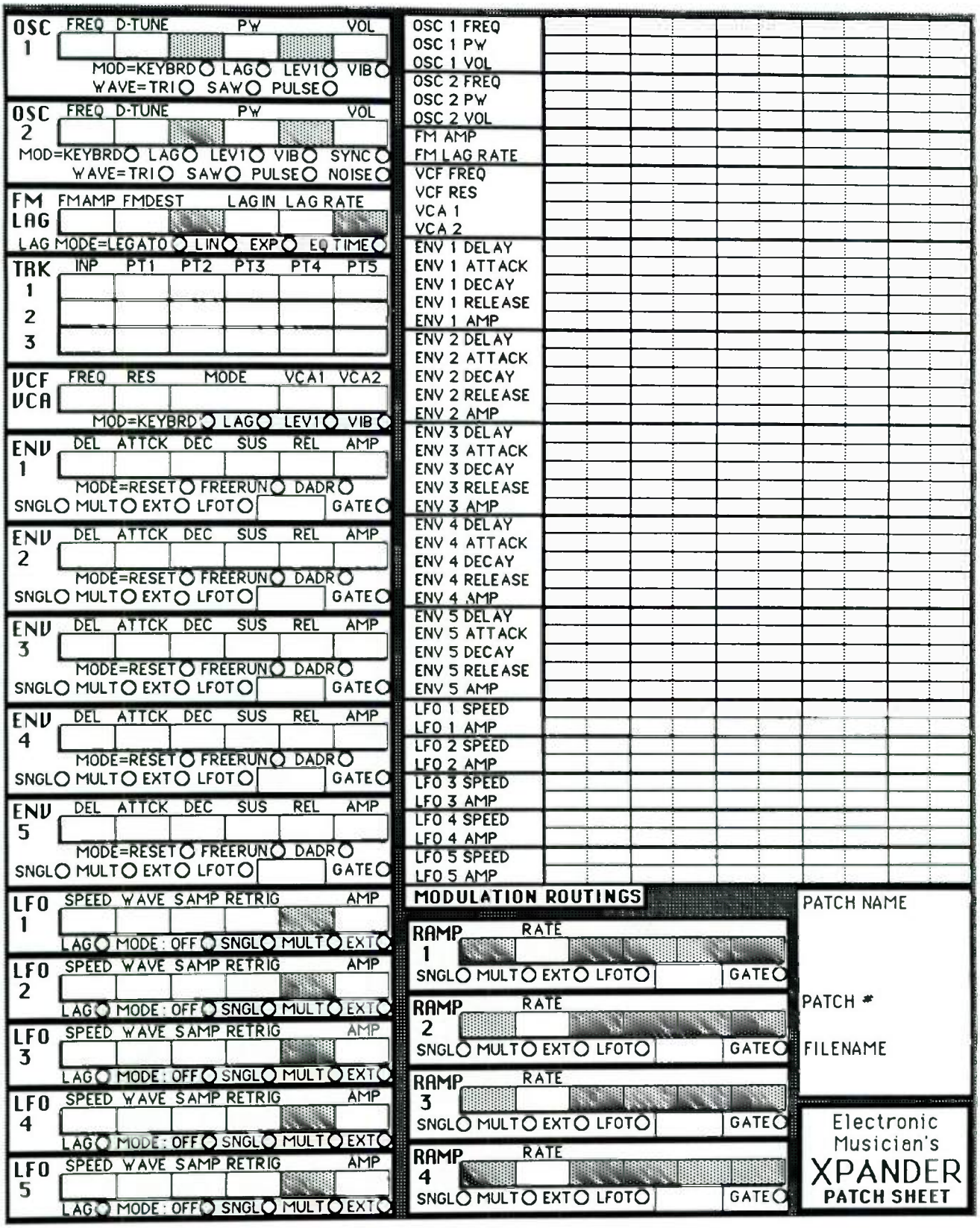
3.5" D.S. MICROFLOPPY

LET'S TALK TURKEY... IT'S AT YOUR DEALER NOW!

ASTRA SYSTEMS, INC.

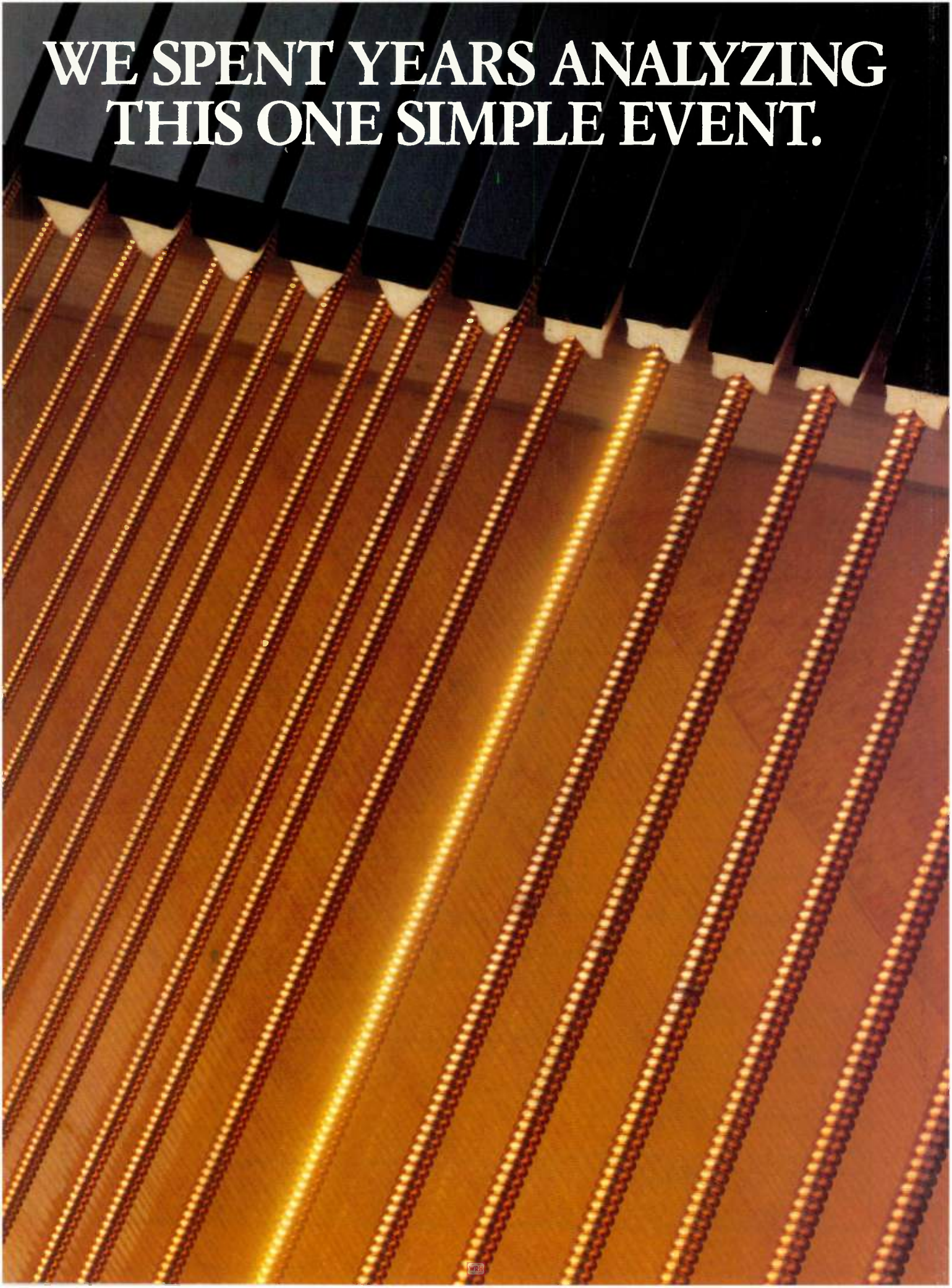
2500 S. Fairview, Unit L
Santa Ana, CA 92704
(714) 549-2141

XPANDER PATCH SHEET



Permission is granted to copy this page, provided the following credit appears on the photocopy: Copyright 1988 by Electronic Musician, 2608 Ninth St, Berkeley, CA 94710.

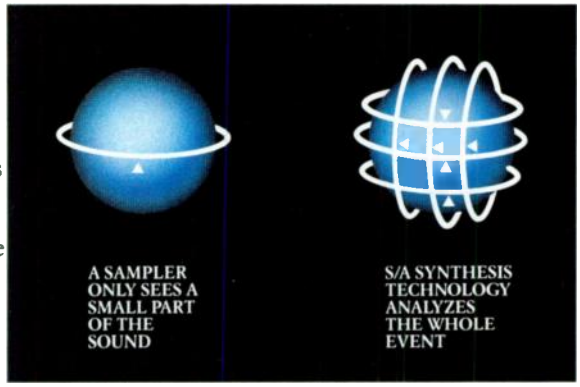
WE SPENT YEARS ANALYZING THIS ONE SIMPLE EVENT.



THEN WE DEVELOPED S/A SYNTHESIS TO RE-CREATE IT.

If you play piano, it's something you almost take for granted—you press a piano key, and a felt hammer strikes a string, which then vibrates. A sound is produced. But behind this seemingly simple event are a myriad of issues, all of which determine the nature and character of the sound. How hard did you strike the key, and at which part of the keyboard, and how long was the note held?

Sampled piano sounds, as good as they are, can provide only part of the answer. A sampler only looks at a small part of this process (for a very short time) and then simply loops it to create the whole event. That's why sampled pianos lack the dynamic response and sound character of a real piano, they don't see the whole picture. (Don't get us wrong—we like samplers—it's just that they don't provide the best solution to reproducing percussive keyboard sounds.) We felt there must be a better way, and that's why we developed S/A Synthesis Technology—the basis for all of our Digital Piano products.



S/A (Structured Adaptive) Synthesis Technology began with years of research. Roland engineers analyzed the striking of each of the 88 keys on several of the top concert grand pianos using a computer-assisted three-dimensional analysis process. We hit the keys hard, we hit them soft, and hundreds of in-betweens. First came the discovery of several distinctive waveforms that essentially characterize each acoustic piano sound. But then we saw that the harmonic structure of these waveforms changes dramatically with how hard the key is struck or where it is on the keyboard. Also realized was the effect of sympathetic vibrations, soundboard resonance, damper and sostenuto pedals.

From this analysis, Roland engineers created advanced digital algorithms of these complex harmonic relationships—for each key on the piano. These were then refined to the ultimate degree, taking out all unnecessary noise and coloration.

Finally, these algorithms were combined with our proprietary VLSI (Very Large Scale Integration) hardware and software technology to produce the S/A Sound Synthesis Chip, the circuit used in all Roland Digital pianos.

The result is already making musical history as the most faithful digital re-creation of the acoustic keyboard experience: the RD-1000, RD-300S and RD-250S Digital Pianos and the MKS-20 Digital Piano module—three keyboard instruments and one MIDI module that provide the fundamental sounds essential to any keyboard set-up.

Just sit down at one of these instruments and experience grand pianos that are truly grand, ringing with life, brilliance and clarity, but with simultaneous depth and fullness on the low end of the keyboard. Strike a note hard and actually hear the sound of the hammer hitting the string. Play it gradually softer, and feel the tone get rounder. Hold down the damper pedal and experience the sustain and natural decay. But Roland engineers didn't stop with pianos, in addition to the two grand pianos and one electric grand piano, we've applied the same S/A Technology to create flawlessly realistic Vibes, two rich Electric Pianos as well as vibrant Harpsichord and Clavichord.

The three S/A keyboard instruments make great MIDI motherboards with their great action as well as their ability to be split and handle MIDI information to and from other equipment. The RD-1000 has 88 weighted wooden keys, and, like the MKS-20 Module, has the facility to store 56 edited equalization and effects settings of the digital sounds. The 88-key RD-300S and 76-key RD-250S incorporate the newly-developed SK-6 dynamic keyboard along with the same great S/A sounds.

If you haven't already experienced the breakthroughs of Roland's S/A Synthesis Technology, do it now. Play any one of these incredible instruments and compare them to any sampled piano—even those costing three times as much. Your ears will quickly tell you what thousands of musicians have been telling us—that our years of exhaustive research were well worth the effort. *RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141.*

Roland®
WE DESIGN THE FUTURE

© 1987 Roland Corporation US

25 HOT MIDI PRODUCTS *FOR UNDER* $500

BY CRAIG ANDERTON

ONLY 20 YEARS AGO, a decent synthesizer could set you back $15,000—and a computer cost a lot more. We've seen prices tumble, and performance skyrocket; fortunately for us, that trend shows no signs of letting up.

In fact, there are some real bargains to be had in the world of MIDI, many of which cost $500 or less. Sure, $500 is still a reasonable amount of money—but it will take you further than it ever did before. Today's $500 digital reverb will outperform, outlast, and have better sound quality than a unit that cost thousands of dollars only a few years ago.

We picked what we feel are 25 significant, cost-effective products that include MIDI features and are priced at under $500 list (prices are subject to change without notice). Of course, settling on 25 products wasn't easy—there's a lot of good stuff out there, and we had to be pretty selective. Generally, we stuck to hardware, since there are so many useful MIDI software packages under $500 that it didn't seem fair to include one without including all the others. (We did, however, spotlight a unique package that should help many of you get started with creating your own MIDI programs.)

There are a lot of musical and cost-effective products out in the world; following are some of the ones that really impressed us. Ready? Here they are.

AdLib Personal Computer Music System™ ($245)
The system consists of the AdLib Music Synthesizer Card,™ the Visual Composer™ composing software, Juke Box™ song selection program, and *Composition Projects #1* (a basic guide to composing music). The Music Synthesizer Card is a half-size card capable of FM synthesis for IBM PCs and compatibles; it allows users to create and play back up to six melodic and five percussive instrument sounds simultaneously. The Visual Composer software comes with a variety of preprogrammed instrument sounds and lets those with no prior musical knowledge create musical compositions; it accepts monophonic MIDI input for voice-by-voice editing, and the entire system will work with any MPU-401 compatible MIDI interface. Additional software is also available. **AdLib Inc.**, 50 Staniford St., Boston, MA 02114 ☎ 800 / 463-2686. In Canada: 220 Grand-Allee East, Suite 960, Quebec, QC G1R 2J1 ☎ 418 / 529-9676.

Akai PEQ6 Programmable Equalizer

Akai PEQ6 MIDI Programmable Equalizer ($449.95)
Akai makes a family of nifty, 1U rack mount MIDI-controlled audio and data processors. **EM** readers already know about the ME25S and ME30P (reviewed in the Sept. '87 "First Take") and ME10D (Feb. '86). New additions include the MB76 MIDI Programmable Mix Bay (an audio patchbay/mixer, with seven trimmable inputs and six outputs) and the PEQ6. The latter provides independent seven-band graphic equalization for six channels of audio. Each channel is programmed via a single set of seven boost/cut controls, with bands centered at 63 Hz, 160 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz, and 16 kHz (± 12 dB, Q=3.5). Thirty-two banks store each set of EQ settings for the six channels, and—you guessed it—the banks are selectable via MIDI Program Change commands. So if you'd like your EQ settings to change during mixdown in response to Program Changes coming from your sequencer . . . here's a solution. **International Music Company**, 1316 East Lancaster, Fort Worth, TX 76102 ☎ 817 / 336-5114.

Alesis MMT-8 Sequencer ($299)
This 8-track sequencer is a perfect song builder for working out MIDI arrangements, or for synching to tape in a multi-track studio to augment the available number of tracks. It offers 100 parts and 100 songs, data filtering, the ability to record controller and System Exclusive information, and four different ways to quantize—all at a price that puts it well within the reach of the typical "bedroom studio" owner. **Alesis**, PO Box 3908, Los Angeles, CA 90078 ☎ 213/ 467-8000.

Alesis HR-16 Drum Machine ($449)
It's hard to believe this

Alesis HR-16 Drum Machine

product exists at this price, but seeing is believing. The HR-16 has 48 onboard sounds; velocity-sensitive buttons; tuning for each sound; great fidelity thanks to 20 kHz sampling; four outputs to which drums can be assigned; and very complete MIDI implementation. (And if you want to add some extra ambience, the Alesis MIDIverb II—which sells for under $400—is an excellent choice.) It's amazing how far drum machines have come in just a few years. **Alesis**, PO Box 3908, Los Angeles, CA 90078 ☎ 213 / 467-8000.

Altech MIDIBASIC Package ($239.95)
If you've been itching to do some MIDI programming on your Mac but lack the expertise, MIDIBASIC (reviewed in the Oct. **EM**) is an easy-to-use MIDI programming language. This package bundles Microsoft's BASIC Compiler along with MIDIBASIC 3.0, so you can jump right in writing programs and use the expanded BASIC instruction set that MIDIBASIC 3.0 provides. Other packages are available; those just getting started in programming might consider MIDIBASIC 3.0 bundled with Microsoft's BASIC Interpreter ($189.95 total). There are also similar packages for those who prefer to write in PASCAL; give Altech a call for details. **Altech Systems**, 831 Kings Hwy (Suite 200), Shreveport, LA 71104 ☎ 318 / 226-1702.

AMR MIDI Director ($99.50)
Whether you're on stage or in the studio, at some time you'll probably want to change your MIDI equipment parameters from a remote location. The MIDI Director can send a number of MIDI commands at the touch of a single button, and allows selection of 128 MIDI presets and any of 128 Songs on any of the 16 MIDI channels while visually indicating the parameter selection with a three-digit LED display. Other command functions include Sequence Start, Stop, and Continue as well as Song Start, Stop, and Continue. It works on either a 9-Volt battery, or an external 9-Volt power supply. Now you'll be able to zap program change commands through your MIDI system from just about anywhere in the studio. **Audio Media Research**, PO Box 1230, Meridian, MS 39301 ☎ 601 / 483-5372.

AMR MIDI Manager ($399.50)
This 1U rack mount package is just the ticket for controlling a sophisticated system that combines both MIDI *and* selected non-MIDI elements. Featuring one MIDI input, MIDI Thru and four MIDI outputs, data appearing at the MIDI In can be routed to any or all of the four outputs, or translated into other data. For example, a Song Start command might send a Program Change over one output, a different Program Change over another output, and appear as the original Song Start command over yet another output. In addition, there are eight logic-level high/low outputs. This allows the MIDI Manager to turn logic-level controlled devices (lighting controllers, most signal processors, etc.) on and off—even put most tape recorders into record mode in accordance with received MIDI data. **Audio Media Research**, PO Box 1230, Meridian, MS 39301 ☎ 601 / 483-5372.

ART Proverb ($349)
One hundred presets, fine sound quality (15 kHz bandwidth), stereo operation, and the ability to map Program Change commands to specific presets make this device a natural for small studios (or a great supplementary reverb in large ones). A battery backup retrofit kit is also available if you want to retain the Program Change maps after the power's turned off. All in all, this rack mount unit represents good value and sound quality in an easy-to-use package. **ART**, 215 Tremont St., Rochester, NY 14608 ☎ 716 / 436-2720.

ART ProVerb

Atari 520ST with Disk Drive ($499)
The only computer with built-in MIDI ports represents quite a value for the budget-conscious musician. Atari's slogan is "power without the price," and the 520ST pretty much lives up to that boast. Featuring a half-megabyte of RAM, a decent keyboard, and an operating system in ROM, the 520ST is currently picking up a lot of software support. The $499 price now includes a disk drive and an RF modulator that will let you use a standard TV as a monitor. **Atari**, 1196 Borregas Ave., Sunnyvale, CA 94086 ☎ 408 / 745-2021.

Casio CZ-101 ($499)
The original budget MIDI synthesizer continues to be a worthwhile addition to any MIDI studio. Thanks to its distinctive sounds and four-voice multi-timbral operation, the CZ-101 makes a great little expander module (just don't try playing the mini-keyboard if you have normal-sized fingers). It's also supported by numerous third-party sound developers, and several books are available giving patches and programming information. **Casio**, 570 Mt. Pleasant Ave., PO Box 7000, Dover, NJ 07801 ☎ 201 / 361-5400.

Casio DG-10 ($349)
Scheduled for a July '88 debut, the DG-10 is a new Casio entry in the electronic guitar market. Fingering on the fretboard and plucking strings combine to trigger sounds from a built-in digital tone generator. The DG-10 has six strings, 20 frets, 12 tones with effects, and 12 PCM rhythms. It is battery-or AC-operated and includes a built-in speaker. The Model DG-20 ($449 suggested

retail) features 20 sounds and adds four drum pads, plus MIDI transmission.

Harmony Systems' SynHance MTS-1 ($229), JL Cooper PPS-1 (each box, $199.50)
Either of these ingenious little boxes takes MIDI Song Position Pointer data from your sequencer, converts it into a signal suitable for recording on tape, and on playback, converts the signal back into Song Position Pointer data to which your various MIDI devices can synchronize. The result? Reliable synchronization that offers many of the advantages of SMPTE, and for strictly musical applications, actually improves upon SMPTE in many respects. There are some differences between the two; the PPS-1 handles MIDI Time Code, while the MTS-1 can also serve as a merger. Either greatly simplifies life when synching MIDI drum machines and sequencers to tape. **Harmony Systems**, PO Box 2744, Norcross, GA 30091 ☎ 404 / 662-8788. **JL Cooper Electronics**, 1931 Pontius Ave., West Los Angeles, CA 90025 ☎ 213 / 473-8771.

IBM Music Feature ($495)
Similar in concept to the AdLib board described above, this plug-in card is just the thing for all the "potential musicians" who look longingly at their IBM PC with dreams of making music. The card includes an FM sound synthesizer (a la Yamaha FB-01) with 240 preset and 96 user-programmable voices; an audio preamp/headphone amp; stereo output connections; and a MIDI interface with In, Out, and Thru connections. Software support is picking up momentum, and there are quite a few educational programs for those who want to improve their musical chops. Available at authorized IBM dealers. Also inquire regarding availability through **Mix Bookshelf** (in all U.S. states except California call ☎ 800 / 642-3349; in California call ☎ 800 / 233-9604; outside the USA call ☎ 415 / 843-7901).

Kawai R-50

Iota Systems MIDI Fader ($499)
Automated mixdown for under $500? Yup, and eight channels' worth, as well. Iota's rack mount unit (reviewed in the Nov. EM) alters gain independently for each of the eight channels, in response to your choice of MIDI controllers (continuous controllers, aftertouch, etc.). It may not be an SSL board, but for the home studio its ability to automate levels is a welcome help to the engineer who needs "just one more hand." It's even pretty painless to use. **Iota Systems**, PO Box 8987, Incline Village, NV 89450 ☎ 702 / 831-6302.

Kawai R-50 Drum Machine ($499)
Put together 24 sounds, 12 programmable parameters for each sound (including volume, accent, pitch, pan, and effects parameters), onboard flange/delay/gate effects, individual tuning and stereo placement for *each note* if desired, and drum sounds that don't cut off other drum sounds if you don't want them to, and you have quite a drum machine on your hands. And to sweeten the deal further, check into the alternate sound chips—after all, what a drum machine sounds like is indeed the bottom line. **Kawai**, 2055 East University Drive, Compton, CA 90224-9045 ☎ 213 / 631-1771.

Korg SQ-8 ($279.95)
This stand-alone sequencer, small enough to fit in your back pocket, features eight channels with independent record, play and mute functions; separately assignable MIDI channel numbers; and the ability to transmit and receive data over all 16 MIDI channels. It will record or play up to 32 notes simultaneously and store nearly 6500 notes. The SQ-8 is easy to work with since its fast-forward and rewind functions emulate a tape recorder; copy, insert, delete, blank and erase functions make editing a snap. **Korg USA**, 89 Frost St., Westbury, NY 11590 ☎ 516 / 333-9100.

Korg 8-Track Multi Sequencer SQ-8

Korg Poly-6 MIDI Retrofit ($350, including installation)
Reviewed in the Sept. EM, this is one of the most complete retrofits we've seen for any piece of pre-MIDI gear. Once installed (kids, don't try this at home!), your venerable Poly-6 will have MIDI In, Out, and Thru; 120 programs; transmit/receive capabilities for pitch bend, mod wheel, Program Change, and sustain pedal; channel and mode select; and arpeggiator sync to MIDI (among other things). Installation can be done at any Korg authorized service center. **Korg USA**, 89 Frost St., Westbury, NY 11590 ☎ 516 / 333-9100.

Peavey RMC 4512 ($299.50)
This MIDI Foot Controller does a lot more than just send Program Change commands. Featuring four independent MIDI outputs, the RMC 4512 can transmit all existing MIDI commands on any of 16 channels, utilizing either hexadecimal or MIDI program modes. Commands are stored in 64 banks of eight slots each (512 total). System Exclusive "load" and "dump" commands enable computer storage of parameters. Designed with performing

VALHALA

The USA's Premier Sound Developers!

Toll Free ORDER LINE ONLY! 1-800-648-6434

Information or Customer Service: 1-313-548-9360

"We were quite impressed with the quality of the sounds." (KEYBOARD magazine. July, 1987)

Our ROM's contain traditional sounds for use when playing live or recording, together with a collection of keyboard like sounds, such as Moog, OBX, Juno along with some classic sound effects. Whether your tastes are more 'traditional' or leans towards 'New Age' Valhala's the ultimate in sound support.

Orchestral • Bass Guitars Percussion •Acoustic Pianos Electric Pianos • Woodwinds Brass • Sound Effects Synth Sounds •Strings and many more!

- 80-Voice ROM's **$37.95** *ea.*
- 160-Voice ROM's **$74.95** *ea.*
- 320-Voice ROM **$139.95**

**** NEW ****

TX81Z Voices now available!

757 different voices on data tape for TX81Z, TX7, DX21, DX27 or DX100.

ESQ1 data tapes-40 voices each for only $16.95 per vol.

- Volume 1 (380 voices) **$44.95**
- Volume 2 (380 voices) **$44.95**
- Both Volumes (757 voices) **$79.95**

Drum Rhythm Patterns

Data tapes available for: RX21, RX15, RX11, RX5, TR505 and TR707. Only $29.95 per tape!

ESQ1 Bible (Prog Ref.)

$24.95

- Enhance your programming skills.
- Learn acoustic sound programming.
- Includes 40 patches explained.

Unsurpassed C64 Storage Librarians!

$99.95 ea.

- Available for DX7,TX7,DX21, DX27,DX100,TX81Z & ESQ1*
- All programs complete with 757 new voices (*except ESQ1)
- Holds 12-Banks of sounds in memory for easy use.
- 100% SuperFast Machine Language

DX7 Sound Patch Library

$39.95

- 757 different patches.
- Sound, algorithm & group indexes.
- 214 pages, spiral bound book.
- Compatible with the DX7II !

If not available thru your music dealer, order direct:

VALHALA Box 20157-EM Ferndale, MI 48220

320 voice ESQ-1 audio demo cassette tape $7.50 P/P

(Refundable towards any ROM Cartridge purchased directly from Valhala).

ESQ1™ of Ensoniq Inc

Specs/Prices subject to change without notice.

VISA

Continental USA add $3.00 Shipping/Handling. Mich. residents add 4% sales tax. Canada, Alaska and Hawaii add $7.50 S/H for surface, $12.00 for airmail. All other countries add $10.00 S/H for surface, $15.00 for airmail plus $3.00 for each additional item. Payments must be in USA Funds-drawn on a USA bank!

MasterCard

ADOBE, APPLE, ATARI, BEAVERTON MUSIC SYSTEMS, COMMODORE, BACCHUS, BEAM TEAM, BLANK SOFTWARE, ULTIMATE SUPPORT, CLUB MIDI, DIGIDESIGN, DIGITAL MUSIC SERVICES, DR T'S, ELECTRONIC ARTS, ELECTRONIC COURSEWARE SYSTEMS, HARMONY, HYBRID ARTS, INTELLIGENT MUSIC, J.L. COOPER, JIM MILLER, KEY CLIQUE, MARK OF THE UNICORN, MAGNETIC MUSIC, MIMETICS, VOYETRA, OPCODE, PASSPORT, ROLAND, SONUS, STEINBERG RESEARCH, SYSTEMS DESIGN ASSOCIATES, TURTLE BEACH SOFTWARE, TWELVE TONE SYSTEMS, ADOBE, APPLE, ATARI, BEAVERTON MUSIC SYSTEMS, COMMODORE, BACCHUS, BEAM TEAM, BLANK SOFTWARE, CLIMATE SUPPORT, CLUB MIDI, DIGIDESIGN, DIGITAL MUSIC SERVICES, DR T'S, ELECTRONIC ART

HO! HO! HOLD IT.

You better think twice. Because only at this time of year will you find these specials on Computer MIDI Systems and products–and only at CompuSound. Our Systems are set-up and ready to go; all you do is plug them in. We warranty our systems for a full year and we service everything we sell. Have a CompuSound Christmas!

Macintosh Plus Music Publishing System

- Apple Macintosh Plus computer
- Opcode Studio Plus II interface
- Mark/Unicorn Performer sequencer
- Mark/Unicorn Pro Composer score pgm.
- Apple Imagewriter II printer w/cable
- 2 10-Foot MIDI cables

Package Price $3095

Macintosh Plus Music Sequencing System

- Apple Macintosh Plus computer
- Opcode Professional Plus interface
- Passport Mastertracks Pro sequencer
- 2 10-Foot MIDI cables

Package Price $2195

IBM PC/XT Compatible System

CompuSound Personal Computer
- 100% IBM Compatible
- Monochrome Monitor
- 640K memory, turbo-speed motherboard
- Key lock, one year warranty
- Voyetra OP-4001 MIDI interface

With 2 floppy drives **$995**

With 1 floppy drive, 20 MB hard disc **$1139**

YOUR CHOICE OF: • Voyetra Sequencer Plus MKIII • Jim Miller Personal Composer • Passport Mastertracks–PC • Texture 2.5...Call for individual prices on software!

ATARI 1040ST Monochrome System

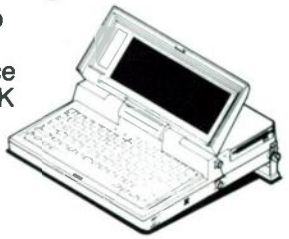
Atari 1040ST Mono computer
- 1 megabyte memory
- 1 800K disk drive
- 2-button mouse
- Atari mono-chrome monitor
- Built-in MIDI interface

Dr. T's Keyboard Controlled Sequencer or Mastertracks Pro and 2 10-foot MIDI cables

Package Price $1095

Call for our special holiday prices on the Atari 1040ST Professional Color System and Hybrid Arts Software!

NEW! SNAP by Datavue



IBM compatible laptop computer
- Voyetra MIDI Interface
- 2 Floppy Drives, 640K
- Backlit Screen

Package Price $1949

Call for options.

System Add-On Specials

- Mac 20 megabyte hard disc by Rodime **$499**
- Casio CZ 101 synthesizer **$295**
- Music Quest MSS-1 Package **$199**
- Casio TB-1 thru-box w/adapter **$75**

SPECIAL!

CHASE-LOCK TAPE SYNC

Voyetra Op-4000 and Harmony MTS-1

$375

CompuSound™

Suite 201, 5715 Buford Highway, Atlanta, GA 30340 (404) 457-3899

1-800-443-7069

All items available separately!

Roland TR-626

musicians in mind, the RMC 4512 is one of those system-savers that streamlines MIDI system control for all MIDI-oriented musicians. **Peavey Electronics Corp.**, 711A St., Meridian, MS 39301 ☎ 601 / 483-5365.

Public Domain Programs (free)
If you have a suitable computer, modem, and telecommunications package, you can download free programs and patches from electronic bulletin board systems. **EM** authors like Jack Orman, Kirk Austin, and others often upload the fruits of their labors to bulletin boards, where anyone with the inclination can download the programs for free to use as desired (non-commercial use only, of course). Many such programs are available on **PAN, the Performing Artist's Network** (☎ 215 / 489-4640), including Kurzweil's excellent MIDI data analysis program.

Roland TR-626 ($495)
Roland has been making clever, low-cost drum machines for longer than just about anyone else, but this is the first with all these capabilities for under $500. Don't let the cost fool you, though—the TR-626 has eight individual outputs, 30 PCM digitally recorded sounds with variable tuning, a large and informative LCD to simplify programming, and a complete MIDI implementation that responds to Song Position Pointer. The internal memory stores 96 rhythm patterns (48 preset and 48 programmable), a tape interface allows for loading and saving drum parts, and optional memory cards are available if you need something faster than tape for on-stage use. **RolandCorp US**, 7200 Dominion Circle, Los Angeles, CA 90040-3647 ☎ 213 / 685-5141.

Southworth JamBox/4+ ($459)
For Mac-oriented studios that need low-cost SMPTE capability, the JamBox/4+ (reviewed in the Oct. **EM**) reads and writes SMPTE, merges up to four MIDI inputs, provides four independent MIDI Thru outputs, filters MIDI data, transmits MIDI Time Code and Song Position Pointer, locks to click tracks, and includes a Tempo Map for synching to compositions with varying tempos. Although designed to work with Southworth's MIDIPaint sequencer, the JamBox/4+ also works with Performer 2.0 and other sequencers are expected to support it in the future. **Southworth Music Systems**, 91 Ann Lee Road, Harvard, MA 01451 ☎ 617 / 772-9471.

Suzuki XG-1m MIDI Guitar ($299)
This has gotta be a joke, right? Yet this is anything but an updated version of the rubber-band string Mickey Mouse guitar—surprisingly, Suzuki has come up with the MIDI guitar controller "for the rest of us." The only strings present are some little short guys you strum with your right hand to trigger sounds; the left hand plays along raised plastic "strings" molded into the neck. The one-octave neck spaces its "frets" just like a standard guitar, and an electronic whammy bar allows for pitch bending and other effects. Such a deal. For more information, see the review in this issue. **Suzuki**, PO Box 261030, San Diego, CA 92126 ☎ 619 / 566-9710.

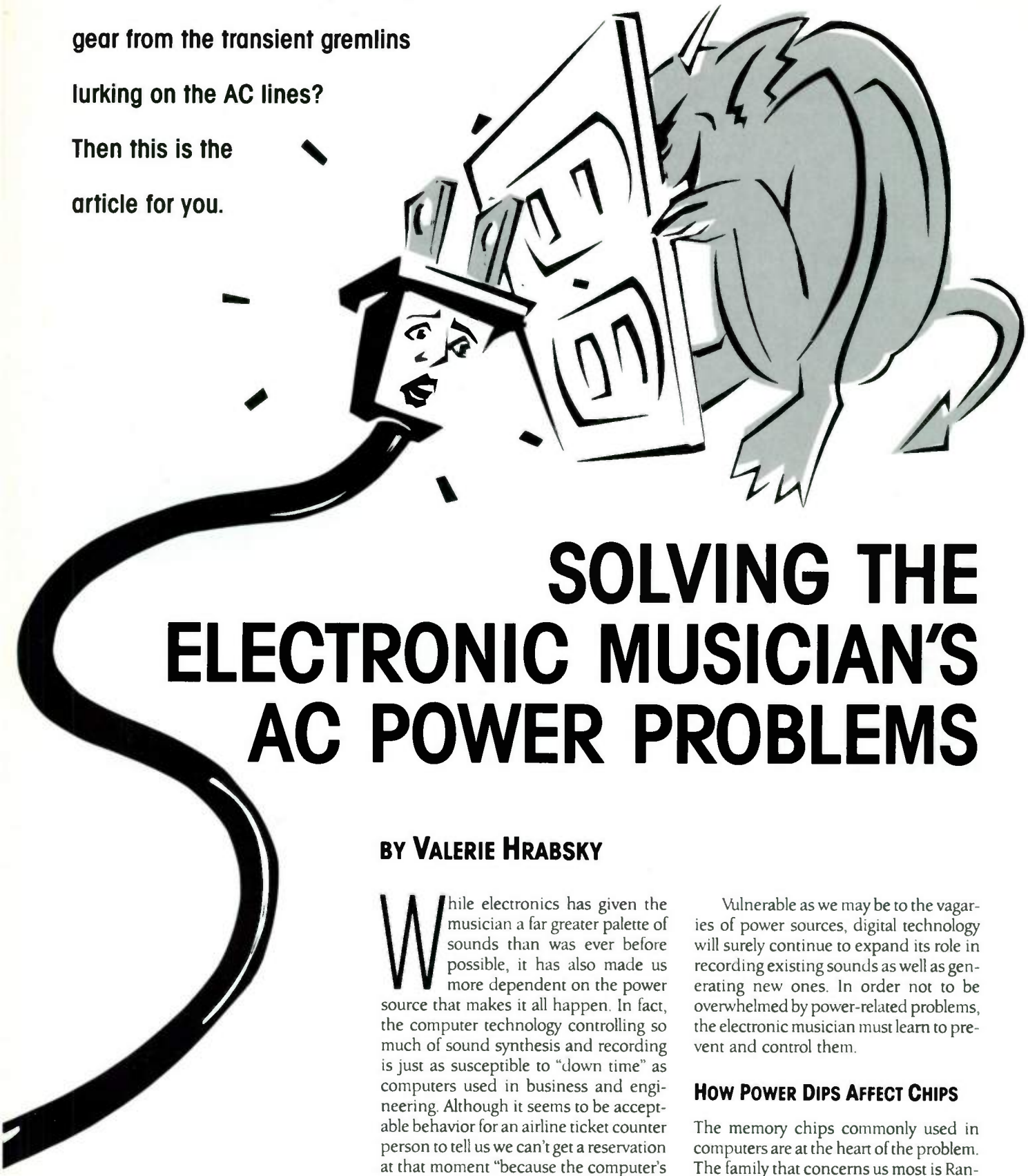
Suzuki SX-500 Programmable Dynamic Stereo Digital MIDI Expander ($399)
Despite the low price, this is indeed a true programmable synth with 50 onboard programs and 50 more if you add a cartridge. Most parameters only cover 16 steps, although fortunately the filter frequency has 100 steps; but there are some cute extras, like a sequencer you can actually sync to MIDI, a metronome, and separate multi-stage envelope generators for the VCA and VCF that respond to velocity. And when you kick into two-oscillator mode, each can have its own VCA settings. Despite any limitations inherent in the low cost, there's no other way we know of to make these kinds of noises at this kind of price. **Suzuki**, PO Box 261030, San Diego, CA 92126 ☎ 619 / 566-9710.

Suzuki SX-500 Expander

Yamaha TX81Z ($495)
This FM synthesis expander module offers four-operator voice architecture (with seven different available waveforms and eight algorithms), eight voices, multi-timbral MIDI assignment, microtuning, and surprisingly clean sound (the 12-bit A/D conversion is the same resolution as in the original DX7)—all in a single rack mount box. It is rapidly becoming the synth expander of choice for musicians on a budget. **Yamaha**, 6600 Orangethorpe Ave., Buena Park, CA 90620 ☎ 714 / 522-9011.

Yamaha DX100 ($449)
Even though it has mini-keys and is fairly old by "MIDI world" standards, the DX100 is an eminently playable four-operator FM synthesis keyboard with 192 presets and 24 user-programmable locations. Although the keyboard is not velocity-sensitive, when driven through MIDI the voices will respond to velocity information. The DX100 is even battery-powered so it can be used as a remote, strap-on keyboard, or for taking on vacations if you want to do a little composing. It's also compatible with sound data for the DX21, and includes a cassette interface for loading and saving patches. **Yamaha**, 6600 Orangethorpe Ave., Buena Park, CA 90620 ☎ 714 / 522-9011. EM

Confused about how to protect your gear from the transient gremlins lurking on the AC lines? Then this is the article for you.



SOLVING THE ELECTRONIC MUSICIAN'S AC POWER PROBLEMS

BY VALERIE HRABSKY

While electronics has given the musician a far greater palette of sounds than was ever before possible, it has also made us more dependent on the power source that makes it all happen. In fact, the computer technology controlling so much of sound synthesis and recording is just as susceptible to "down time" as computers used in business and engineering. Although it seems to be acceptable behavior for an airline ticket counter person to tell us we can't get a reservation at that moment "because the computer's down," try telling a club owner you're not going to play because your computer isn't feeling well.

Vulnerable as we may be to the vagaries of power sources, digital technology will surely continue to expand its role in recording existing sounds as well as generating new ones. In order not to be overwhelmed by power-related problems, the electronic musician must learn to prevent and control them.

HOW POWER DIPS AFFECT CHIPS

The memory chips commonly used in computers are at the heart of the problem. The family that concerns us most is Random Access Memory (RAM), since it is *volatile* (meaning that it retains data only while it is powered by electric current).

ILLUSTRATION BY LANEE LA'SHAGWAY

EV gives you Extended Range™ Speaker Systems

. . . and we're also giving you an EV T-Shirt just for listening to them!

One brief "listen," and we've gotcha! We're so convinced that you can't resist buying a pair of our SH-1502ER or SH-1512ER two-way Extended Range speakers, once you've heard them, that we're authorizing our participating dealers to give you a certificate redeemable for an EV T-shirt, just for hearing a demonstration!

The first thing you'll notice about these systems is their upper-end transparency and detail, extending into the critical 12,000-to-20,000-Hz range, where many systems fail. Our superb DH2010A driver assures flat response up to and beyond audibility, capturing the exciting shimmer of a cymbal, the highest overtones of a horn, the harmonics that impart vibrant life and "sizzle" to vocals.

Whether you choose the vented, horn-loaded SH-1502ER, with its extra sensitivity and power, or the balanced warmth of the SH-1512ER direct radiator, you'll enjoy tight, deep bass with plenty of punch. Our EVG-15 woofer, conservatively rated at 200 watts, gives you distortion-free sound with excellent transient response, even at the high sound pressure levels and dynamics common to live performance.

Our patented Road-Wood™* enclosures are carefully fitted and bonded, and covered with durable abuse-resistant carpeting to ensure years of hard use. And our five-year warranty is a rarity in speaker systems for the working musician.

See your EV dealer soon and hear what an EV Extended Range speaker system can do for you and your music. And for the people who paid to hear you.

For more information, write Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107.

*Patent #4,624,338

Electro-Voice®
EV
a MARK IV company

A filter which attenuates Radio Frequency Interference (R.F.I.) before it penetrates computer circuits or electronic equipment is included between the input power line and the six outlets. R.F.I. will cause computer and electronic malfunctions by creating erroneous signals. The Wire Tree Plus® effectively filters out transverse and common mode noise by means of a Pi type filter.

FIG. 1: Example of what to look for in product literature to determine the type of RFI protection in a particular device.

Any information contained in RAM is lost when the current flow is halted, so this type of memory is most susceptible to power problems (particularly outages). Another common memory type, Read-Only Memory (ROM), stores information permanently and is nowhere near as problematic. Although internal capacitance in a unit's power supply *might* provide enough current to cover a power loss of a few milliseconds, most of the time even a fraction of a second of power loss will cause your computer to lose any data in memory. Fortunately, many synthesizers, drum machines, and other electronic devices now include battery back-up, but the computers that do our sequencing, voice editing, and so on usually do not.

Transients: Damage At The Speed Of Light

But losing power momentarily is not the only problem facing the electronic musician. Voltage transients—sudden increases of electrical energy due to sudden line voltage changes—are just as bad. One of the problems here is the speed at which mishaps occur. Transients lasting a few nanoseconds (billionths of a second) can commit irreparable mayhem to instruments that rely on memory chips. Since many chips are highly sensitive to transients that exceed their rated voltages, even a transient of extremely short duration can cause a chip to fail, or at least significantly shorten its life.

Surge Suppressors

Protection from voltage surges or spikes is usually handled by a *surge suppressor*. This not only protects against surges on power lines, but also on telephone lines; nearby strikes—not even a direct hit on the line—can induce thousands of Volts onto the phone lines. If you have a modem hook-up for your computer, this can be a big problem (and you can forget about ever using your answering machine again if your line is not protected and there's a nearby hit). Surge suppressors offer two types of protection: *transverse-mode* and *common-mode*. With the standard electrical outlet consisting of three wires—hot, neutral and ground—the transverse-mode type provides protection against the most prevalent type of surge: across the hot and neutral wires. But a surge can also occur from hot to ground and from neutral to ground, and this requires common-mode protection. To protect computerized instruments fully, it's important to have both transverse and common in a single device, so make sure that any surge suppressor you use includes both.

An effective method of suppressing surge and spike transients—also not provided by all types of devices—is to limit or *clamp* the voltage at a constant magnitude. When voltage is below the clamping level, the suppressor offers a high resistance to ground, and does not interfere with the operation of the circuit. However, sudden voltage jumps are absorbed by the suppressor, since it exhibits extremely low resistance to voltages above the clamping voltage, and therefore shunts this excess voltage to ground.

The actual component that clamps high-voltage signals is a variable resistor known as a *Metal Oxide Varistor* (MOV). Clamping components that exhibit clamping voltage levels far below those of the MOV type rely on silicon *Zener diodes*. Because of the fast clamping speed of the Zener diodes, the most effective surge suppressors use a combination of the two types. Since voltage suppressors of this type are for power line-supplied electrical wall outlets, they are specifically designed for alternating current (AC).

Phone lines are more commonly a DC circuit, so voltage transients that hitch a ride on the telephone lines and can damage modem-connected computers require a different type of clamp. As with AC circuits we again find the fast-acting

Specifications:
- RFI Filter: PCB Mounted
- Silicon Transient Suppressor/MOV Combination
- Continuous Peak Voltage: 185 130V RMS
- Typical Response Time: Approximately 1 nanosecond (a billionth of a second)
- Rated Current: 8 Amps
- Rated Voltage: 125 VAC
- Energy Rating: 40 Joules, self restoring
- Maximum Clamp Voltage at I peak of 4.6A: 328V (232V RMS)
- Peak Power dissipation: 1.5kW, 1msec
- Temperature Range: -25°C to +85°C

FIG. 2: Specifications for Networx The Wire Tree,™ a surge suppressor for computers.

Specifications:
Transient Suppression Modem:
Two-stage Silicon/Gas Tube for Tip-gnd and Ring-gnd
- Reverse Standoff Voltage: Vbr +220V
- Peak Breakdown Voltage @ 1 ma 209-231V (148-163V rms)
- Maximum Clamp Voltage: 350V @ 5,000 Amps

Power Line:
- RFI Filter: PCB Mounted
- Silicon Transient Suppressor/MOV Combination
- Continuous Peak Voltage: 185V (130RMS)
- Typical Response Time: Approximately 1 nanosecond (a billionth of a second)
- Rated Current: 10 Amps
- Rated Voltage: 125 VAC
- Energy Rating: 40 Joules, self restoring
- Maximum Clamp Voltage: at I peak of 4.6A 328V @ 5,000 Amps
- Peak power dissipation: 1.5kW, 1 msec
- Temperature Range: -25°C to +85°C

FIG. 3: Specifications for Networx The Wire Tree Plus,™ a surge suppressor for computers *and* modems.

silicon Zener diode, but for protection at higher voltage levels, it is used in conjunction with a heavy duty *gas tube* surge arrester instead of the MOV used in AC circuits.

Surges aren't the only undesirable signals that travel along the AC lines. Protection against radio frequency interference (RFI) and electromagnetic interference (EMI) is also necessary, and neither should be allowed to penetrate computer circuits or peripheral equipment. This type of interference (noise) occurs in the form of short, high-frequency blips that can contribute to erroneous signals and memory errors. Since most noise occurs between the hot and neutral wires, a computer system, as noted earlier, requires both the transverse-mode and common-mode protection. The most effective filter to reduce RFI and EMI is known as a *Pi-type* filter circuit. (See **Figs. 1-3** for examples of what to look for in product specifications and literature for surge suppressors.)

Uninterruptible Power Supplies

The devices just described are designed to act within nanoseconds—in time to sense and act on transients before they reach and damage electronic instruments containing semiconductor memory chips. However, the need for nanosecond-speed action is just as necessary in instances of power failure or brownouts as in surges. The effect of total or partial cessation of power can be disastrous to data stored in a chip.

For protection against power failures and brownouts, an *uninterruptible power source* (or *UPS*; **see Fig. 4**) is usually the answer. This provides auxiliary power for a period of time, so you can save any data in memory before the power goes away completely. A UPS is an indispensible insurance policy against memory failure due to power outages. Just how important it is to protect computerized equipment against power problems is clear when we consider how often such problems occur. One readily available indication of this is the flickering of lights in a building—something that happens numerous times in a single day. The flickering is caused by sags or momentary brownouts of the incoming line voltage. This causes a temporary "starvation" of the computer power supply which, depending on its severity, could corrupt

Julian Music Systems

• • • • • • • • • *Specializing* in Macintosh Systems that Work!

• Macintosh II Audio/Visual Workstations •

NTSC Adaptor — *Create* on the Macintosh II and send the video signal to Video Tape or Broadcast TV!

• *AKAI* Digital Matrix Patch Bays for Audio & Video •

• SMPTE/MIDI Synchronization •

• Programmable Audio Mixing •

• Digital Direct to Disk Recording •

For more information or Demo on *Akai* Professional/Digital Products Please call:

Julian Music Systems

2280 Bates Ave, Suite J

Concord, CA 94520

415/686-4400

AKAI Professional/DIGITAL Dealer

Authorized Value Added Reseller

NTSC Adaptor is a trademark of Julian Systems, Inc. Apple is a registered trademark of Apple Computer, Inc. Macintosh is a trademark of Apple Computer, Inc.

PROFESSIONALS DEMAND THE BEST TOOLS AVAILABLE.

MANNY'S SUPPLIES THE BEST SUPPORT SYSTEMS NECESSARY TO HELP ACHIEVE EXCELLENCE—PROFESSIONAL TOOLS TO ASSIST IN CREATING THAT EXCELLENCE.

MANNY'S—THE PROFESSIONAL'S CHOICE.

MANNY'S MUSIC

156 W. 48th Street

NYC, NY 10036

(212) 819-0576 Mon.-Sat. 9:00-6:00

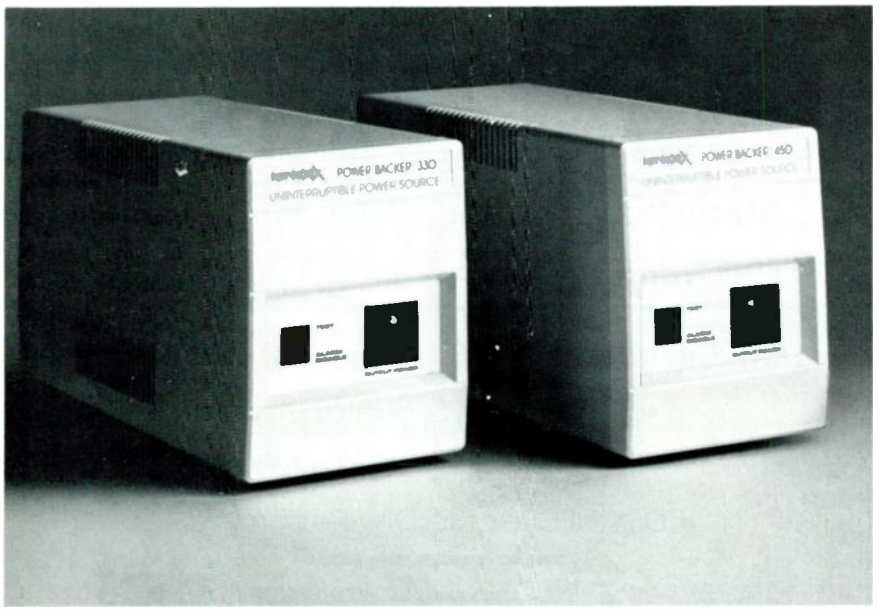


FIG. 4: The Networx Power Backers 330 and 450 are uninterruptible power supplies that restore power within two milliseconds, as well as protect against power surges, spikes, RFI and EMI. The Model 330 has a peak current output of 6A (instantaneous); Model 450 has a peak current output (instantaneous) of 9A. Both are battery-operated.

data in the computer.

The UPS, which responds rapidly to these types of disturbances, serves as a backup source of power, and must act before the computer becomes "starved" due to lack of power. Computers normally have a built-in power reserve that will allow them to remain in a non-starved operational mode for possibly up to 30 milliseconds (some computers, however, have a much lower margin of safety). To preserve memory, the UPS device must be able to detect and furnish backup power only milliseconds after power fails. It is important to note that there is considerable ambiguity in the specifications of various UPS manufacturers. What might seem like ample time to restore power (e.g., 10 milliseconds) may be designated by the manufacturer as "transfer time;" in other words, the time it takes for power to be taken over by the UPS. This, however, does not include *detection time* for the brownout condition, which can be considerably longer. Adding detection time to transfer time may involve a long enough period for power starvation to set in.

However, just having a UPS is not sufficient. A UPS will only restore power temporarily—say, 10 to 30 minutes. In that amount of time, it is essential to do what is necessary (save to disk, modem to another computer, save to hard disk, whatever) to protect what is in the computer's memory. That may entail finding a new source of power, or shutting down the computer system in a way that will preserve data. To know that a power problem exists, then, it is important that the UPS sound an audible alarm to alert the user that a problem is happening. The UPS, at that point, will automatically—within 2 milliseconds for some brands—restore power. The faster the response time, the more certain the musician is that power was restored well within the margins required by the most intolerant computer (some of the most popular computers can lose all data in a power outage as brief as four milliseconds).

Equally important as knowing when power falters is having some definite indication that the UPS batteries are nearing exhaustion. Indication of this on the better types of UPS devices is given audibly, too.

It is also important that the UPS respond not only with quick power, but with the *right kind* of power. This means a sine wave voltage that duplicates the correct peak and RMS values of normal AC power. It also means that parts of a system that require more power can feed off the peak of the wave, while lower power needs are satisfied at other points on the sine curve.

All UPS devices do not, however, supply sine wave voltages. Some curves are in the shape of square waves, with

SPECIFICATIONS

INPUT

Nominal: 120 VAC, 60 HZ single phase.
AC connections: 6 ft 3-wire power cord (NEMA 5-15P).

OUTPUT (inverter operating)

Nominal: 117 VAC, + / – 5% (RMS).
Peak current: 9A (instantaneous).
Waveform: modified sinewave.
Frequency: 60 HZ, + / – 1HZ (unless synchronized to AC line).
AC connections: four 3-wire receptacles (NEMA 5-15R).

OPERATION

AC output: supplied via EMI noise filter and surge suppressor from commercial supply; inverter pre-synchronized and phaselocked to commercial supply; automatic transfer to battery/inverter on commercial power fault; automatic re-synchronization and re-transfer on recovery.
Transfer time: 4 ms typical, 8 ms max.

Nominal service time on battery/inverter:

5 min	at	300W
10 min	at	225W
20 min	at	150W
30 min	at	110W
45 min	at	90W
70 min	at	60W
8 hrs	at	no load

Low-battery shutdown: continuous audible tone warning prior to shutdown.

BATTERY AND CHARGER

Battery type: 12 VDC 10 AH maintenance-free sealed lead acid, spillproof; operation in any position.
Recharge time: 12-14 hrs typical from total discharge.

CONTROLS AND INDICATORS

Controls: OUTPUT POWER (ON/OFF, suitable for use as master system power switch), TEST/ALARM DISABLE.
Indicators: output power ready (lighted OUTPUT POWER switch).
Alarm: audible 6 kHz tone burst every 5 seconds on utility fault, continuous tone prior to low-battery shutdown.

PROTECTION

Input: 5 Amp fuse (rear of unit); 95 joule/6500 Amp surge suppressor.
Charger: 1 Amp internal fuse.
output (inverter operating): electronic overcurrent protection with current foldback; automatic recovery on overload removal.
Battery: 50 Amp internal fuse; low-battery shutdown and battery overcharge prevention.

ENVIRONMENT

Operating: 0 C to + 45 C (32 to 113F), 0 to 10,000 MSL, 0 to 95% RH (non-condensing).

PHYSICAL

Color: beige.
Size: (H × W × D): 6.6" × 4.7" × 14.2" (17 × 12 × 36 cm).
Weight: 25 lbs (11.3 kg).
Shipping: 27 lbs (12.2 kg); 1.4 cubic feet; shipped via UPS.

Model 613-0003

FIG. 5: Specifications for Networx Power Backer™ 330. Shown as an example of a typical spec sheet for a UPS (Uninterruptible Power Supply).

identical RMS and peak values. This type of design can severely overstress some loads while starving others. Even worse, square wave voltage values fluctuate with changes in load demand and battery power level—exactly the situation UPS devices are meant to prevent. For this reason, getting familiar with UPS devices and their specs is crucial in selecting the right model to protect important computer data.

It is possible, too, to protect data in memory *and* shield a system from surges, spikes, EMI, and RFI without having to invest in a flock of separate devices. Again, attention to the specs will reveal that some UPS devices also act as transient suppressors. (See **Fig. 5** for an example of UPS specifications supplied by the manufacturer.)

Forewarned Is Forearmed

Musicians, as "electronic" as they may get, are still by and large not engineers. Even though they may be surrounded by computerized devices of every description and be thoroughly knowledgeable in their use, they may not realize the susceptibility of this equipment to damage from the very power sources that turn them on. Plugging computer equipment into a wall outlet is often treated in the same carefree manner as plugging in a toaster or TV set, with no thought given to the consequences of "dirty" current or power outages. It is very important that musicians and composers familiarize themselves with, and avail themselves of, the surge protection and UPS devices currently on the market. Just as important is the realization that these devices, like other such devices, are in competition with one another at the retail level. Often what may appear to be less expensive as an initial expenditure may turn out to be more costly in the long run when you take equipment damage, and lost data, into account. Good luck—and may your power supply never leave you powerless.

Valerie Hrabsky lives in New Jersey and is product manager for the Networx division of Dialight Corp, which manufactures LEDs, switches, toggles, terminal blocks, and surge protectors (packaged in silver foil boxes with the electric blue, purple and black logo). She enjoys skiing, fresh water fishing and the fine arts.

The best thing about Listen? It works.

Listen's interactive design provides a perfect environment for anyone - from beginners to professional musicans - who wants to develop a sharper ear.

- **triads, 7th, 9th, 11th, and 13th chord exercises**
- **inversions, intervals, simple and complex melodies**
- **on-screen piano and guitar**
- **playback using 4-voice Mac synthesizer or MIDI keyboard**
- **adjustable degree of difficulty**
- **full Mac and MIDI compatibility**
- **newly revised and expanded manual**

Listen™ 2.0

Interactive Ear Training Software for the Macintosh

"A music educator's dream and a Mac musician's salvation" -- Geary Yelton, **Electronic Musician**

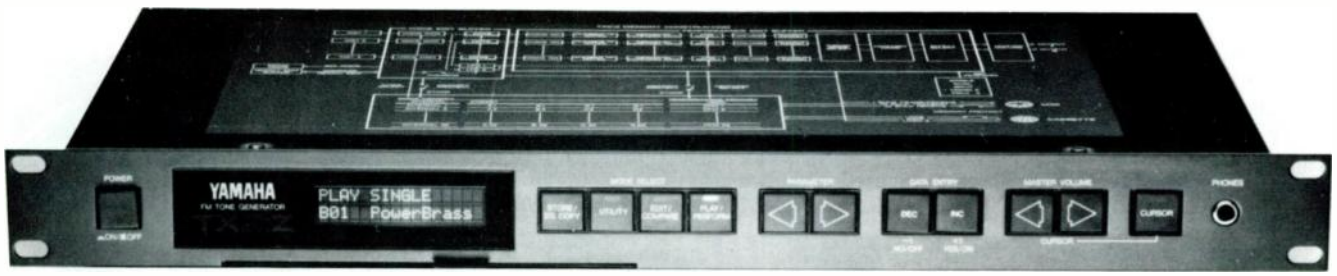
by Resonate

$99

PO Box 996, Menlo Park, CA 94026
Check, money order, or MasterCard/Visa
Order by phone: **(415) 323-5022**

128 preset sounds, 32 user-programmable sounds, microtuning, special effects, and more—all in one rack space. The TX81Z is quite an instrument, and here are some tips to help you get the most out of it.

Mastering the Yamaha TX81Z



BY BILL THOMPSON

PRODUCT SUMMARY

PRODUCT:
TX81Z
TYPE:
Eight-voice, four-operator FM MIDI synthesizer expander module
LIST PRICE:
$495
MAIN FEATURES:
Multi-timbral operation, eight 8 waveforms to choose from for each operator, microtuning tables, front-panel programmability, and built-in special effects.
MANUFACTURER:
Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620
☎ 714 / 522-9011

The TX81Z is Yamaha's latest four-operator synth module; it resembles—but improves upon—the FB-01 (reviewed in the Nov. '86 EM). The sound quality is a little better, voices can be programmed from the front panel, there are a bunch of new features, and the price is right ($495 list). We'll start with a mini-review for those who aren't familiar with the instrument, then move right into hints and tips that show off some of the TX81Z's more interesting features.

The four-operator voice structure used to generate a sound is not as versatile as the six-operator system used in the DX7 (see sidebar), but thanks to some new twists it outperforms previous four-operator machines. There are two main modes of operation:

Single and *Performance*. Single mode provides a single voice with eight-note polyphony. This has its uses, of course, but Performance mode is what really sets this unit apart. When creating what Yamaha calls a *Performance*, you assign (among other things) each of the eight voices to a range of notes or a MIDI channel. For example, one voice might be assigned to play a bass sound over one MIDI channel, four voices might play a piano sound over a second MIDI channel, and the remaining three voices could provide three different percussion sounds, each controlled over three different MIDI channels (**Fig. 1**). Being able to assign voices to different note ranges is also very useful, since you don't need a fancy keyboard to do splits and layers—the TX81Z does it all for you. Performance mode is particularly applicable to sequencer and guitar controller applications.

Performance mode also lets you assign each voice to one of two, or both, stereo outputs. The stereo outputs come into play with the panning functions (described later), which can help give a more spacious sound through the use of stereo and chorusing, and also come in handy for sending different voices to different mixer inputs.

The TX81Z's MIDI implementation is quite complete. In addition to the Performance mode options, you can dump voices, Performances, tunings, effects, and system setup data to a computer. There is also a patch map for mapping incoming Program Change commands to any Single voice or Performance, and you can even combine two TX81Zs (or a TX81Z and an FB-01) for 16-voice operation, or to provide eight-voice polyphony for layered Performances.

There are also several extra features worth noting:

✓ Three *special effects* that can be part of each Performance (transposing delay line with feedback that operates on the MIDI data; panning effect controlled by LFO, velocity, or note value; and one-note chords).

✓ *Microtuning tables* for experimenting with alternate tunings. Be careful—this feature is addictive.

✓ A *copy utility* to copy envelope parameters from one operator to another with a couple of keystrokes.

✓ A pull-out *reference card* that gives a short-form summary of programming parameters and options.

✓ Front-panel *MIDI event indicator* that shows whether the TX81Z is receiving data or not.

✓ A reliable (no kidding) *cassette interface*. Sure, a computer librarian is faster and more convenient, but you don't necessarily *need* it. (If you want to do serious programming, though, you will need a voice editor—editing solely from the front panel, while possible, is cumbersome.)

So what does the unit lack? Compared to a DX7, there's no pitch envelope generator, and there are fewer amplitude envelope generator parameters. Some aspects of the modulation routing system are a little weak as well; amplitude and pitch sensitivity are set for the voice, not each operator, and only amplitude sensitivity can be turned on or off for each operator. These decisions may have been made to make the TX81Z a little easier to program and easier on the wallet, but they also limit the sounds that can be created.

I also am a little confused about the effects. They are selected in the Performance mode, but are edited in the Single mode utility. When creating a Performance, you therefore must switch back and forth between Single and Performance if you're trying to create a Performance *and* edit the effect so it sounds right with the Performance.

Regarding the manual, there are only two-and-a-half pages devoted to explaining FM synthesis. I realize an in-depth tutorial could fill volumes, but if this were my first FM synth I suspect I would never hit the edit button. There are also a few confusing functions; for example, the "combine" function (which preserves a particular set of function parameter set-

TX81Z Voice Architecture

The TX81Z's voice architecture is similar to the DX21/27/100 and FB-01. Each *operator* consists of a tunable sine-wave oscillator and amplitude envelope generator; the four operators can be combined in eight specific ways (called *algorithms*). Depending on the algorithm, some operators serve as *carriers* and provide the audio signal we hear, while others serve as *modulators* and alter the *timbre* of the carriers. For each algorithm, operator four can modulate itself via the use of feedback, which provides additional effects. Each voice also has its own LFO. (For additional background information on FM synthesis, see "The Continually Expanding Universe: Tips to Tame the DX7II" in the Nov. '87 **EM**.)

TX81Z voice data is directly compatible with the DX21/27/100 (see page 48 of the user manual for complete details of compatibility). You can also swap System Exclusive dumps between machines, but you'll have to do a few tweaks for incompatibilities (like variations in velocity sensitivity).

The frequency for each operator can be set with both coarse and fine tuning; an additional fixed mode tunes an operator to a single pitch no matter what key is hit. (For an unusual effect that's well-suited to percussive sounds, I like to fix the carrier frequency and let the modulators follow the keyboard.) The envelope generators also have a couple of interesting new twists. A *shift* parameter compresses the EG's range (in other words, the EG covers a narrower range), which can help emphasize the effect of a particular modulator.

Note that instead of using just sine waves for the operators, the TX81Z provides *eight* different waveforms for each operator. Thus, more complex timbres can be created than one might expect with a four-operator machine. This technology makes the TX81Z capable of creating some very fat sounds; however, even four complex waveform operators don't replace six sine wave operators (as used in the DX7).

Incidentally, the TX81Z sounds cleaner than the FB-01, largely because of 12-bit operation (for comparison, the old DX7 also used 12-bit operation; the new DX7 uses 16 bits, while the FB-01 uses only 10). Although you'll still hear a bit of grunge when sweeping modulators set to high amplitude values, overall the sound quality is good.

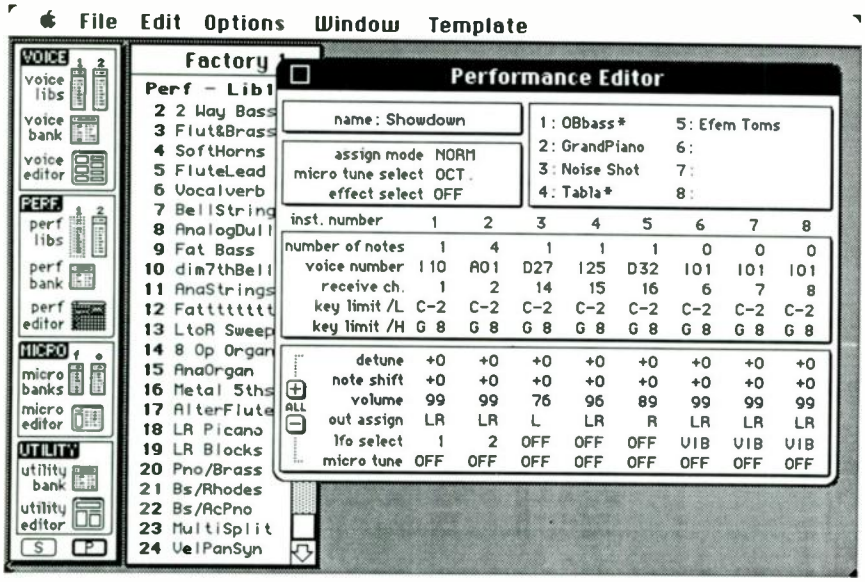


FIG. 1: The various Performance mode options (as listed in the Performance edit screen from the Digital Music Services TX81Z editor/librarian program).

tings as you switch between voices) is quite useful yet cryptically named.

Finally, although it's becoming a standard complaint against most synths, the factory presets take up 80% of the machine's total voice memory yet provide only a limited demonstration of the machine's capabilities. There are some very good presets in the factory set, but some are fillers that don't have a lot of musical use. Presets can be edited, but the catch is that there are only 32 user-programmable RAM storage locations into which edited voices (or voices you create from scratch) can be stored.

Still, the instrument's advantages far outweigh any limitations, and I like the TX81Z a lot—in fact, I'm even making plans to get a second one. It lends itself well to sequencer applications and alternate controllers, produces dramatic and musically useful sounds, and offers a bunch of extras (the microtuning capability will provide hours of experimentation, and maybe even a little inspiration). It's quite a package for $495.

Now that we've described the basics, let's look at several ways to use the TX81Z on stage or in the studio.

Super Samples and Analog Augmentation

The TX81Z sounds blend well with other synths to create more interesting composite timbres. One application is to add high-frequency audio information to a sampler; combining (via MIDI) one of the TX81Z electric piano presets with an electric piano sample produces a very convincing sound—the attack of the tine jumps out. Combining an analog synth and the TX81Z gives extra "fatness" and definition that never existed in any of my analog gear when played by itself.

I also use the TX81Z to add percussion to a Hammond organ sample so that I can turn the percussion on or off without changing samples. Another advantage of this particular combination is to improve the rotating speaker effect; use LFO modulation on either the TX or the sampler (but not both) for additional depth.

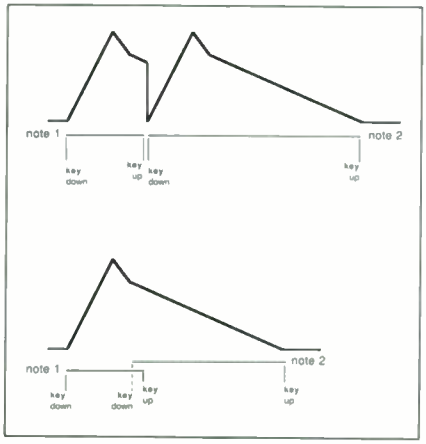


FIG. 2: In mono mode, releasing one note before playing the next re-triggers the envelope; playing one note before releasing another does not.

Greater Articulation

This synth, of course, does more than layering. It is at home as a solo synth and has several features that will add new dimensions to your playing, once you master them.

Single mode offers a deceptively innocent-looking feature called *poly/mono*. In *mono* mode (not to be confused with MIDI mono mode) only one note will sound at a time; if you play a note while holding the previous note, the envelope will not retrigger (**Fig. 2**). Try this mode with trumpet or sax solos—you can actually articulate the attack of the instrument with your playing style. Release one key before hitting the next for staccato tonguing, or hold the previous note for a more legato style.

While in mono mode you can also access "fingered portamento," which uses the same articulation tricks to control portamento. If you play two consecutive notes and release the first before playing the second, you will hear two distinct pitches. But if you hold the first key, the synth will glide to the second pitch. Very short portamento times increase the realism of wind and other voices that have a certain amount of attack time, as the pitch change helps simulate the variations that occur when a human player plays an instrument.

Yamaha Breath Controller fans should check out using it in conjunction with the TX81Z's *EG Bias* function (this gives a finer degree of control), and in mono mode as well. If you don't like huffin' and puffin', breath controller functions can be re-assigned to aftertouch in the Utility page. (Of course, to take advantage of this you will need a synth that generates aftertouch, or that can re-map a controller, such as a footpedal or mod wheel, to aftertouch.)

What's In Control Of Your TX?

A few words about controllers for the TX81Z: you may well be disappointed with the voices if you drive it with non-Yamaha keyboards. Unfortunately, most of Yamaha's products seem not to expect the entire range of values for velocity and aftertouch. If your keyboard allows, try scaling both quantities down a bit, or try different available keyboard velocity scaling curves (if present). Otherwise, you may have to modify the voices by reduc-

ing the values of velocity-related parameters, and possibly reducing some of the operator output levels somewhat.

There are two sides to every coin, though. Since the TX81Z expects a limited range of values from velocity and aftertouch, you can get some pretty exaggerated effects if you leave the voices alone and use a controller that tends to put out higher velocity values. This is especially apparent when you assign aftertouch to the breath controller destinations. When "overdriven" by high velocity, the TX81Z makes some truly rough-and-tumble sounds with impact comparable to fuzz guitar effects.

Making Performance Mode Perform

Performance mode controls splits and layers, how different voices will be allocated to different MIDI channels, tunings, effects, and a bunch of other parameters. Your controller only has to send out note values; the TX will assign the specified range of notes to the specified sounds. One of my favorite aspects of this arrangement is that you can "stack" notes on a single MIDI channel (or range of notes) for some excellent doubling and tripling effects—or even octupling if you restrict yourself to single-note lines. Flexibility! And incidentally, it's not hard to figure out all this stuff either.

Pitch bend and MIDI controllers can be assigned to a *global channel* so that one channel can provide controller information for several voices at the same time, but you can also send the controller information on individual channels. The global channel is a real system-saver in complex sequences, as it greatly reduces the amount of data transmitted over MIDI. It is also a real convenience in guitar setups, especially if you have the Ibanez controller and use its "electronic whammy bar" for vibrato effects.

One application that takes advantage of sending controller data on individual channels is creating two keyboard "zones" that respond differently to aftertouch. Try assigning four notes of one patch to one MIDI channel, and four notes of the *same* patch to a second MIDI channel. Assuming you have a split keyboard with independently selectable MIDI channels for each split, set one split to the same channel as one group of four notes, and the other split to the same channel as the other group of notes. Now you can add LFO depth or any other aftertouch modulation independently for each half of the keyboard.

For those without a fancy controller, there are still many other tricks you can do. One is to create splits by assigning different note ranges to different voices; for solos, this puts two completely different sounds at your disposal. Try this: assign two different voices to the two halves of the keyboard by specifying different note ranges for the voices, then use the transpose function to put each in a useful range. *Voila*—you can play two different sounds just by moving your hands from one side of the keyboard to the other.

If you want to get really strange you can do that too: use alternate reception with eight very different voices.

Animation and The Human Touch

One of the problems electronic musicians always have had to face is that synthesizers are not people, so some sounds can seem pretty lifeless. Many techniques have been invented to animate electronic sounds; phase shifters and chorus simulators are two that have found widespread use. (Large mainframe computers and multi-megabyte samplers are two that haven't, but I keep hoping....)

No musician can (or would *want* to) duplicate the exact same articulation for every note, yet that's what most synths do, including the TX81Z in Single mode. Also, there are very few instruments that play exactly in tune throughout their range. (None in my experience, actually.) This means that most performances are slightly imperfect, and this human quality helps music to live and breathe.

To help put some of the human element back in, the TX81Z has two features for animating your Performance. The first, *alternate key assign mode*, means that playing a new note sounds a new voice. If you assign a slight variation of the same voice to each voice, ensembles start to come alive. You are limited to eight attacks, eight modulation depths, and so on, but since this is seven more than what we're used to hearing, the effect is astounding.

If you want to get really strange you can do that too: use alternate reception with eight very different voices. Now try to voice the chords so that the bass stays on the bottom, the flute on the top, and so on. For those of you who remember the pre-MIDI days, this is the way the vintage Oberheim four- and eight-voice synthesizers used to work.

The second humanizing factor is that you can also assign different LFOs to each voice. If you select "vib," that voice will use its own LFO settings for pitch modulation. Or, select the LFO settings of either of the first two voices in a Performance to control the amplitude and pitch modulation of any other voice.

Another neat trick is to use the same LFO on two very different sounds. If you ever experimented with synchro-sonics this will entertain you for hours.

Microtuning

Recently, microtunings have received a lot of attention. Wendy Carlos used them to stunning effect in her latest album *Beauty in the Beast*, and the capability to experiment with them is included in new instruments and software. The TX81Z has a dozen different alternate tunings already programmed so you can immediately experiment with microtunings and it also allows for two user-programmable tunings.

So what can you do with this newfound power? For starters you can play period instruments and pieces in the tuning they were originally heard in. But you won't want to look back forever.

The first thing I did was create a *stretch tuned* scale for piano sounds. Stretch tuning is a technique that "stretches" the tuning of a piano's high end slightly sharp (higher notes are "stretched" by a progressively greater amount), and the low end "stretched" slightly flat in a similar fashion. This creates a somewhat brighter sound (an ancillary benefit for piano tuners is that since the stretched

BEAVERTON DIGITAL SYSTEMS

D-50
TX81Z
ESQ-1
FB-01
DX21/27/100
Editors/Librarians
for the MACINTOSH™
MacPatch™ generic patch librarian!
Patch Librarian Desk Accessories!

Macintosh MIDI Interface
2 Ins 6 Outs assignable
$149.00

Order Hotline
Outside CA. 800-356-MIDI
Inside CA. 818-584-5814
Info 503-641-6260
P.O. Box 1626 Beaverton, OR 97075
Dealer Inquiries Welcome

Call MacMusic MIDI BBS!
(503) 646-2095

EYE AND I PRESENTS . . .
VOICE™ Crystal
FOR
ESQ1
AND NOW FOR THE
D-50

AVAILABLE AT YOUR DEALER

ESQ-1

Voice Crystal 1 ..... $62.95
Deep Blue 80 Voice E²PROM

Voice Crystal 2 ..... $62.95
Magnificent Red 80 Voice E²PROM

Voice Crystal 3 ..... $62.95
Mellow Yellow 80 Voice E²PROM

Voice Crystal X $49.95
Crystal Clear Blank 80 Voice RAM

D-50 (with write protect)

Voice Crystal 1-D50 ..... $110.00
64 Voice RAM w/32 Voices & 32 Blank

Voice Crystal 2-D50 ..... $110.00
64 Voice RAM w/32 Voices & 32 Blank

EYE AND I Productions, Inc., 2151 Old Oakland Rd., #224
San Jose, CA 95131, PH: (408) 943-0139

upper notes will go slightly flat over time, they will slip into perfect tuning). The amount of stretching is a matter of preference; try maximum alterations of just a few cents at first, spread over a couple of octaves. With electronic instruments, this seems to give a subjectively "larger" sound (if you still have a Fender Rhodes in your basement, try stretch tuning it—it may work its way back into the studio). For more information on stretch tuning, check your local library for books on piano tuning.

You can also create quarter-tone scales, 61-note scales, or whatever your mind can conceive. This could inspire you to write the next great symphony, or it might get you kicked out of the neighborhood; so keep the volume down while you're experimenting (some people just don't understand!). For sound effects, eighth-tone scales are particularly good since you are not locked into as much of a sense of pitch (very few explosions occur in even-temperament).

Aside from the abstract and historical applications, microtuning can also add animation to a sequence. Try tuning the keyboard so the notes for each instrument are just slightly detuned with respect to each other, as this will add a great deal of depth to your ensemble. Or try layering an alternate scale on top of the standard scale, or on top of another alternate scale. The advantage of using this approach, as opposed to simply detuning the entire voice by a given amount, is that each note can be tweaked for the best sound. For example, with even-tempered scales the sixth is out of tune compared to the fundamental, while the fifth is not. Therefore, when detuning a voice, you might want to detune the sixth so that it tends towards being more in tune. (These approaches work nicely with vocal voices, by the way.)

Special Effects

Okay, let's talk one-finger chords. No one wants to admit that they use them, but most people do. The one-finger chord police may even have seen *you* using this technique the other night! With the TX81Z, you can specify 12 four-note chords that will sound whenever you play a single note. This feature is especially useful for wind controller players who want to be freed from the tyranny of always having to play single-note lines.

There are two very good reasons for keyboard players to use one-finger chords. The first is that they reduce the amount of data your sequencer has to send—one note instead of a chord. The second is that not everyone can reach a tenth interval on the keyboard every time. I can't, and I love the open sound of that interval . . . so I let the synth help me out a little.

To be honest, I haven't found a whole lot of use for the automatic panning yet. It is fun for special effects, but I'm still used to doing it with a panpot on my mixer,

There are two very good reasons for keyboard players to use one-finger chords. They reduce the amount of data your sequencer has to send, and not everyone can reach a tenth interval on the keyboard.

especially since you can "play" the panpot more easily. But I do use the automatic panning for animating layered sounds: the master synth plays one patch without panning, while the TX81Z has velocity-triggered pan on one of its presets. If you restrict the pan range on the mixer (you don't always want the signal flying back and forth) you'll hear a very open effect. Add a little delay to the TX81Z patch and the effect becomes downright strange.

By far my favorite effect is the transposing delay line. First of all, having it built in frees up my signal processors for other uses. Second, this delay can be controlled dynamically by Note-On velocity. A light touch and minimal feedback creates arpeggios; slam the keys with lots of feedback for cascading harmonies. Or feed the entire thing through a pitch shifter/delay line combination

d you can get notes going in two rections at once.

QUENCER HEAVEN

ht new voices in one rack space is very ful, since not every part needs eight- polyphony. With sequencing, being to assign each voice is great, particular- r percussion parts and effects.

But the TX-81Z goes beyond that. If an sync your sequencer to tape, you xtend the various animation effects. xample, set up for alternate mode, se slight variations of the same for each of the eight voices. This will give you a single animated line recorded in a single tape track. To add extra lines, play another line using similar settings into another tape track. You could record, for example, four animated violin lines into four tape tracks. Sure, this technique uses up tape tracks unless you bounce them down—but it's cheaper than buying four TX81Zs.

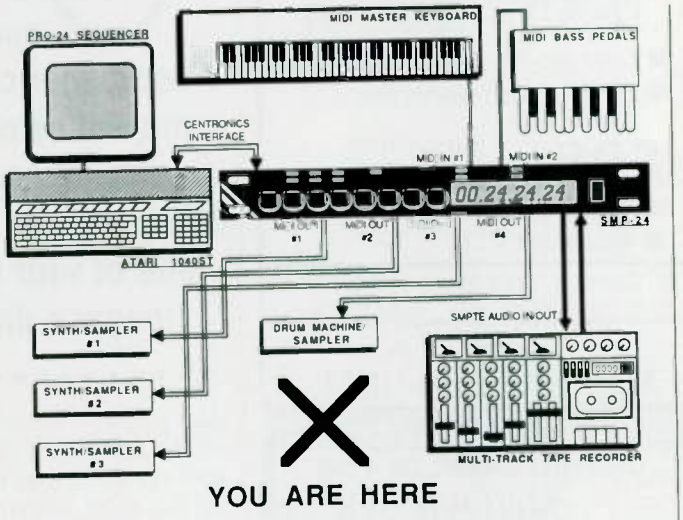
If you sync your sequencer to tape, and use all your synths during final mixdown, the TX81Z will extend your signal processing power. In addition to the built-in delay line, there is also a pseudo-reverb function (it works by gently extending the release time for a voice). This won't necessarily replace your digital reverb in live playing, but combined with a bunch of other synths it makes a tasty addition.

CALLING ALL GUITARISTS

If you haven't bought a guitar-to-MIDI converter yet, this synth is a good reason to do so. With the voice assignment flexibility provided in Performance mode this box is unbeatable. If your controller sends out data for each string on a different channel, the TX81Z's multi-timbral capabilities really shine. It's also fun to assign different voices to different note ranges instead of to different strings, because it

Complete control over your MIDI system

Steinberg JONES



You know what you want out of your MIDI equipment. But more often than not you find youself sacrificing your creativity to the technological anarchy of your tools. Up until now, you've had to choose from equipment that may satisfy one or two needs, and have ended up investing too much time just to get them to talk to each other. Steinberg offers a professional MIDI system that caters to the creative individual, bringing all the MIDI power under your control. Steinberg is here.

For more information on the Steinberg professional MIDI system, see your local dealer or write us.

The System

The Computer:
Atari 1040ST

The Sequencer:
Pro-24 ver 2.1

The Time-Box:
SMP-24 SMPTE-MIDI-Processor or
Time-Lock SMPTE interface

The Synth Editors:
SynthWorks for the DX-7II/TX802, ESQ-1, FB-01, TX-81Z, D-50 and more

The Sampler Editors:
SoundWorks for the Akai S900, Prophet 2000, Mirage

The Score:
MasterScore music notation printing software

FB-01, TX-81Z and DX7II/TX-802 are trademarks of YAMAHA CORP INT'L. Prophet 2000 is a trademark of SCI. ST is a trademark of ATARI CORP S900 is a trademark of AKAI CORP MIRAGE and ESQ-1 are trademarks of ENSONIQ CORP D-50 is a trademark of ROLAND CORP

17700
Raym reet
Suite
Northridge
California
91325

818-993-4091

FAX:
818-701-7452
Telex:
5106017237

Roland Not Copy Protected
ZERO ONE MEMORY CARD
D-50 ™
PATCH LIBRARIAN $49.95
- Complete manipulation of Patches, Banks & Sets
- 64 New Patches

Roland PG-1000
Simulator $69
- D-50 Visual Editor-Slider Icon Based
- Controls all Parameters

D-50 Editor
- Graphic Parameter Display
- Smart Patch Generator creates by:
  - Interpolation
  - By subject
- Musical terms editing
- Multi-tasking

$99

All Software is DA/Memory Resident
Runs concurrently with Sequencers

Available on the
Macintosh ™ & IBM

ZERO ONE DESIGNER SOUNDS
DIGITAL SAMPLES FOR
EMAX
ROLAND D-50 SAMPLES
OBERHEIM MATRIX
HARD ROCK
ETHNIC
FIVE DISK SETS
$49.95 each

Send Check or Money Order to:
ZERO ONE Research
PO Box 301
Brisbane, Calif. 94005
Cal Residents add 6.5% tax
Call for COD
(415) 467-5007
Dealer Inquiries Welcome!

gives you access to each voice at different places on the neck. Piano might appear on the top three strings in open position, but shift to other strings as you move up the neck. This requires a lot of thought to use in a predictable manner, but can be interesting.

And the two "extra" voices on the synth (we're assuming you don't own an eight-string guitar) come in very handy. You can use the leftover oscillators to double two of the strings, or "triple" a single string. Adding an extra voice to a string also means you can play a note, then play another note without cutting off the first one. If you assign just one note to a string, then playing a new note on that string will cut off the old note. While it won't replace true dynamic voice allocation, it still provides at least some of the benefits.

Guitarists can use the one-finger chords too; you will be able to play voicings previously impossible to realize. The size of your hand is no longer a limitation!

You will also find the mono mode (note, not MIDI) very useful. Try it with a sax patch; you'll probably find you can imitate a sax better with a guitar controller than with a keyboard. Using mono mode also has a tendency to clean up pitch bend problems on some guitar converters.

Speaking of pitch bend, as mentioned earlier you can assign the voices to respond to their own pitch bend data by using MIDI mono mode and sending separate data on six channels (for the six strings of a guitar). However, you can also use the global function to bend *the entire guitar* when you do a pitch bend. This is an entirely different sound from anything you have ever heard before.

Guitarists can use the one-finger chords too; you will be able to play voicings previously impossible to realize. The size of your hand is no longer a limitation! Try setting the chords for four notes, each a fifth above the other. Now play a C and a G. The result is a beautiful major seventh with a sixth and a ninth added (C-G-D-A-E-B). You could also set the notes for three thirds and create a major seventh by playing a C and an E (C-E-G-B).

A final tip for guitarists: don't be shy about trying some of the performance controllers keyboard players enjoy so much. Yamaha's MCS-2 lets you add two MIDI foot controllers, two MIDI switches, pitch bend, and breath controller to your arsenal if you don't have a keyboard that will do these for you.

Programming Tips

No article on the TX81Z would be complete without a few tips on what can be done with the basic voice, so here are some of my favorite tricks.

You can create a pair of two-operator voices within a single four-operator voice. You will need to use the "parallel" algorithm (algorithm #5) and since each voice will have only two operators, the sound may not be all that incredible, but there are some advantages to this approach. First, you can have a string/piano or piano/trumpet combination with eight-voice polyphony. Second, by adjusting the velocity sensitivity you can fade the second voice in and out with key velocity. (You can obtain the same effect in Performance mode, but you will have only four-voice polyphony.) Actually, some two-operator sounds are quite pleasing; it's not hard at all to make a convincing brass effect, for example, or a plucked string.

Filter sweep sounds are also possible on the TX81Z, and are accomplished by varying the amplitude of the modulator in a modulator/carrier stack. You're not going to replace a minimoog or ARP 2600, but you will have MIDI control. The trick here is to take advantage of the envelope shift feature, as this allows you to control the modulators over a smaller range than the carrier.

A real nice panning effect can be created by setting two voices as mirror images; have one sweep up while the other sweeps down. Assign each to only one output channel and when you play, the sound will move gently from one side to the other.

ADDITIVE SYNTHESIS

The TX81Z is an FM synthesizer, but it is also capable of crude additive synthesis. If you have been itching to try your hand at this technique, here's the ticket.

Additive synthesis *adds* multiple simple sounds (usually sine waves) to create a new sound. Each component sound will have its own amplitude envelope, so very complex, ever-changing sounds are possible. The catch is that additive synthesis is fairly expensive to implement, as it requires quite a bit of computer power for real time sound manipulation.

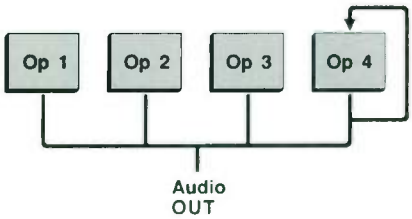


FIG. 3: Algorithm 8 mixes together the audio outputs from four carriers, and is therefore suitable for primitive additive synthesis effects.

Algorithm #8 with the TX81Z (**Fig. 3**) provides four operators whose audio outputs can be added together, so we have the beginnings of additive synthesis. Although you can't specify phase information, you can specify the amplitude (via the envelope generators) and frequency relationships between the operators. You can also "cheat" and use some of the non-sine wave operators to create more complex effects. Set the operators to different frequencies and change their amplitudes; you'll be able to create a number of sounds with this simple arrangement. Octave multiples work well, but even nonharmonically related frequencies create some interesting voices. This is an extremely crude form of additive synthesis, but it will introduce you to the technique.

I suppose these are enough applications for now, so start experimenting! The TX81Z must be one of the most cost-effective synths going (at least for this week). If you're into MIDI on a budget, this is an excellent place to start. EM

Bill Thompson is by day a telecommunications engineer, and by night an audio fanatic. He is the kind of guitarist who likes to play with synthesizers, or if you prefer, the kind of synthesist who likes to play with guitars.

X-LIB

A professional 10-bank librarian system for all Yamaha DX/TX synths and the Commodore-64 computer.

- **Auto multiple-bank load & transmit** - with a single command up to 10 banks can be automatically loaded from disk & transmitted to up to 10 DX/TX synths
- **Fast action** - sends and receives complete banks in less than one second
- **Nice handling** - no "enter voice number" - type commands
- **Voice-copy/swap/rename** - over the complete system
- **File compatibility** - with most other programs
- **Passport & Sequential-type interfaces**
- **Midi: thru/re-channel/play**
- **Disk command functions**
- **Excellent color**
- **Printer support**

Includes 320 New DX/TX Patches!
$45 Complete

Handles the DX7, DX7II, DX7S, DX1, DX5, DX9, DX100, DX27, DX21, TF1, TX816, TX216, TX802 & TX-81Z -
all in one program! All at the same time!

"...I only wish I had seen your ad before paying $99 for another librarian and not getting nearly as much. X-lib is absolutely the most loaded DX/TX librarian for the C-64. Excellent patches too!"
Greg Daniels
NYC Musician

Prompt 1st Class Shipping

Music Design
Box 28001
Crystal
MN 55428

(612) 537-5457

WISE MUSIC

"VISIT THE MIDWESTS' LARGEST MULTI—KEYBOARD SPECIALIST"

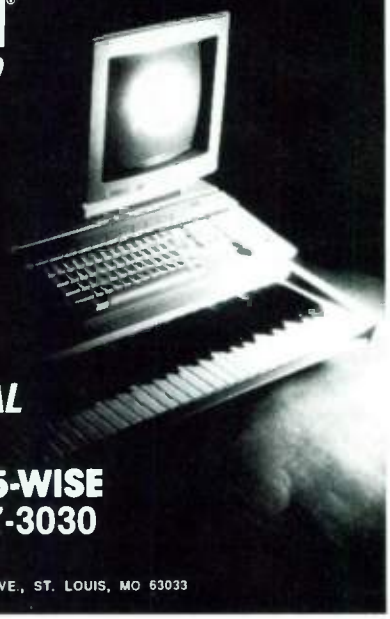
KEYBOARDS
DRUM COMPUTERS
SEQUENCERS
PA
RECORDING
SOFTWARE
COMPUTERS
SERVICES
SUPORT

KURZWEIL
E-mu Systems, Inc.
SEQUENTIAL
AKAI
KAWAI
Oberheim
KORG
CASIO
TOA
Ibanez
AUDIO-TECHNICA
FOSTEX
dbx
Studio Master
BOSE
ALESIS
RANE
OTARI
SIMMONS

SOUTHWORTH
digidesign
PASSPORT
Hybrid Arts, Inc.
JL COOPER ELECTRONICS
Performer
Dr. T's
Opcode

ATARI
ST-1040-520
Sold and Serviced

MIDI
SMPTE
SYSTEMS
FOR
THE
PROFESSIONAL



800-635-WISE
314-837-3030

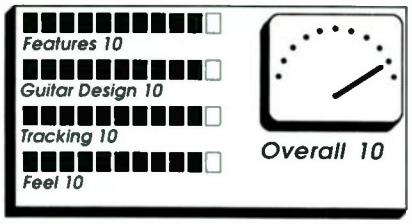
11740 WEST FLORISSANT AVE., ST. LOUIS, MO 63033

FIRST TAKE

THE RATING SYSTEM: *First Take* is just that—people's first impressions of some of the latest products. Two different sets of ratings are provided by each reviewer according to their particular standards. The 11-step "LED meters" show a product's rating in a *specific* category (ease of use, documentation, construction, etc.; categories are chosen by the reviewer), while the 11-step "VU meter" shows the *overall* rating. The latter is not a mathematical average, since the reviewer may judge some specific categories as having more weight than others. For example, if a guitar synth is well-constructed, has great documentation, is easy to use, but doesn't track worth a hoot, it could have several very high LED meters but a low overall rating.

We would like to remind you that these are opinions, not gospel, and as always, **EM** is a communications medium that welcomes opposing viewpoints. We urge you to contact manufacturers for more information and, of course, tell them you saw it in **EM**.

Casio MG-500 & MG-510 MIDI Guitars (Model 500 or 510, $899)



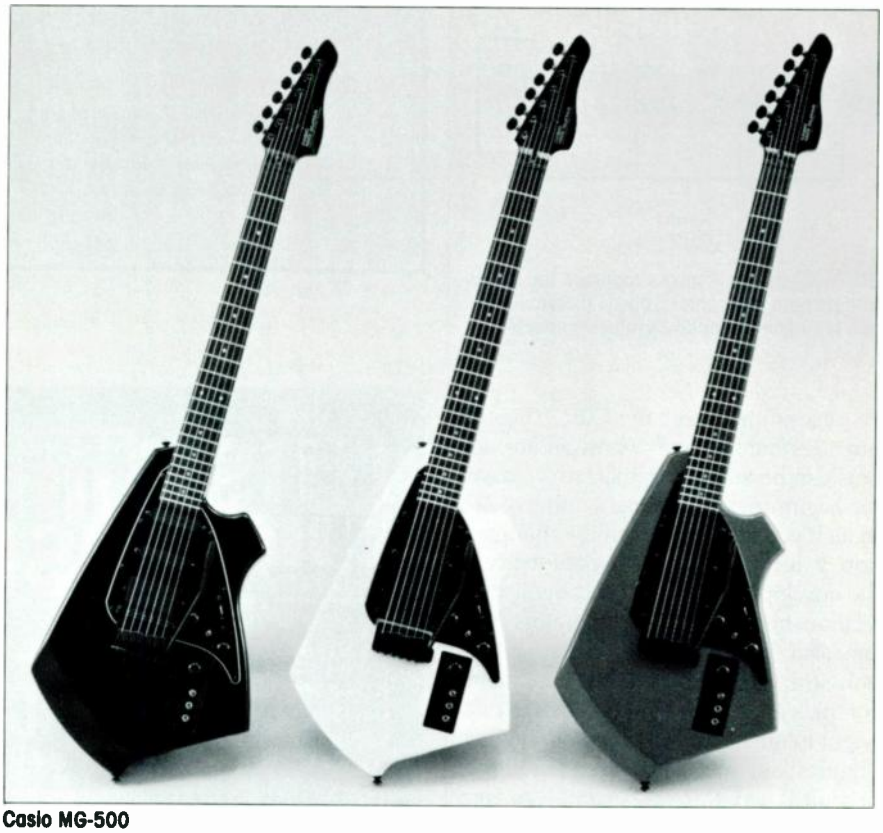
I haven't played guitar in ten years, but I just might take it up again. You see, I was wandering through your basic mini trade show, and as I cruised by the Casio room, I heard what sounded like a mutated Hammond B3 playing guitar licks. "MIDI guitar," I mused as I whipped out my indefatigable Press Pass.

Inside, a young male MTV type wailed on a black Strat copy. "Tracks well . . ." I said to myself, "but, hey, where's the cumbersome-but-obligatory rack mount interface gizmo?"

Listen up, MIDI whiz kids, there isn't one. Casio put all the MIDI electronics *inside* the guitar. This MIDI axe is totally self-contained; it runs off a nine-volt battery, six "AA" batteries or an external adapter. So what did they scrimp on, is it a cheese guitar? No way, it's *solid*. It feels great and plays lightning-fast, and the whammy bar is a real stay-in-tune dive bomber—even without a locking nut. The one I played was virtually straight out of the box, and it was the first electric I've felt comfortable with since my old SG Standard.

Two body styles are available: the 500 is a trapezoid shape with a single cutaway and the 510 is a Strat type; both come in black, white, or red. The bolt-on maple neck has a 22-fret rosewood fingerboard and the instrument has good sustain (given the expanse of electronics inside it). There are two single-coil pickups and a humbucker; volume and tone controls; a five-position pickup selector switch; and a separate switch for the bridge pickup.

Then there are the MIDI controls: a *MIDI Volume* knob affects volume on MIDI slaves by rescaling the velocity data the guitar sends.



Casio MG-500

Three toggle switches control: Performance Mode (straight guitar, MIDI, or both), Octave Transpose (Up, Normal, or Down), and Pitch Bend (Normal or Chromatic). The Pitch Bend switch also has a Program Change position: when you fret a string, it sends program change commands—numbers 0 through 96—so you can gliss up the neck and segue through patches. If that's not enough, the MIDI control section has a *built-in guitar tuner!* Whenever you play an open string, LEDs show whether it's flat, sharp, or in tune—outstanding. With all these features for $899, you might expect the instrument to track sluggishly, but watch out—it *flies!* There is some delay on the low E and A strings—a fact of life with pitch-to-digital designs—but it took my fastest, sloppiest trick licks to trip up the high strings. If you play clean, it plays clean. (Just think what I could do if I played more than once a decade!) Setting up the instrument is a snap. A hatchway on the back accesses six trimpots—one for each string—to set the sensitivity to taste, and the rest is just regular guitar mechanics.

The pitch bend tracking is excellent; double bends sound great (in Chromatic mode with a piano patch it sounds like Floyd Cramer). I really didn't expect the pitch bend to track the whammy bar very well, but it's great—over a range of about a minor third it's *flawless*. I could even rock my finger and produce pseudo-vibrato, though it sounded a bit quantized. But wait, there's *more*. The Casio

MIDI guitar can transmit not only in Poly mode, but also in Mono mode, where each string sends on a separate (consecutive) MIDI channel with *independent pitch bend!*

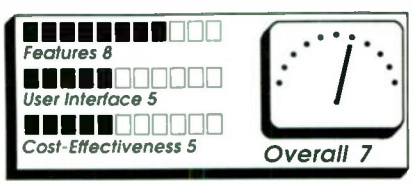
Is there anything that *isn't* cool about this axe? Well, you have to open a hatchway and set a bunch of DIP switches to select the Mode (Poly/Mono), normal MIDI channel, and Mono mode base channel; but this is something you'll probably only mess with occasionally. Also, the separate audio and MIDI Outputs and DC Input are just screamin' for an all-in-one audio/MIDI/DC cable mod. Where's my screwdriver?

It had to happen. . . the genesis of *everyman's* MIDI guitar. Sure, there are some exotic MIDI axes that can out-track the Casio, but not at anywhere near this price. Anybody wanna buy a used SG?

—Alan Gary Campbell

Casio Inc.
15 Gardner Road
Fairfield, NJ 07006
☎ 201 / 575-7400

ES1 Librarian for Ensoniq ESQ-1 and C-64/128 ($99.95)



The Valhala ES1 librarian operates in two modes: one mode holds up to 12 40-patch banks in computer memory, while the other mode holds three banks plus sequence data. A bank of patches takes up 17 blocks on C-64 disk; a single disk should be able to hold more than 1,400 programs. This program has no patch editing features, but editing features are not missed all that much for the easy-to-program ESQ-1.

This program eliminates the "cartridge shuffling" involved in making custom banks, easing the process by enabling single patch and bank transfer between ESQ-1, computer, and disk. ES1 also will work with sequences, so two sets of sequences can be spliced together.

ES1 *patch mode* displays a full bank of patches at the top of the screen, and all relevant function keys towards the bottom (and the screen display is attractively laid out in pleasing colors). Number keys select banks, cursor keys select patches, and function keys control the moving of patches. ES1 is written in machine language and all internal machine functions are instant. MIDI transfer and disk delays are no longer than what one expects from serial transmission.

The ESQ-1 sequencer is very accurate, but lacks editing flexibility (I cope with this by exporting tracks to an external sequencer via MIDI for editing) and is impractical for live use without some sort of mass storage device. The ES1 librarian can store (but not edit) sequences from the ESQ-1 internal sequencer, though it requires many keystrokes to do so. I've been hoping that someone will write a program to use a C-64 as a MIDI-disk for ESQ-1 sequences. Although ES1 does do that, I still wouldn't want to use the ESQ-1 sequencer live because it takes too long to dump sequences to and from ESQ-1 via MIDI, no matter what form of sequencer storage you use, because of the slow rate of data transmission with MIDI. Regardless, the ES1 librarian enables me to save the entire ESQ-1 sequencer memory or selected sequences (which is the only way I know to do this for the ESQ-1).

The ES1 program is so easy to learn that the two-page operation manual is sufficient, assuming one already knows how to use a C-64 and ESQ-1. I agree with this approach; a novice should read the C-64 and ESQ-1 manuals rather than expect a 100-page manual from the software vendor. All features of this program work and are prompted from screen—cryptic codes need not be memorized.

One must be subjective when judging a user interface; I had a friend use ES1 for a couple of days, and he liked the user interface just fine. But I feel that the program may be excessively user-friendly. This program asks "ARE YOU SURE? (Y/N)" for almost *everything* (by the way, I would much rather press "Return," since it is closer to the function and cursor keys, than "Y"). Incidentally, some of the sub-menus require you to hit F5 to exit, whereas other sub-menus require F7, so you have to stay alert to the screens.

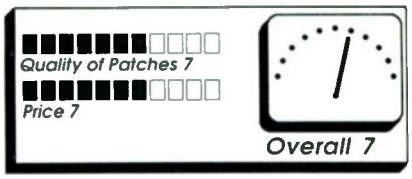
The "exclusive Valhala scrolling disk directory" is another feature with which I was uncomfortable. This method of loading multiple patch banks is easy but time-consuming, requiring an awesome number of key presses to load 12 banks into memory. There is no macro function to load all banks at once. (Valhala states that a macro feature has been added to their similarly designed DX librarian, and they may add a macro to the ES1 in the future, so this may not be a problem by the time you read this.)

In summary, the ES1 program is a well-written and useful program that Valhala is supporting well. The review version was bug-free, but they already have released a new revision that adds several features and supports Ensoniq's ESQ-1 2.3 ROM. Although the program's "idiot-proof" design slows down operations enough that I don't see it as practical for live use, ES1 is extremely useful for manipulating sequences and patches during recording and preparation for live performance.

—James C. Chandler

Valhala
Box 20157—EM
Ferndale, Michigan 48220
☎ 313 / 548-9360 ext. 502

ESQ-1 80-voice patch collections
80-/160-/320-voice ROM $37.95/$74.95/$139.95
80-voice C-64 disks of above patches (for use with ES1 librarian) $24.95



The ESQ-1 can be viewed as one of the fattest analog synths ever made, which just happens to also be capable of very good sampler and FM emulations. The Valhala patch collections make good use of these capabilities. Included are an assortment of acoustic and electric piano sounds (ranging from realistic to bizarre), emulations of classic analog synths of the past, basses, orchestral emulations, organs, and some good sound effects.

Several fine marimba sounds are present, and the sets include the only successful acoustic guitar patches I have yet heard on an ESQ-1. There are several charming sounds that deserve their descriptive names such as "2600" and "-ISAO-". The strings and horns are passable, but I have heard better. The clav sounds are weak, as are most ESQ-1 clav sounds from other sources.

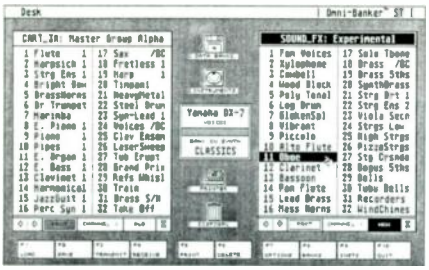
The Valhala patches are a very balanced set. Most of the patches have stereo modulation built in. The variety of the sets makes them useful to the musician who does not have a big synthesizer stack. The marimbas are great, but not desperately needed if you have some FM synths, and the pianos are not essential if you have a sampler available. A synth-rich musician would probably want to build a patch collection based on sounds where the ESQ-1 outperforms FMs and samplers, such as thick pads, animated lead lines, and fat stereo bass. There are many good examples of these types of sounds in the Valhala sets, though the only way to get them all on a single IC is to buy the 320-voice ROM or have Valhala burn a custom chip for you. (*Editor's note: Valhala will burn custom ROMs for consumers with either their patches, or the customer's own patches, in the 80-, 160- or 320-voice varieties for not much more than the prices listed above; please write to the manufacturer for complete details.*)

In summary, the average musician will find a good percentage of "keepers" in this set, and the price is comparable with other sources. It's always hard to evaluate patches, but to my ears Valhala has done a good job.

—James C. Chandler

Valhala
Box 20157—EM
Ferndale, Michigan 48220
☎ 313 / 548-9360 ext. 502

Omni-Banker™ ST



"Universal" MIDI Librarian for the Atari 520/1040 ST

- View *entire banks* of up to 128 named patches
- Select, audition, and arrange patches within or between banks, using the mouse or keystrokes
- Use as Desk Accessory or normal program

- Manage dozens of *different* synthesizers
- Organize thousands of patches on a single disk
- Inexpensive alternative to slow tapes, costly cartridges, and single-instrument librarians

- Already supports: Ensoniq ESQ's; Yamaha DX-7's/9/5/21/27/100, TX-7/racks/81Z, FB-01, RX-11/17/21; and Casio CZ-101/1000/3000/5000
- Expandable to support most current *and future* MIDI devices, with free updates issued quarterly

- Works in monochrome or medium-res color
- **No risk trial, 30 day money-back guarantee**
- NOT Copy Protected. Shipping Oct 1/87

available *exclusively* from:
Paradigm™ Software Products
1369 Concord Pl, Suite 3-B
Kalamazoo, Mich. 49008
(MI resid. add 4% tax, foreign $10 S/H)

Introductory Price...
$55
Plus $5 S/H
Check/M.O.

SPECIAL INTELLIGENCE

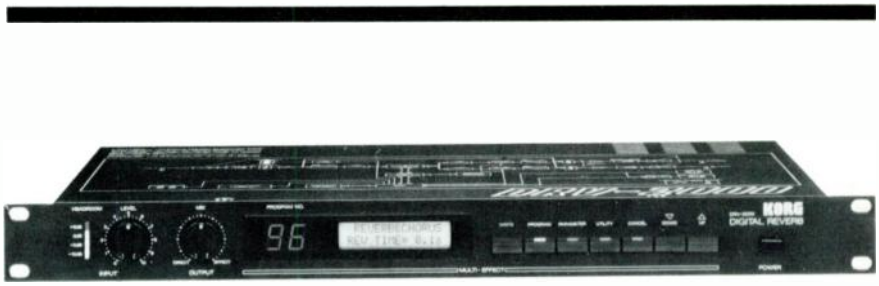
THE KEYBOARD SHOP —HOUSTON

WE SPECIALIZE IN INTELLIGENT, TECHNICAL INFORMATION ON WHAT WE SELL. THAT'S WHY WE DO IT BEST!

THE DRUM·KEYBOARD·GUITAR SHOP

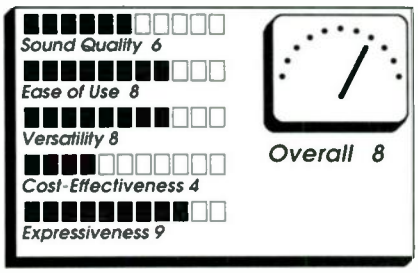
CALL TOLL FREE
1-800-624-2347
713/781-3786

THE KEYBOARD SHOP IS A DIVISION OF THE DRUM/KEYBOARD SHOP
5626 SOUTHWEST FREEWAY
HOUSTON, TX 77057



Korg DRV-2000

Korg DRV 2000 Digital Reverb ($650, $1,250 Canada)



Digital reverbs and multi-effects have been popping up all over the place, and in the search for novelty, the temptation exists for manufacturers to resort to gimmicks. So Korg comes out with the DRV-2000, with "multi-modulation." Behind this attention-grabber, though, is anything but a gimmick. In fact, multi-modulation (MM) is what the DRV-2000 is all about. Simply put, MM means control. It's the capability to modulate the parameters externally—via foot pedal, input volume or MIDI.

First, let's take a look at the available effects. There are 16 programs in ROM containing algorithms for reverb, gated reverb, echo, flange, chorus, panning and a couple of programs where echo and chorus are combined with reverb. Eighty user programs come factory-preset in nonvolatile RAM, and though these are only edited versions of programs 1 through 16, some of them are very good and even include stored MM control settings. They're definitely a good place to start experimenting. The reverb programs include an early reflection level giving them a clean and natural sound, though perhaps not as warm as an SPX90. The echo programs are output in stereo with individual left-right input and output levels (programmable as well as "MM-able"). Some interesting stereo rhythmic effects can be created by cross-inverting the feedback levels. Maximum delay in each channel is 800 ms. The three modulation programs are also stereo effects: flange, chorus and—something truly unique—space pan, where the left-right motion of the pan is synchronized with a tremolo effect. This causes the sound to increase and decrease in volume as it swings back and forth in the stereo field, yielding a two-axis rotation of sound (left-to-right and near-to-far) along with, get this, a phase control that lets you select the *angle* and *direction* of the motion. (Caution: don't expose yourself to this effect for long periods of time while wearing headphones.) The combination effects are handy since you don't need to have two units to get the desired effect. The reverb and echo program, which is great for singing, has a shorter delay time but allows you to output each effect from its own channel (another head-spinning effect which can be quite useful).

Each of these excellent programs can be controlled using MM. The number of controllable parameters per program ranges from three to seven, though only two can be selected from simultaneous control. In general, reverb time, early reflection level, feedback, modulation frequency and depth, as well as input and output levels, are MM-able. The sources for control are impressive: two pedals (each one assignable); input level (great for guitar); direct/effect; and MIDI data, including independent plus and minus pitch bend, aftertouch, note number, velocity and 64 MIDI control changes (such as portamento, modulation wheel, damper, and others). I've had the opportunity to try out such things as controlling the pan speed with a bender, "singing" the reverb time, and (imagine this one), velocity acting on the input level of the reverb when echo and reverb were split left and right. Amazing. One significant feature of MM is the ability to slope the control, giving it some sensitivity. With this, I was able to play a MIDI keyboard and have the reverb go from long to short—not on to off—every time the damper pedal was lifted. This prevented the reverb from muddling up the chord changes and made playing very natural. And these are just a few of the many MM possibilities. Let your imagination take it from here.

Add features like program change via MIDI, bulk or single patch data dump, 12 kHz bandwidth and all information displayed on a 32-character backlit screen and you'll agree with me that Korg didn't get carried away with gimmicks while forgetting quality. What they do offer is nice: expression. And isn't that what music is all about?

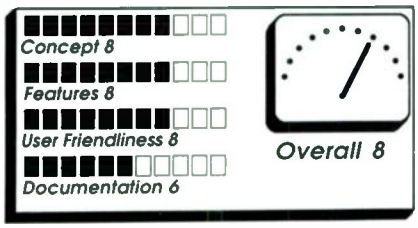
—George DaNova

Korg USA, Inc.
89 Frost Street
Westbury, NY 11590
☎ 516 / 333-9100

in Canada:

Erikson
378 Isabey St.
Laurent, Qc H4T 1W1
☎ 514 / 738-3000

Triangle Audio C-64 DX/TX and CZ Patch Librarians ($45 ea.)



Despite the inroads made by late-generation personal computers, the Commodore 64 remains a fixture in MIDI systems; and software developers are keeping the C-64 market alive with budget software—patch librarians, MIDI data processors, and the like. If you're in the market for a budget DX/TX or CZ librarian, have I got some software for you!

The Triangle Audio librarians run on the C-64 or C-128, and work with Passport or Sequential (Dr. T) interfaces. The two programs are similar (DX/TX version shown); a single screen displays the bank name and patch names for the current bank (two banks in the CZ version), an eight-patch buffer that lets you rearrange patches between banks, and mini-menus of available commands.

The function keys control basic patch juggling functions. You can send or receive banks or single patches, save and load to and from disk, copy patches between locations, and name banks and patches. When an operation requires a decision, the program queries. For example, when you select SEND 1, it asks "Send to: (I)nternal or (C)artridge" (or to the "(S)ound Buffer" in the CZ version); and when you select LOAD BANK, a pull-down window displays a directory of patch files on the disk, and you select the file to be loaded with the cursor keys—what could be simpler? The programs read both Triangle and Dr. T format files automatically, though they write only Triangle-type files. To copy a patch from one location to another, you use the wraparound cursor to select the source and destination locations.

Other program features let you set the MIDI channel, toggle the Verify function (so it no longer asks "Do You Want To? Y/N" before every operation), and print out parameters for a bank or single patch. The DX/TX version also lets you select a DX or TX "Instrument" mode, but does not remember the extra TX function parameters. All these features respond to simple, single-key commands ("C" for Channel, then enter the number, "V" for Verify, etc.) that are listed at the bottom of the screen. In fact, the programs are so intuitive that I had them up and running without referring to either of the concise manuals.

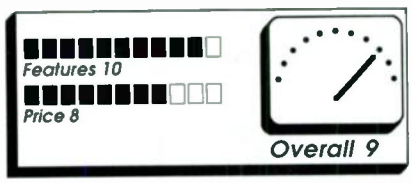
Any quibbles? Not really. The PRINT functions won't print to the screen only, but at this price, *any* print function is gravy; and on the CZ version, the screen shows only the name of the most recently loaded bank—a minor inconvenience.

Each librarian includes 64 mixed-bag patches (from in-house programmers) that range from "heard it before (yawn)" to "lemme hear that again!"—but, hey, they're free! There's also a set of 576 DX patches (18 banks) that can be purchased separately on disk or TX tape for $60, or on the librarian disk for $75 *total*. The banks include: Acoustic Pianos, Electric Pianos, Strings, Brass, Organs, Clavs, Orchestral, Basses, Synths, Voices, Leads, Splits, Drums, Mallets, FX, Guitanimals (!), Unusual, and Miscellaneous Percussion. There are some great patches here, though it will take you a while to sift through the entire set. There are also some *average* patches too, including the usual stuff—even so, the patches probably are worth the extra money when purchased with the librarian.

What can you say about software that's inexpensive, works great, and is fun to use, and by the way, is *not* copy-protected? Check it out. —*Alan Gary Campbell*

Triangle Audio, Inc.
PO Box 1108
Sterling, VA 22170
☎ 703 / 437-5162

JiffyDOS/64 for the Commodore 64 and SX-64 ($49.95 postpaid)



JiffyDOS/64 is a firmware quickload product for the Commodore 64 or SX-64. It comes as two ROM ICs and some related hardware. One ROM replaces the Kernal IC on the C-64 circuit board and the other ROM replaces an IC on the disk drive circuit board. JiffyDOS/ 64 is available for C-64 systems using 1541, 1541C, 1571, and FSD-1 disk drives. Additional disk drive ROMs are available at $17.95 each, for those interested in speeding up a second, third, or fourth disk drive. The model of computer (C-64 or SX-64) and disk drive should be specified when ordering JiffyDOS/64.

Using the supplied instructions, installation should be a snap for all but the most thumb-fingered musicians, assuming the two ICs to be replaced in the computer and disk drive are socketed. If a user with no soldering experience is unfortunate enough to have a computer without sockets at these locations, get a service center to do the installation.

JiffyDOS/64 speeds up loading of all types of files, and worked with all programs I tested. If a program isn't compatible, JiffyDOS/64 can be turned off via software or a toggle switch included with the hardware. In addition to fast loads, JiffyDOS/64 includes the standard "wedge" commands that allow files to be manipulated without typing long lines of clunky Commodore DOS commands.

Before JiffyDOS/64, I had tried several other types of quickload programs, hoping to speed up the loading of sequencer files, and experienced frustration. Problems ranged from sequencer files erasing disk-loaded programs when loaded, to having to use a cartridge expander card to hold a MIDI interface cartridge *and* quick-load cartridge. I also tried a fast-loading Kernal replacement IC from Megasoft. Maddeningly, the Megasoft DOS seemed to work on everything *except* sequencer data files! I half-expected JiffyDOS/64 to be inoperative on sequencer files too, but was pleasantly surprised to find that it worked 100 percent as advertised.

On the Passport and Syntech sequencers, JiffyDOS/64 accelerates file-loading up to 300 percent, depending on file length (long files have the most improvement). For example, the Syntech Studio One program loads in 17 seconds, and full Syntech song files load in 14 seconds. Without the JiffyDOS/64, I never considered live performance practical with the Passport or Syntech sequencers, due to the slow file-loading times, but JiffyDOS/64 makes these as viable for live use as Dr. T's KCS program (which has an edge on the other programs because sequences can be compressed and looped more effectively than with the other major C-64 sequencers). Though I have not tested the Sonus sequencer programs, I strongly suspect that they also will be accelerated, since the Sonus is an improved version of the Syntech sequencer program.

One thing I did not try was to re-save the Passport and Syntech files to disk after JiffyDOS was installed. Re-saving files originally saved with the stock Commodore DOS can further accelerate their load speed by nearly two times (which would mean a resultant 500 percent speed increase for the Passport and Syntech files). By the way, according to the manufacturer, the maximum speed increase attainable with JiffyDOS is 1,000 percent (ten times faster); this occurs when loading program-type (PRG) sequencer files that have been saved under JiffyDOS/64. Although not tested for this review, I've been told that Steinberg/Wersi sequencers can load files at this rate with JiffyDOS installed.

I had to modify an early rev. of Dr. T's KCS program to get it to work with JiffyDOS/64. Due to problems with the early Sequential 64 MIDI interface, older KCS programs load a Kernal from disk. Replacing the Kernal file on the KCS disk with the JiffyDOS/64 code gave an almost 200 percent improvement when loading long sequencer files. Newer KCS programs (ones that do not load a Kernal from disk) do not require this modification, and are speeded up as with JiffyDOS. In addition, newer KCS programs use a different (faster)

file-access scheme, resulting in a 500 percent speed improvement with JiffyDOS/64 installed according to the manufacturer.

Those who want to modify an early KCS program to work with JiffyDOS/64 will need a JiffyDOS/64-equipped computer. This modification does not subsequently speed up file-loading on non-JiffyDOS/64 computers, since the disk drive ROM would still be "stock." If you only have one copy of KCS, the backup you order ($15) will be the newer version, so use the backup as your main disk and only modify the original. Though you will be copying the JiffyDOS/64 ROM to disk, I wouldn't consider this piracy, since you still need the entire IC set to benefit most from JiffyDOS/64. This procedure should also speed up disk access for Dr. T's DX and CZ librarians, though slow disk access is not usually as aggravating in a librarian program. To modify KCS, get a backup copy, remove its copy-protect tab, and while it's in the drive, run the following program (check *carefully* before running):

```
10 OPEN 15,8,15,"S0:KERNAL":CLOSE15
20 OPEN 8,8,8,"0:KERNAL,P,W":Z$=CHR$(0)
30 PRINT#8,Z$CHR$(224);
40 FORI=57344TO65535:A$=CHR$(PEEK(I))
50 PRINT#8,A$;:NEXT:CLOSE8
```

The KCS disk should now operate with JiffyDOS/64; replace the disk's write-protect tab.

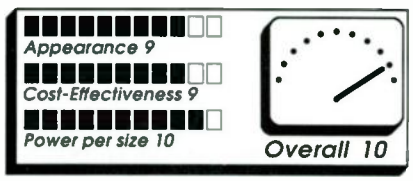
It may be possible to use this method to place other cartridge-based quickloads on a Dr. T disk, assuming you find a cartridge-based quickload which is actually an external Kernal replacement, and accelerates sequential file types.

JiffyDOS/64 is relatively easy to install and works perfectly. It finally makes the venerable C-64 sequencers fast enough to be truly practical for live performance.

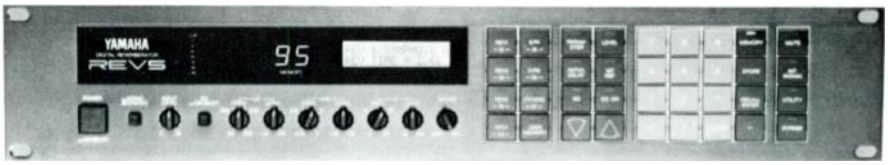
—James C. Chandler

Follows Inc.
41 Brynmawr Dr.
E. Longmeadow, MA 01028
☎ 413 / 525-8197

Realistic Minimus-7 Stereo Speakers, cat. no.40-2030B ($49.95 ea.)



The Minimus 7 is an attractively packaged, 2-way "mini" speaker with a 3½-inch woofer and a dome tweeter. I like them better than some expensive speaker control monitors because I feel those specialty monitors sound *too* good. I already have large, professional monitors that give me *good* sound; what I need is a small reference monitor that really sounds like a small speaker.



Yamaha REV5

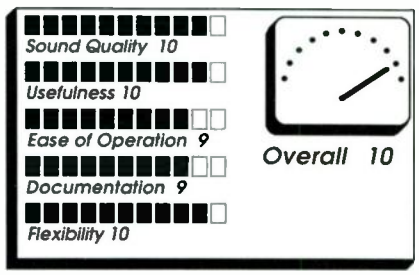
Make no mistake though, the Minimus 7 will handle 40 watts and, according to my sound level meter, it's just as loud as my E-V Sentry 100's in the mid and high frequencies. Speaking of loud, I have no trouble mixing at 85 to 90 dB with these little guys and the mixes are better. I've even mixed heavy metal with them. Of course, the whole idea is to use small reference monitors at a low level (70 to 80 dB), and if you can get the mix to sound good on these little things at 70 dB, it's bound to sound great on your monsters at 100.

I can think of nothing Radio Shack could do to improve the Minimus 7. The sound is just what I want from a reference monitor, the power handling is more than adequate, and the price is more than right (I got mine on sale for $29.95). They also look appealing, and are available in black, silver, or woodgrain.

—Bob Damiano

Radio Shack
Tandy Corp.
Fort Worth, TX 76102
☎ 817 / 390-3011 (Nat'l Headquarters)

Yamaha REV5 Digital Reverberator ($1,895)



The REV5 reverb/delay unit samples either a mono or stereo audio signal at the compact disc rate of 44.1 kHz along a 16-bit data path and delivers a processed mono or stereo output with a 20 Hz to 20 kHz frequency response. Its reverb has a 78 dB dynamic range; its delay, 84 dB. It has a switchable, digital, three-stage, fully-parametric EQ for every program, as well as a three-stage, analog, quasi-parametric EQ controlled from the panel. It uses up to 22 editable parameters for its programs. In addition to front panel operation, it provides a hand-held remote control and a jack for an optional footswitch, both of which can access the unit's programs. It has both ¼-inch and XLR balanced inputs and outputs that are both switchable between -20 dBm and +4 dBm.

The REV5 has a MIDI In port for receiving Program Change messages and a second MIDI port switchable to either Thru or Out—for dumping programs to an external storage device. An eight-segment LED meter indicates input levels, a two-digit LED displays the current program number, and a 16-character by 2-line backlit LCD shows the name and editing parameter of the selected program.

The REV5 contains 39 preset programs and offers 60 user locations in memory for programs created from scratch or from edited presets. The presets consist of five types of programs: *Reverb* (including gated effects); *Delay and Echo*, with a delay time that goes up to 2,900 ms; *Early Reflection* (divided into more and less dense programs); *Pitch Change*; and *Modulation*.

The Reverb programs have an impressively complete set of programmable parameters, including separately adjustable decay times for both high and low frequency bands, as well as overall decay. *Diffusion* is a useful parameter that subtly alters the richness and complexity of the reverb signal. You can also specify: balance of early reflections to reverb; a secondary reverb effect that follows the initial signal to emulate realistic room response; low-pass filtering; *Space Modulation* (simulating interference among reverberated reflections); and gate level.

In addition to its liveness, room size, feedback and other parameters, the Early Reflections mode has a *Rehearsal Room* program with piano, organ, brass and guitar settings. These are programs designed to enhance those instruments. The Stereo Delay and Echo type programs and the Modulation programs—Flange, Chorus, Phase, Tremolo and Symphonic (Symphonic is a "hyper chorus" that uses modulation and sums three separate delays and modulations)—have the usual feedback, delay and gain, as well as low-pass filtering.

The Delay, Modulation, Early Reflections and Reverb programs have separate gain control for left, right and *center* channels that can tailor the mix of reverb and early reflections to enhance the listener's sense of hearing the sound in a realistic space.

The three Pitch Shift programs have a range one octave above and one octave below the source signal, settable in two ways. An external MIDI device such as a keyboard or sequencer can adjust it in half-steps, and an internal adjustment in the unit's digital domain works in increments as small as one cent. There's a delay time and a *feedback* feature that gives you a controllable number of repeats, each of which will be pitch-shifted—

by the amount you set—up or down from the previous repeat. The unit will simultaneously put out three notes at three different pitches: the source note at its original pitch, a second note shifted up and a third note shifted down, in mono or stereo, to create three-part harmony effects.

For each program, the processed signal has a three-module digital parametric EQ, fully featured with adjustable bandwidth ("Q") and high and low shelving. In addition to this high-powered tool, the front panel provides a three-module *quasi-parametric* (non-adjustable Q), analog EQ that pre-processes the signal. Yamaha says this is intended to give you a "house mix" kind of overall processing.

Programs 91 through 99 are *Combination Programs*, each a combination of two effects and a five-parameter gate. These allow the simultaneous and gated use of Reverb with either Early Reflections, Echo, Pan, Chorus or Pitch Change—a nice way of getting triple-duty from the machine. The nine combinations are fixed in the machine's software (you cannot create your own) and offer a real and appreciable degree of processing power. The *Pan* feature, logically enough, only works in these combinations, and will pan the effects it follows either left to right, right to left or repeatedly back and forth.

The controls are laid out well and feel sturdy, well-constructed, and reliable. Once you learn where they are and the kinds of functions allocated to each of them, getting around these controls is easy and fast. You can enter parameter numbers by using the *scroll* buttons or with the calculator-style keypad; and believe me, you *don't* want to scroll from 0.1 ms to 2,900 ms. There are better uses of your time. Moving from one parameter to another is quite facile. As opposed to the SPX90, say, where you use just one or two buttons to scroll through all the parameters in only one direction, the REV5 offers more buttons (so each has fewer parameters to scroll through) and you can go forward *and* backward. This is progress. The documentation is good, and not overly long.

The unit is *very* quiet and the quality of the sound reflects the REV5's specs: it is open, smooth, transparent and downright lovely. Even the reverb from a close, dissonant tone cluster is pleasant and without the harshness of small-memory algorithms and low bandwidth. At the longest reverb (99 secs.) I could hear the looping, but it was subtle and musical.

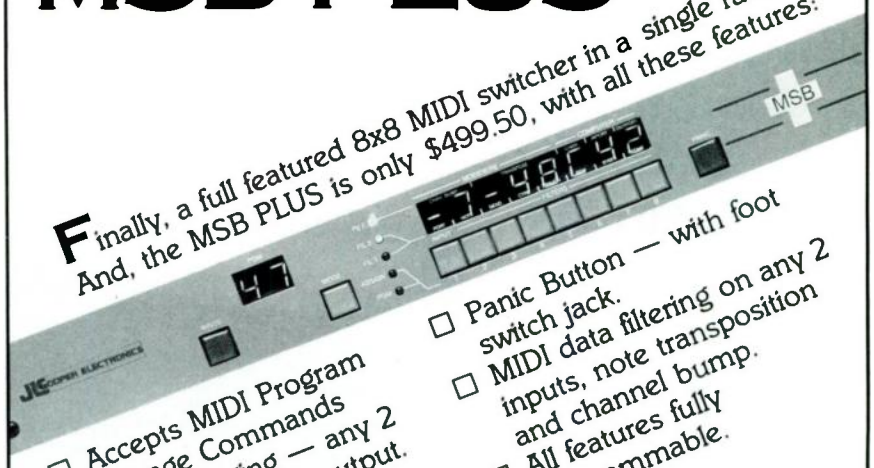
This machine is a real beauty that I had trouble keeping my hands off; I wanted to put every sound in my studio through it, just to hear the effect. The REV5 is a superior unit that will fit well into any professional studio.

—*Tim Tully*

Yamaha
6600 Orangethorpe Avenue
Buena Park, CA 90620
☎ 714 / 522-9011

MSB PLUS™

Finally, a full featured 8x8 MIDI switcher in a single rack unit. And, the MSB PLUS is only $499.50, with all these features:



- ☐ Accepts MIDI Program Change Commands
- ☐ MIDI Merging — any 2 inputs to any 1 output.
- ☐ Panic Button — with foot switch jack.
- ☐ MIDI data filtering on any 2 inputs, note transposition and channel bump.
- ☐ All features fully programmable.

The best MIDI tool available!

JL COOPER ELECTRONICS
1931 Pontius Avenue • West Los Angeles, CA 90025
(213) 473-8771 • TLX: 5101001679 JLCOOPER

Rhythm City

America's Largest Dealer for the Electronic Musician
All Name Brands
Roland • Korg • Ensoniq
E-mu Systems • Kurzweil • Casio • Akai
Tascam • Fostex • Soundcraft • Studiomaster
All lines of keyboards and software in stock!
Digidesign • Passport • Dr. T. • OpCode • Mark of the Unicorn
Complete MIDI Recording & Performance Systems
Professional Advice *New and Used Equipment Available*

Call for a catalog and pricing information.

Musicians Buy At Rhythm City!
287 E. Paces Ferry Rd.
Atlanta, Georgia 30305
(404) 237-9552
Hours: Monday thru Saturday: 10-6

Having problems booking the Cleveland Symphony Orchestra for your sampling session? Did you try to sample a car crash, but your engineer didn't punch record as you drove your car into the nearest brick wall? Why sample the hard way?

Sampling Alternatives: The Sound Ideas Sampler Library

BY GEARY YELTON

Face it, good samples cost money. If you do all your own sampling, you need a top-notch (that usually means expensive) microphone and great chunks of time to set up and record instruments and effects individually, preferably in an acoustically perfect studio environment. You also need well-trained musicians to play each instrument. Recording samples can be artistically rewarding, but it's often a hit-or-miss proposition. As for convenience, have you ever tried to find a session sitar or bagpipe player in a small town past midnight? And where do you find a car crash when you need one?

You can buy sample libraries on disk from a multitude of vendors, but these don't come cheap. Even if you swap original sounds with your friends, at some point somebody puts some cash on the counter. A decent digital sampler is expensive enough, and it's useless without a generous handful of well-crafted samples. What's an aural explorer to do?

A Sampler Library On Compact Disc

Sampling from CDs has become a common practice, but isolated sounds are still difficult to find. Enter the new Sound Ideas Sampler Library: $495 for 3,100 different samples, superbly recorded in stereo on six compact discs—an entire orchestra, and then some, at your disposal. I'm not exaggerating. The Sampler Library (the latest product of a Canadian company also offering a 5,000-effect studio sound effects library on CD) was one of the highlights of this summer's NAMM show.

You still have to do all the sampling, looping, and mapping on your own sampler, but recording from compact discs is far easier than individually miking all those instruments. If the source material is recorded right the first time, chances are good your results can sound *very* pro-

fessional. Every sound in this set was meticulously miked, digitally recorded, and digitally mastered. With very few exceptions, they sound as good as the best samples I've heard.

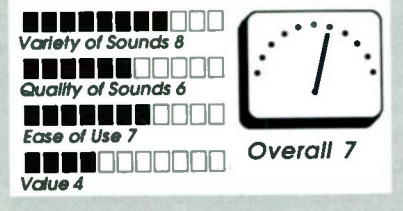
The Sound Ideas Sampler Library includes tones from 135 different musical instruments and over 375 assorted sound

Okay, 500 clams doesn't sound cheap, but how quickly can you go through that much bucks in studio time when you do it yourself?

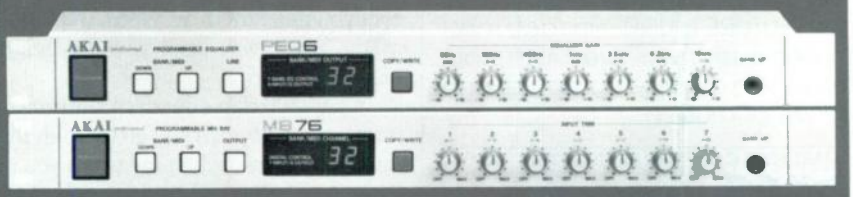
effects, all carefully indexed and cross-referenced for easy access. The user's manual lists sounds both alphabetically and in the order they appear on disc. Magnetically storing such a huge collection would require hundreds of floppies; even a hard disk would get filled quickly. With compact discs, though, you have perfect samples at your disposal when-

Product Summary

Product: Sound Ideas Sampler Library
Type: Six-CD set of instrumental sounds and sound effects
Retail price: $495
Hardware requirements: CD player, digital sampler
Manufacturer: Sound Ideas, 86 McGill Street, Toronto, Ontario, Canada M5B 1H2 ☎ 1-800/387-3030, or ☎ 416 / 977-0512.



ABSOLUTE NECESSITIES



The Akai PEQ6 Programmable Equalizer

adds the EQ your sound or recording system needs,with 6 separate 7-band EQ circuits, all programmable into 32 memory banks, MIDI switchable, and in a 1 space rack.

The Akai MB76 Programmable Mix Bay

adds the extra inputs your system needs, with programmable volume and routing on each of the 7 inputs into any of the 6 outputs, MIDI switching, and in a 1 space rack.

Akai Professional builds products to increase *your* output.

For a demo, see your local authorized Akai dealer, or write:
Akai Professional
P.O. Box 2344 Fort Worth, TX 76113
Phone 817 336-5114 Telex 163203 IMCTX UT
FAX 817-870-1271

AKAI *professional*
Creative at Heart

OUR BEST FEATURE IS ALWAYS RIGHT BEHIND YOU

The new fashion in music retail these days is "service." Of course, that's easier to say than it is to do. At Reliable Music, service has been a way of life for over 25 years, from guiding you through product selection, applications and system integration to after-the-sale service and support. Reliable Music is so committed to customer satisfaction that we are **doubling** the manufacturer's warranty — at no extra charge — on every keyboard that we sell. Reliable Music invites you to compare this unique offer with anyone's service; we think you will agree it separates the men from the boys in the music business.

When you are ready for more than a box, give us a call.

Reliable Music
650 E. Stonewall Street
Charlotte, NC 28202
704-375-8662

FREE MIDI CATALOG!

COMPUTERS AND MUSIC FOR EVERYONE

You don't have to be a PRO to buy from FUTURE MUSIC - in fact, most of our customers are "just plain folks" with a home computer and a love of music!

START YOUR COMPUTER MUSIC SYSTEM TODAY

$295 CASIO CZ101

PROFESSIONAL SYNTHESIZER SOUND UP TO FOUR UNIQUE SOUNDS AT ONCE PROGRAMMABLE. PORTABLE. EASY TO USE — THE STANDARD —

FREE AC ADAPTER & SHIPPING

MIDI INTERFACES FROM $39.95

ALL MAJOR BRANDS AVAILABLE

BOOKS ON MIDI, MIDI PRODUCTS

- Understanding Midi, Vol. 1, Now Only . . . 2.95
- New! Understanding Midi II 3.95
- Synthesizer Technique 9.95

Add $1.50 for postage/handling per book.

Future Music

800-FOR-MIDI 10-6 M-F 12-5 SAT.

(800) 367-6434 or (702) 826-6434

900 W. FIRST - P.O. BOX 1090 - RENO, NV 89504

MasterCard and Visa Accepted

Assured Excellence

Custom pressing, tape duplication and packaging.

1,000

7"-45's including mastering, metal parts and processing, white sleeves, labels, pressing.

$439.00

12" Albums with jackets including mastering, metal parts and processing, poly dust sleeves, labels, pressing and printing of full colour ultra high gloss board jackets from customer supplied process film.

$1,390.00

(F.O.B. DETROIT)

- 2 - 3 WEEK SERVICE
- VIRGIN VINYL
- HIGH GLOSS BOARD JACKETS
- CrO_2 CASSETTES
- CUSTOM 7" SLEEVES
- INHOUSE ART & TYPESETTING

Call Toll Free Continental U.S.A.

1-800-263-7798

Canada's Largest Custom Producers

the custom record people **WORLD RECORDS**

BASELINE ROAD WEST, BOWMANVILLE, ONTARIO L1C 3Z3

ever you need them, in a form that's only a few steps away from your keyboard-playing fingertips.

Okay, 500 clams doesn't sound cheap, but how quickly can you go through that much bucks in studio time when you do it yourself? The only other way to get higher-quality samples is to buy a CD-ROM system for your sampler, and then you're talking *really* big bucks. For a lot less money and a little more trouble, you can still have digitally recorded quality and save a bundle. If you have a sampler that's so new there's no extensive library available yet (like mine), or if you use more than one sampler (like me), this set may be especially attractive to you.

The Sounds

The variety of sounds is amazing. Most instruments are recorded at intervals of every major third or so. Legato tones range from four to 20 seconds long. Almost every member of the string family is here, from viola and cello ensembles to mandolin and electric fiddle, not to mention upright bass, Steinberger and Fender electric basses, Les Paul, Stratocaster, Martin 6-string, 12-string, pedal steel, dobro, Melobar, classical, and seemingly every other guitar played in every way possible. You'll never want for guitar samples again.

On one CD you'll find *every note* of a very fine concert grand piano, with and without the soft pedal, miked both closely and ambiently. There are also 15 piano effects (strumming and beating on the strings and so forth), Hammond and pipe organ, harmonica, Jew's harp, washboard, sitar, tabla, recorder, and 125 saxophone samples. Orchestral instruments are all available, played legato, staccato, spiccato, pizzicato, bowed, overblown, muted, with and without vibrato and tremolo, solo, duo, and ensemble.

Over 150 human voices are recorded, from male falsetto to female contralto, with only one mixed vocal group. The biggest disappointment is that while most voices sing different syllables, they often sing the same pitch over and over. You may have to look elsewhere in your quest for the complete sampler library if you want a set of vocal sounds with a wider range.

To some, the percussion sounds alone may be worth the cost of the library. All the standard drum sounds are here, including 50 snares, 20 hi-hats, and over 20 bass drums. Cymbals, bells, gongs, temple blocks, wind chimes, RotoToms, Simmons, rosewood and Kelon marimbas, and all kinds of Latin percussion instruments can be found. This collection can turn your sampler into the ultimate drum machine. (Now what would you pay?)

While the selection of sound effects is ample, many of the choices seem kind of odd. Fifty-one types of footsteps? Twenty-six seconds of alarm clock? Sixteen different automobile horns? The release on the rear hatch of a Japanese car? These are fine for Foley work, but they aren't the kind of sound effects a stage or studio player usually needs. Besides, there's only one howling wind, one crackling fire, and seven water samples. Even though most of the sound effects may be useful, I'd rather hear a greater variety with fewer permutations. According to Sound Ideas, this is currently under consideration.

If you have a CD player with both indexing and looping, the time you spend sampling will be most efficiently used.

Sampling From Compact Disc

Certain features on your CD player can make sampling a lot simpler. Some CD players can loop over a specified portion of a track—a real time-saver for pulling samples off discs. While the sound repeats continuously, you have plenty of time to set up your input level and other sampler parameters before you record anything. Every sound in the Sampler Library is digitally indexed, so it's very useful to have a CD player that can locate not only a specific track, but a specific index as well. Because most CDs aren't indexed, a lot of CD players don't feature index search. Without indexing, record-

ing takes longer, so if you have a CD player with both indexing and looping, the time you spend sampling will be most efficiently used. I actually went out and bought a new CD player that had these features.

So What's Not To Like?

The original release of the Sampler Library has a very few sounds containing extraneous noises, like paper rattling or throats clearing. An occasional tone is poorly played or even slightly out of tune. It's really weird to map a string ensemble across your keyboard, only to have one sample stick out because it's flat. A couple of sounds even have their attack portions completely chopped off. In response to user feedback (complaints), Sound Ideas is working to improve and update their product. In fact, a new and improved version should be available by the time you read this.

The idea of putting a sampler library on audio CDs will surely become more commonplace (Korg also offers an audio CD for sampling purposes). The quality of most of these sounds will be hard to beat. With the Sound Ideas Sampler Library, problems with miking instruments are solved completely; now all you have to do is perfect your button-pushing technique. EM

Geary Yelton is a Macintosh fanatic and techno-chameleon from somewhere near Atlanta, Georgia. He spends too much on sophisticated toys that lose most of their value within months. His hobbies include procrastination and avoiding life-threatening situations. He lives and works in a hole in the ground surrounded by lots of trees. Everybody loves him.

Nobody gives you more sound for less than Sam Ash.

You'll find everything you need to make music at Sam Ash at consistently low prices. It's a fact that Sam Ash has been filling America's playing and recording needs for more that 60 years. So whatever your needs may be, you'll find that the helpful and expert people at Sam Ash will bring music to your ears.

YOUR SOURCE FOR MUSIC AND SOUND

Call Toll Free: 1-800-4-SAM-ASH
OR 1-718-347-7757

Sam Ash®

124 FULTON AVENUE HEMPSTEAD, N.Y. 11550 MUSIC STORES

THE MIDI CONNECTION

FROM $199

A Musical Instrument Digital Interface for your IBM or compatible.

The **CMS-401** is a fully Roland MPU-401 hardware compatible on an IBM interface card. Totally IBM music software compatible. The CMS-104S Thru Box with FSK or CLK Sync and Cakewalk™ 256 track sequencing software, makes for a complete system.

CMS COMPUTER MUSIC SUPPLY

Rackmount your computer - $249

800/322-MIDI 714/594-5051

382 N. Lemon Ave., Walnut, CA 91789

Is it really possible to take a $299 MIDI guitar seriously? While those who market high-end guitar controllers won't lose any sleep over this new entry, it does promise to bring MIDI guitar to more people than ever before.

Suzuki XG-1m MIDI Guitar Controller

BY CRAIG ANDERTON

When I first saw the XG-1m at the June NAMM show, I was quite impressed with how it worked, but what impressed me even more was the price tag. Granted, the thing looks and feels like a toy, but underneath that toy veneer is a MIDI guitar that, within the limitations of a $299 MIDI instrument, works remarkably well.

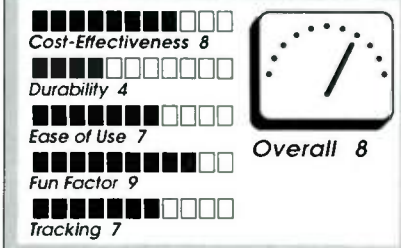
How It Works

The XG-1m is a dedicated MIDI controller. It produces no sound of its own; in fact, it doesn't use strings in the conventional manner. There is a set of short strings for strumming with your right hand, but that's it. The way you "fret" notes is by pressing (as you would press on a guitar string) on raised, thin plastic "strings" molded into the 12-fret, standard-size neck. You might think that you'd miss the old steel-on-wood feel, but interestingly, it takes very little time to adapt to these "strings." One helpful feature is that the "strings" use a patented rubber membrane technology that makes their top surfaces slightly rough, so you can actually feel a bit of resistance as you move your fingers around the fretboard.

Being naturally inquisitive (a polite way of saying I like to take things apart as soon as I get the chance), I took off the bridge cover and noticed that each string was hooked up to a little piezo transducer. Apparently this triggers the note being fretted on the neck. While the cover was off, I stumbled on a nifty playing technique if you want sounds with an instantaneous, rather than strummed, effect: fret the chord to be played with your left hand, and slap a finger from your right hand down on the plastic tops of the transducer assemblies. This is great for punchy horn effects. I'm sure this is not a Suzuki-approved operating mode (it would be easy to get carried away and break the rather fragile transducer assemblies), but if you always thought the Synth-Axe's trigger buttons were a good idea, here's one way to accomplish something similar.

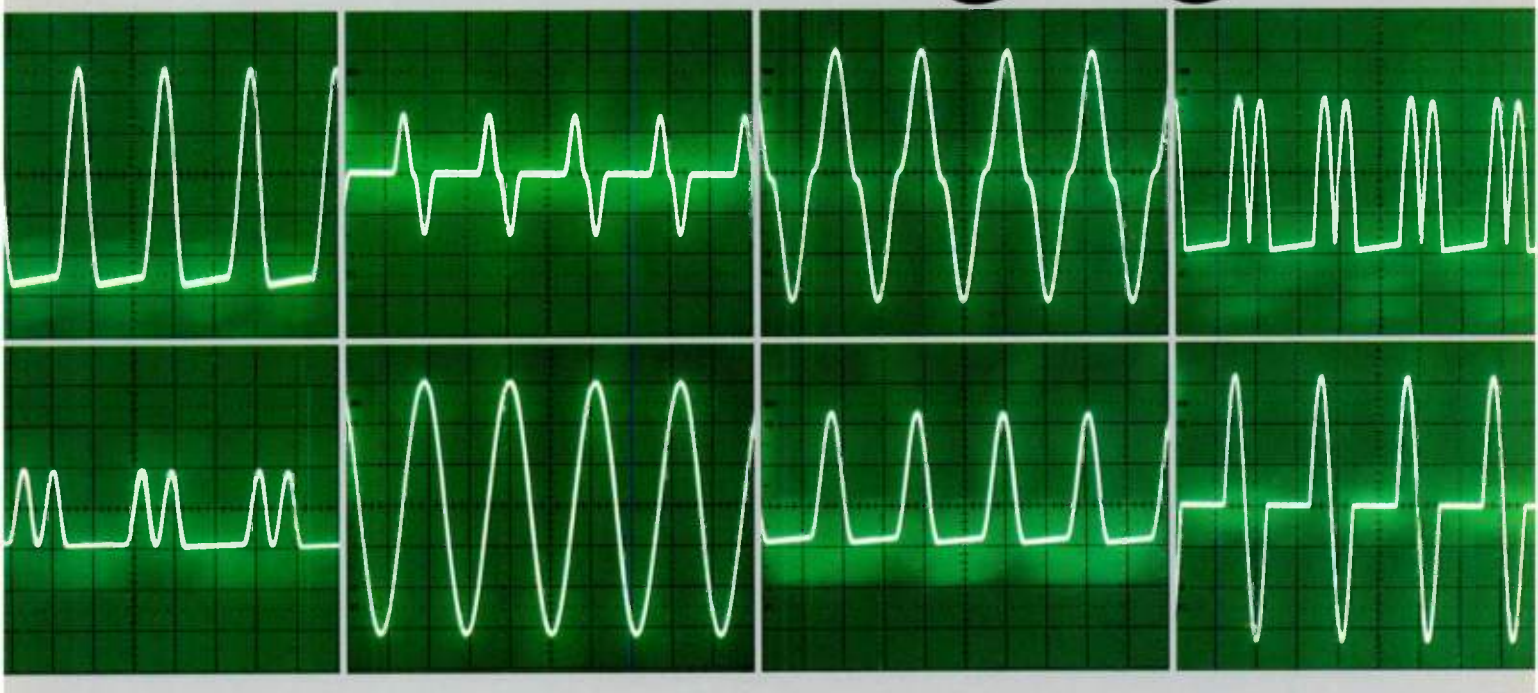
Product Summary

Product: XG-1m Electronic Guitar
Type: MIDI Controller
List Price: $299
MIDI Implementation: Note-On/Off, Velocity, Pitch Bend, Transmits over Channel 1
Main Features: Stringless touch-sensitive fret board, strings for right-hand strumming, electronic whammy bar for pitch bend (with associated range control)
Manufacturer: Suzuki, PO Box 261030, San Diego, CA 92126 ☎ 619/566-9710



Craig Anderton is the author of MIDI for Musicians, Home Recording for Musicians, The Digital Delay Handbook, Electronic Projects for Musicians, Seven Simple Steps to Buying a Word Processor, *and* Guitar Gadgets. *He has just completed* The Electronic Musician's Dictionary *for AMSCO Publications which will be available the first quarter of 1988.*

It understands more than sine language.



The new TX81Z is the first FM tone generator from Yamaha that offers eight different waveforms for each operator. So besides sine waves, now there are seven other exciting waveforms you can play with.

This not only increases the almost limitless sound possibilities of FM, it also gives the four-operator TX81Z a "six-op" sound. Yet the TX81Z is still compatible with other Yamaha four-operator synths and tone generators.

The TX81Z's Play Single mode lets you play voices with 8-note polyphony. There are five banks of 32 voices to choose from, including 128 preset voices and 32 user voices, programmable from the front panel.

Twenty-four additional performance memories let you play up to eight voices at one time. Instrument 1, for instance, could be a piano voice with 5-note polyphony while instruments 2, 3 and 4 could be monophonic voices. Note limits, MIDI reception channel, voice numbers, detune and volume settings for each instrument can be instantly changed in this mode.

Eleven preset and two user-programmable micro-tunings let you play a harpsichord voice, for instance, in authentic mean-tone temperament, or gongs and bells in Balinese gamelan scales.

And three effects including Pan, Transposed Delay and Chord Set (which assigns up to four notes to be sounded by a single incoming note) let you add greater expressiveness to your music.

And you get all this at a price that translates into a great deal.

Hear the new TX81Z FM tone generator at your Yamaha Digital Musical Instrument dealer. For more information, write: Yamaha Music Corporation, USA, Digital Musical Instrument Division, P.O. Box 6600, Buena Park, CA 90622. In Canada: Yamaha Canada Music Ltd., 135 Milner Ave., Scarborough, Ont., M1S 3R1.

YAMAHA

MIDI IMPLEMENTATION

In addition to sending Note-On and Note-Off messages, the XG-1m produces velocity data (an associated Sensitivity control sets the range, from no velocity to max velocity), pitch bend, master volume messages (sent over MIDI controller 7), and Program Change commands. Pitch bend works via an electronic whammy bar that works in conjunction with a range control marked Tremolo Range. Unfortunately, the bar's action is a little abrupt, and you'll have a hard time getting smooth and subtle pitch bends. For dive bomber and radical pitch-bending, though, it works just fine. Concerning channel selection, data is sent over channel 1—period. There's no way to send on other MIDI channels, short of an external channelizer.

Regarding Program Changes, there's a small ten-key numeric keypad, two-digit LED, and Enter button. Sending a change is simple: type a two-digit number, press Enter, and the job is done. However, three-digit program changes are not accommodated, so Program 99 is the highest numbered program you can access.

The volume control works just fine, although of course you must be feeding a MIDI synth that implements controller 7 as the way to control master volume.

THE ENVELOPE CAPER

I've always felt that electronic guitarists need to make up custom sets of patches for guitar synthesis, since what works for keyboards doesn't always work with guitars. This is even more the case with the XG-1m, due to the way it triggers envelopes. A single Sustain control determines how much time elapses before a Note-Off is sent for each Note-On you play. Minimum sustain gives very little Note-On time, and works well if you kick the sustain on your synth's envelope generator up all the way and adjust release for the desired amount of decay. Increasing the Sustain control lets you set attack and initial decay times on the synth's EG, but as one would expect, if the attack lasts longer than the Note-On time, the signal will never reach full volume. According to the manual, turning up sustain all the way gives "infinite sustain"; though it is not actually infinite, the sustain will last as long as the string is vibrating (however weakly). This can create some decidedly cool effects, especially since playing a note on one string generally will not cut off previously played notes (this will also depend on the synth you're using).

Speaking of cutting off notes, damping the strings *won't* do the job—more than likely, if you have a note fretted you'll get some Note-Ons simply from the damping action. To silence a note, either wait until the sustain runs its course, or press the Shut Up button (my terminology, not Suzuki's!) located towards the base of the bridge. Pushing a button to mute the strings takes some getting used to, and I'm not sure I really have gotten used to it, but it does work.

PLAYING STYLE

Although one would think that this type

At the bottom of every composition is a solid bass.

Serious musicians will tell you that great compositions are created from the bottom up. So why lay a foundation of thin bass sounds? When your own composition is at stake, there's no room for compromise. Now, play bass lines with the extra measure of quality and realism that will make your rhythm section a stand-out. Professional Midi Bass offers an exceptional library of multi-sample sounds that put the world's finest bass instruments under your fingertips the instant a patch is called. No "down time" for loading, no lost disks, no waiting — your entire library is always on-line.

The Pro Midi Bass offers sophisticated sounds and great features in a package you don't have to be a professional to afford. So, next time you start building a composition, make sure you're building it on a solid base — Professional Midi Bass from 360 Systems. Hear it at better keyboard stores everywhere.

Features:
Programmable Zones • Accent Sounds • User Presets
MIDI Patch Change • Velocity Crossover • Variable
Decay & Release • Transpose • Note Priority Select
LCD Display • Alternate Sound Library

Send $5.00 for demo cassette.

360 Systems
18740 Oxnard Street • Tarzana, CA 91356

Made in U.S.A.

Always the Bottom Line!

of design approach would eliminate glitches since there are no strings to track, the XG-1m (like any other guitar synth) still demands that you alter your playing style somewhat to accommodate the device's needs. For example, I'm used to fretting a real string as close as possible to the fret; with the XG-1m, you're better off fingering a chord in the middle of the frets. Also, there are a lot of times when I pluck a real string a moment before fretting it, so that there is a "slapback" effect caused by first hearing the open string, then the fretted tone a few milliseconds later. That's not recommended with the XG-1m—you'll end up with a bunch of sustaining, confused notes. As long as you fret first and pluck next, you're okay. However, matters become much less critical if you're playing strum-oriented rhythm guitar parts, as the strums occur often enough that you can afford to hit a few clunkers now and then and no one (including the guitar) will notice. Cautious and deliberate playing gives the best results, although you can get away with a certain amount of slop.

I also noticed that the "strings" seem to respond best to horizontal motion, as typically happens with a flat pick. I use a thumbpick, though, and tend to push more downward on the string, so there's a lot of string motion in the vertical direction. Normal guitar synthesizers aren't too thrilled with that kind of playing technique, and neither is the XG-1m. I did find that playing on the strings closer to the neck improved matters considerably, but other players might find that plucking the middle of the string, or the end closest to the bridge, might be the way to go.

I also have to use a little lighter touch than normal—this is not the axe for doing windmill power chords! Still, tracking is remarkably good, and the more willing you are to meet the XG-1m halfway, the better it will perform for you (so what else is new?). One interesting point is that the XG-1m will work very well with folk-style strumming using your fingers. I can't quite envision masses of folksingers going out and getting one of these goodies, but if they do, they won't be disappointed.

Construction

So far, so good, so where did they cut corners to hit that $299 price point? Well, the unit is definitely fragile. Plugging a MIDI cord into an XG-1m does *not* give the same solid feel as plugging a ¼-inch phone jack into a Les Paul. The connector wobbles around a bit, and I'm sure that with one good tug on the MIDI cord, you could do serious damage to the body (note that the manufacturer informs me that I was using a prototype model and that production models will not have this problem—but you should check out one at your local dealer to be sure). The controls jiggle around a bit, and are not firmly mounted. If I was going to take the XG-

I have to use a little lighter touch than normal—this is not the axe for doing windmill power chords!

1m on the road, a backup would be mandatory.

Power comes from either batteries or an AC adapter. The AC adapter sends its juice to the guitar over one of those typical skinny AC adapter cords (but at least it's real long). I'd recommend batteries for stage use, or modifying the guitar so that you can feed power over the MIDI cable.

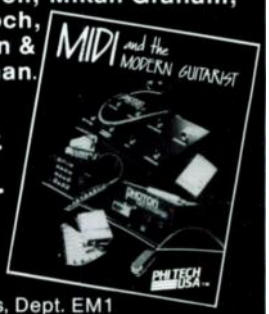
Guitars 'R Us

The XG-1m is an extremely cost-effective way to get into MIDI guitar. If you have a small MIDI studio with a couple of keyboards but your main instrument is guitar and you're on a tight budget, this instrument will be a blessing. You can lay down strummed parts into a sequencer, and if you play the guitar through the right patch, it's almost as good as being able to record a standard guitar into your sequencer. You have to work around some limitations, to be sure (not being able to bend notes does kind of cramp my style), but considering the cost it seems rather Scrooge-like to dwell on these. I still don't quite believe it, but the thing works remarkably well. I suspect that many a budding MIDI guitarist will find this to be the perfect entry-level ticket. Check it out; you could be in for a real surprise. EM

MIDI and the Modern Guitarist

Phi Tech, manufacturer of the **Photon MIDI Converter**, has produced a 16-page guide to help guitarists better understand the benefits of MIDI. Explore sections on enhancing the guitar, effects control, tricks with MIDI and more.

Discover how the pros are using MIDI, with comments from: **John Abercrombie, Carlos Alomar, Steve Bargonetti, Brian Bromberg, Bunny Brunel, Larry Coryell, Mikail Graham, Nick Moroch, Chris Stein & Al Weissman.**



For Your FREE Copy

Contact:
Phi Tech
4605 N. Stiles, Dept. EM1
Oklahoma City, OK 73105
(405) 521-9000

DEEP MAGIC MUSIC
(The Patch Cassette People) Presents:
THE ELECTRONIC MUSICIAN'S CHECKLIST:

Headphones: check. Digital delay: check. Eclectic collection of synths: check. Dinosaur food: dinosaur food? DINOSAUR FOOD!!! (That is, patch cassettes with hundreds of exciting new pro sounds for vintage synthesizers!) Okay, maybe you program yourself. Great! But it's a known fact that dinosaurs get sick of same old thing. Long to eat out. Hence our fantastic gourmet take-out service! Everything from hard-driving work sounds to rare ethnic instruments and rich space textures. We KNOW you secretly cherish some of these synths, and without Deep Magic, you're missing out on their true potential!

- ☐ DW-8000/EH-8000: 320 SOUNDS $49.95
- ☐ DW-6000: 320 SOUNDS $49.95
- ☐ POLY-800/EH-800: 64 SOUNDS w/seq. $25
- ☐ POLY-61/61M: 64 SOUNDS $25
- ☐ POLYSIX: A mammoth 640 sounds! $49.95
- ☐ PROPHET-600: 100 SOUNDS w/seq. $25
- ☐ MOOG SOURCE: 64 SOUNDS w/seq. $25

FEATURING Easy tape loading, instructions, patch names, tips for your model synth. Sound charts included for models using parametric data entry. "Me Caveman, me CHEAP!" you say? Well, you get what you pay for. Order from cheap place, food never come -- or make Dino burp and growl! Deep Magic's prompt service, time-honored reputation, and critically acclaimed sounds make us the electronic musician's natural choice. In fact, EM gave us four stars! (Feb. '87) And KEYBOARD said *"Deep Magic's imitative patches are accurate, and their imaginative sounds are very appealing. There are a lot of good, meaty timbres among the conventional patches, and a multitude of good ideas in the realm of fantasy sounds."* © 1986 DPI

C.O.D.'s -- 2nd DAY AIR -- DEALERS -- FOREIGN
CALL, OR SEND CHECK/M.O. TO DEEP MAGIC MUSIC, 217 E. 85th ST., SUITE 298-E, NEW YORK, NY 10028. (212) 534-0728. Postage: $2; NY res. incl. sales tax.

Although many companies are working feverishly to produce inexpensive and cost-effective drum machines, E-mu continues to take the high road with their sampling products. But given the competition, can the SP-1200 follow up the enormous success of the SP-12?

E-mu SP-1200 Sampling Drum Machine

BY JIM JOHNSON

E-mu led the way for the current crop of sampling drum machines when they introduced the original SP-12 in 1985 (reviewed in the July '86 EM). But, time and technology being what they are, some of the less wonderful aspects of the SP-12 are perhaps a bit more bothersome today than when the instrument was first released. In answer to this, E-mu has released an updated version of the SP-12—dubbed the SP-1200—which alleviates most of its predecessor's memory and mass storage limitations. For those who aren't familiar with the SP-12, here's a little background information. The original model had 11 built-in sounds, and 32 memory locations slots where the user could store up to 1.2 seconds worth of 12-bit linear, 27 kHz samples. Up to 5,000 notes could be distributed among 100 segments and 100 songs. The new machine has *no* built-in sounds, but sports *ten seconds* of sampling time, and about 15,000 notes of storage. Best of all, you no longer have to store sounds on the hopelessly slow Commodore 1541 disk drive (or buy a Mac and Blank Software's Drum File)—the SP-1200 solves storage problems once and for all with a built-in 3.5-inch disk drive. In addition, some serious problems with the system's Song Position Pointer implementation (i.e. there wasn't any!) have been corrected. *(Editor's note: We understand that E-mu is considering adding Song Position Pointer output to the SP-12 as an update if there is enough interest from users.)*

General Operation

Overall, operating the SP-1200 is very straightforward. The front panel is laid out in a menu system that breaks the instrument down into each major function (called a "module"). The functions available in each module are consistent enough that anyone who is moderately experienced with MIDI equipment syntax should be able to access 98 percent of this machine's capabilities within a few minutes of turning it on, no small feat for an instrument with this kind of depth. On power-up, the first thing you'll notice about the SP-1200 is that it does *nothing*—until you insert a disk in the drive. Like many current samplers, this instrument loads its operating system from the disk, along with all the sequences and sounds on that disk. Individual sounds and sequences, as well as banks of same, can be

loaded and saved independently. Unfortunately, individual sounds can only be loaded into the memory slots from which they were saved; to create a custom drum disk, you will have to do some reshuffling with the Copy and Delete functions. Loading a sound disk takes about 25 seconds for all 32 sounds, and sequence loading time is less than ten seconds for a full disk (well within reasonable limits for live use). Sampling on the SP-1200 is simple and painless. Press the Sample button or adjust the sampling threshold and the LCD becomes a peak-reading VU meter. This makes sampling a breeze. The machine also will issue a warning message if a sample overloads the A/D converter (although the sound still will be available for use). The sampled signal is not fed through to the output when sampling (too bad)—instead, a nasty digital noise appears at the output when the internal preamp is set to 40 dB, though this disappears at the zero and 20 dB settings. Sample time can be set in 0.1-second increments up to 2.5 seconds, depending on how much memory is left.

Sample editing on the SP-1200 is handled by a single *truncate* and *loop* page, where the start and end points of any sample can be adjusted, and a single loop point can be set. The start and end points can only be set to zero crossings, which is cool, but the loop length must be set in increments of 25 samples, which makes it tough to get a good loop. Fortunately, the SP-1200 supports the MIDI sample dump standard, so it should be possible to optimize looping on an external computer if need be. Sounds also can be reversed.

One of the SP-1200's most interesting features is its drum tuning and output architecture, which allows a number of variations to be created from any sample. For each note of a sequence, either the decay or tuning of each sound can be controlled with a slider, MIDI controller, or from the drum play buttons (explained below). The tuning range covers a total of 32 semitones, but a single voice will access only a 16-semitone range (of your choice) within those 32 semitones. Having a little over an octave makes the SP-1200 marginally useful for bass lines, however there is a way around this: tune the original bass sample to the lowest 16 semitones of the 32-semitone range, copy the sample over to another sound, and tune the copy to the highest 16 semitones of the 32-semitone range. This will allow for bass parts that cover just over two octaves and a fifth.

All eight pads can be assigned to play a single sample at different volume, pitch, or decay settings.

There are eight individual outputs which have varying types of output filtering schemes: outputs 1 and 2 are tuned for bass and snare drums; outputs 3 through 6 have varying amounts of low-pass filtering (3 the most severe and 6 the least severe); outputs 7 and 8 are unfiltered. The filtered outputs are connected to stereo jacks; using a mono plug you can access the unfiltered sound (insert plug halfway), the filtered sound (insert plug all the way), or use a stereo plug to access the filtered and unfiltered sound simultaneously. The filtering helps to optimize the sound quality of conventional drum sets, or produce special effects (such as creating the world's largest bass drum by assigning a sampled explosion to channel one). In addition, you can assign more than one sound to an individual output with the last sound played having priority; one use for this is to assign the open and closed hi-hat sound to the same output and then have the closed hi-hat cut off the sustain of the open hi-hat. A mono Mix Out jack combines all the filtered outputs into a single signal.

Sequencing

Recording and editing sequences on the SP-1200 is virtually identical to the SP-12, with the step-time editing and recording arrangements being especially well-done. When recording in real time, you can temporarily disable the recording function in order to practice a part without interrupting the groove. The eight pads are billed as being velocity-sensitive, and they are, in a sense; however, their response is so unpredictable and their feel so switch-like that most musicians will probably leave the dynamic button feature turned off. The pads can access eight of the 32 samples at a time, or all eight pads can be assigned to play a single sample at different volume, pitch, or decay settings, making the creation of complex accents or tuned percussion patterns a snap. Samples also can be triggered and tuned via MIDI, but since each tuned drum hit requires two Note-On messages, it's tough to access different tunings from an external sequencer, and even harder from most electronic drum sets without the help of some sort of MIDI processor like the Axxess MIDI Mapper.

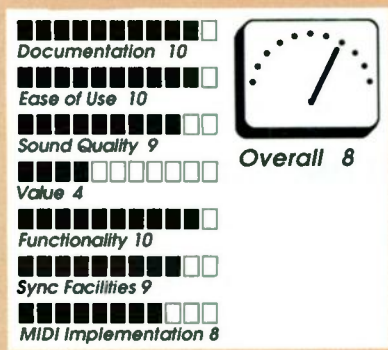
Songs

The song programming features of the SP-1200 are equally complete. In addition to segments, songs can contain *Mix Changes*, *Tempo Changes*, *Repeats*, *Trigger Changes* and *Subsongs*. A Subsong is the use of another song within a sequence, allowing you to build songs one section at a time. Trigger Changes can turn off the pulse trigger output from the Metronome jack or set it—at any point in the song—to any rate from one to 24 PPQN. This is especially handy if you have an arpeggiator or any other device with a trigger input. Mix Changes select one of eight

—continued on page 104

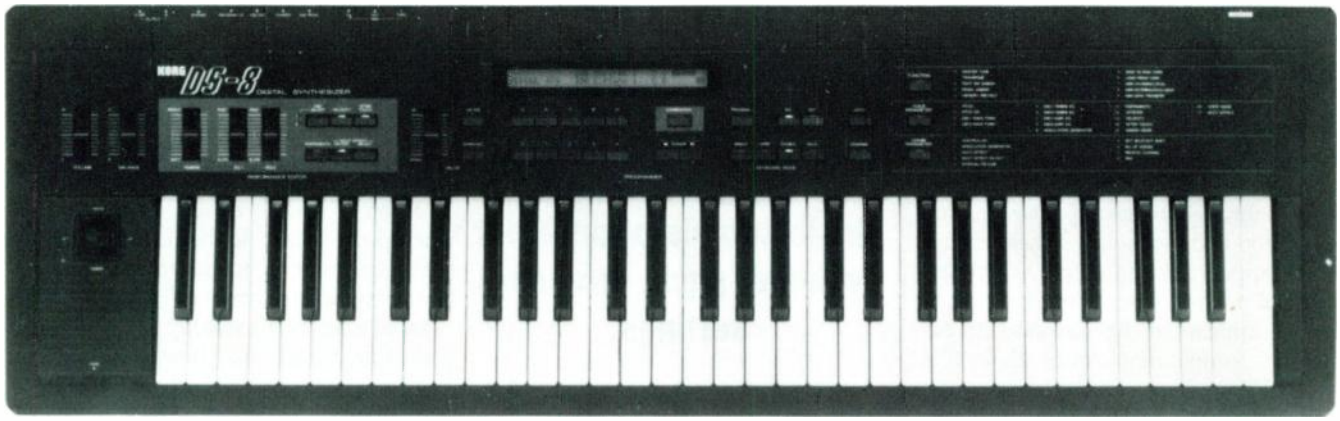
Product Summary

Product: SP-1200
Type: Sampling Drum Machine
Retail Price: $2,995
Manufacturer: E-mu Systems, 1600 Green Hills Road, Scotts Valley, CA 95006 ☎ 408 / 438-1921



FM synthesizers have a reputation for being difficult and tedious to program, but Korg is determined to change all that with the DS-8.

Korg DS-8 FM Synthesizer



BY ALAN GARY CAMPBELL

The DS-8 is an eight-voice, multi-timbral FM synthesizer, with a five-octave, weighted, velocity-sensing keyboard with aftertouch and an onboard programmable digital delay. Korg's major design goal with the DS-8 was to produce an entry-level FM synth that could serve as both a controller and a multi-timbral sound source, and yet be as user-friendly and easy to program as possible. They've largely succeeded—but not without some tradeoffs.

Physical Parameters

The DS-8 measures 40 × 4 × 13 inches (102 × 10 × 32 cm), and weighs a light 22 pounds (10 kg). Its clean lines and sexy high-tech contours lend it an elegant appearance with a quality look *and* feel.

The front panel controls include: Volume, Balance, and Timbre sliders; two envelope-rate control sliders; a data-entry slider with associated increment/decrement switches; and a pseudo-numeric keypad. Program parameters are presented on a backlit, blue, 40-character × 2-line LCD, whose rather low contrast level is not adjustable.

On the rear panel, you'll find stereo line-level output jacks; a program-advance footswitch jack; an assignable-function footswitch jack; an assignable-function pedal jack; MIDI In, Out, and Thru jacks; a power switch; and a receptacle for the detachable two-wire line cord.

The lightly weighted keyboard has a somewhat resistive, springy feel that is closer to that of a DX7 II than that of a DW or older DX. Some players might even consider it a bit stiff, but it does provide good velocity control. To the left of the keyboard are a two-axis joystick and a RAM/ROM card access slot for external program storage.

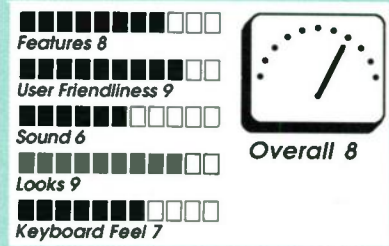
My only real complaint with the DS-8's construction is the constant, high-pitched whine emitted by the power supply. While this is at a low level, it could be annoying to persons with good high-frequency hearing.

FM Made Easy

What's unique about the DS-8 isn't the way it sounds (it has fewer timbral capabilities than Yamaha's four-op FM synths), but the way you *program* it. The many and sometimes confusing parameters of FM synths are replaced by familiar "wave-

Product Summary

Product: DS-8 Synthesizer
Type: Multi-timbral digital FM synth
Retail Price: $1,198
Features: Velocity-sensing keyboard with aftertouch; extensive performance controls; internal programmable digital delay; simplified, user-friendly operating system
Manufacturer: Korg USA, Inc., 89 Frost Street, Westbury, New York 11590 ☎ 516 / 333-9100



Alan Gary Campbell is owner of Musitech, a consulting firm specializing in electronic music production design.

SOUNDTRACS

Affordable Quality

FMX SERIES MIXERS

A British company dedicated to the design and manufacture of one of the broadest ranges of mixing consoles in the World. We offer ten individual models in over fifty versions to suit your specific requirements.

The choice is yours.

Exclusive U.S. distributor:

AKG ACOUSTICS, INC.

77 Selleck Street, Stamford, CT 06902

Telephone: (203) 348-2121

Applications: Sound Reinforcement;
Video Post Production;
4&8 Track Recording;
Broadcast "On Air"; Stage Monitoring.

form," "spectrum," "ring mod," and other parameters more commonly associated with analog synths. Apparently, some of these parameters affect more than one FM function at a time, but their names do seem to intuitively fit the functions. It's easy to get caught up in programming the DS-8 without realizing there's an FM synth inside.

In DS-8 terminology, each synth voice has two transposable "oscillators." Each offers Waveform Type, Spectrum, Ring Mod, Limit, and Keyboard Follow parameters, and oscillator 2 can be detuned.

The *Waveform* parameter sets the basic oscillator timbre. Oscillator 1 has Sawtooth, Square, Bright Sawtooth, and Bright Square; oscillator 2 has Sawtooth, Square, and "XMOD" (cross-modulation). These are not complex waveforms like on the Yamaha TX81Z, but the timbres do, generally, fit the descriptions.

Spectrum modifies waveform timbre, somewhat analogously to an analog pulse width control. The *Limit* parameter restricts oscillator harmonic content, to avoid "overdriven" sounds in programs with complex modulation. The Keyboard Track parameter affects oscillator timbre so notes sound progressively brighter as you move up the keyboard—like filter "overtracking" on an analog synth.

Each oscillator has separate Attack-Decay-Sustain-Release (ADSR) envelopes to control timbre and amplitude (these are roughly analogous to VCF and VCA envelopes, respectively). ADSRs are easy to program, but don't allow double-envelope "horn-blips" and similar complex effects; however, the envelopes do have very natural-sounding, exponential curves. Unfortunately, the resolution of the envelope parameters is a bit coarse (e.g., the Decay times range from one millisecond to 35 seconds, with only 15 programmable values). Envelopes can track the keyboard, so higher notes have shorter Attack, Decay, and Release times. Keyboard tracking is separately programmable for each envelope.

Each envelope has an overall level adjustment that affects the peak and sustain levels without altering the envelope times—a considerable improvement over most competing designs. Keyboard velocity can control envelope levels; and velocity sensitivity is separately programmable for each envelope.

A global LFO provides Triangle, Sawtooth (ascending ramp only), Square, and Sample-and-Hold waveforms. LFO frequency ranges from 0.07 Hz (measured) to well into the low audio range; LFO delay ranges from one millisecond to ten seconds (approximate, measured values). The LFO can affect oscillator frequency (both oscillators simultaneously), or timbre and/or amplitude.

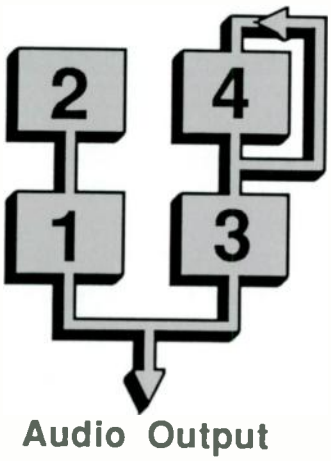


FIG. 1: An algorithm that provides an oscillator with two parallel carrier-modulator pairs.

A multi-segment pitch envelope affects both oscillators. This provides fairly complex pitch transients; but, unlike the auto-glide function on a DW-8000, you can't bend just one oscillator. The pitch envelope parameters are the most DX-like of those present, with "Rates" and "Levels;" in fact, the Pitch EG (and LFO) functions seem somewhat counter-intuitive.

The DS-8 provides a Unison mode that stacks all eight voices on a key, with four programmable levels of detuning, to produce a "fat" sound. In this mode, the keyboard responds with last-note priority, with selectable single or multiple triggering. The DS-8 also provides polyphonic and monophonic linear portamento. Poly portamento can provide "random" glides or proceed from the most recently played pitch; Unison mode can provide fingered or continuous portamento.

PROGRAMMING

Programmable parameters are divided into groups called *Functions*, *Voice Parame-*

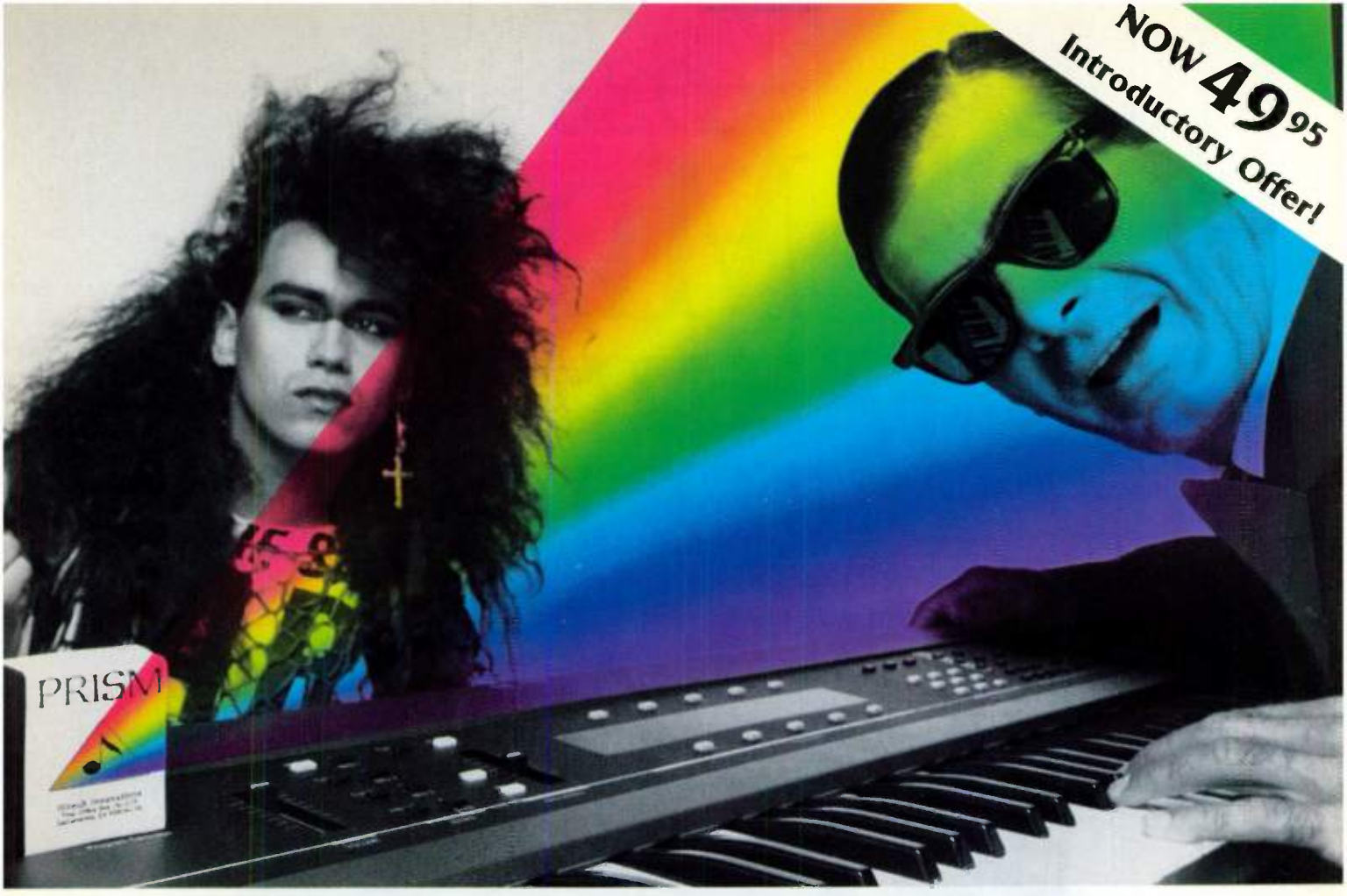
An FM Synth From Korg? Isn't That Yamaha's Shtick?

It is. Yamaha now owns an interest in Korg, and this recent influence is evident not only in the sound of the DS-8, but also in many aspects of its design. We contacted Korg USA to find out more about the DS-8 specs, but product manager Jack Hotop reported that Korg-Japan has been somewhat reticent regarding information on the DS-8 architecture; they feel the instrument's internal functions should remain "transparent" to the user.

Not to be outdone, we opened up the DS-8. On the main board, we found the same YM2164/YM3012 OPS/DAC chip set as used in the Yamaha four-operator *FB-01*. (This is often referred to as a 10-bit architecture, and that "sounds" about right.) Then we tried to determine aurally what FM functions the DS-8 parameters were controlling.

Apparently, the four operators are divided into two carrier/modulator pairs, each referred to as an "oscillator." Oscillators can be configured in one of only two possible algorithms: the first provides two parallel carrier-modulator pairs (see **Fig. 1**); and the second assigns one carrier/modulator pair to "cross-modulate" the carrier of the other pair (**Fig. 2**). (These configurations are equivalent to algorithms 5 and 4, respectively, on Yamaha gear.) The Spectrum parameter adjusts the modulator frequency through 16 harmonic values, corresponding to relative frequencies 1.00, 4.00, 8.00, 12.00, 16.00, 20.00, 24.00 and 30.00. The Limit parameter provides modulator level-clamping, and the Keyboard Track parameter applies modulator level-scaling with a positive linear curve across the keyboard. The timbre and amplitude envelopes control the modulator and carrier levels, respectively. The remaining parameters manipulate more than one FM function at a time, and we finally abandoned trying to unravel them without access to the unit's source code.

—*AGC*



FROM RED HOT ROCK
TO COOL BLUES,
THE PRISM VOICE CART

Introduces true color sounds for the ESQ-1 and the new SQ-80*

80 masterfully engineered patches on each cart make the Ensoniq synths more versatile than ever. Strings, horns, pianos, woodwinds, percussion & drums, reproductions of acoustic instruments and classic synths, and some sounds so original they have to be heard to be believed. All designed for accuracy and playability. Our E² carts have read/write capability while our ROMS are read only. We also have blank E² carts available for you to store your own artistry.

We are pleased to announce Indian Valley's innovative new MIDI disk drive. The "MIDI Disk" features 128K internal storage (more than 5 full ESQ sequencer dumps), 800K per disk, a single high rack mount, 22-key pad, MIDI in, out and thru, and 4 digit display. It will store patch and sequence data from virtually any MIDI machine. All for only $449.00 including 80 of our voices on disk. Also new from IVM are the MIDI Keypad, a calculator style device with 8K of memory that will put up to 256 64-step program changes at your fingertips, and the SQX-100, a 100,000 note sequencer expander for the ESQ-1.

*ESQ-1 and SQ-80 are registered trademarks of the Ensoniq Corporation

ORDER NOW:

80 Voice ROM (A or B) . . .	$49.95 ___	MIDI Disk	$449.00 ___
80 Voice E² (A or B)	$59.95 ___	MIDI Keyboard . .	CALL
3.5" Disk (for MIDI Disk) (A)	$39.95 ___	SQX-100	CALL
(B)	$39.95 ___	Blank E²	$34.95 ___

NAME

ADDRESS

CITY STATE

ZIP PHONE

Or Call 1-800-541-0900 (orders only)
Visa & MasterCard accepted
California residents add 6% sales tax

DEALER INQUIRIES WELCOME
1-916-362-1449 Info/Dealers

Hitech Innovations, Inc., Sound Division, PO Box 16-1239, Sacramento, CA 95816

1988 MIX ANNUAL DIRECTORY

OF RECORDING INDUSTRY FACILITIES & SERVICES

ONLY $25.00!

NEW & ENLARGED!
MORE THAN 7,000
UPDATED LISTINGS!

The Recording Industry's most comprehensive Sourcebook.

Audio/Video Professionals everywhere rely on the regularly updated, monthly MIX Magazine directories for accurate, thorough and *fresh* information about their business. The new **1988 MIX ANNUAL DIRECTORY** is an exhaustive, "nuts 'n' bolts," single-source reference compiled from these detailed directories and expanded with other indispensable industry data.

When you want information fast, the **1988 MIX ANNUAL DIRECTORY** has everything you need right at your fingertips—in one, easy-to-use, definitive reference source. Because the new 1988 edition contains more than *400 pages of new information,* we've added new, heavy-duty, *tabbed Index Pages* which makes sourcing fast and easy.

The totally revised **1988 ANNUAL DIRECTORY** contains more than **7,000** up-to-date listings, arranged by geographic region, in more than a dozen different categories, including:

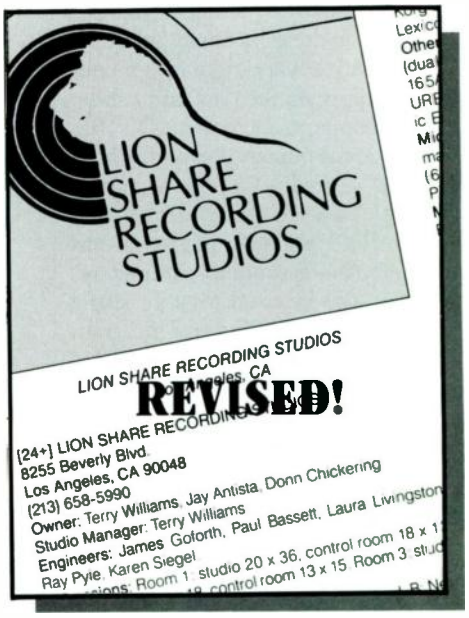
- ❑ **Recording Studios of the U.S. & Canada.**
- ❑ **Video Production & Post-production Facilities.**
- ❑ **Facility Designers and Audio/Video Equipment Suppliers.**
- ❑ **Mastering, Pressing and Tape Duplication Facilities.**
- ❑ **"A to Z" listing of Audio, Video and Musical Equipment Manufacturers.**
- ❑ ***Enlarged*** **Market Data & Industry Statistics section.**

NEW LISTINGS FOR 1988!

❑ **Sound Reinforcement** companies including lighting, staging and audio/video equipment rentals. ❑ **Remote Recording Services.** ❑ **Recording Schools, Programs and Seminars.** ❑ Other essential industry services.

Don't pass-up this opportunity to get your hands on the recording industry's most comprehensive Sourcebook. The price is just $25.00 each. Use the convenient order form or place your order TOLL-FREE at: (800) 233-9604. In California: (800) 641-3349.

© 1987, MIX Publications, Inc.



1988 MIX ANNUAL DIRECTORY listings have the detailed and important info industry professionals need to make decisions.

Please send me _____ copies of the New & Revised 1988 Mix Annual Directory of Recording Industry Facilities & Services as soon as it's off the press. I've also enclosed $2.00 per copy for postage and handling. If I'm a California resident, I've enclosed 6% for the Duke (sales tax).

Enclosed is _____ ☐ Check ☐ Money Order

Charge to my credit card
☐ Visa ☐ Mastercard ☐ American Express M188

Card #_____ **Exp. Date** _____

Signature_____

Name/Title _____

Company _____

Address _____

City, State & Zip _____

Mail this Order Coupon directly to: **ANNUAL DIRECTORY c/o MIX Bookshelf.** 2608 Ninth, Street, Berkeley, California 94710. You may also place your order TOLL-FREE at: (800) 233-9604 (In California: 800 641-3349).

ters, and *Combination Parameters*. This is reminiscent of a DX synth, but some function parameters on a DX are *voice* parameters on the DS-8; and Combination parameters control only multi-timbral functions. Still, it's an easy scheme to get used to.

To edit a program, you simply press a switch and enter the parameter number from the list on the front panel. Select the parameter with left and right cursor controls and edit it via the data entry slider and/or increment/decrement switches (but *not* from the numeric keypad). There is an edit "Compare" function, but no "Edit Recall." The DS-8 provides internal storage for 100 programs, and ten "Combinations" (multi-timbral parameters) which can also be used to store single programs, if desired. External program storage is provided via ROM and RAM cards. No cassette interface is provided, but the DS-8 can send and receive program data over MIDI.

THE SOUNDS

The DS-8 is easy to program, but some timbral power is sacrificed to achieve this (see sidebar). The factory programs include DX-like electric pianos, guitars, basses, tubular bells, etc., and some of them are quite good. As with most FM instruments, the plucked/struck timbres are the best: the steel drum is great, and the slap bass has a nice "whap." There are some good sustained sounds, too, including several compelling synth timbres, a great harmonica ("Reed 1"), some minimoog lead simulations, and a number of "stacked" timbres. Yet, many of the sounds suffer from the DS-8's compromise-architecture: the string, brass and organ programs are particularly weak; the acoustic pianos are unconvincing; and the ubiquitous "moaning" fretless bass patch is absent.

Korg is currently developing alternate sounds for the DS-8, which may improve the patch situation somewhat; and no doubt countless independent patch hackers will follow suit.

MULTI-EFFECT GENERATOR

The DS-8 includes a programmable, stereo digital delay (40 microseconds to 850 milliseconds), termed a "Multi-Effect Generator." It has positive and negative feedback, a blend control, and a modulation generator independent of the main LFO. Confusingly, delay modulation is referred to as "vibrato," though it's more likely to be used for flange and chorus effects. You can edit all the parameters in *Manual* mode or just tweak the presets for quicker edits.

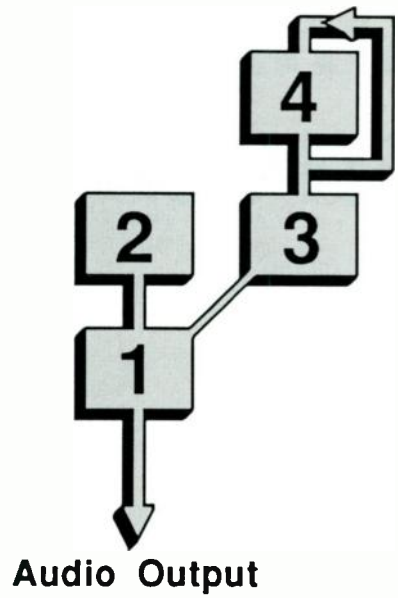


FIG. 2: An algorithm that assigns one carrier/modulator pair to "cross-modulate" the carrier of the other pair.

The delay is relatively quiet and the frequency response is adequate, but the effect sounds a bit thin, and yields a small stereo image. Additionally, the delay takes several seconds to "start up" after you change programs—a problem for live performance.

PERFORMANCE CONTROLS

The DS-8 provides extensive and unusual performance controls. The two-axis joystick, with programmable depth, bends pitch (or timbre) up or down, and modulates timbre and amplitude. Interestingly, the joystick can control modulation *rate*, as well as level, for rotating speaker simulations, Tomita-like modulation-braking effects, expressive vibrato and uncannily realistic tremolo for harmonica sounds.

The keyboard aftertouch has a great feel and is very controllable. It can control pitch and/or timbre modulation for both oscillators, and/or amplitude modulation for one or both, with programmable depth; unfortunately, it can't bend pitch.

The front panel provides several dedicated sliders and buttons—termed *Performance Editor* functions—used to vary program parameters in real time. A *Timbre* slider adjusts the brightness of both oscillators, and two *EG* sliders increase or decrease envelope times (amplitude and timbre only, not pitch) for each. If a program sounds too bright during performance, you can adjust it by moving the slider; if the envelope Attack and Release times are too long for a given tempo, just reduce them in a similar manner. Six panel buttons are provided to enable/disable Velocity, Aftertouch, Portamento, Oscillators 1 and/or 2, and the Multi-Effect; and to select the Multi-Effect mode. An assignable footswitch can control any of these parameters—except Multi-Effect mode—or function as a program backstep control. Two dedicated footswitches control sustain pedal and program advance functions. An assignable pedal can control Volume (also transmitted over MIDI), Timbre, Pitch modulation, or Timbre/Amplitude modulation. The DS-8 even provides a bar graph display for instrument tuning!

COMBINATION MODES

The DS-8 Combination modes allow split, layered, and multi-timbral operation. **Double** mode (split mode) provides arbitrary splits; upper and lower sounds can overlap, if desired. The upper and lower sounds can be transposed or detuned. The number of voices assigned to each side of the split is programmable, but the voice allocation is fixed, not dynamic—the DS-8 won't rob voices if the number of notes played on one side of the split exceeds the current allocation.

Layer mode stacks two sounds, for four-note polyphony; and one sound can be transposed or detuned. This sounds really fat—but in this mode, the instrument's fixed voice allocation can be a problem. For example, if you're holding a left-hand note and playing three-note right-hand chords, and inadvertently strike a fourth note in the right hand, the left hand note will be silenced. Even if it remains held, it will not be reassigned to a voice when the "extra" right-hand note is released.

Multi mode provides multi-timbral operation under external MIDI control. A voice or voices can be assigned to a given program on a selected MIDI channel, and up to eight different timbres can play simultaneously—a veritable MIDI orches-

tra. The DS-8 keeps track of the number of voices currently allocated, and doesn't allow more than eight to be assigned at once. Again, the voice allocation is fixed.

In each mode, you can separately assign controller, LFO, and Multi-Effect parameters from any program used, to affect the Combination. Each program in a Combination can be assigned to the Left or Right output, or both. This is not a true pan function, but it is useful: in Double or Layer mode, each of the two programs can be sent to separate outputs, for individual processing. Additionally, the Multi-Effect Generator can obtain its input from either or both outputs, and send its output to either or both. All combination parameters are programmable. Performance Editor functions affect all the programs in a Combination.

Despite its multi-timbral capability and excellent performance control implementation, the DS-8 offers somewhat less sonic potential than competing FM synths.

MIDI

The DS-8's MIDI implementation—multi-timbral capability notwithstanding—is rather basic. Omni On mode is implemented; in Omni Off/Poly On mode, it can send and receive on any selected channel, but can't send and receive on different channels. With multi-timbral operation, each of the eight voices can respond to a different channel if desired. Local control can be disabled. Transmission and reception of Active Sensing, Program Change, and Controller data can be selectively disabled; but you can't affect transmission and not reception, or vice versa. The DS-8 can transmit program change commands or System Exclusive data for each program, but not both simultaneously (though you can send and receive bulk dumps of Program/Combination data).

The keyboard transmits only as a whole, and doesn't provide any MIDI split capabilities, something that significantly limits the DS-8's utility as a master keyboard. On the plus side, the performance-control MIDI implementation is excellent. The unit sends and receives pitch bend, modulation, data-entry slider, MIDI volume, sustain pedal, portamento pedal, and data increment/decrement switch functions. It also sends breath controller data (Controller #2) in response to downward motion of the joystick (now you can access those breath-controller parameters on TX modules) and responds to this data from external controllers—and it receives pan position data as Controller #10.

The unit responds to "All Notes Off" commands, but doesn't transmit them (however, pressing the front-panel "Compare" button when MIDI is active will reset the instrument if it locks up). Nonetheless, I was able to create a stuck-note condition, involving the program-advance footswitch, that this function would not clear.

CONCLUSIONS

The DS-8 is certainly the most user-friendly FM synthesizer yet. There is a definite psychological advantage in being confronted with familiar, intuitive terms; it's easy to be enticed into programming by the accessibility of it. Nonetheless, a few parameters remain unnecessarily technical, and some common functions have non-standard names—even with the DS-8, you'll have to read the manual.

But despite its multi-timbral capability and excellent performance control implementation, the DS-8 offers somewhat less sonic potential than competing FM synths. I also feel its operating system could be improved, especially with regard to the voice allocation scheme, Multi-Effect Generator, and MIDI transmit parameters. It doesn't come with footswitches or a pedal—these are accessories that must be purchased separately. Still, at $1,198 it's a good buy, and if you want a multi-timbral FM synth that's easy to program, it's the only game in town. EM

New! Inexpensive Center Track Time-Code for Non-TC Audio Machines.

Now you can make your 2-track machines synchronizer-ready for a fraction of the cost of a new machine. Otari's new TC-50 Time Code/FM Processor is primarily designed for the Otari BII or Mark III-2, but it is also adaptable to most 4-head-position ¼" tape recorders.

So if your older machines have just been gathering dust, or if you're looking for a way to get synchronizer-ready performance at low cost when you buy a new machine, the TC-50 is the answer. From Otari; Technology You Can Trust.

Contact your nearest Otari dealer, or Otari at (415) 592-8311.

OTARI

© Otari 1987

BY ROBERT CARLBERG

Well, well, well. Craig (our Editor-in-Chief) informs me that this record review column came in **dead last** in the reader poll. It seems most of you would rather make electronic music than read about it.

So why am I still here? Ask your beloved editor. I offered to quit, even begged to be relieved of my responsibilities, but he insisted we give it one more try, with a format change. Seems he *likes* reading my reviews. Go figure.

He also thinks maybe a format change would make this column easier to read. See, according to the reader survey, most of you don't have much idle time on your hands. You want to know what's going on, but you can't afford to try everything to find out. What you want, probably, from a review column is a quick overview of what's new, with particular emphasis on the best and most innovative. It also makes sense to concentrate on the independent releases that aren't reviewed elsewhere.

So that's what Craig suggested. Or rather *this* is. He wants me to say a few words first about whatever's on my mind, then get into describing the most interesting new releases of the month. There won't be full reviews of *everything* that comes in anymore, which should make it easier to read—and by the way, easier to write, too.

To tell the truth, this change comes none too soon for me. For a while it was fun digging out from under the pile of new releases every four weeks, but as the piles grew and grew it began to seem too much like work. I realized I never listened to music any more—I only found out what things sounded like.

Listening to music shouldn't be work. There's so much wonderful music happening out there that I don't want to become jaded or burned out. Granted, it isn't possible to buy every new release worth owning anymore—a quick glance at the Eurock catalog will convince you of that. But as electronic musicians, it's probably a good idea to be aware of the trends in music just as much as we need to know about the latest hardware. With this in mind, I'll try to sift through the piles to come up with the most interesting new stuff and present it in this column. We'll be watching the mail closely for the next few months to see how you like all this—because if you don't, I'm history!

One of the more encouraging trends these days is the cross-cultural merging resulting from the shrinking world and the availability of sampling technology. My favorite this month is British drummer Ginger Baker's ***Horses and Trees*** (Celluloid). He lays down restrained (Ginger Baker restrained?!) drum lines, over which U.S. bassist Bill Laswell, Indian violinist Shankar, Brazilian percussionist Nana Vasconcelos, Senegal percussionist Aiyb Dieng, Gambian multi-instrumentalist

Foday Musa Suso, Cuban percussionist Daniel Ponce, and New York musicians Bernie Worrell, Nicky Skopelitis, Robert Musso and D. St., layer their respective specialities. Sound like a mess? It isn't, thanks to the tasteful subordination of all concerned.

Closer to home is New Yorker David Gilden, who plays the kora, a 21-string African harp on ***Distant Strings*** (165 Prospect Park West, Brooklyn, NY 11215). Gilden plays African and Irish folk tunes, accompanied by synthesizer. I met David briefly this summer. He'd just gotten kicked out of the Public Market for panhandling (which is permitted) while playing his kora through a little guitar amp (which is not permitted). Luckily, the delicate beauty of his instrument is faithfully captured here for anyone who throws $10 into his hat.

A very interesting tape of musique concrete has come in from Ricardo Dal Farra of Argentina. ***Musica Electroacustica En Tiempo Real*** is just what it says: electroacoustic music in real time. Dal Farra utilizes guitar, panflutes and DX7 altered beyond recognition with digital delays and pitch transposer. Some very rich textures result. The opening track was created at CCRMA in Stanford and another was recorded while he was being filmed for Australian TV, so international ties abound here too. Azcuenaga 2764, (1640) Martinez, Buenos Aires, Argentina ☎ 54-1-553-3015.

And finally, from the USSR, we have ***Russian Rock***, a single recorded in Moscow by Melodiya and released on an Australian label, available in the U.S. for $3 from Brave New Music, PO Box 25695, Los Angeles, CA 90025. Both groups (one on each side) sound very Western—the Stas Namin Group singing in English, and Zodiac providing a very smooth synthesizer instrumental. I tell you it's enough to make your head spin.

If you can't bring yourself to go around the world, there's plenty of activity here at home too. When I'm buying unfamiliar names I want to get as much for my money as possible, so I like compilation tapes. For sheer diversity, it's hard to beat the ***Camera Obscura Sampler, Vol.I*** ($5 from 1508 Faymont, Manhattan Beach, CA 90266). It's an entertaining mix of tape collages, droning atmospheres and simple tunes from 11 dedicated amateurs. Farther out is ***Discordia/Concordia***, a collection from the nether regions of musicland, including Controlled Bleeding, John Wiggins, Jeff Greinke and four others. It'll give you plenty of ideas—if not nightmares (Arthur Potter, 51 Center Street, Patchogue, NY 11772). Back here on Earth is ***NEMUS***, a baker's dozen of Northwest Electronic MUSicians who are more traditionally "musical" (Doug Haire, 101 S. Spokane Street, Seattle, WA 98134 ☎ 206 / 324-9216).

Speaking of variety, there's a lot of it on Hugh Caley's tape ***Plasma Bat*** (33535 Gertrude, Wayne, MI 48184 ☎ 313 / 722-4134). Synthesizer instrumentals pop up between guitar rock tracks featuring vocals ranging from David Byrne to Robert Wyatt. Caley plays everything himself and sounds very comfortable doing it. Also playing everything himself is Mark D'Amico (Orbian Music, 28421 Center Ridge #A-12, Westlake, OH 44145 ☎ 216 / 835-3743). His tape ***The Myth*** is a very strong set of mainstream instrumentals featuring electric guitar and DX7. Because it is a Stratocaster, the guitar has a distinctly rock edge to it, while the keyboards, bass and drum programming provide solid backing.

Somebody say guitarist? Here is another trend, although I don't know what it means: three new albums from guitarists named Phillips. Glenn Phillips has an album of white-hot guitarwork over Nashville/rockabilly straight-ahead rhythms. If you like good guitarwork, ***Elevator*** (SST) is a trip right to the top. Anthony Phillips (ex-Genesis) presents the seventh in his series of Private Parts and Pieces: ***Slow Waves, Soft Stars*** (Audion). It's pleasant but inconsequential like the rest. Last, Chuck Phillips's ***Windows Without Walls*** ($6 cassette from Bender Productions, PO Box 42892, Tuscon, AZ 85733) stands out from the morass of fuzzy new age instrumentals simply because it is neither fuzzy nor new age. These stripped-down guitar/synthesizer tracks cut right to the core of the tunes.

As usual, we received a number of new age/new acoustic albums as that seems to be the hot style these days. The best of the bunch is Mark Sloniker's ***Paths of Heart***. His piano and synthesizer, with ensemble backing, would feel right at home on either Windham

—continued on page 104

HIGH TECH BOOKS FROM MIX BOOKSHELF AND HAL LEONARD PUBLISHING

Presenting the most comprehensive reference material available on MIDI, synthesis, recording and more.

Our goal is to provide you with all of the information you need to understand the whole new world of music technology. The following publications do just that. They are basic guides to understanding music and sound technology in practical, easy-to-understand terms for musicians of any level.

THE FERRO TECHNOLOGY SERIES

The Ferro Technology Series presents the whole picture of music technology in easy-to-understand terms. These books are the standard desktop reference for musicians, computer programmers, designers, educators or anyone else who uses MIDI on a day-to-day basis.

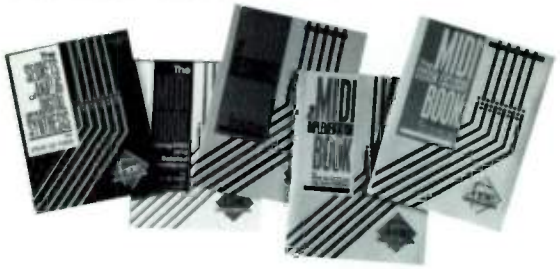
The series was co-written by Steve DeFuria and Joe Scacciaferro. DeFuria is an active studio musician/synthesist with numerous album, film and session credits and is a featured columnist for KEYBOARD Magazine. Scacciaferro is a MIDI expert specializing in digital systems design and is also President of Triple S Electronics, a leading design and service facility for computer-based musical equipment and synthesizers.

The following books in the Ferro Series are both dictionaries and encyclopedias of the MIDI "language."

Secrets of Analog and Digital Synthesis
This book is ideal for both the novice and experienced synthesizer player and is the foundation book in the Ferro Series. This is a complete method for learning how to create sounds on any type of synthesizer, including Analog, FM, PD, Additive and LA synthesis. Learn how to make any sound you want on your synthesizer.
136 pp. $14.95

Secrets of Analog and Digital Synthesis Video
A simple guide to making any sound on any synthesizer that includes insight into stage and studio performance technique. Contains hands-on demonstrations utilizing such innovative visual teaching tools as computer animation and split screens.
120-minute, VHS $59.95

The MIDI Book
This book starts out with a brief explanation of why and how MIDI works. It includes information on how to link keyboards, sequencers, drum machines and computers into powerful MIDI systems. Discusses every message in the MIDI "language" in a musical as well as technical point of view. Includes more than 100 detailed illustrations and diagrams showing the finer points of how to use MIDI equipment to its fullest. 104 pp. $14.95



THE MIDI Resource Book
The most complete collection of MIDI documentation available. Contains updated versions of all MIDI technical documents: MIDI Specification, MIDI Time Code Specification (MTC), Sample Dump, Standard, System Exclusive Extensions and more. The perfect launching point into applying and expanding knowledge learned in THE MIDI BOOK.
148 pp. $17.95

The MIDI Implementation Book
The complete collection of every MIDI implementation chart (the industry standard method for showing an instrument's MIDI features) ever produced! This is a collection of data supplied directly from the manufacturers which allows you to find MIDI functions of a specific instrument, compare features of similar instruments or find equipment to solve specific MIDI problems. This book lists the complete MIDI capabilities of more than 200 MIDI products from virtually every MIDI manufacturer in the world.
208 pp. $19.95

The MIDI System Exclusive Book
This is an excellent reference for technical people as well as the average musician. Contains over 700 pages filled with MIDI data that talk about advanced MIDI performance applications for more than 150 synthesizers, samplers, sequencers and drum machines.
320 pp. $29.95
Available November 1987

Also Available . . .

MIDI – IN'S, OUT'S & THRU'S
By Jeff Rona
This book is a guide for the musician, performer, composer, producer, recording engineer, computer enthusiast or anyone desiring a good understanding of how to work with MIDI.

MIDI – IN'S OUT'S & THRU'S shows how a MIDI system or systems for a wide range of situations can be assembled quickly, easily and trouble-free. Describes how to synchronize MIDI recording equipment, SMPTE-based equipment, and other MIDI instruments. Describes each and every MIDI code and the techniques used in transmitting these codes between various MIDI devices. A brief description of computer terms and technologies is included. This book explains how to get the most out of any musical situation that calls for the use of synthesizers and electronic music instruments. Includes pictures, diagrams and a detailed glossary.
128 pp. $12.95

PERSONAL RECORDING
Both a general introduction to multitrack recording and a guide to the use of Yamaha equipment – especially the MT1X and MT2X multitrack recorders. Topics covered include: basic recording and overdubbing; punch-in and punch-out to make spot corrections; ping-pong recording as a means of squeezing more parts onto fewer tracks; using sync recording to harness the power of MIDI; using effects units; mixdown; choice and use of microphones.
96 pp. $10.95

FM THEORY & APPLICATIONS
By Dr. John Chowning and David Bristow
FM synthesis – the method of sound generation used in the Yamaha DX synthesizers, is thoroughly explained here. This book covers the mathematics of FM synthesis yet it speaks in a language that musicians can understand. It goes beyond the theory, into applications of the principles in creating useful sounds on the Yamaha DX7. 192 pp. $29.95

ORDER THROUGH MIX BOOKSHELF, 2608 NINTH STREET, BERKELEY, CA 94710
(415) 843-7901 ORDER TOLL FREE (800) 233-9604, IN CALIFORNIA (800) 641-3349

Classified Ads!

Starting next month in Electronic Musician

Call Lauri Newman, at 415/843-7901 for rates and information.

—from page 102, RELEASED AND REVIEWED

Hill or ECM but it's actually his own label, DMS Records (PO Box 9032, Fort Collins, CO 80525 ☎ 303 / 484-9600). Maybe in a little while we'll do a New Age Roundup right in this here column, partner. Meanwhile, I'll leave you with the direct opposite, ***Scubatronics*** by Square Wave. Synthesists David Price and Tim Boone (10518 Maplegrove, Dallas, TX 75218) create a contemporary high-tech version of the time-honored "electronic freakout," utilizing analog and digital synthesizers, drum unit and sequencer, all recorded live, in real time. Nothing really develops into tunes, just events, rhythms and sequences floating around in a great cosmic soup. And as you know, soup is the best thing for a sour stomach.

Well, that's all the space we have for now. If you like the new format be sure to let Craig know. If you don't, well, you wouldn't have read this far so you wouldn't know to send in your card. *C'est la vie.* EM

__Robert Carlberg__ says he gave Jimmy Page his first guitar, taught Keith Emerson piano, and was awarded a Nobel Prize for service to mankind. Forced into an early retirement by a crippling mental disorder, he now vents his spleen for a pittance.

—from page 93, E-MU SP-1200

programmable mixes, which contain levels, channel assignments, and tune/decay status for all 32 drums. Mixes, by the way, are saved to disk along with the sequences—a useful tidbit of information *not* found in the otherwise excellent manual.

The SP-1200 stores initial tempo settings for each song, but the procedure for setting this is a bit confusing. Apparently the tempo for each song is remembered any time it is adjusted while a song is selected and not playing, even if song editing is not active. Tempo changes may be specified as gradual accelerandos and ritards, rather than as abrupt changes—something more sequencer designers should incorporate in their devices. Tempo also can be set by tapping quarter notes on the Tap/Repeat button, but like the dynamic drum pads, the response of this feature is difficult to predict, and the tempo has an unsettling habit of shifting wildly if one stops tapping for a beat or two (*Editor's note: I usually tap it about ten times, look at the display each time, and set the tempo for an average of the displayed values*). On the plus side, the sync features on the SP-1200 are as good or better than any other machine, and include SMPTE read/write capabilities, as well as MIDI clock (with Song Position Pointer) and our old friend, the 24 PPQN tape sync signal. With capabilities like these, it's obvious that E-mu isn't aiming the SP-1200 at the home studio market, and a quick look at the price tag ($2,995) will confirm such suspicions. For many recording applications, the combination of a computer-based sequencer and a mid-priced sampler loaded with drum samples would be more cost-effective and also more versatile (playing live, of course, is often a different matter—and that's where the built-in disk drive *really* comes in handy). But for those who require quick access to a wide variety of percussion sounds (E-mu is noted for making extensive sound libraries available for their machines) and need a dedicated drum machine, the SP-1200 is certainly worthy of serious consideration. EM

Until recently, __Jim Johnson__ was an engineer drone for a major electronics company. Then the example set by Craig Anderton convinced him to toss it all away for the freewheeling lifestyle of the freelance musician/writer/programmer. Currently, Jim is saving for a new pair of shoes.

Advertiser Index

Adams-Smith 19
Akai/IMC 85
Altech Systems 40
Aphex Systems 33
Applied Research & Technology (ART) 4
Sam Ash Music 87
Astra Systems 48
Beaverton Digital Systems 74
CompuSound 56
Computer Music Supply (CMS) 87
J.L. Cooper Electronics 83
Deep Magic Music 91
Dr. T's Music Software 29, 31
Drumware, Inc. 22
Electro-Voice 59
Ensoniq 67-72
Eye & I Productions, Inc. 74
48 Track PC 30
Fostex Corporation 12
Future Music 86
Guitar Shack 63
Hitech Innovations, Inc. 97
Intelligent Music 21
Russ Jones Marketing Group 75
Julian Music Systems 61
Kawai 105
The Keyboard Shop 80
Korg 2-3
Kurzweil Music Systems 106
Lake Butler Sound Company, Inc. 38
Leister Productions 30
Manny's Music 61
Midi Concepts, Inc. 27
MIDImouse Music 25
1988 Mix Annual Directory 98-99
Mix Bookshelf 103
Music Design 77
Music Quest, Inc. 17
Musication 40
New York School of Synthesis 22
Nimbus Records 7
Opcode Systems 35
Otari Corporation 101
Paradigm Software Products 80
Phi Tech 91
Reliable Music 85
Resonate 63
Rhythm City 83
RolandCorp US 11, 50, 51
RP Micro, Inc. 24
Sound Quest, Inc. 13
Soundtracs 95
Steinberg 75
TASCAM 9
Thoroughbred Music 41
360 Systems 90
Twelve Tone Systems 38
Valhala 55
Voyetra 45
Wise Music 77
World Records 86
Yamaha Music Corporation, USA, Digital Musical Instrument Division 15, 89
Yamaha Music Corporation, Professional Audio Division 18
Zero One Research 76

THE RIGHT STUFF

Kawai's R-50 has the right sounds and the right features. Check it out:

POLYPHONY

Polyphonic note assignment lets a single instrument sound more than one note simultaneously. With polyphony, a crash cymbal can continue to ring even after the same cymbal is struck again–even at a different pitch. Or build a kit with 10 different sized toms or a scale of tuned Agogo Bells.

PITCH AND PAN FOR EACH NOTE

Every note in a pattern is stored with its own tuning and pan for ultimate control over your sounds.

ON-BOARD EFFECTS

Flange, Delay, and Gate effects are built in and also programmable for every note.

PAD PROGRAMMABILITY

12 Drum Pad programs allow assignment of any sound to any pad, each with its own settings for volume, accent, pitch, pan and effects. Each program can then be recalled with the touch of a button or footswitch.

MEGA-MIDI

The velocity-sensitive R-50 is the perfect slave for MIDI keyboards and sequencers. Each MIDI note can be assigned to any drum, with unique pitch, pan, and effects settings. MIDI Song Pointer enables synchronization with SMPTE controllers. And eight extra note triggers enable the R-50 to play external MIDI devices as well.

KAWAI ALTERNATE SOUND CHIPS KEEP YOUR OPTIONS OPEN

From ten snare drums, to bass guitars, orchestra hits and brushes, the wide range of sounds available keep the R-50 at the top of its class.

TAPE INTERFACE & MIDI DATA DUMP

Store patterns on computer or use the inexpensive tape interface.

Kawai's small R-50 with the big sound. Before you decide on a drum machine, give the R-50 a good listen at your authorized Kawai EMI Division dealer.

KAWAI

KAWAI AMERICA CORPORATION
EMI DIVISION
2055 East University Drive • PO. Box 9045
Compton, California 90224-9045

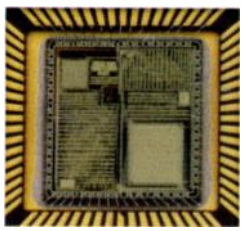
The price you have to pay to be free.

As a musician, you know you've got to be free. Free to express the music that's inside you. But, sadly, buying an "affordable" keyboard or sound module often means compromising your expressive freedom by accepting second-rate sounds and limited capabilities.

At Kurzweil, we don't think the instrument you play should build fences around your imagination. So we developed our revolutionary 1000 Series to help turn it loose. The 1000 Series delivers authentic Kurzweil sounds with more voices, more programming power, more creative freedom than you ever thought possible at prices you never thought possible.

Freedom from Financial Oppression.

Thanks to our new VLSI microchip, Kurzweil 1000 Series modules start at just under $2000. VLSI has enabled us to pack each Series 1000 instrument with up to 120 of the same impeccable, 16-bit floating point, digitally-sampled sounds found on the legendary Kurzweil 250.® Choose from the **1000 SX String Expander Module, 1000 HX Horn Expander, 1000 GX Guitar Expander, 1000 PX Professional Expander** (which provides a varied collection of our most famous samples) or the **K1000** (the keyboard version of the 1000 PX).



Freedom of Expression.

The 1000 Series' generous polyphonic capabilities free you from the expressive limitations of 12-voice or 16-voice systems. The 1000 PX and K1000 offer the power of 24 voices while the 1000 SX, 1000 GX and 1000 HX each have 20 voices. And, if you need more voices, you can combine all four 1000 Series modules to create an 84 voice, 8-output super-system. So go ahead. Stack voices to your heart's content. Build complex, multi-voiced sequences. Go for those big, two-fisted chord shapes. The 1000 Series modules give you miles of sonic territory to roam at will.

Freedom of Choice.

The 1000 Series is truly democratic too. Three different operating modes let everyone—from novices to advanced programmers—benefit from the 1000 Series' bountiful capabilities. In Play Mode, you can use those great Kurzweil sound programs just as they are. Simply select a program and play. The Compiled Effects mode lets you apply a variety of popular effects to any of the preset sound programs. And the Modular Editing mode takes you deep inside the 1000 Series' voice architecture.

So stand up for your rights. You owe it to yourself to check out the 1000 Series. For more information, visit your nearby Kurzweil dealer. Or write to us at Kurzweil Music Systems, Inc., 411 Waverley Oaks Road, Waltham, MA 02154, (617) 893-5900. In Canada, write to Heinl Electronics Inc., 16 Mary Street, Aurora, Ontario L4G 3W8, (416) 727-1951.

KURZWEIL™
Music Systems

*$1995 suggested retail price for 1000 SX and 1000 HX. $2,395 suggested retail price for 1000 GX and 1000 PX. $2,995 suggested retail price for K1000. All specifications and prices subject to change without notice.