Software Reviews

Electronic MUSICIAN

MAY 1987

A MIX PUBLICATION

U.S. $2.50/CANADA $3.50

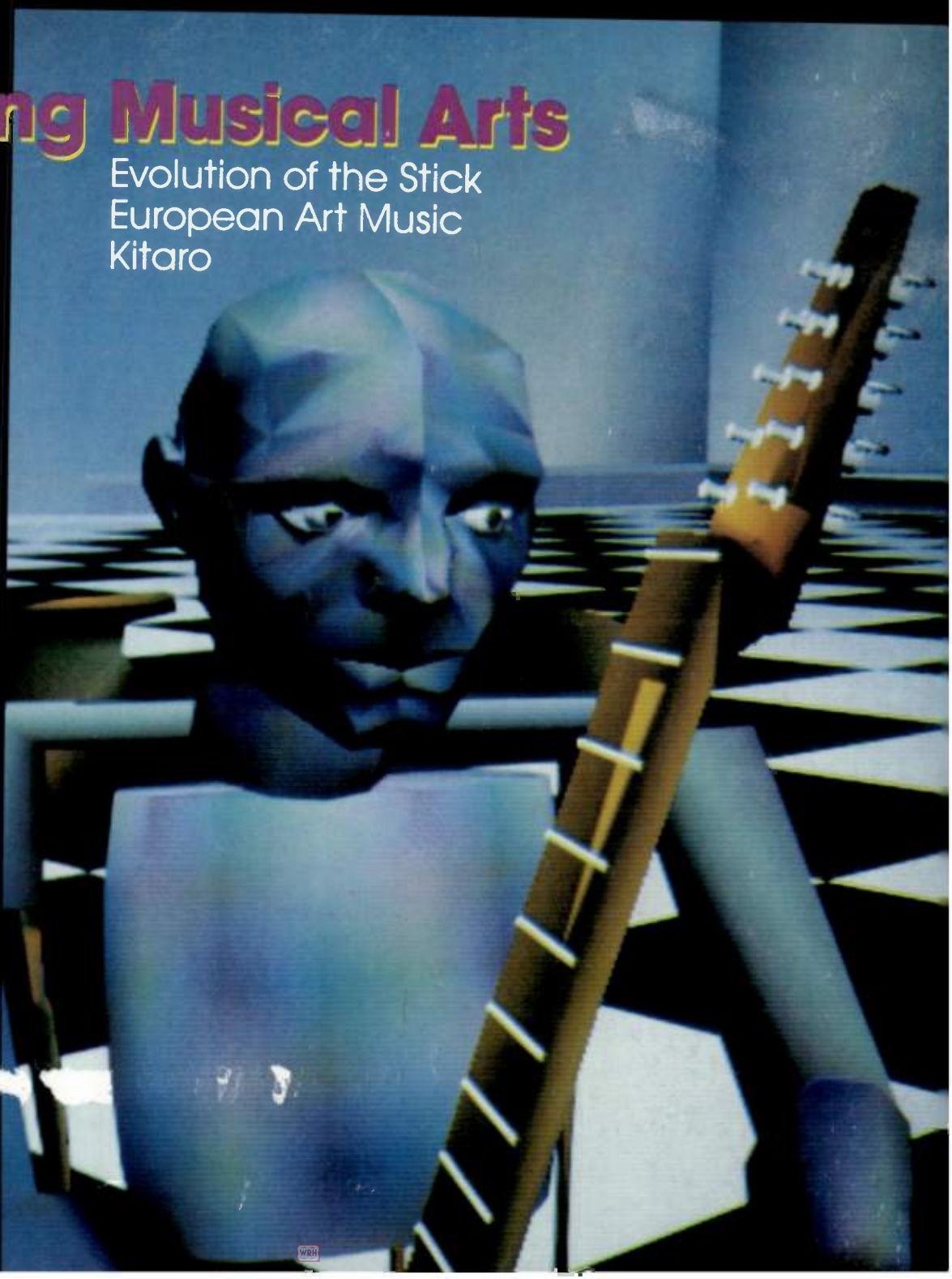
Exploring Musical Arts

Evolution of the Stick
European Art Music
Kitaro

Tips and Techniques:

- For the Mac
- Atari ST
- MIDI Systems
- Home Recording

Build: Quality Mic Preamp



0 76956 14050 3

While you were playi

INTRODUCING THE NEXT GENERATION DX7.

You said you wanted a DX7 with more voice memory. And function memory. A split and dual tone system. More extensive MIDI implementation. Micro-tuning and a larger backlit LCD. We heard you.

We also did some listening on our own and came up with improvements like random pitch shift, real-time parameter changes, digital pan, two-channel design. And two models, the DX7IIFD with built-in 3.5″ floppy disk drive. And the DX7IID.

Both have dual and split play modes to give you the power and sound of two DX7s. Any two voices can be combined and played as one in the dual mode. Split mode lets you assign different voices to the right and left sides of the keyboard.

The dual FM tone generators in the II give true stereo output. They also open up some exciting new digital pan possibilities. And you can determine the position of the voices in the stereo field according to velocity, LFO and key number.

For more memory, we doubled the on-board single voices to 64. We also added 32 internal performance memories to the II. So you can store voice position data with function (or what we now call performance) parameter data.

We've also greatly expanded the new DX7II's data storage capacity. In two ways.

First, with the new RAM4 cartridges. One of these will store the DX7II's total memory including 64 voices and 32 performance combinations, or 63 micro-tunings.

Second, with the DX7IIFD's built-in 3.5″ disk drive. One 3.5″ disk equals the storage capacity of 40 RAM4 cartridges. So you can

ng, we were listening.

have a massive voice, performance, micro-tuning and fractional scaling library ready for virtually instant use and access. And a MIDI data recorder for recording and storing external MIDI equipment information.

A new larger 40-character by 2-line backlit LCD and two alpha-numeric LEDs make operating and programming the II a lot easier.

The II's new micro-tuning feature has 10 preset alternate tunings besides the standard. And two on-board memories let you create and store your own.

The all-new fractional level scaling function lets you precisely adjust the output level of each operator in three-key groups.

The new Unison Poly mode combines four tone generators for each key so you can detune to achieve a fatter sound. Aftertouch can also now control EG bias and pitch bend.

And an all-new FM tone generator system gives the DX7IIFD and DX7IID greatly improved fidelity.

So FM is sounding better than ever. Especially when you hear the new DX7IIs' very reasonable prices. Just visit your Yamaha Digital Musical Instrument dealer. And listen.

Or write to Yamaha International Corporation, Digital Musical Instrument Division, P.O. Box 6600, Buena Park, California 90622. In Canada: Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario, M1S 3R1.

100
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YAMAHA.

HOW TO BOUNCE TRACKS WITHOUT BOUNCING OFF THE WALLS.

The more tracks you record, the harder they can be to keep straight. And the more you'll appreciate the personal recorder that makes it easy to sound good.

The Tascam 246 Portastudio.

EVERYTHING'S UNDER CONTROL.

To begin with, the controls of the 246 practically explain themselves. When you want to assign any of its 6 channels to any of its 4 tracks, just push 1, 2, 3, or 4 on the channel strip.

That's it. The signal's routed. (And mixed, if you've decided to send other channels to that track.) No blind guesses about what's bouncing where. Or about levels, since the 246 has separate sets of meters for recording and mastering.

KEEP IT CLEANER.

The 246 cuts down on confusion. As well as hiss. In fact its built-in dbx gives you 10dB more broadband noise reduction than Dolby C.

And if you want to record Code or FSK, you can clear dbx out of Track 4 with the flip of a switch. What's more, you won't have to sacrifice Track 3 to guard against crosstalk, thanks to Tascam's advanced head design.

PUT MORE IN. GET MORE OUT.

Each channel of the 246 has line *and* mic inputs, complete with effects and EQ. Even Channels 5 and 6.

Which makes things much less frustrating when, for example, you're trying to mic a full drum set. Or use a multi-keyboard MIDI setup.

Everything else about the 246 makes recording easier, too. From a dual speed selector, to a transport control that lets you loop automatically and find any point on a cassette within seconds.

Visit a Tascam dealer today and test a Portastudio.

No matter what you assign it, the 246 will keep things simple. While keeping you calm, cool, and creative.

TASCAM

VOL. 3, NO. 5 MAY 1987

Electronic MUSICIAN

A MIX PUBLICATION

DEPARTMENTS

COVER

This month's cover was created at Ohio State University's Advanced Center for Computing in Art and Design by Michael Czeiszperger, Craig Caldwell and Greg Foss. The image features a model of The Stick™ (a musical instrument designed by Emmett Chapman) and a facial animation model by Brian Guenter.

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ARTICLES

MUSIC AND ART

DO-IT-YOURSELF

RECORDING

INTERVIEW

MIDI

REVIEWS

Editor's Note

Craig wearing "art headphones." See page 42 for story.

Tube versus transistor—stereo versus quad—VHS versus Beta—Megalon versus Godzilla—are you ready for CD versus DAT?

Yes, the savior of the record industry—the CD—is already facing the first prospects of competition from Digital Audio Tape, or DAT. A DAT tape cartridge is actually a bit smaller than a cassette, yet delivers CD-quality sound in an eraseable/recordable format. So am I getting ready to sell my CD player and meager collection of CDs? No way. I think CDs and DATs will co-exist quite peacefully, and here's why.

For starters, we already know the big disadvantage of the CD: you can't record on it. But let's also look at some of the disadvantages of tape. Tape is physically more fragile than a CD, and does deteriorate with time. The action of scraping across a head causes damage to both the tape and the head. Granted that this damage is subtle, but still, tape has a finite life span. And of course, put that tape near a magnet, and all the error-correction in the world isn't going to help (ditto if you put your CD on the radiator, of course).

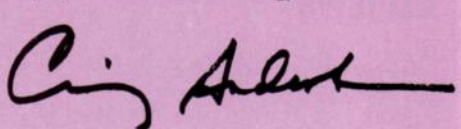
Tape is also not conducive to random access. Finding cuts on a CD is simple; finding them on tape, due to the time required by fast-forwarding and rewinding, is not. Many people like CDs because of players that let you sequence your own order of musical selections. Doing those kinds of tricks with tape will be much more complicated.

There's also a reasonable chance that the cost of CDs will go down. Already, supply is catching up with demand, which will encourage discounting. There are also reports of new techniques that might eventually cut CD manufacturing costs. When it comes to DATs, high-speed digital duplication should be less critical than doing it in analog, but still, I expect there to be not too much difference between the cost of CDs and DATs when prerecorded DATs finally appear.

Another factor is Compact Disc Interactive (CD-I), a system that records video, animation, sound, speech, text, and software on a CD-type disc. Though not yet available, when the proper software and hardware are in place, CD-I offers the promise of incredibly sophisticated games, educational programs, simulations (a trip to the moon, anyone?), and much more. Fortunately, CD-I players will play back standard CDs, so if you upgrade to a CD-I machine, your CD collection doesn't become obsolete.

What about player price? I bought my CD player (a Sony, even) for $150. I think it's going to be a while before the DAT hits that level.

So am I down on DATs? Not at all. I've put off buying a PCM adapter for mastering while waiting for the DATs to arrive. The first DAT players are expected to sell for about $800 to $1,200, which makes them price-competitive with a PCM/VCR combination. A portable DAT would be great for sampling fanatics and sound effects fans, and I wouldn't mind preserving some of my out-of-print records by taping them with perfect fidelity either. DATs definitely have a place—probably a major place—but I don't subscribe to predictions that they're going to bury the CD market. And if CD-I takes off in a big way, or CD duplication costs come down, we can expect CDs to remain the most popular audio technology for some time to come.



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The MIDIfied Farfisa

Several readers have asked about MIDI retrofits to existing electronic organs. The following should help.

Thank you so much for your reply to my letter about a MIDI retrofit for a Farfisa. Not long after writing you, we made contact with one of the European companies you suggested as a possible source—Dr. Bohm, Postfach 2109, D-4950 Minden, West Germany. They have something they call a "universal" MIDI retrofit for generating MIDI Out (not In) from older organs. In response to our inquiries, they claimed it has been successfully installed in our model of Farfisa. Thanks for your help and personal reply.

Steven Webman
Pondicherry, India

Making Cents of Alternate Tuning

I found the November issue (on alternate tunings) stimulating but would like to elaborate upon some of the issues Wendy Carlos addresses about various equal-tempered scales. In the interview Wendy states: "Twelve steps in an octave happens to hit the fifth well, as we all know. It doesn't do as good a job on the thirds; sixths are a little better." The fit to the fifth is indeed good, a 0.12% offset. The third is off by 0.79% and the sixth is worse, not better, by being off at a 0.91% offset. She also said "The next good fit occurs as we move on to 15 steps. That one actually misses the fifth, the third, and the minor third by being a little too small, but it is equally a little too large for the fourths and sixths." I find just the opposite offsets: the fifth, the third, and the minor third are 1%, 0.8%, and 0.25% too *large* whereas the fourth and the sixth are 1% and 0.25% too *small* respectively.

In addition to 19 steps hitting the minor third almost exactly (0.009%) it is equally accurate with regard to the sixth. This 19-step scale approximates eight of the 12 intervals to within 0.5%. Both 34 and 41 steps in an octave fit all 12 intervals to within the same 0.5% tolerance, with 41 steps fitting the fifth to within 0.02%. Likewise 46 steps fits all well and 53 fits to within 0.1% except the tritone (0.36%).

Among those scales that are not mentioned, the one with 45 steps would work quite well in an approximation to a minor mode scale.

Wendy's scales that don't have an integral number of steps per octave can be seen as every third step in a scale with 46 steps (Carlos Alpha) and as every second step in a scale with 69 steps (Carlos Gamma).

Craig Paul
University of Kansas
Lawrence, KS

Those Were the Days

Today I came down with the flu and was feeling pretty miserable when my day was made somewhat brighter by the February issue of EM. I would have to say that your magazine is getting better than ever. It had the right mix of every subject, i.e. interviews, construction articles, information, reviews. And of course, despite what many people think of them, ads. I actually enjoy seeing ads or press releases for equipment, even if I would never be able to afford it.

This issue got me thinking back a bit to where the magazine has been. I first subscribed to it back in the days when it was published by PAiA (1976). Electronic music instrumentation has completely changed since then, when it was really something to purchase a VCO chip for your project that really had exponential control. Nowadays, analog oscillators are getting rare indeed.

Naturally, this change has brought about some sadness on my part. Construction of one's own equipment is getting more and more un-economical as time goes on. Back in about 1981 or so, I remember the PAiA Proteus I purchased cost $399 (which was worth more back then); the FB-01 that I just got recently cost $345.

But I am glad to see that there are still people like H. W. Cano who will design projects—like his sampled drum—that are fairly simple to build, quite effective, and possibly (I hope) even fun. Yet, if you compare the $40 per module for Cano's machine (ten different voices are $400) to the prices and the features of the ready-made equipment . . . well, it makes me sad.

I also miss John Simonton. I remember his series of articles back in '75 and '76 on using the old PAiA 8700 microcomputer for making, of all things, a polyphonic synthesizer for next to nothing (I seem to recall a Prophet 5 was several thousand dollars). I guess in some ways those were the Golden Age of the Electronic Music Hobbyist.

Computers are another interesting subject. In 1976 I paid $500 for a Polymorphic Poly-88 kit with 512 bytes (not Kbytes) of RAM. Just recently I purchased an Atari 520ST for $600 that had 512K and about an order of magnitude better performance.

Anyway, keep up the good work. And keep those interesting articles coming. I can hardly wait to see what electronic music is going to be like ten years from now.

James Patchell
Santa Barbara, CA

James—Thanks for the comments. By the way, John Simonton is working on a very inexpensive DIY MIDI-to-CV converter with a bunch of useful features. We'll publish his article as soon as we can get our hands on it.

Inexpensive MIDI to CV/gate?

I have enjoyed your magazine and look forward to reading more. I was interested in Dean Heinbuch's review of the MPU-101, but like some musicians, I only own one or possibly two analog synths. The MPU-101 is a four channel converter MIDI to CV/gate with many frills, but is there anything simpler and less expensive? Maybe this calls for a do-it-yourself article?

Anthony Thompson
Gainesville, FL

Anthony—See above.

Amen

Congratulations to Peter Stapleton for his article in the October '86 issue on the use of synthesizers in church music. To say that there are 300,000 potential jobs for synth players in churches is by no means an exaggeration. In recent years church musicians have (along with everyone else) become intrigued by the use of "new sounds" produced by synths. Due to the common use of these instruments in secular and contemporary Christian music in particular, the use of synthesizers in churches has finally begun to take hold. In addition, church music is no longer dominated by Bach organ preludes and Palestrina madrigals. Adherence to tradition and musical conservatism notwithstanding, more and more church services are featuring the music of artists like Amy Grant, Farrel and Farrel, Russ Taff, and others. Most would agree that synthesizers are in the midst of the contemporary Christian music mainstream. Therefore, the need for synthesizers and *synthesists* in churches is growing. I even have a Rabbi friend who recently purchased a Kurzweil 250 and a Mac! To Mr. Stapleton and others who promote the use of synthesizers, sequencers, drum machines, computers, and whatever else in churches, I say: Amen!

John Gross
Music Director
Cornerstone Church
PAN Electronic Mail: JHGROSS

ACCESSORIES

▶**Interlink 400** audio system cable is claimed to improve overall sound reproduction, deliver greater dynamic range, and increase clarity. 1-meter pair, $29.95; 2-meter pair, $39.95; 20-foot pair $79.95.

Monster Cable
101 Townsend St.
San Francisco, CA 94107
☎ 415 / 777-1355

▶The **Pro Rack** is made of ¾-inch multiply hardwood and comes in 7 ($129), 13 ($165), and 20 ($215) rack space models. Accessories include casters ($65), mounting hardware, and Rhino (ATA) flight case.

Jan-Al Innerprizes
4452 E. Washington Blvd.
Los Angeles, CA 90023
☎ 213 / 260-7212 or 213 / 669-0550

Accessory Research Engineering "Static Killer"

▶**Static Killer,** available in quart and gallon non-aerosol containers, kills static charges on surfaces and prevents build-up for hours.

Accessory Research Engineering
7129 20th Ave. N.
Centerville, MN 55038
☎ 612 / 426-4450 or 800 / 328-9695

COMPONENTS

▶A D-sub-connector **gender changer** is available in 9-, 15-, 25- and 37-pin dimpled and undimpled versions.

ITT Cannon
Commercial Interconnect Division
10550 Talbert Avenue
Fountain Valley, CA 92728

▶The **LM12** Fault-Tolerant High-Power Op Amp ($20 each in hundreds) is short-protected and delivers 150 watts into 4 ohms at 0.01% distortion. Packaged in four-lead TO-3 case. The **LM837** Quad Low-Noise Op Amp ($1.25 each in quantities of 25,000) features 0.5 μV equivalent input noise, 140 dB minimum dynamic range, less than 0.0015% distortion, 10V/μs slew rate, gain bandwidth of 25 MHz, and power bandwidth of 200 kHz.

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, CA 95052

COMPUTERS

▶The **Trackstar 128** emulation board ($399.95 plus installation) lets the MS-DOS Tandy 1000/1000SX computers run most software for the Apple II family of computers.

Tandy Corporation
1800 One Tandy Center
Fort Worth, TX 76102
☎ 817 / 390-3487 (Fran McGehee)

▶The **CMS Visual Sequencing System** package ($1,299) includes a rack-mount 8 MHz IBM-compatible computer with 640K RAM, hi-res graphics card, monitor, dual 360K floppy drives, and software (MS-DOS 3.1 and Sequencer Mach-1). Options include hard disk, printers, modems, etc.

Computer Music Systems
382 N. Lemon Ave.
Walnut, CA 91789
☎ 714 / 594-5051

▶An IBM PC add-on board, the **Music Magic Synthesizer 1** ($795), controls up to 16 voices on one board; four boards may be operated in one computer for a total of 64 voices.

Music Magic
180 Basswood
Cleveland, OH 44022
☎ 216 / 247-8818

▶CORE (approx. $200) is a Controller of Remote Electronics that interacts with virtually any infrared-controlled home electronics product to allow for remote control, timed control of appliances, and so on. Macros can be entered that execute long series of commands with the touch of a single key.

CL 9
475 Alberto Way
Los Gatos, CA 95030
☎ 408 / 996-9999

ELECTRONIC PERCUSSION

▶The **MTX9 Percussion System** expands an SDS9 electronic drum set (and many others) by adding 11 sampled sounds along with a variety of control functions (pitch change, echo, setup memory, etc.). Basic brain price: $699 with cables. Also available as a self-contained percussion system with three pads and cables for $899.

Simmons USA
23917 Craftsman Rd.
Calabasas, CA 91302
☎ 818 / 884-2653

▶The **SS-1 Sound Sticks** ($99.95), designed for plugging into compatible Casio keyboards, have built-in sensors; upon hitting any surface, the SS-1 triggers the instrument's drum sounds.

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

KEYBOARDS

▶The **K250** synthesizer, with Sound Modeling Program, Version 4 software, and QLS personal computer interface, has been reduced in price to $9,995.

Kurzweil Music Systems
411 Waverly Oaks Road
Waltham, MA 02154
☎ 212 / 354-2100

▶The **DS-8** synthesizer translates FM operators and algorithms into familiar analog-style parameters and controls for easy programming. Features include eight voices, 61-key velocity/aftertouch keyboard, 100-program internal memory, programmable digital effects unit, and LCD display.

Korg
89 Frost St.
Westbury, NY 11590
☎ 516 / 333-9100

PUBLICATIONS

▶The **1987 Music Business Directory** lists over 4,600 record companies, distributors, and key personnel. The **1987 California Music Directory** includes 6,500 listings of booking agents, radio and TV stations, magazines, reviewers, studios, schools, etc. The **1987 Music-Radio Directory** lists the 4,200 most important U.S. radio stations in all major music formats. Each directory lists for $29.95 plus $3.50 p/h; all three for $75 plus $5 p/h.

Augie Blume & Associates
PO Box 190
San Anselmo, CA 94960
☎ 415 / 457-0215

▶A booklet of **SPX-90 Applications** is available from Yamaha.

The Kurzweil 150 Fourier Synthesizer

The Kurzweil MIDIBOARD® The Ideal Master Controller

The Kurzweil 150 Fourier Synthesizer
The Kurzweil 150 is one of the most unique synthesizers available on the market. The 150 is a real-time additive synthesis machine with multiple resident sound blocks and extensive programmability for extraordinary user creativity. It's a rack-mountable, multi-timbral sound source with 16 voice polyphony, designed to work with any MIDI controller.

The 22 resident voices and 69 preset programs are just the beginning. You can modify and combine them to create new programs, and save up to 186 of them in the 150's non-volatile memory.

For example, you can create infinite numbers of sound combinations. You can split a keyboard into three regions with up to seven layers of sound in each, and each sound layer may be individually tuned, transposed and balanced. Layers and regions can be copied and inserted in other locations. Combined with the many programmable modifiers, the Kurzweil 150's sound layering techniques enable you to create distinctive sounds with remarkable ease.

You can vary the overtones of each sound using Kurzweil's unique Timbre Shift™ capability. You can also control how effects such as pitch bend, chorusing, vibrato and graphic equalization are applied. You can even use polyphonic afterpressure to control pitch bend, vibrato depth and chorus detune on a note-by-note basis.

The 150 Fourier Synthesizer also provides additional editors which allow you to modify velocity and loudness response, tuning intervals, program mapping and controller assignments. And, of course, the 150 has full MIDI implementation, with Omni, Poly and Multi modes of MIDI operation.

Best of all, the Kurzweil 150 Fourier Synthesizer is designed to get even better. With our Sound Laboratory for the Apple® IIe, written by Hal Chamberlin, and additional Sound Blocks, the 150 is truly an incredible instrument for the creative musician.

Now with Sound Laboratory and Additional Sound Blocks.

The Kurzweil MIDIBOARD®
The Kurzweil MIDIBOARD is a powerful master MIDI keyboard controller with unique features unavailable in any other product of its kind: the ability to control 8 MIDI devices, true polyphonic key pressure sensitivity, and completely adjustable keyboard response.

The MIDIBOARD's 88-key weighted wooden keyboard has the feel and velocity sensitivity of a concert grand piano. In addition, the MIDIBOARD produces release velocity, polyphonic afterpressure, and channel pressure, which let you shape the dynamics of individual notes as you play them. Dedicated sliders adjust the keyboard's attack, release, pressure, and retrigger sensitivity, enabling you to fine-tune the MIDIBOARD's response to your own playing style.

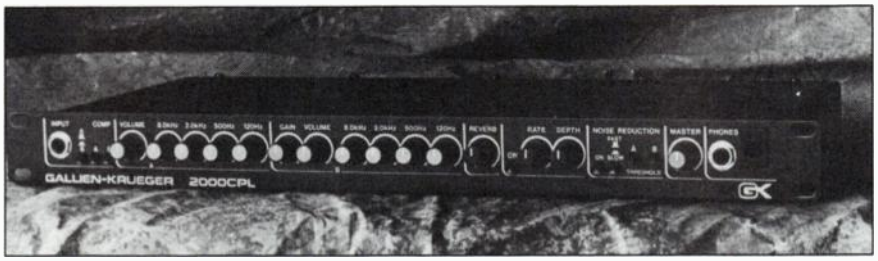
The MIDIBOARD lets you set up and control up to eight MIDI instruments, then conveniently change any of 44 operating parameters that tell how the MIDIBOARD controls any one of those instruments. Multiple parameters tell how the MIDIBOARD's complement of wheels, sliders, buttons and external controls are connected to your instruments. YOU assign what controls what . . . so each of the MIDIBOARD's 12 assignable controls is where you want it, when you want it. You can save up to 99 of your favorite setups in the MIDIBOARD's non-volatile memory, or store them on cassette tape or via MIDI for safe keeping.

Now with Version 2 Software.

Two Instruments. One great MIDI system.
The Kurzweil 150 Fourier Synthesizer with its Sound Laboratory and the Kurzweil MIDIBOARD make great investments.

The Kurzweil 150 is designed to accept state-of-the-art control sources like the Kurzweil MIDIBOARD. The MIDIBOARD's power and flexibility make it an unsurpassed MIDI controller. Together they allow a level of expression previously unavailable with keyboard instruments. Audition them both at your local authorized Kurzweil dealer.

KURZWEIL™
The Best Gets Better.
Kurzweil Music Systems, Inc.
411 Waverley Oaks Rd.
Waltham, MA 02154
(617) 893-5900



Gallien-Krueger 2000CPL stereo guitar preamp

Yamaha, Professional Audio Division
PO Box 6600
Buena Park, CA 90622
☎ 714 / 522-9134

RECORDING

▶The Mac Plus/Sun 3-compatible **Dyaxis** disk-based audio recorder provides 16-bit linear audio processing, mass storage capable of storing up to two hours of sampled stereo sound at 48 kHz sampling rate, and software to record, retrieve, edit, and mix stereo audio files. Project price: under $15,000 with one hour recording time.

IMS
1552 Laurel St.
San Carlos, CA 94070
☎ 415 / 592-8055

SIGNAL PROCESSORS

▶The **RDS 7.6** rack mount digital delay/-sampler ($379.96) records up to 7.6 seconds of sound or provides 7.6 seconds of delay. Also includes modulation controls. 85 dB signal-to-noise, 15 kHz bandwidth at ± 1 dB.

DigiTech
5639 S. Riley Lane
Salt Lake City, UT 84107
☎ 801 / 268-8400

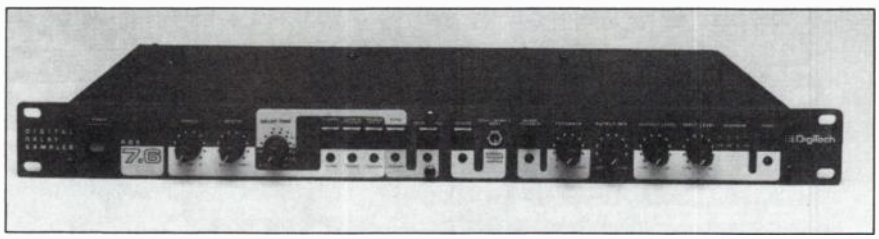
▶The **2000CPL** ($649) is a two-channel stereo guitar preamp with built-in compressor, stereo reverb, stereo chorus, and noise reduction.

Gallien-Krueger
504B Vandell Way
Campbell, CA 95008
☎ 408 / 379-3344

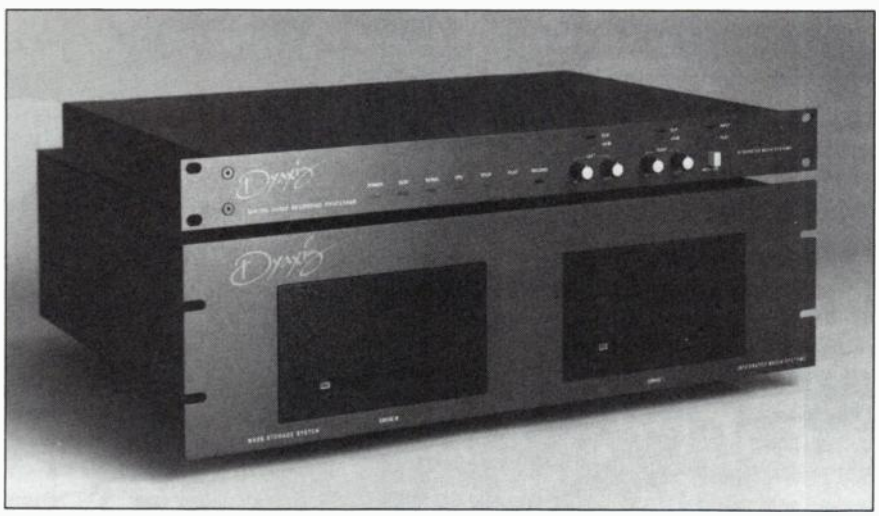
SOFTWARE

▶**MIDIBASIC** ($49.95) adds over a dozen MIDI commands to Microsoft's BASIC and Zedcor's ZBasic for the Macintosh. **MIDIBASIC Casio Voice Editor/Librarian** ($29.95) for the Mac works with the CZ-1-1, 1000, 3000, and 5000 synthesizers. An equivalent program is available for the DX7. **MIDIWrite** ($29.95) decodes incoming MIDI data and displays in English, decimal, hex, and ASCII.

Altech Systems
Suite 200, 831 Kings Highway
Shreveport, LA 71104
☎ 318 / 226-1702



DigiTech RDS 7.6 sampler/delay



Dyaxis disk-based audio processor

▶**Click Conversion Program** for film score composers converts hit point locations on film to musical locations. Supports all formats (70 mm, 35 mm, U.S. video, EBU, etc., Mac or IBM version $79.)

Pete Levin Music
Box 1611
New Milford, CT 06776
☎ 212 / 674-0142

▶**Soundfiler ST** visual editing programs are available for the Akai S612/X7000 ($199) and S900 ($299). Features include standard editing features plus digital processing (enveloping, state-variable digital EQ, and gain change).

Drumware
12077 Wilshire Blvd., Suite 515
Los Angeles, CA 90025
☎ 213 / 478-3956

▶The **ES-1 Patch Sequential Library** ($99.95) for the C-64/128 and ESQ-1 holds ten sound banks or three sound banks plus all sequence memory. Stores up to 1,560 voices per diskette and supports sound swapping between banks. Four different sound diskettes are available for $39.95 each.

Valhala Music
Box 20157E
Ferndale, MI 48220
☎ 313 / 548-9360

▶**Sound File** ($99.95), a librarian for the Ensoniq ESQ-1 from Blank Software, is available for the Commodore 64/128 and Mac computers. **ESQ Manager** ($99.95), from Turtle Beach Software, is an IBM-compatible ESQ-1 librarian.

Ensoniq
263 Great Valley Parkway
Malvern, PA 19355
☎ 215 / 647-3930

▶**MIDI Additive Software Synthesis** ($99.95; demo disk $29.95) for the Ensoniq Mirage and Apple II family of computers allows for the creation of complex sounds in the computer which can then be transferred over to the Mirage.

Black Squirrel Software
The Graduate College
Box 319
Princeton, NJ 08544
☎ 609 / 924-1470

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Otari Corporation, 2 Davis Drive, Belmont, CA 94002, 415/592-8311, Telex 9103764890

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

▶**Turbo FB** ($79) is an FB-01 editing/librarian for IBM PCs and compatibles with full printing functions and active directory for three drives. Demo disk: $5.

Poshek Productions
838 Van Dyke Dr.
Laguna Beach, CA 92651
☎ 714 / 497-7210

▶**Deluxe Music Construction Set** ($99.95) for the Amiga features a selection of digitized instruments, ability to add lyrics, guitar chord music symbols, and three-way music entry (built-in library, selection from Note Palette, or mouse-clicking on the program's onscreen piano keyboard). DMCS reads *Instant Music* files as standard music notation, and creates scores for *Deluxe Video*. DMCS has also been upgraded to version 2.0 ($99) for the Mac. Upgrade available to owners of version 1.0.

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
☎ 415 / 571-7171

▶**MIDI Arpeggiator** ($40; demo disk $5) for the Commodore-64 arpeggiates to an internal clock or syncs to MIDI and supports MIDI sync out, multiple repeats, and transpositions. **Organized Sound Library** ($40) is a collection of 576 DX7/TX7 patches arranged in 18 banks by instrument. Available on disk for Triangle's DX/TX Librarian and other popular disk formats.

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

▶The **Rhythm Machine** ($25) for IBM PCs and compatibles creates rhythmic patterns based on your input of numerical generators, and produces MIDI note outputs. Rhythm patterns are also displayed onscreen and can be printed out.

Gateway
Allen C. Conti
1700 Cleveland Ave.
San Jose, CA 95126
☎ 408 / 286-5490

▶The **VC1 Voice Crystal** ($54.95) for the ESQ-1 is an erasable/programmable 80-

voice cartridge, packaged in semi-translucent blue epoxy and pre-loaded with voices. The voices are also available on data cassette for $15.95.

Eye and I Productions
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Los Gatos, CA 95030
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▶**TX81Z Graphic Editing System** ($199.95) for the IBM PC is a high resolution, mouse-based voice editing system with multiple overlapping windows.

Bacchus Software Systems
2210 Wilshire Blvd. #330
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▶The **BR-3100U** VHS VCR includes noise reduction for the luminance signal, four heads and a variety of automated features.

JVC
41 Slater Dr.
Elmwood Park, NJ 07047

CALENDAR

▶**Educational Workshops:** The Lab for Computer-Assisted Instruction in Music at Brooklyn College will offer three workshops (June 29 through July 3, July 6 through 10, July 13 through 17) for teachers interested in using computers as a teaching tool. $250 per workshop. Offered in affiliation with the Center for Computer Music at Brooklyn College.

Gary S. Karpinski, Director
Lab for CAI in Music
Conservatory of Music
Brooklyn College, Brooklyn, NY 11210
☎ 718 / 780-5286

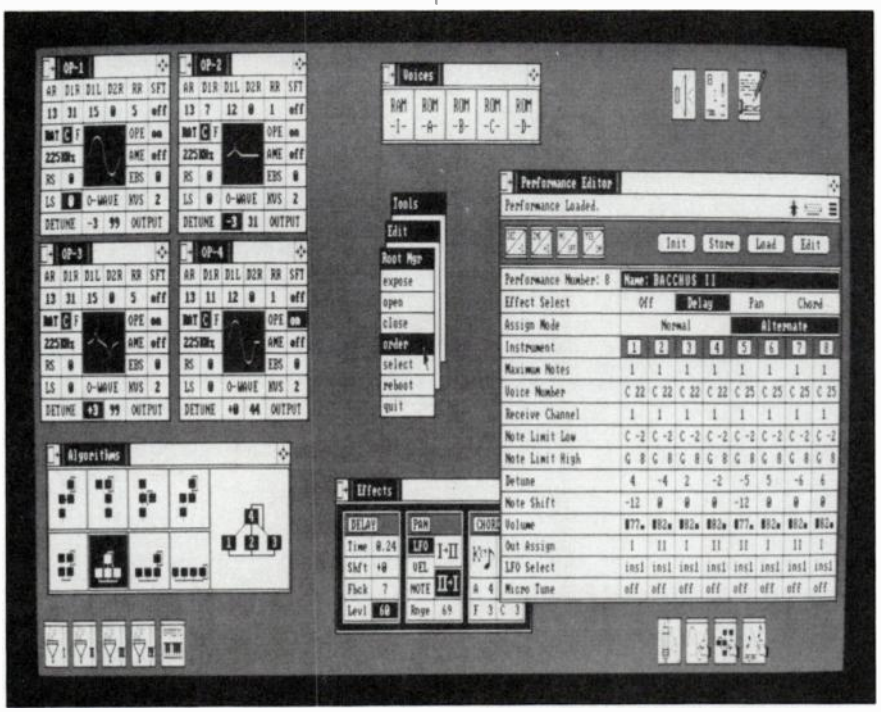
▶**The Music Information Symposium** will be held May 16 through 17 at the Atlantic Community College in Atlantic City, NJ. This two-day educational seminar will feature seminars by experts in the music industry on such subjects as electronics in music, MIDI, music theory, and composition. For more information contact:

Dan D'Angio
PO Box 3145
Margate, NJ 08402

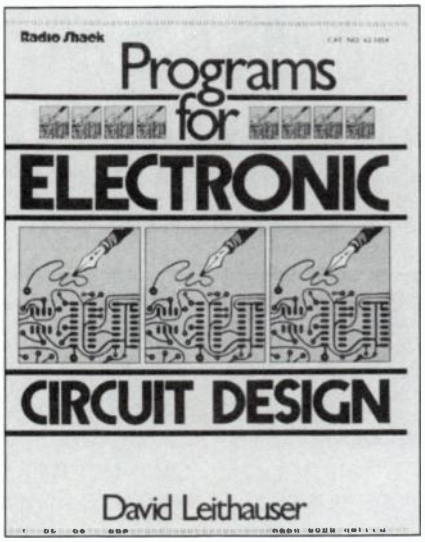
▶**AES Conference on Music and Digital Technology.** The Audio Engineering Society's 5th International Conference will be held May 1 through 3, at the Biltmore Hotel in Los Angeles, dealing with the topic of Music and Digital Technology. Conference Chair John Strawn has organized a program of lectures, demonstrations, concerts and panel discussion to "summarize the state-of-the-art of digital music-making and to point toward future developments." There will also be an exhibition of selected products relevant to the theme of the conference. For information about registration, contact:

Audio Engineering Society
60 E. 42nd St., Rm. 2520
New York, NY 10165
☎ 212 / 661-8528

EM



Bacchus TX81Z librarian software



First Take is just that—people's first impressions of some of the latest products. Ratings are provided by each reviewer according to the following standards:

★★★★★ *The cream of the crop—offers exceptional value or vision*

★★★★ *Very good product with few, if any, flaws*

★★★ *Solid, workmanlike product but not particularly exciting*

★★ *Below-average for its field; often flawed in some way*

★ *Has serious problems—try before you buy!*

We would like to remind you that these are opinions, not gospel, and as always, **EM** *is a communications medium and we welcome opposing viewpoints.*

Radio Shack *Programs for Electronic Circuit Design* ($4.95) ★★★★

Programs for Electronic Circuit Design, by David Leithauser (Radio Shack, 1986; Catalog Number 62-1054), is a new type-'em-in-yourself book from Radio Shack. It sticks pretty close to the *basics* (no calculus here), runs in *BASIC*, and if you're wondering just how useful that is, well, so did I as I browsed through it in the store. But then I remembered that, just a few minutes before, I'd been wishing for an easy way to calculate the cutoff frequencies provided by various input caps in a junk box mixer project—'nuff said.

There are two introductory chapters that explain how to use the book, and provide easy-to-follow instructions for converting from one type of BASIC to another. The remaining chapters contain one program each (some with multiple functions), and circuit examples and instructions. You get: "Resistor Circuits," "Capacitor Circuits," "Inductor Circuits," "Resistor-Capacitor Circuits," "Resistor-Inductor Circuits," "Inductor-Capacitor Circuits," "Resistor-Inductor-Capacitor Circuits," "Operational Amplifiers," "555 Timers," "Electronic Filters," "Transistor Circuits," and "General Math for Electronics." The program lines are numbered *consecutively* throughout the book, so all the programs can be put under the control of a "master menu" given in chapter 2.

I tried out the "Operational Amplifiers" subprogram on a Franklin 1000 Apple-clone; it took about an hour to type in. Did it run the first time? Of course not—it took another hour to get the bugs out. But, in all fairness, the bugs were in the "improvements" I added when I typed it in—the program by itself would have run fine! That's pretty good for a one-code-fits-all program. It even ran reasonably fast (for BASIC). Some of the user-input formats did look a little ragged; but the book mentions that the PRINT statements were simplified to conserve memory, and gives suggestions for improving the cosmetics, so I can't complain. Do-it-yourself fans who find themselves doing repetitive circuit calculations will want to check this one out. Besides, there's something about getting an entire collection of programs for $4.95 that just seems like a good deal—even if you do have to type them in yourself!

(P.S. If you like *P.E.C.D.*, you might want to check out the Loudspeaker Design Programs in *Building Speaker Enclosures, 2nd Edition*, by David Weems, also from Radio Shack.)

—Alan Gary Campbell

Alesis Microverb ($249) ★★★★

How much can you expect from a non-MIDI digital reverb so small three of them fit in a standard single-unit rack space, and which costs less the $250? Although the Microverb isn't the ultimate reverb, it certainly delivers far better performance than the price might lead you to believe.

The rear panel has ¼-inch phone jacks instead of RCA phono jacks—two for L and R inputs, two for L and R outputs, and one for a defeat (i.e. kill the reverb tail) switch (note that stereo inputs are summed, from which a stereo signal is generated). There's also a jack for the AC adapter supplied with the unit. The front panel has an input control with bi-color LED level indicator, mix (reverb/dry balance) control, output control, and a 16-position rotary switch for selecting 16 different reverb programs. Thankfully, switching from one program to another clears the device so you don't hear any garbage or "leftovers" when you dial in the desired program. Another goodie is that the input is flexible enough to accommodate anything from low-level stock guitar to +4 line-level effects sends. And the sucker is sturdy; the box is metal, not plastic, and both feels and looks substantial.

So, how does it sound? The first thing you notice is the lack of noise and the crispness of the effect, undoubtedly due to 16-bit internal processing. Spinning through the programs, there are six "Small" and seven "Large" programs, plus reverse and two gated effects. I don't care for the gated sounds much; I would prefer a more drastic decay on both presets. The reverse effect is *excellent* on legato parts, but is a bit too long for staccato parts with which the reverb becomes more like an indistinct background drone.

The Small programs are my favorite because of their cleanliness and articulation—perfect for percussion and guitar. Although some periodicity is noticeable at the longer delay programs, you have to listen for it. The Large programs are good, but aren't as universally applicable as the Short programs; vocals and washes work well, but percussion does not. In fact, much of whether you like the Microverb or not will depend on whether you match the right program with the right source material. Programs that sound heavenly on some instruments sound totally wrong with others. Fortunately, Alesis recognizes this and has included a lucid and intelligent manual that helps in this matching process.

For guitarists looking to ditch their spring reverb once and for all, for bedroom studios, for anyone who wants to conserve space in a live setup, for theatre groups, and for a supplementary reverb for those occasions when you need more than one reverb sound, the Microverb is perfect. The sound quality is not as good as a top-quality acoustic or digital reverb, but it handily beats anything else in its price range.

At the rate Alesis is going, their next product will be called the Picoverb and they'll pay you to take it away. Meanwhile, in my book the Microverb gets three stars for sound quality, but its exceptional cost-effectiveness, sturdy construction, ease of use, and intelligent design kick that up to an easy four stars.

—Craig Anderton

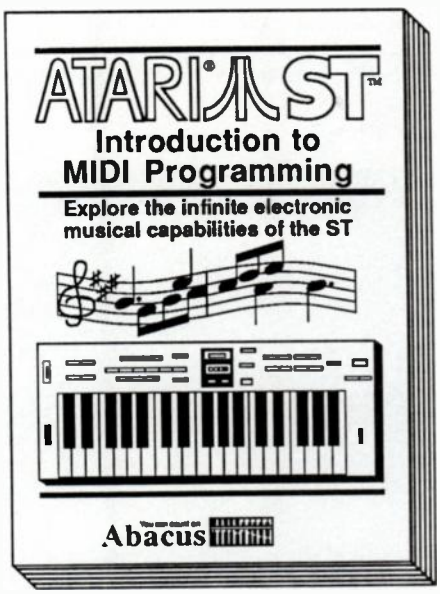
Alesis
PO Box 3908
Los Angeles, CA 90078
☎ 213 / 467-8000

***Atari ST Introduction to MIDI Programming* ($19.95) ★★★**

Atari ST Introduction to MIDI Programming (Abacus, 1986), by Len Dorfman and Dennis Young, is not so much a book for musicians who want to learn about computers, but rather, a book for computer fans who want to learn about MIDI. The first chapter talks about MIDI in general and

how it applies to the ST, while chapter 2 covers the MIDI language. These first 49 pages are well-done and should be extremely helpful to those who are comfortable with the ST (or computers in general) but not with MIDI. The MIDI information is accurate, presented with obvious enthusiasm, and does a very good job of relating the MIDI language to computer concepts.

Chapter 3 spends a few pages on hexadecimal notation and the extended BIOS, then without warning you are transported into listing-land, where everything is written in the "C" programming language. Those who do not have a working knowledge of C need go no further in the book; this is not a coursebook on C, and you'll have to go elsewhere to learn about that language before the rest of the book makes any sense. Three short, instructive programs make up the bulk of chapter 3: one routine on how to write note data to a MIDI instrument, one on how to read MIDI data and print it on the screen, and a simple CZ-101 patch librarian to demonstrate how system exclusive code works. Chapter 4, which stretches from page 95 to page 250, is devoted almost exclusively to the full source code for *ST Music Box Auto-Player* version 1.0, which consists of note entry, editing, and music playing routines. We're talking about 6,000



lines of code here; those who dread the idea of typing in all this will be glad to hear that a disk is available from Abacus for $14.95 plus $2 postage and handling.

The logical audience for this book is people who are familiar with programming in C on the ST and want to extract routines from the various examples here to write their own software—although I'm sure some people will just use the software "as is." For these people, the book is no doubt a treasure trove of programming ideas. Musicians who want to learn about programming MIDI on the ST are better off learning about programming in general before tackling this book.

Rating a book like this is hard, because it will be the perfect "fit" for some people yet be useless to others. Overall, it's a workmanlike book that provides a useful service but is not the be-all, end-all comprehensive ST/MIDI book. . . that remains to be written. Still, ST fans who want to learn about the marvels of MIDI will find the first two chapters alone worth the price of the book, and the last two chapters a welcome sourcebook of ideas and programming tips.

—Craig Anderton

Abacus Software
PO Box 7219
Grand Rapids, MI 49510
☎ 616 / 241-5510

BY ROBERT CARLBERG

Send records, tapes, CDs, and music videos for review to Robert Carlberg, PO Box 16211, Seattle, WA 98116. And hey, when ordering, tell 'em you saw it in EM*!*

Victor de Bros, *Kulu Hatha Mamnua* (private LP). Victor writes that he is "curious for an American opinion on this album, since people here don't really go for it." My guess is musical taste is universal, and the fault isn't in the album but in finding his proper audience. Victor's music is a charming mix of live percussion and tape-altered sounds; real woodwinds, accordion, piano and violin with digitally sampled and altered instruments and ethnic-versus-electronic music structures. He integrates all those diverse elements into a compelling and coherent panorama unlike anything I've heard. Poor excuse for a familiar comparison: a more experimental Penguin Cafe Orchestra. Surely there's an audience for such a bizarre genius. Victor de Bros, Rue de la Poste 2, 2013 Colombier, Switzerland.

Camberwell Now, *The Ghost Trade* (Ink 19). Long-time readers of this column will recall the reviewer's weakness for This Heat, a hardcore British experimental rock group which met with little success. Camberwell Now is their direct descendant, using ex-Heat Charles Hayward's voice, lyrics, drums and keyboards to similar effect. Two new cohorts join Hayward in the fray. Are they ahead of their time or just left field? Only time will tell.

Johannes Schmoelling, *Wuivend Riet* (Erdenklang 942.160). Schmoelling is a classically trained keyboardist who brought a European classicism to Tangerine Dream after Tangram. Now on his own again, he puts aside his classical roots to pursue a solo path not too different from his Dream experiences. The 19-minute title track was composed as the soundtrack to a Dutch play (it means "windblown reeds" in Dutch), and contains many elaborate Fairlight sounds in a long dreamy suite.

Robert Carlberg used to buy records based on an unusual name, strange instruments, or long tracks. Although not always successful, he discovered a lot of interesting music this way. Now, as a reviewer he gets a lot of unfamiliar music in the mail, allowing him to explore new territory almost every day. "If only it paid enough to live on," he laments.

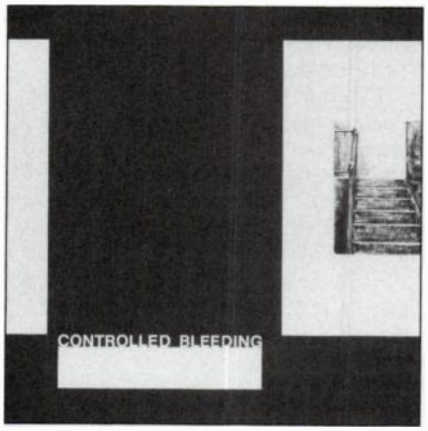
Gondwanaland, *Terra Incognita* (Powderworks 6113); ***Let The Dog Out*** (Powderworks 6112). Electronic music from Australia featuring the unusual sound of the didgeridu, a huge wooden Aborigine flute played as a rhythm instrument because it always sounds the same pitch. Charlie McMahon gets more sounds out of it than I've ever heard before, nicely supported by synthesist Peter Carolan and a different percussionist on each album. This band takes the cake for uniqueness.

David Sylvian, *Gone To Earth* (Virgin VDL1). Ex-pop star Sylvian continues to bash away at his confining fame by putting out slow atmospheric mood music, one disc instrumental and one barely vocal. The gorgeous tonalities, drawn from a number of guests including Robert Fripp and Bill Nelson, are countered by the gaunt humorless development. Pretty, but not warm.

Randy Alberts, *Sound Paintings* (cassette). No favoritism here; acoustic guitarist/synthesist Alberts—who happens to work in the office of Mix Publications (EM's publisher)—deserves high praise for his slickly packaged, beautifully recorded, part Windham Hill, part Private Music three-song cassette (half a C-20). There is talent all around us. 7109 Ramsgate Avenue, Westchester, CA 90045.

Saqqara Dogs, *World Crunch* (Pathfinder 8658; EP). Innovative, mostly instrumental guitar rock with a rhythm section of dumbek (North African hand drum) and Chapman Stick (for bass). These four tunes are a potent foretaste. A little more work on the concept and they'll really have something.

The Atom Smashers, *First Strike* (Pathfinder 8621). Amateurish rap music using LinnDrum, cheap synthesizers and occasionally some "found" tapes. If it weren't for their moronic lyrics they'd have some potential, possibly.



Controlled Bleeding, *"Headcrack"* (Sterile 11); ***Curd*** (Dossier 7516). Last month I got all excited about *Between Tides* by this group so this month I went searching for the rest of their catalog. They certainly do have international ties: *Between Tides* (1985) was on a Swedish label, *Curd* (1986) is on a West German label, and *"Headcrack"* (also 1986) comes to us from London. All three share a singular approach to experimental music; outside comparisons just couldn't do them justice. Otherworldly wordless singing, tape loops, sped-up and slowed-down guitars and synthesizers, found and manufactured noises—it's remarkably full-bodied and varied while still remaining essentially minimal. I guess it's also a little hard to describe. Paul Lemos, 54 Locust Street, Massapequa, NY 11758.

Michael Chocholak, *Skomorokhi* (cassette). Chocholak has, by his own admission, been composing electronic music for some 14 years, and lists his influences as Varese, Cage and Le Caine. His pieces are definitely in that academic tradition, about half being abstract percussion montages, the other half piano duets with his flautist wife Michelle. His delicate, thoughtful synthesizer work underlies both. M & M Music, Route 1 Box 55, Cove, OR 97824.

August, *August* (Avastar 1886). Geeky love songs from singer/songwriter/keyboardist/drummer Wally August, with Randy Tobin on bass and Neil Kunen on guitar. At times he resembles Elvis Costello, though E.C. doesn't dedicate albums to L. Ron Hubbard and sing lines like "Baby just for a start I'll give you my love, the keys to my car, I'll give you my yacht and a place on my cot." Avastar Recordings, 4608 Greenwood Place, Los Angeles, CA 90027.

—continued on page 89

The World's "Next Generation" Music Studio...

Desktop Multi-Media Production.

Nowhere has technology moved so fast as in todays music studios. Two years ago MIDI was just being established as an industry standard and the number of music software manufacturers could be counted on one hand. Over the same period music video has gone from experimental to an established art. Computers, video and music have joined to make musicians multi-media technology artists.

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P.O. Box 60238 Sta. A
Palo Alto, CA 94306
(408) 741-0117

The Professional Software Source.

More and more, visuals are meeting music, and computers are often responsible for making the introductions. Here is a report of how high-level computers are being used in an academic context to merge several art forms at once.

Music, Art; and Technology

BY MICHAEL CZEISZPERGER

As technology becomes more a part of modern life, its effect is reflected in the work of musicians and artists. This phenomenon has been evident since the start of the industrial age, but has never been more noticeable than it is right now. This use of technology as a common base for human expression has generated the concept of media arts technology—a technology that communicates, as well as expresses, visual and musical ideas.

Technology, and especially computer technology, is creating a new breed of artist who is aware of not just one discipline, but of many ways to use technology creatively and expressively. This phenomenon is already apparent, for example, in the number of musicians using computer-generated video images, and magazines that previously limited themselves to music and musical instruments, now including information about video tape production. At the same time, many professional computer animators are also musicians. Too, computer graphics images are becoming more prominent in art galleries as well as on television where

commercial computer animation houses create complex, three-dimensional computer animations that draw attention to companies and their products.

The commercial side of computer graphics however, was made possible by many years of university research that still goes on. The Media Laboratory at MIT, for example, is investigating the uses of technology in such areas as drama, music, and spatial imaging. Stanford University, Northwestern University, Ohio State University, and the Art Institute of Chicago, among others, encourage technology research in their Fine Arts Departments.

This month's cover photograph was produced on a system in Ohio State University's Advanced Center for Computing in Art and Design (ACCAD), a facility where people involved with technology in many different creative arts can work together and exchange ideas. The system, capable of generating both high resolution graphics and digital audio, is Digital Equipment Corporation's VAX 11/780, running a Unix operating system.

In this picture, the human figure was constructed by grouping three-dimensional forms which, combined, give the appearance of being part of a humanoid. ACCAD researcher Brian Guenter created the interesting face of the creature using a program he wrote that strives to create human facial expression by computerized data manipulation.

The creature is gazing at a model of the Chapman Stick Touchboard (a string instrument created by Emmett Chapman that is tapped, rather than plucked to create sound). The model of the Stick was created by entering the instrument's three-dimensional coordinates into the computer, using data like those below.

61 points 122 polygons
Point 1: 0.1 -0.2 -5
Point 2: 0.42 -0.2 -3.55

Michael Czeiszperger *is a musician, computer graphics artist, electronic music composer and a senior in Electrical Engineering at The Ohio State University. He recently won the National Computer Graphics Association's Music Visualization Award for the soundtrack to "Vision Obious," a computer animation by Rudy Leeman of Cranston/Csuri Productions.*

The complexity and irregularity of the Stick's main body necessitated using this technique, but the other, simpler parts of the Stick were done using data generation programs where the computer generates most of the points comprising the figure. The tuning pegs and frets, for example, were designed with a data generation program written by Wayne Carlson, now vice president of the computer animation firm Cranston/Csuri Productions.

The whole image is a still from the computer animation "Looking In," created on a custom-built frame buffer—a hunk of memory attached to the 11/780—providing a resolution of 640 X 480, and a palette of 16,777,216 simultaneously displayed colors. On the average, it takes about five to 15 minutes to display a high resolution picture on the frame buffer. Since it takes so long to display each image, creating animation was a problem. While machines that can display high quality animation in real time do exist, their high cost makes them available only to the military. The solution in this case came from the Amiga laboratory at Ohio State, where each separate frame was shot with a 16mm camera controlled by the computer. The images are calculated to be shown at 24 frames a second. Each frame is drawn separately, and when a frame is complete, the computer triggers the camera. By the way, this technique can be used to create computer animations with a home computer and a consumer movie camera.

In addition to the cover, the picture included with this article was also created at ACCAD and is an example of another computer/art technique: the mathematical analysis of sound. The artwork was created by digitizing interesting sounds using a DEC PDP 11/45 computer. A fast fourier transform (FFT) extracted the spectral components of the sounds, which were transformed on a PDP 11/780 into polygons, then scaled, rotated, and transformed into three-dimensional images. The horizontal (x) axis displays frequency information; the vertical (y) axis displays amplitude information; and the depth axis (z) shows event time. (The hum on our digitizer is evident from the huge peaks around 60 Hz.) It is interesting to note that these pictures consist of only 16 simultaneous colors, well within

the capabilities of most home computers.

Besides generating complex objects, music analysis can also be used to control motion. This requires another analysis tool, since the FFT used to create complex objects contains too much information to control motion easily. In other projects, I have been able to extract both tempo and timbre from sounds using a technique called linear prediction. I used a pattern recognition algorithm that returned two parameters, the instantaneous amplitude, and an abstract value know as the error function, an indication of the amount of timbral change in the source sound. These two parameters were converted to a film rate (24 per second), and then used to control both the shape and paths of objects moving in an animation.

As exciting as the technical side of this may be, it is still subordinate to the primary focus here. The computer is simply the *tool* by which the artists express themselves. The computer, the program, and the data used by the program are only the media through which Guenter, in this case, expresses the artistic focus of the image: the emotion projected by the facial expression of the person/creature. Technology is a tool for expression and not an end in itself.

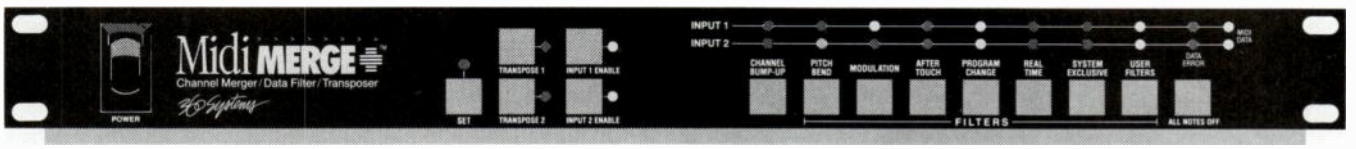
The technological palette available to the individual artist is not just an opportunity, it is a responsibility. Although computers are most often thought of as machines that take over the tedious chores and make our work easier, the technological artist must continually remain in control of the materials, and this is sometimes even more difficult than with brush, bow, and the other more traditional media.

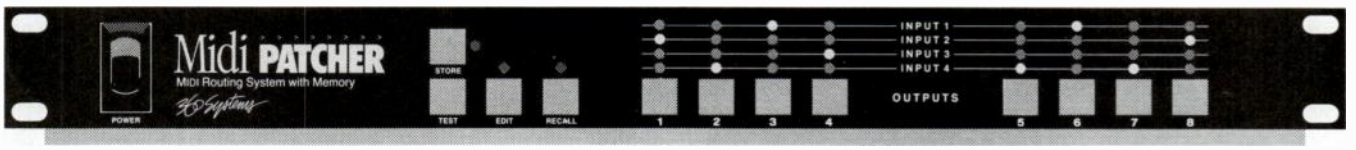
This brief overview of Media Arts Technology—in concept and in practice—is but a tip of the research and work out there. If you have an interest, and have access to UseNet, feel free to contact me at: [decvax,ucbvax]![cbatt,cbosgd]!osu-eddie![osupyr!artsvax,osu-cgrg]czei(uucp)

ACKNOWLEDGEMENTS:
I'd like to thank Professors Charles Csuri from ACCAD and Thomas Linehan from the Art Education Department at OSU, for providing the computer graphics equipment. I'd also like to thank Dr. Thomas Wells, director of Sound Synthesis, and George Cisneros from Urban 15.

INTRODUCING

PROFESSIONAL OUTBOARD EQUIPMENT FOR THE MIDI MUSICIAN





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The Evolution A Musical

In 1969 in a Laurel Canyon Studio, a new playing method was born that bridged the guitar and keyboard.

BY EMMETT CHAPMAN

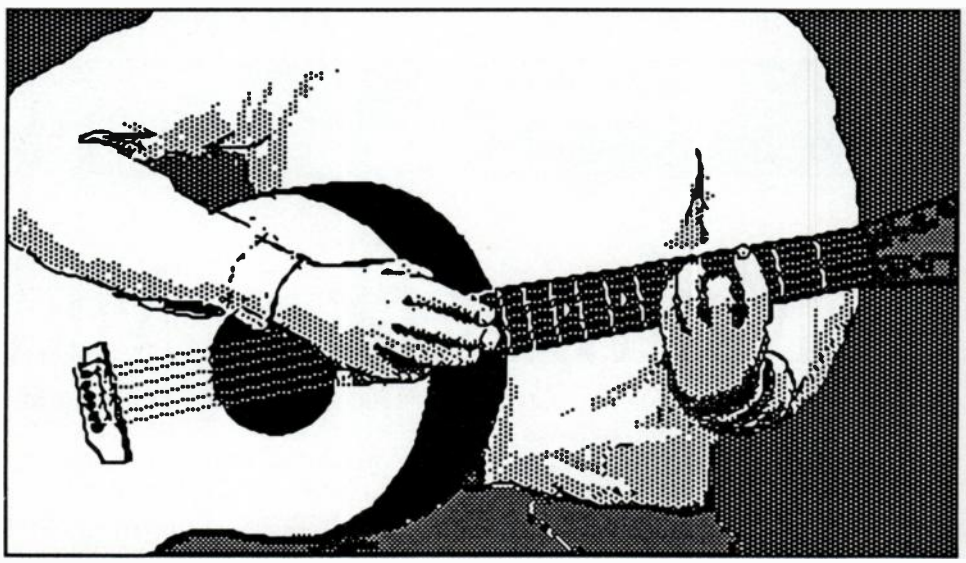


Fig. 1 *A two-hand playing technique for guitar used in the 1940s.*

Contrary to what seems to be prevailing popular opinion, two-handed tapping of the guitar didn't begin with Stanley Jordan or Eddie Van Halen. In fact, when you see a guitarist using this technique, you're seeing the influence of Emmett Chapman, who started popularizing this method of guitar playing in the late '60s. But he didn't stop with the guitar, choosing instead to optimize an instrument with the two-handed playing technique in mind. The result was The Stick,™ which is being used by an increasing number of musicians.

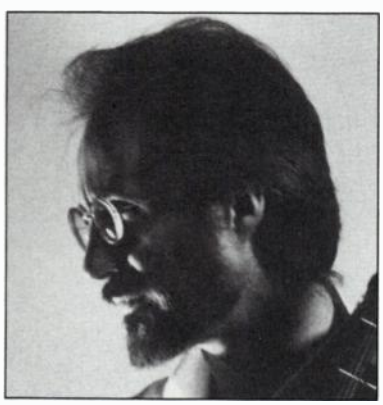
What makes a person design a new instrument? What design problems are involved? What are the economic considerations? How long does it take to turn an idea into reality, and at what point is the evolution complete? Since The Stick is almost exclusively the product of one person, we thought we would go directly to the inventor to find out exactly what is involved in the evolution of a musical art. —*Craig Anderton*

How It All Started

As a musician, my goal has been to create a new musical language. Improvisation has always been a key element, drawing upon all mainstreams of music, past and present, with the intention to be to communicate in a new way with the audience and the musicians on stage. I began playing guitar in 1959 to back my vocals while I sang in a trio to work my way through college. After listening to Barney Kessel's guitar trio albums I began the long road as an instrumentalist.

From 1959 to 1969 my instrument, the guitar, evolved with my music. To make the kind of instrument I wanted, it was necessary to become an instrument builder and customizer. I made the neck wider, then longer—I added strings, springs, levers, and other novel mechanisms. The purpose of these changes was to allow greater expressiveness; they all worked rather well and I enjoyed using them for

ALL PHOTOS: J. DANIEL CHAPMAN

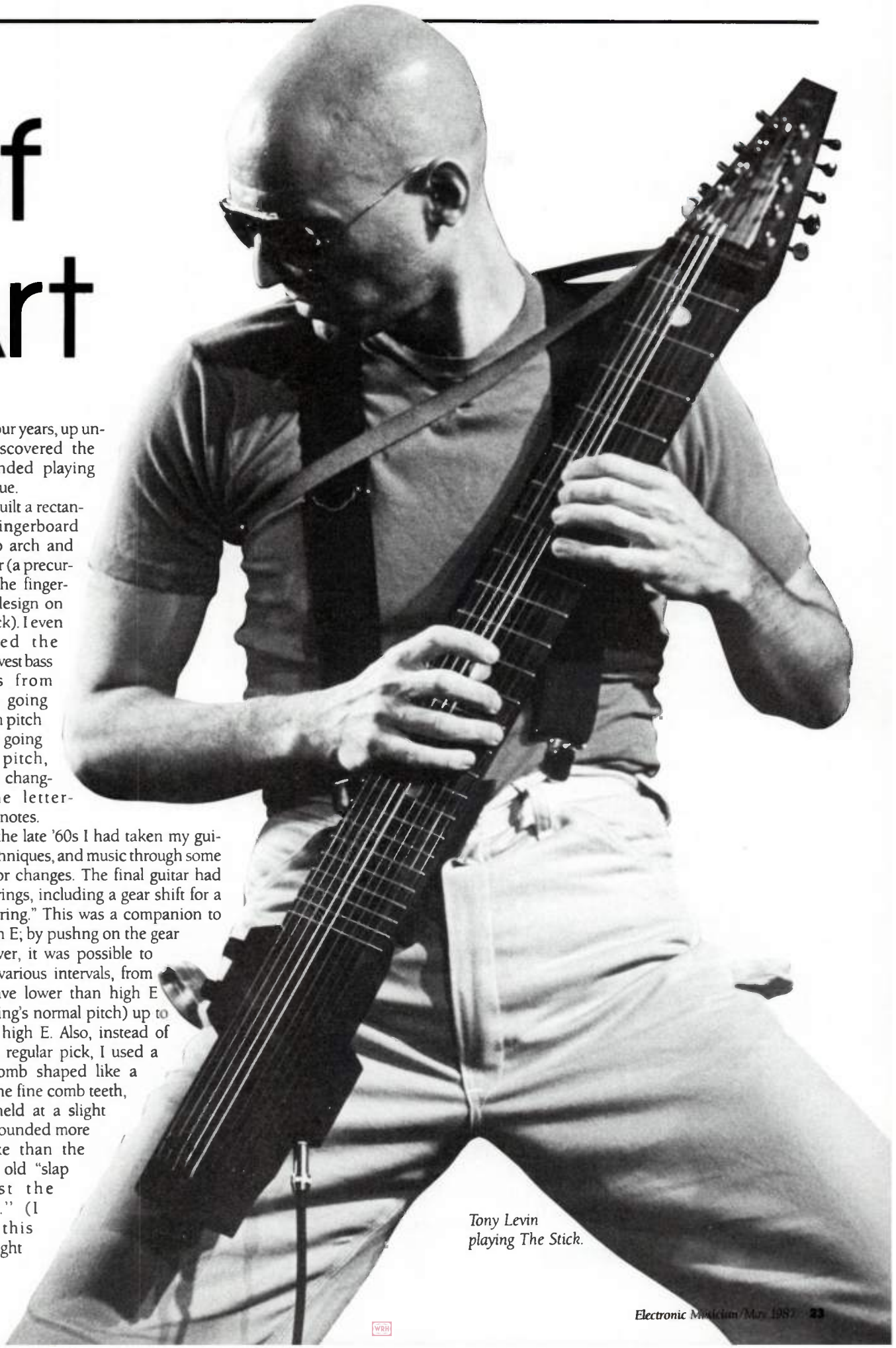


In addition to running Stick Enterprises, Inc. with his wife, Yuta, and regularly performing in concerts and lectures (especially in the Los Angeles area where he lives), ***Emmett Chapman*** *is an active tennis player, a seasoned astrologer and enjoys reading scientific and humanistic literature. His second album will feature The Stick in an all solo Latin-jazz format, with MIDI interface to his TX7 synth.*

# of Art

about four years, up until I discovered the two-handed playing technique.
I then built a rectangular fingerboard with no arch and no taper (a precursor to the fingerboard design on The Stick). I even reversed the three lowest bass strings from fourths going down in pitch to fifths going up in pitch, without changing the letter-named notes.

By the late '60s I had taken my guitars, techniques, and music through some 40 major changes. The final guitar had nine strings, including a gear shift for a "wild string." This was a companion to the high E; by pushng on the gear shift lever, it was possible to obtain various intervals, from an octave lower than high E (the string's normal pitch) up to unison high E. Also, instead of using a regular pick, I used a baby comb shaped like a pick. The fine comb teeth, when held at a slight angle, sounded more bow-like than the regular old "slap against the string." (I think this idea might still be



Tony Levin playing The Stick.

worth pursuing for guitarists.)

Then, one evening in August, 1969, while practicing guitar in my Laurel Canyon Hills studio, a sudden impulse struck from "out of the blue" and I started to play the full two-handed technique. Realizing the implications this would have for my music sent me leaping around the house in sheer delight.

The Playing Technique

At that time I was under the spell of Jimi Hendrix and the new language of melodic expression he created for guitarists. I was always trying to play expressive free melody lines like what I was hearing from Hendrix and John Coltrane, and at the same time play harmonically and orchestrally (like pianists Bill Evans and McCoy Tyner). Trying to combine both elements on a guitar was not easy, yet I didn't want to give up all the chordal and contrapuntal guitar techniques that I'd assimilated from jazz pianists in exchange for the melodic freedom of Hendrix.

However, with only one hand (the left one at that) doing all the fingering, the choice had always been "either-or," never the full musical statement for which I was searching. But when I placed my right hand over the fingerboard, tapped the strings, and turned my amplifiers up, I could immediately play some fast and fluid lead lines. Then with my left hand in its normal position, but tapping the strings independently, it was possible to play the chords and bass lines familiar to that hand, thus giving harmonic and rhythmic depth to my new-found right-hand voice. Not only that, the right-hand fingerings exactly matched those for the left hand with the index finger on each hand closer to the tuning pegs than their

Partial Stick Discography

Recent Releases

Bruce Cockburn, ***World of Wonders*** on CBS Records, Canada, with Stick player Fergus Marsh. Also ***Stealing Fire*** on A&M Records.

King Crimson, ***Three of a Perfect Pair*** on Warner Bros. Records with Tony Levin on The Stick. Also ***Discipline*** and ***Beat*** albums on Warner Bros.

Kaja of England, ***Turn Your Back on Me*** on EMI with Stick player Nick Beggs.

Matthew Wilder, ***Bouncing off the Walls*** by Private Eye and distributed by CBS, with Lloyd Moffitt playing The Stick on "Hey Little Girl" and "Scandal."

Midnight Oil, ***Red Sails in the Sunset*** on CBS with Stick player Peter Gifford.

Gowan of Canada, ***Strange Animal*** on CBS Records, Canada, with Tony Levin playing The Stick throughout.

Emmett Chapman, ***Parallel Galaxy*** on Back Yard Records, for sale in the US at local record stores, or through Stick Enterprises for $9 ($11.50 foreign). Also available on cassette.

Earlier Releases

Kittyhawk, ***Fanfare*** on Zebra Records with Paul Edwards on The Stick. Also, ***Race to the Oasis*** and ***Kittyhawk*** albums on EMI America with Paul, Dan Bortz and guest artist Randy Strom all contributing Stick parts to the group.

Alphonso Johnson, ***Spellbound*** on Epic Records.

Paul Edwards, ***Silent Night*** a solo Christmas album on Revere Records.

Power Play, ***Avanti*** on CBS with Dutch Stick player Peter van Straten.

Amy Grant, ***Straight Ahead*** with Andy Widders-Ellis playing The Stick on the Grammy Award winning song, "Angels Watching Over Me."

respective pinky (these hand positions are illustrated in the photo of Tony Levin). I knew immediately that in spite of my previous ten years of research, it was going to be like starting from scratch. From one minute to the next I had resolved the melodic versus harmonic limitations in the one-handed guitar fingering techniques, which completely changed my character as a musician.

At that time, I had never before heard of anyone playing a two-handed fingering technique on guitar. I later learned that back in the late-'40s when electric guitar was just developing, there were two or three guitarists who recognized a connection between electrical amplification and independent two-handed playing. But they played with the right hand addressing strings in the orthodox guitarist's position with the right arm, hand, and fingers parallel to the strings (see **Fig. 1**). Among them was Jimmy Webster who wrote an instructional pamphlet and recorded an album featuring this form of the "touch system," as he referred to it.

However, this position severely limited the right-hand techniques of these players. They used one or two fingers to poke or punch individual notes, and compensated for the lack of finger alignment with successive frets by moving the entire right arm back and forth to find the notes. Their discoveries remained virtually unknown to guitarists and teachers, and were not passed on.

From the outset of using the full-fingered technique of both hands, even back in 1969, I brought my right hand onto the strings from the side of the fingerboard opposite to that of the left hand. My right arm and fingers were now perpendicular to the strings, so that the fingers were overlying adjacent fret spaces. All fingers of both hands were now locked in and matched the frets anywhere on the board; this step is essential for a true sequential fingering technique on a stringed instrument. The musical result is that you can play two, three, or even four notes on a single string with only finger manipulation and no arm movement. If you hold your fingers parallel to the strings, to play chromatic scales on a single string you have to move your *whole arm* at the shoulder joint. Although Eddie Van Halen does this very elegantly and plays some highly exciting parts, paradoxically it's difficult to play regular old scales and melody lines. Note that the full two-handed approach offers a pianistic technique to the fretboard player (the keyboard player's hands must also be perpendicular to the row of keys in order to sequentially play a succession of adjacent notes).

Now that the playing technique had been discovered, it was time to adjust the instrument to make it more suited to this style of playing. At the moment of first discovery I brought my guitar to a more vertical position. Had I continued to hold the guitar in the traditional horizontal guitar position, my right hand would have accessed the strings from over the board, and the left hand from under. Both wrists would have been somewhat contorted, and the right shoulder hunched upward. The basic playing method is the same, regardless of the fretboard angle, but my new position felt more natural. I could still "wear" The Stick like a guitar, but with both hands hovering over the board and coming down upon the strings, as if I were playing patterns on my chest.

This change felt very natural and simplified everything. As the days went by, my guitar began to shed some of its sophisticated accessories. I found a more straightforward tuning of uniform intervals for two groupings of strings (nine strings in total at that time), and I dropped

the whammy bar, the "sliding capo" (a way to do quick and easy transpositions), and the odd-shaped picks.

Developing The Instrument

It took several days to set up my solid body electric guitar to accommodate the new playing style. For the first year, I played on a guitar I built myself set up with very low string action, somewhat looser strings than a regular electric guitar, precision fret work, close pickup adjustment, and a string damper by the nut.

In 1970 I built a much abbreviated version of the current Stick out of an ebony board and named it "The Electric Stick." With the two-handed percussive playing method everything became simple in the design—a uniform, logical tuning, and no more gadgets. In the following two years I added extra bass strings, divided the strings into two groups of melody and bass, made the pickups stereo for these two groups, and designed a belt hook and neck strap for the more vertical playing position. I now had an instrument with a greatly extended range more like piano, and with the double tuning concept of uniform fifths reciprocally matching uniform fourths.

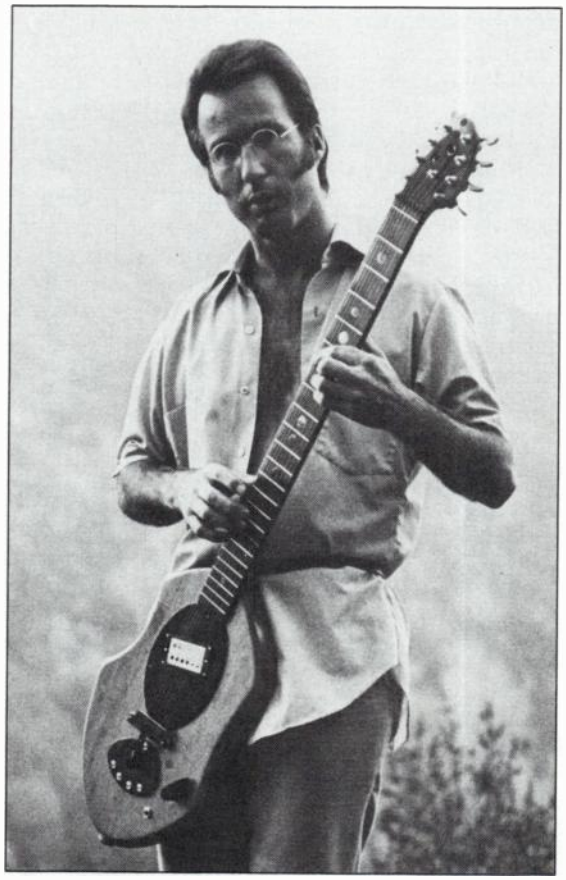


Fig. 2 *Emmett in 1970 with stick prototype number one.*

By placing two groups of strings on the same fingerboard, I reconciled another dilemma having to do with basic techniques. It was now possible to play with full independence of hands, each on its own group of strings, as if The Stick were a double-necked instrument. But I could also play the ten-fingered "interwoven" patterns possible only on a single neck, with all ten fingers selecting notes from any of the ten strings—something one certainly can't do with a double-neck.

Between 1970 and 1974 I made five prototypes, each looking more like the present sculptured design and representing an advance over the previous model (see **Figs. 2** and **3**). Tuners, fretwork, and the overall shape improved with each model. In 1973 I went from nine strings to ten. In 1974, I built the first production models—six of them, all with hand tools. I built up quite a physique during the production process, and might as well have been building the instruments with my teeth! Although The Stick itself could have been conceived in any shape, I designed a minimal one. Also, I could have chosen from a wide variety of tunings, but settled on the double grouping of ten strings—five melody strings tuned in descending fourths, and five bass and chord strings tuned in ascending fifths, which I found would optimize the two-handed possibilities.

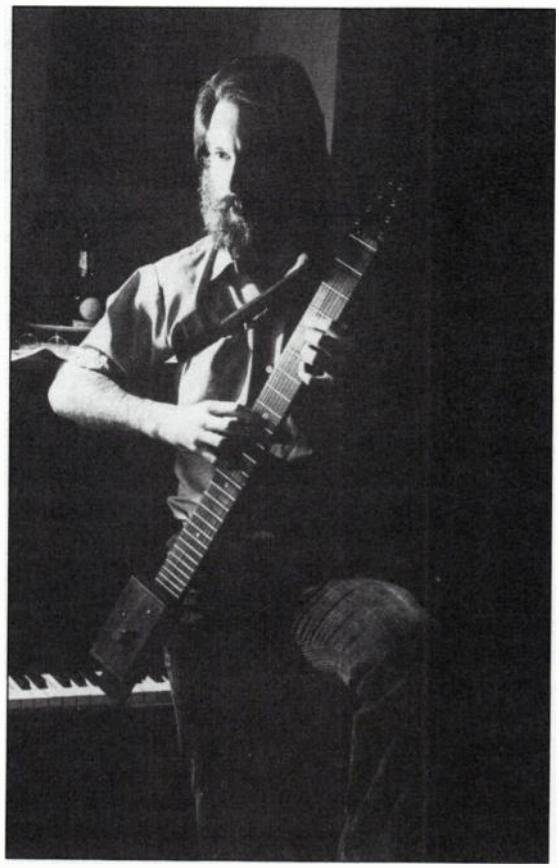


Fig. 3 *Emmett in 1971 with stick prototype number two.*

While I refined the instrument to meet my own musical needs and instincts, I also began to emerge as a performer, doing West Coast concerts with guitarist Barney Kessel and singer Tim Buckley. In 1974 I began manufacturing The Stick for other musicians and teaching the two-handed technique at large. Since then I've been about equally active in playing concerts, recording, teaching and touring, as well as manufacturing, marketing, and running the business. Although many artists seem to dislike the business aspects of their art, somehow it all seems to fit together for me, with each endeavor giving depth to the other.

The Stick Today

Originally The Stick was manufactured from Brazilian Iron Wood, a dense and stable material of unusual variety in grain color and texture. I embedded two non-adjustable, spring tempered steel rods buried in black epoxy into the rear of the fretted area to prevent warping.

I still make the Iron Wood Stick, and last year I introduced a new model made of injection-molded polycarbonate resin reinforced with spring steel bars. The sustain is almost exactly equivalent to the wood version, but the tone is a little brighter. This thermoplastic, a material much like stone and metal combined, is injected in a molten state into the cavities of the mold, producing the 3½-foot long by 3¼-inch wide neck and body. The fingerboard is flat, with no arch and no taper; although the fingerboard could have been curved, as stated earlier I prefer a minimal approach, and a curved fingerboard is not necessary for the two-handed playing technique. A flat fingerboard is also easier to make, and provides a uniformity of tactile cues that a curved fingerboard does not provide.

Regarding overall range of the instrument, the 25 frets and ten strings cover 5¼ octaves. Like a bass guitar, the overall range from the bridge to the nut is 34 inches. Although custom round wound Stick string sets are available, it is possible to use equivalent guitar and bass strings except for bass strings six and seven (which are 0.095 inches and 0.065 inches in diameter respectively).

While the wood Stick uses jumbo guitar type frets, the frets on the polycarbonate Stick are even larger, and consist of stainless steel rods anchored firmly into the molded grooves of the fingerboard. My patented Fret-Rod™ design is exceptionally smooth to the fingers and these frets won't wear down. While the traditional fret metals, brass and aluminum, would work, there's no advantage to using them. The reason why soft metals are used is that when the frets are hammered in to the neck, you don't want one side to rock out when you bang the other in; soft metal, which has a certain amount of "give," allows for easy fret hammering. Since the polycarbonate Stick frets are glued and locked in rather than hammered, a harder metal can be used.

Considering that The Stick owes its heritage to the guitar, some people wonder why The Stick has a unique tone above and beyond that caused by using ten strings and a two-hand playing technique. The answer is that much of The Stick's distinctive, clav-type sound is due to metal strings tapping against metal frets; this creates a somewhat "dry," precisely articulated sound that is nonetheless rich in harmonics. Most guitarists use a plastic pick, which is of a softer material and therefore gives a softer kind of sound. Of course, I'm not saying that one method is better than the other—just that it's nice to have options. Some guitarists, in fact, use metal picks for a harder sound, or their fingers for an even softer attack.

The stereo pickups (one for each set of five strings) use standard, double-coil humbucking technology (see **Fig. 4**). There's no fancy electronics—just a volume pot for each pickup. Considering the need to amplify these relatively small string vibrations, shielding is important. For some reason, it seems that all-metal housings cause a loss of highs, so for the past four years, the pickups have used a metallized plastic housing. Since these housings are injection-molded, during the molding process conductive carbon graphite fibers are injected into the hous-

ing. The high level of shielding this provides means that the strings need not be grounded, which makes for a safer instrument. The one problem I have encountered is some minor crosstalk between the bass and treble strings. Possibly in the future some kind of optical pickup could solve that problem.

Enter MIDI

The Stick, like any other instrument, continues to evolve. One recent addition is MIDI. I've done two MIDI sticks for myself based on IVL's guitar-to-MIDI technology (essentially a Pitchrider 7000, labelled as Touch Board MIDI, with some software changes to best accommodate The Stick's characteristics) with the top five strings going to MIDI. This adds $900 to the cost of The Stick; retrofits are also $900. Interestingly, The Stick seems to provide a signal that's easier to "MIDIfy" than a guitar, possibly because a pick isn't involved. The next step is to try out a modified version of the IVL Steelrider, a ten string device designed for steel guitar, to see if all ten strings can be used with MIDI.

Production

I manufacture The Stick from the raw Brazilian Iron Wood from start to finish at my workshop in production runs of 70 instruments at a time. I have a second ongoing production of injection molded polycarbonate Sticks which began in 1986. Customization is also a part of production; I have done customized tunings in my production for musicians who have their own preferences. These have included double guitar tunings, guitar and violin, guitar and standard bass, bass in fourths plus bass in fifths, single sequences of strings, left-handed (reversed) models, fretless ones, and others that are more exotic (such as a double-bass model recently completed for an album project I played on for Ryuichi Sakamoto).

So Is It A Guitar?

I was a guitarist for ten years until 1969 when my guitar became the vehicle for this radically new method. Guitarists have provided the main inspirations for my music, especially John McLaughlin. That I chose to name this instrument "The Stick" does not detract from its guitar-like qualities. It's a stringed instrument in the family of fretted guitar-like instruments. I could have chosen any shape or tuning for my new "guitar" but settled on a minimalist design. What I'm saying is, this method and approach applies to all electric instruments that have strings and frets, not just The Stick.

The Stick was created more by my fingers and my music than by any plan to invent something. The core ingredient of the instrument then is the playing method itself, which is what I've been telling students and audiences since 1974. I could have called my instrument a guitar. "The Stick" is simply my brand name for a musical instrument in the guitar family. The two-handed playing technique that I developed works best on The Stick but is still available to guitarists. In fact, I enjoy a lot of the music produced by the two-handed touch guitarists today, including the novel approach taken by Michael Hedges.

Most of the currently publicized guitarists who are playing the two-handed touch technique remain committed to holding the right arm horizontally and parallel to the strings, so that they can still pick and pluck the strings at will. These guitarists are currently playing double-handed melody lines with the notes interwoven between the hands, or else they play right-hand embellishments to their left-hand fingerings. Some of these musicians, Eddie Van Halen most prominent among them but also musicians like David Torn, are playing some unique, energetic, and expressive lead lines with this "combined hands" technique. However, while certainly valid this should not be confused with the same method that I've been playing and teaching.

THE SPREADING OF A MUSICAL LANGUAGE

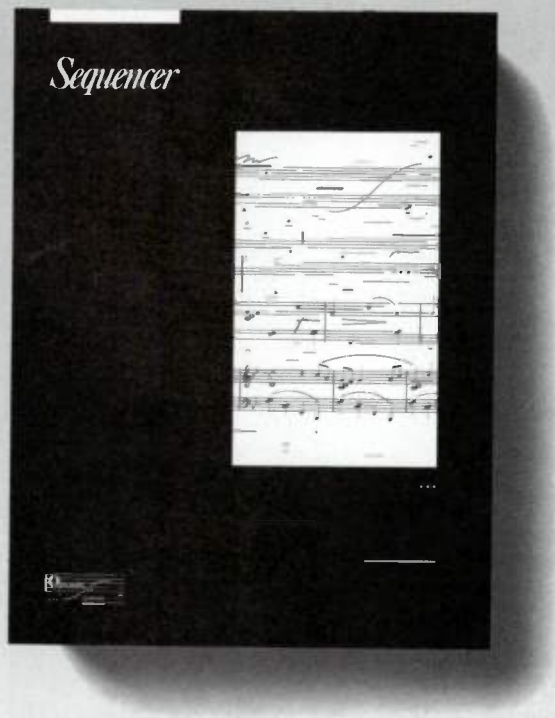
There's no use in inventing a new musical language without making it available to those who might also find it useful. Over the past 12 years, upon requests from individuals and institutions, Stick Enterprises has provided over 250,000 Stick brochures that describe the two-handed tapping method in detail. These brochures, along with many thousands of accompanying recorded and printed materials, have been given to individual musicians, music stores, and have been available at most of the US music trade shows since 1975.

Before 1969, no one I know was using my two-handed technique. Now there are close to 2,000 musicians in the world who play The Stick, mostly in the US, who are using this method on the instruments that I've built for them. Some of them have been on world tours using The Stick to support major recording groups. Many of them I've personally taught. All of them have my lesson book, *Free Hands*, first published in 1974. I've referred many new players to Stick teachers all over the world. Many have learned to play without a teacher, strictly on their own, or after seeing The Stick live or on television (I first played The Stick on national television in 1974). The ease with which one can learn to play The Stick is largely due to the natural finger positions and the instrument's ergonomic design, which complements the two-handed, fingers-perpendicular-to-the-strings technique.

It is good to look back over the past 17 years of work and know that it has proven fruitful and productive for many musicians—not just myself. Considering how many artists don't have the chance to see their work accepted, I consider myself fortunate to have accomplished the goal of creating a new musical language.

Editor's note: Readers who are interested in the Chapman two-handed playing method can order the instruction book Free Hands *from local authorized Stick dealers or from Stick Enterprises for $15 plus $1 postage/handling (California residents add sales tax). The Iron Wood Stick lists for $1,041 and the Polycarbonate Stick is $936; both prices include case, stereo cord and* Free Hands *instruction book). For further information contact your local Stick dealer or: Stick Enterprises, 8320 Yucca Trail, Los Angeles, CA 90046 ☎ 213 / 656-6878.* EM

Put more sh shang-a-lang



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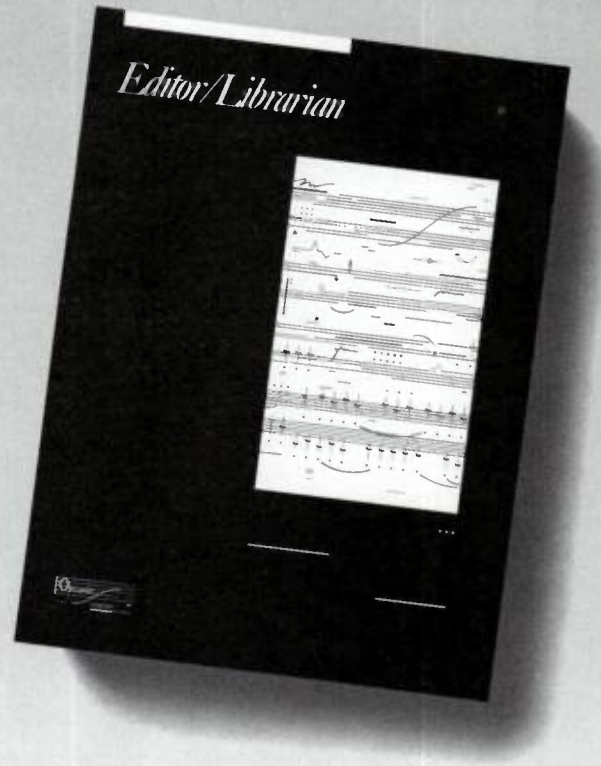

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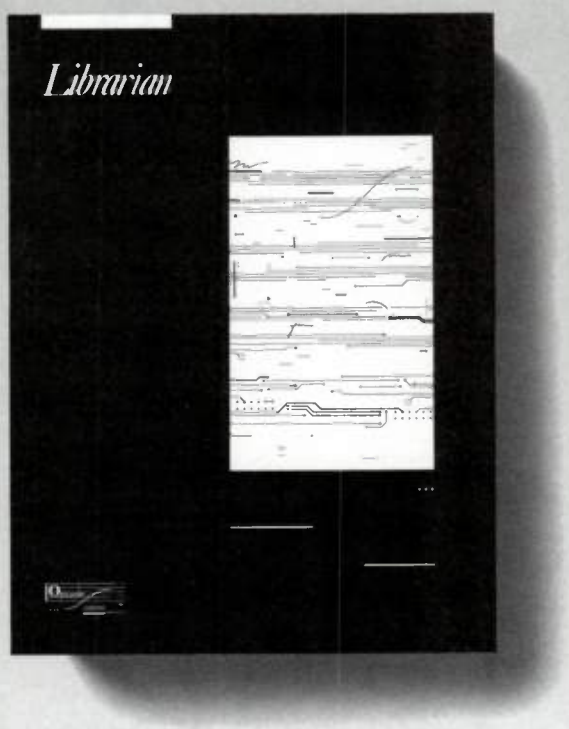

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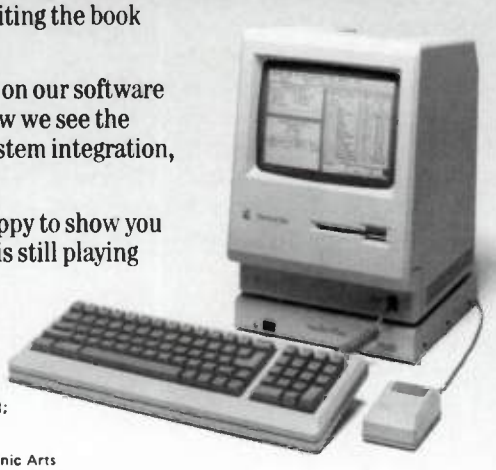
So, when you're ready to roar out of the chute, take a good look at what the other guys are pushing, then come straight to the authors who are rewriting the book on music programs.

For more information on our software and interfaces and how we see the importance of true system integration, please call or write.

We'll be more than happy to show you why the competition is still playing musical chairs.



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Build a *Hot* Mic Preamp for Top Notch Sample Collecting

BY JON GAINES

Sampling in the studio environment is relatively straightforward: plug a mic into your console, connect it to your digital sampler, and record. But what if you want to capture a sound that won't come to your studio—the calliope at the amusement park, a baby's cry, traffic noise, lightning? You can't bring your mixing console with you into the field, and the mic preamp built into your sampler or cassette deck just won't cut it. For quality sampling in the field, you need a preamp that will survive the rigors of travel and do justice to the audio quality of the sampler itself. (In fact, just about any time you need to use a mic for sampling, an external preamp will give superior results compared to a sampler's internal mic preamp.)

You can build a high-quality microphone preamplifier yourself, save some money and have fun in the process. This preamp has lots of available gain for capturing even the most subtle sounds; it's quiet; it will reject most types of RF noise; it has good distortion specs; it's easy to build; it's portable, and it can be powered from either AC or batteries. The parts are available from several sources, and the design offers a number of parts options for balancing cost against quality.

How can you lose?

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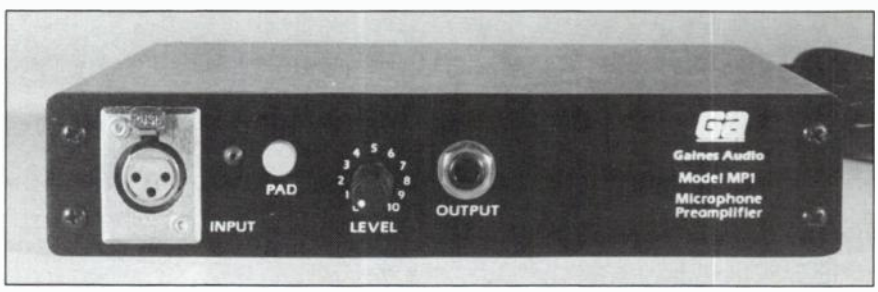
Total Available Gain: 72 dB
Slew Rate: 9V/μS (with NE5532)
Maximum Output Level: +20 dBV
Input Impedance: 1400 ohms at midband frequencies, suitable for use with microphones with an output impedance of 150 ohms to 1K ohms
Minimum Load Impedance: 600 ohms
Phantom Power: 15V DC
Chassis Size (Kit): 1.75H × 8.5W × 6"D, 16 Ga. steel

BASIC DESIGN CONSIDERATIONS

The circuit is based on a variable-gain, two op amp design with a transformer "front end" (i.e. the first part of the circuit the signal encounters). The transformer offers several benefits, the most important being superior rejection of RF and other common-mode noise. Since you'll be using your preamp in a lot of different locations, you'll want to minimize the possibility of the local Top 40 Countdown mysteriously appearing in your sample—and the transformer is tough to beat in this regard. It also helps keep the parts count low and simplifies phantom powering. The biggest disadvantage of a transformer is financial; a good one costs a fair amount of money, but for the purpose of this preamp, I decided it's a reasonable tradeoff.

The two op amp approach satisfies the high gain requirement of this project without sacrificing distortion or noise specs. By using two amplifiers, neither one is pushed beyond its open loop gain limitations and a reasonable amount of negative feedback is maintained at all times. The power supply for the project is integrated into the main printed circuit board, although you may use an external ± 15V supply or even batteries for power.



The Gaines Audio MP1 Mic Preamp

Jon Gaines heads new product development at a Rochester, NY audio manufacturer and is president of Gaines Audio. After winning the '82 Indy, he judged several Miss America Pageants, flew the first solo transatlantic flight, and appeared in numerous off-Broadway roles; he also has a great imagination.

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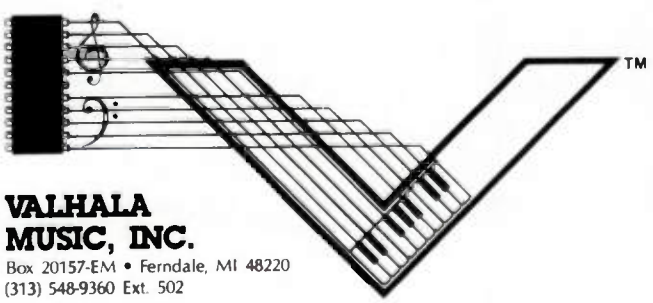

VALHALA MUSIC, INC.
Box 20157-EM • Ferndale, MI 48220
(313) 548-9360 Ext. 502

ESQ-1 is a trademark of Ensoniq, Inc.

Fig. 1 shows the complete schematic for the mic preamp.

BUILDING THE PREAMP

The easiest way to build this project is to use the available printed circuit board (see parts list). You can also etch and drill one yourself from the accompanying artwork (Fig. 2), or assemble the project on perf-board. In any case, keep the layout compact and wire lengths short to minimize noise and instability. Locate the power transformer away from the mic input transformer and shield it if necessary. If hum problems occur, you may even want to mount the power transformer outside the chassis or in a separate enclosure.

If you do use the printed circuit board, assembly is as easy as plugging in and soldering the components. Use a medium-heat, pencil-type soldering iron (not a gun) and rosin core solder specified exclusively for electronics work. *Never* use acid core solder as it will utterly destroy the project by producing intolerable noise. If you're not sure what kind of solder you have, throw it out and buy a new roll.

When inserting components, pay particular attention to the polarity of capacitors, diodes, and the IC. The resis-

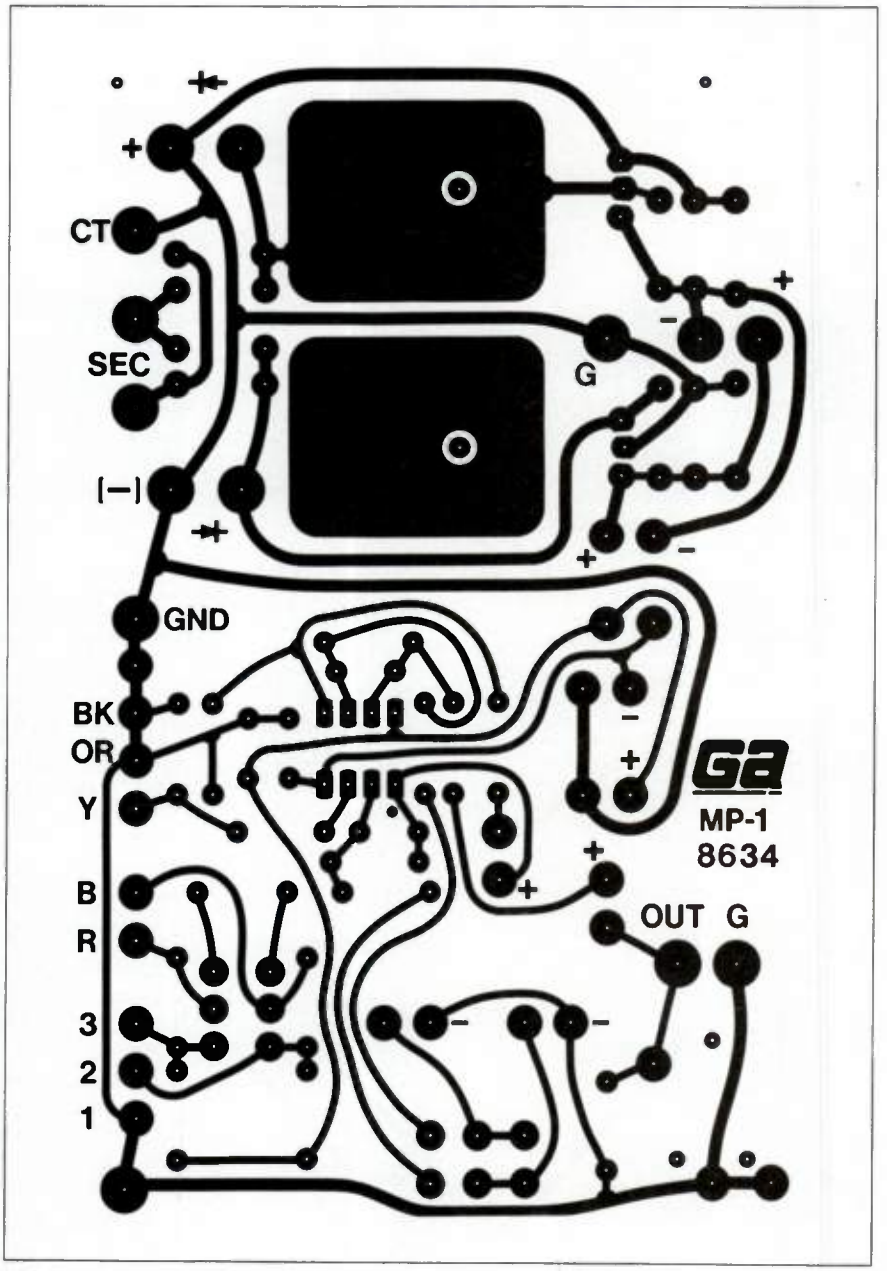

Fig. 2 *Full size artwork for PC board. This view is from the copper side of the circuit board.*

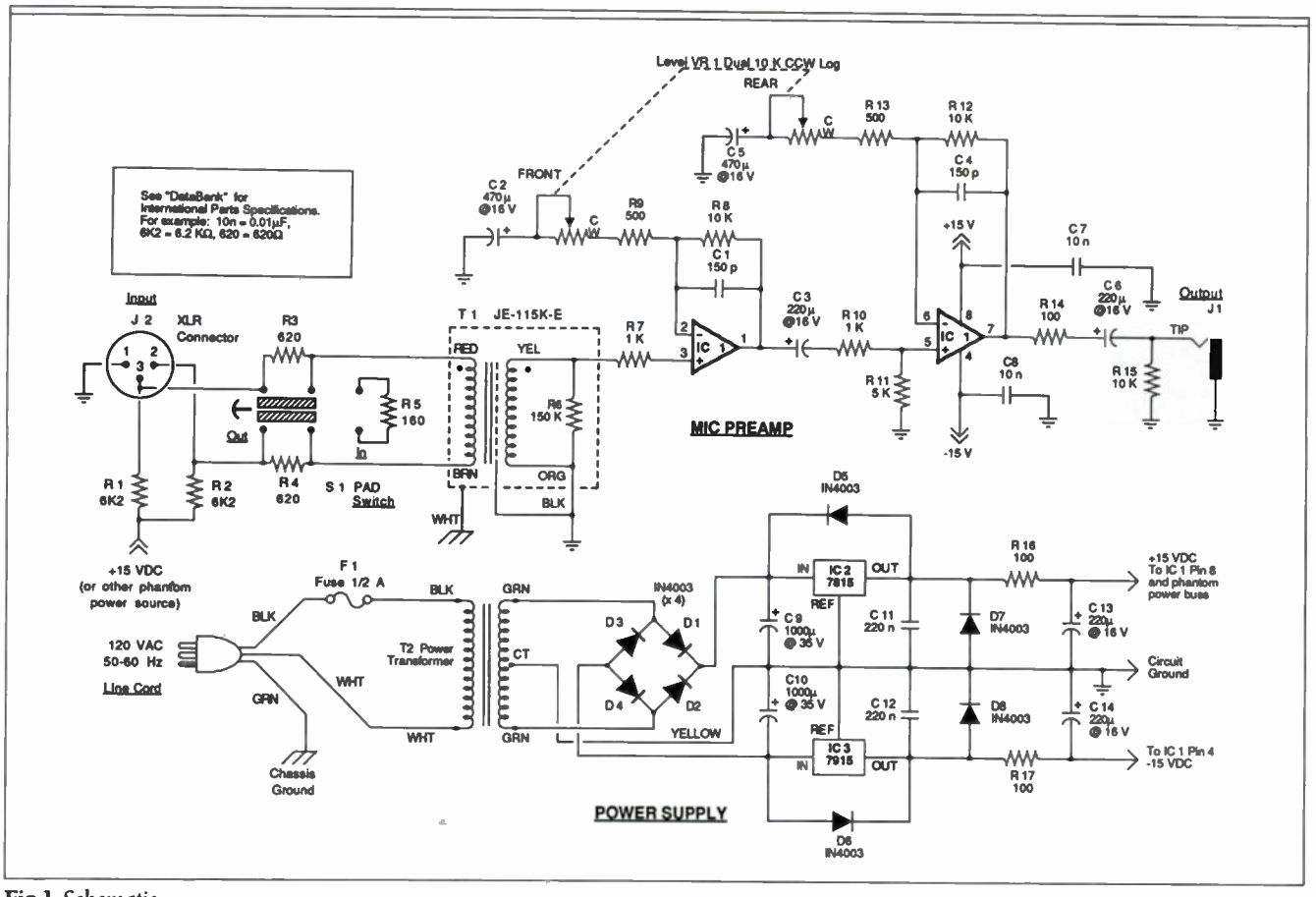

Fig.1 *Schematic*

tors, disc capacitors, and the two 220n (0.22 μF) film capacitors are non-polarized and can be oriented either way. See Fig. 3 for component placement.

External Wiring

After inserting all the components into the main PC board, soldering and lead-trimming them, complete the assembly by making the necessary hard-wired connections.

We will now describe how to build and connect the power supply. **Be forewarned that this sub-circuit contains potentially hazardous voltages. Do not attempt to build a power supply if you are not familiar with proper safety procedures for line voltage wiring!** You can either buy the kit assembled, or use batteries. (*EM encourages one to limit the use of batteries whenever possible because they are not good for the health of our Earth environment. See "Batteries For Electronic Musicians" in the February, 1987 issue.* —Ed.)

The power supply line connections

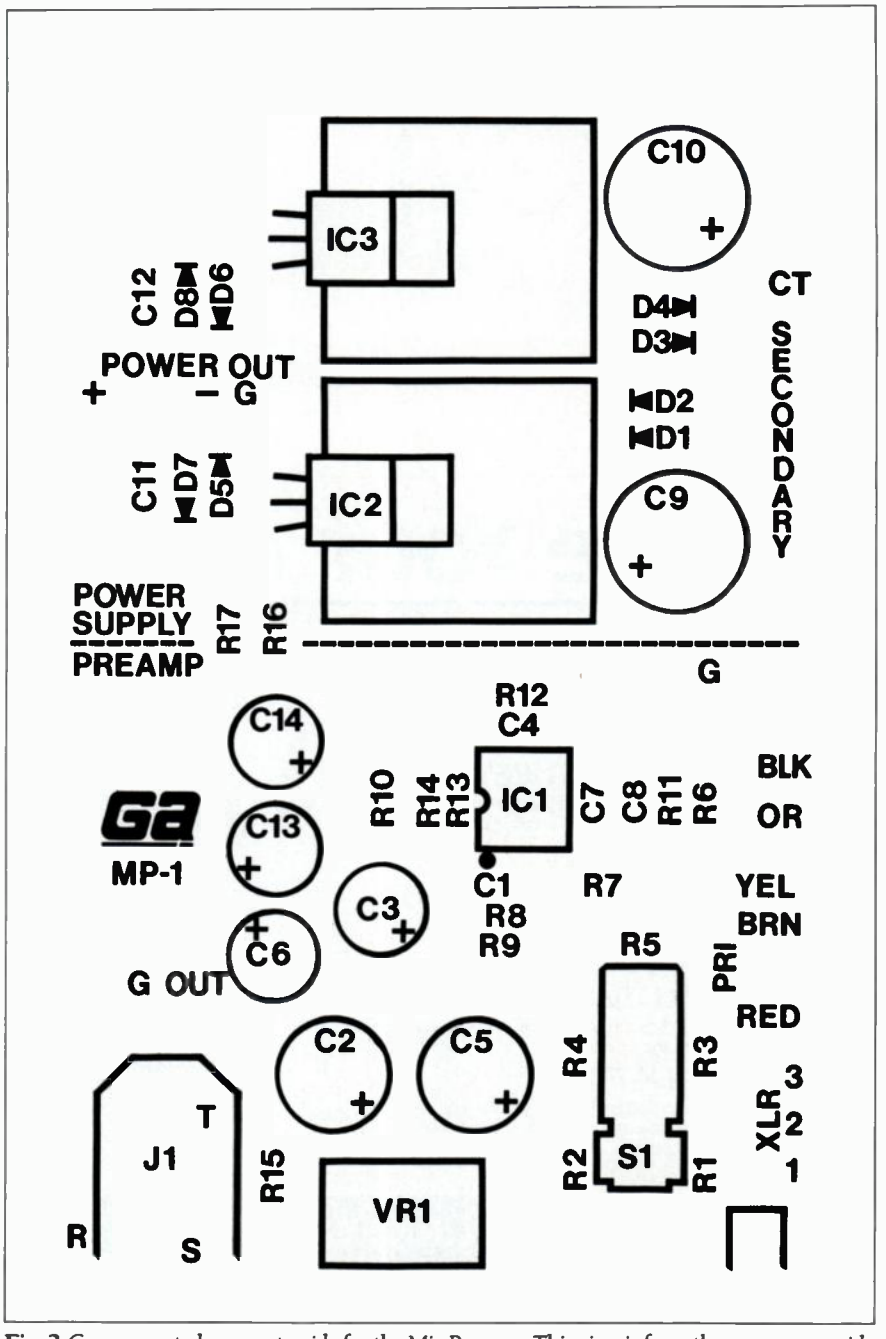

Fig. 3 *Component placement guide for the Mic Preamp. This view is from the component side of the circuit board.*

consist of attaching the AC line cord to the fuse and power transformer. A typical power cord has three wires: Black (AC Hot), White (AC Neutral), and Green (AC Ground). Be sure to attach the green ground wire to the preamp chassis. The white wire from the power cord connects directly to one wire of the primary on the power transformer. In the case of the transformer supplied with this project kit, the power transformer primary wires are color-coded white and black to correspond with the AC line cord color code, so white connects directly to white.

Instead of connecting the power cord's black wire directly to the black primary wire of the transformer, fuse it first with a half Amp fuse. If you'd like a power switch (a nice convenience) insert it in the line between the fuse and transformer. The schematic shows all of these connections.

A few notes about safety. Be careful when working on the 115V AC line (it has *potentially lethal voltages*); never work on the unit when the power cord is plugged in; insulate any and all exposed AC connections with wire nuts, shrink tubing, or tape as appropriate; always use the correct value fuse; and always know what's in contact with what before plugging in the power cord. If you're not entirely sure that you know what you're doing, STOP and consult a qualified technician. A good source for the basic information and techniques needed here is Craig Anderton's book: *Electronic Projects For Musicians.* (Available from Mix Bookshelf, 2608 Ninth St, Berkeley, CA 95470 ☎ 415 / 843-7901; write or call for free catalog and ordering information.)

After you've completed the primary power transformer connections, connect the three secondary wires to the PC board between the two large 1,000 μF capacitors. The transformer secondary Center Tap (yellow on the supplied power transformer) connects at the point marked CT. The remaining two wires (green on the supplied transformer) connect to the circuit board at the pads marked SECONDARY. Polarity need not be observed here; either wire can be hooked to either pad.

The power supply connections are now complete, and you can finish the project by connecting the input XLR connector and input transformer to the PC board. To connect the XLR, run short leads from the connector's pins 1, 2, and 3 to the pads marked 1, 2, and 3 on the

circuit board. Assuming the connector is located close to the board, you can use light gauge, unshielded wire for this.

Finally, connect the microphone input transformer to the appropriate remaining pads. If you are using the suggested Jensen JE-115K-E transformer, follow the color coding on the PC board and schematic; otherwise, refer to the schematic and compare it to the manufacturer's notes supplied for the transformer you've chosen. If the mic transformer has a wire connected to its metal case, connect that wire (white on the JE-115K-E) to the preamp chassis. Note how in **Fig. 4** the mic and power transformers are located as far away from each other as possible. **Fig. 5** shows the external view.

You'll notice that there are still a few

Parts List, Microphone Preamplifier

Resistors (¼-watt carbon film or metal film)

R1,2	6k2	(Blue-Red-Red)
R3,4	620 Ohm	(Blue-Red-Brown)
R5	160 Ohm	(Brown-Blue-Brown)
R6	150k	(Brown-Green-Yellow)
R7,10	1k	(Brown-Black-Red)
R8,12,15	10k	(Brown-Black-Orange)
R9,13	510 Ohm	(Green-Brown-Brown)
R11	5k1	(Green-Brown-Red)
R14	100 Ohm	(Brown-Black-Brown)

Capacitors

C1,4	150 pF ceramic disc
C2,5	470 μF, 16V electrolytic
C3,6,13,14	220 μF, 16V electrolytic
C7,8	10 nF (0.01 μF) ceramic disc
C9,10	1,000 μF, 35V electrolytic
C11,12	220 nF (0.22 μF) disc or film

Other Parts

IC1	NE5532, RC2043, RC4558, etc.
IC2	LM7815 Positive 15 Volt Regulator
IC3	LM7915 Negative 15 Volt Regulator
T1	1:10 turns ratio mic input transformer: Jensen JE-115K-E or Triad-Utrad A-10J or Whirlwind, Beyer, Stancor, etc. See text.
T2	115V Primary/45V CT Secondary Power XFMR
F1	0.5 Amp fuse
J1	Switchcraft RN112BPC phone jack
J2	3-pin XLR style connector
VR1	Dual gang 10k Ohm CCW Log Potentiometer
D1-8	1N4003 Silicon Rectifier Diode
S1	ITT Schadow LT series DPDT switch

Mechanical Parts

1	AC Line Cord and strain relief (Heyco)
1	Fuseholder
1	Power Switch (if desired)
1	Chassis
1	Knob
2	Heat sinks (Thermalloy 6106B)
1	8 pin DIP socket
Misc.	Printed Circuit Board or perf-board, hardware, standoffs, wire, solder, wire nut, etc.

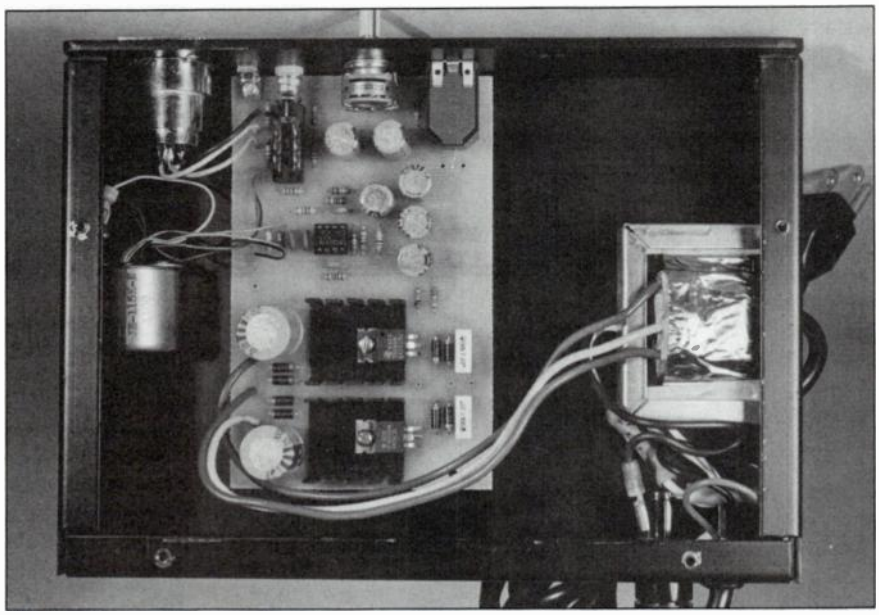

Fig. 4 *An internal view of the completed project with the chassis cover removed. Note the deliberate attempt to locate the sensitive mic input transformer as far as possible from the power transformer.*

unused pads on the circuit board. They're provided as external wiring options. Three of these pads, labeled "POWER OUT," are in the power supply section. They provide a convenient spot to tap the output of the regulated power supply should you want to power a second mic preamp or any other audio project requiring ± 15V. In the preamp section of the PC board, right behind the output phone jack, you'll find pads that allow you to tap the audio output to add alternate connectors (e.g. an RCA connector) to your chassis.

Phantom Power Provisions

In transformer-coupled mic preamps, phantom power hookup is as easy as connecting the appropriate phantom supply to the input XLR connector, since the transformer itself prevents the DC supply from reaching the input of the first amplifier. In this preamp design, two resistors (R1 and R2) connect to the internal 15V supply, thus providing an easy means of powering any condenser mics that will function on such a relatively low supply. If your mics require a standard 48V supply, you'll need to cut the trace where R1 and R2 connect to the 15V supply and carry that point, instead, to a separate 48V supply. Alternately, you can just leave R1 and R2 out of the circuit and use an external phantom power supply when necessary, or even install a switch to enable and disable the internal 15V supply.

Testing The Completed Preamp

After assembling the preamp, but before inserting the IC, power it up and check for correct power supply operation. You should find +15V DC on pin 8 of the IC socket and -15V DC on pin 4, give or take a volt. If not, stop and find the problem. If you continually blow fuses on power-up, look for obvious mistakes or shorts in your AC wiring. Incorrect polarity on the rectifier diodes (D1-4) or filter capacitors (C9, C10) will also blow fuses.

If the power supply operates correctly, turn off the supply, wait a few seconds, insert the IC, turn power back on, and try out your preamp. The circuit is so simple that, barring any blatant errors, it should work immediately. Most common mistakes include solder "bridges," cold solder joints, incorrect parts placement, and reverse polarity of inserted parts.

Component Selection Guidelines

The schematic (**Fig. 1**) and accompanying parts list offer suggested nominal values for a preamp with 70 dB of overall gain. However, many of the values and specified parts can be scaled or modified to meet individual designer preferences. For example, the electrolytic capacitors sprinkled through the audio path are shown with suggested minimum values; you may substitute higher values of capacitance for improved low frequency performance, or even use esoteric types such as the Roederstein EKU series. Similarly, you can build the preamp with common 5% tolerance carbon film resistors, or use 1% metal film types for slightly lower noise and tighter gain structure control.

The selection of a microphone input transformer will revolve entirely around price versus quality. Basically, you get what you pay for. Jensen transformers are generally regarded as the best available, and the quality is reflected in the price; the JE-115K-E recommended for this project currently sells for $51.35 direct from the manufacturer. There are less expensive alternatives available from such manufacturers as Beyer, Triad-Utrad, Whirlwind, Stancor, and others. All will pass audio, with varying degrees of fidelity.

This design uses a dual op amp IC for the sake of simplicity and low parts count. To achieve a slight improvement in performance, you may opt to substitute single op amps in individual eight-pin packages, such as the NE5534AN or the Analog Systems MA-332.

Acknowledgements

Many thanks to Bill Thompson of Ashly Audio, Inc. and Deane Jensen of Jensen Transformers, Inc. for valuable assistance in the preparation of this article. EM

Kit Availability

The following parts are available from Gaines Audio, 1237 E. Main St., Rochester, NY 14609; ☎ 716 / 266-0780. Printed Circuit Board only: $12.95 ea., ppd. Complete parts kit as shown, including chassis but NOT including mic input transformer: $74.50. Complete Assembled & Tested Preamp as shown, including Jensen transformer: $179.50. Please add $3.35 S/H each item except PCB. NY state residents add 7% sales tax. Thirty day return privilege on all items.

The Jensen JE-115K-E transformer is available directly from Jensen Transformers, 10735 Burbank Blvd., N. Hollywood, CA 91601; ☎ 213 / 876-0059. For other makes of transformers, contact the manufacturers for price list and ordering information.


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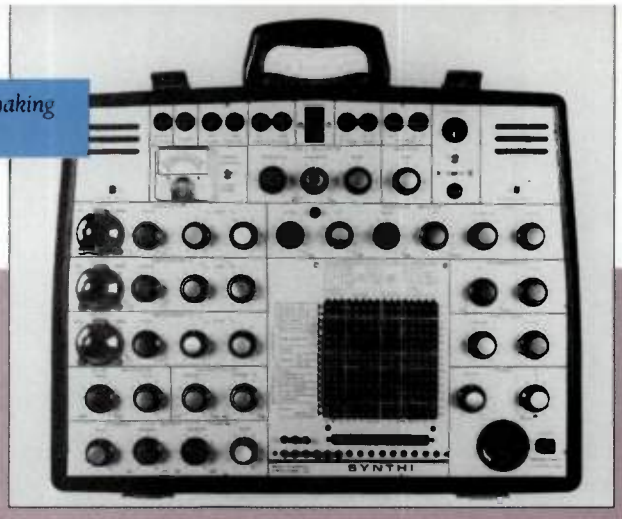


Fig. 1 *The EMS Synthi, making a comeback at Frankfurt.*

from

Fig. 2 *Sleek, clean, functional: gray tones and innovative design marked the Stepp Guitar exhibit.*

BY CRAIG ANDERTON

When people think of Europe they often think of castles, or Paris, or the Alps, or the rich and complex history spanning centuries of different civilizations. But Europe is also a center of the arts, and that includes electronic music. Between the birth of sampling in Paris, the IRCAM research center, and the many conservatories dotted throughout Europe, there's quite an academic scene; but Europe also gave us Kraftwerk, Tangerine Dream, and many other artists who helped define '70s and '80s popular music. "New York, London, Paris, Munich—everybody's talking 'bout pop music. . . ."

This report then, starts at the Frankfurt Musik Messe (the world's largest music trade show) but doesn't end there. Since this issue's theme is "art and music," I decided to go in search of whatever art and music combinations I could find. I didn't have to look far.

FRANKFURT MUSIK MESSE

The Frankfurt Musik Messe is as different from a NAMM show as, well, as Europe is from the United States. It's huge; we're talking about a giant hall with three floors of exhibitors from all over the world, including China, Iron Curtain countries, and of course, Europe, Japan, and the United States. The show lasts five days

Craig Anderton plays guitar and keyboards in the group Transmitter, writes books, edits this magazine, and seldom passes up an opportunity to eat good food.

REPORT EUROPE

Just another show report? Not really. There's a lot happening in Europe these days, and the Frankfurt Musik Messe was just the tip of the iceberg.

(the last day is open to the general public), and typically over 50,000 people attend the show.

Among European manufacturers, I noticed a couple of interesting trends. One is that there is a fairly active market for consumer-type products (organs, etc.), and these "traditional" manufacturers have discovered MIDI. Another is that there are several major kit companies (making available their electronic instruments in "build-it-yourself" form for lower cost), most notably Wersi and Dr. Bohm. Their product lines include Heathkit-style drum machines, MIDI expanders, even complete kit synthesizers. I asked if these companies had any plans to market in the U.S., and the answer was no for now; they didn't want to have to deal with the service aspects. (Of course, Wersi also makes assembled units, and these are already available in the U.S.)

Most of the products there I had already seen at NAMM, but there were a few surprises. **EMS** (Electronic Music Labs), one of the big names in musical electronics from the '70s, was back and showed their line of classic synths, including the Synthi (**Fig. 1**). A lot of musicians cut their teeth on these low-cost, temperamental marvels in the late '60s. EMS also showed a very interesting Distance to Voltage Converter (£500; U.S. price not available). Designed for control voltage-based systems, this unit puts out a voltage proportional to the distance between its sensor and an object. Talk about art and music: here's the perfect interface for dancers, theatrical presentations, and performance art.

Fig. 3 *Artist Piet Jan Blauw, the kind of guy who wears mice on his head(phones) and makes complex rotating sculptures, turned the Ensoniq booth into one of the big hits of the Musik Messe.*

Akai, who did not show at NAMM, demonstrated the EWI (pronounced "ee-we" but also an acronym for Electronic Wind Instrument). This instrument, designed by Nyle Steiner, had acquired semi-underground status as something that wind players wanted but couldn't get. With Akai's marketing muscle behind the product, the long wait for a mass-produced wind-to-MIDI converter should be over. With Yamaha also anticipated to get into the fray, and the Frankfurt introduction of the Sting, a wind-to-MIDI converter from **SSSound** in Japan, it looks like the age of the electronic woodwind player is here.

PPG gave a comprehensive demo of their hard disk recording unit (HDU), which can (among other things) shorten and lengthen music without changing pitch. At one point, they combined a cut from Frankie Goes to Hollywood and Aretha Franklin, matched the tempos, and synched them together. Wild. The HDU can record up to 12 minutes of mono, six minutes of stereo, or three minutes of 4-track acoustic material. When slaved to a MIDI sequencer, it will follow the sequencer so acoustic sounds can be treated as just a couple more tracks of the MIDI sequencer. The HDU also does sound effects and signal processing. Rumors abound of similar product introductions by other companies; I think hard disk recording is going to be *the* buzzword of the late 1980s.

One of the most popular German software companies, **JMS**, showed the C Mix Automation system that retrofits existing consoles (up to 64 faders) in a very elegant way—it mounts on the underside of the console, hooks into the faders, and is "hardware-transparent." **Friend Chip**'s SRC2 is a "do-all" sync box with SMPTE, MIDI/FSK/Clock Pulse/DIN Sync, accelerando/ritardando capabilities, click input, parameter storage as a "header" to SMPTE, automatic cue, and more.

I was also impressed by some of the guitar stuff coming out of Europe. More companies seem to be hooking MIDI up as a way to control guitar signal processors. One company, **Efex**, showed bass and guitar preamps that store all switch and control settings to be recalled via MIDI.

Atari, Atari Everywhere

One surprise to me was the Atari ST's complete dominance of the German music market. Although I saw a few Macs and IBM PCs, they were vastly outnumbered by STs. Most German software companies were developing all their new software on the ST; in fact, **Steinberg** software showed a prototype sampling drum machine that uses the ST. The concept is simple—since you have all that RAM and a processor anyway, why not add a hardware interface for individual outputs and create a drum machine? I asked a few people about why the ST had taken off, and the answer was simple: economics. The Mac and Amiga are both every expensive in Europe, and the people I talked to felt that IBM-PC computers are overpriced for the amount of performance they offer compared to an ST. The other popular "Eurocomputer" seemed to be the Armstrad, which has more penetration on a consumer level.

There were many other products, but I'd like to focus a bit more on the art and music aspects of the trip. Actually, a good place to start is at the show. The manufacturers seemed to have more of a sense of style; some booths were works of art. For example, the outside of the Schimmler

PHOTO: PETER HIRSCHFELD

Fig. 4 *The band Cloud About Mercury featured guitarist extraordinaire David Torn who tore up the stage with trumpeter/synthesist Mark Isham, bassist Mick Karn, and drummer Bill Bruford.*

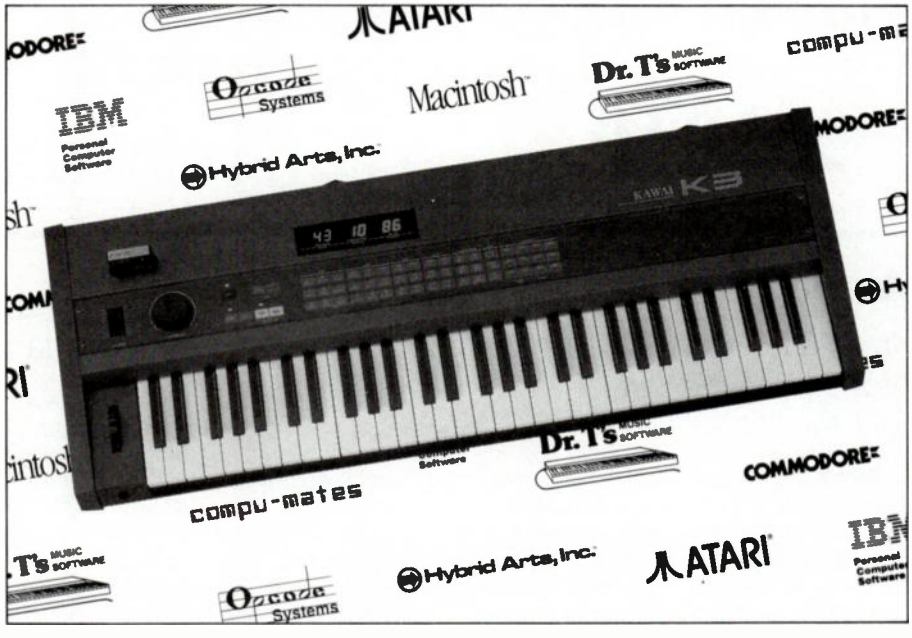
KAWAI ELECTRONIC MUSICAL INSTRUMENT DIVISION

PRODUCT NEWS

May 1987

Kawai Announces New K3 Computer Support

K3 Software Now Available for Every Major PC Brand



Kawai America has been closely cooperating with the MIDI industry's top software developers. Now, software specifically written for the advanced features of the K3 is available for every major PC brand sold in the U.S.

Major MIDI software producers, including Compumates, Dr. T's Music Software, Hybrid Arts and Opcode Systems have created some of the industry's most exciting music software products. Through a special arrangement between Kawai and these companies, owners of the Atari ST or 130 XE, the IBM PC, Commodore 64 and 128, Apple II or Macintosh can now buy software for the K3 synthesizer and K3M synthesizer module directly from the same dealers who sell the K3.

Don Ulrich, Kawai's EMI Sales and Marketing Manager, comments, "This level of cooperation between MIDI hardware and software companies is unusual in our industry and we are proud and delighted that Kawai is a part of it because everyone will benefit. K3 owners and software producers are very enthusiastic about the program and of course Kawai dealers are happy to be able to offer software that complements our products so well."

Each of the new computer programs for the K3 and K3M makes the instrument's programming possibilities easier to manage by graphically displaying sound parameters and user waveforms right on the computer's screen. Once the K3's sound is just right, a musician can use each program's voice librarian to save the patch on the computer's disk for recall later. This gives a musician unlimited storage and quick access to K3 patches.

Every program sold by Kawai dealers is endorsed by Kawai America to assure you that it will help realize the full potential of Kawai's state-of-the-art MIDI products.

Dee Farr

New Sequences for Kawai's K3 Computer System

Dee Farr, Kawai's product clinician, has created a series of special MIDI sequences to demonstrate the superb capabilities of Kawai's K3 synthesizer: the K3M synthesizer module and the R-100 drum machine. Using Hybrid Arts Midi Track III software on an Atari 130XE computer, Dee developed an exciting demo to show off the unique voicing and flexibility of the K3 music system.

Kawai is making this special demo diskette available to anyone who has purchased the K3 computer system package for the cost of the diskette and mailing only.

For information about how to order yours, contact your Kawai dealer or sales representative.

Top Studio Musicians Using K3

Jan Hammer and Tom Coster Endorse K3

Jan Hammer and Tom Coster; two of the world's top studio synthesists, are incorporating the K3's hybrid digital/analog sound into many of their latest projects. Jan and Tom are responsible for many of today's film, TV and record scores. Both of these trendsetting musicians have made the K3 sound an integral part of their state-of-the-art MIDI studios.

Tom, busy preparing for an upcoming tour with Steve Smith's Vital Information, came to Kawai's booth at Winter NAMM '87, the national show for musical instrument dealers around the world. There, he joined drummer Steve Smith and bassist Tim Landers for a phenomenal demonstration of the incredible power and flexibility of the K3 synthesizer. Many listeners thought they created some of the best music at the show.

Back in his studio, Tom combines three K3M modules with a K3 keyboard to get four times the power of a single K3.

With Jan Hammer, Kawai's new instruments couldn't be in better hands.

Like few other musicians in the world, Jan can really pull the full sonic potential out of a MIDI instrument and Kawai is extremely proud that Jan is so excited about his K3M.

Hybrid Arts, Inc.™

ATARI®

Opcode Systems

Macintosh™

Dr. T's MUSIC SOFTWARE

COMMODORE

Atari 130XE

Kawai/Hybrid Arts Atari 130XE Software Still Available

When the K3 first became available, Kawai and top MIDI software producer Hybrid Arts teamed up to create the K3 Wave Table Editor for Atari's 130XE. It's still a best-seller because it brings complete control over the K3's user wave to a very affordable computer. The Atari 130XE usually sells for under $300 with a disk drive. The software, including a MIDI interface, sells for only $149.95.

The K3 Wave Table Editor graphically displays the K3's user wave on the Atari's screen. A musician can manipulate the wave and instantly alter the K3's sound. Individual patches, along with user waves, can be saved in 50-patch banks on the computer's diskettes. The K3 WTE even comes with several ready-to-use patch banks.

Like Dr. T's Commodore software, the K3 Wave Table Editor runs on an inexpensive but powerful computer, making it one of the finest values on the market and a best buy for any MIDI musician. Of course, the K3 WTE is endorsed by Kawai and available at all Kawai dealers who sell the K3 and K3M synthesizers.

Apple's Macintosh

Opcode K3 Editor/Librarian

Opcode Systems, a leading developer of MIDI software for the Macintosh computer, is now shipping special K3 voice editing and storage software for Mac users. Priced at only $125, the Opcode K3 Editor/Librarian takes full advantage of the Macintosh's extraordinary software environment with a particularly easy-to-use and powerful product.

The Opcode K3 Editor/Librarian uses the high-resolution graphics display of the Macintosh to enable a K3 owner to edit both sound patches and user waves at the same time. A musician can use the mouse to edit envelope and user wave settings by simply redrawing them onscreen.

The K3 Editor/Librarian also stores banks of patches on the Macintosh's 3½" diskettes. The Librarian is unusually powerful. Patches can be individually selected and sent to the K3 by simply clicking on the patch name with the mouse. Users can move patches from one file to another and arrange them alphabetically within the Librarian.

User-waves are also stored in user-wave banks. They may be selected and sent to the K3 just as easily as patches.

Apple II, Commodore 64, Atari ST

Dr. T's Creates K3 Software for Many Computers

Dr T's Music Software, world-renowned for its affordable, yet highly-professional MIDI software, has created a number of K3 programs for a variety of computers, including the Commodore 64 and 128, the Apple II and the Atari ST.

Dr T's programs, available for $99 each, graphically show patches on screen and include visual displays of envelope settings. K3 and K3M users can easily modify one of their instrument's patches and save it on the computer's diskette using each program's special voice librarian. Dr. T's software can display two separate patch directories at once. It can even print patches. For even more flexibility, the programs also maintain a separate directory of K3 user waves. These waves may be selected and instantly sent to the K3 through MIDI.

Kawai is delighted to be able to add Dr. T's K3 software to the roster of programs that have been written specifically for the K3.

compu-mates

ATARI®

Atari ST

Compumates Updates Atari St Editor

Compumates created the world's first K3 software for Atari's newest computers, the extraordinary 32-bit ST series. Now they've updated their original program to create K3PO+, a revised user wave editor and patch editor and librarian for both the K3 and K3M synthesizers. K3PO+ is endorsed by Kawai America and available at all dealers who sell the K3 and K3M.

K3PO+, like its predecessor K3PO, takes advantage of the ST's extremely easy-to-use GEM environment. Running as a GEM application, K3PO+ is completely mouse-driven and sports pop down menus for easy access to all of the program's functions.

With K3PO+, a musician can change the K3's tone patches by redrawing the K3's user wave right on the computer's screen with the ST's mouse. With the push of a single button, the K3 immediately creates the new sound. This interactive process gives a musician instant feedback and extremely fine control over every aspect of the K3's voice.

Charles Faris created K3PO and K3PO+ and he's pleased that "its so responsive to a musician's need for complete and easy control of the K3."

K3PO+ sells for $99.95. Users of the original K3PO can update to the new version for a nominal fee. Updates are available from your local software dealer or directly from Compumates. 8621 Wilshire Blvd., Suite 177, Beverly Hills, CA 90211. Phone (213) 271-7410.

Compumates is also introducing new software for the ST to make programming Kawai's R-100 Drum Machine even easier. The Drum Droid lets a musician create custom drum patterns and songs right on the computer's screen. Drum Droid even takes full advantage of the R-100's ability to accept tuning, velocity, panning and level changes through MIDI. Like K3PO+, Drum Droid instantly improves a musician's productivity. Drum Droid sells for $99.95.

IBM

Personal Computer Software

IBM PC

IBM Software Author Surprises NAMM

John and Kathy Lilley's K3 editing software for the IBM PC was one of Winter NAMM's most delightful surprises.

John, based in Boulder, Colorado, is a student at University of Colorado. While studying audio engineering, he developed software for his own IBM computer and K3. Kawai dealer Craig Damon, of Hi-Tech Computers and Music, was so impressed that he encouraged John to make the same software available to other K3 users. Kathy Lilley added beautifully-detailed graphics to John's program and not long after, both John and Kathy made a special trip to NAMM to show off their completed software.

Other Kawai dealers at the show were just as impressed as Craig. The Lilleys' K3 editor features pull-down menus and complete control of all of the K3's functions through MIDI. Its fully-integrated user-wave editor, patch editor and voice librarian offers IBM users the same graphic control of the K3's digital voices as similar software for the Atari ST, the Macintosh and Commodore and Apple II computers.

For the Lilley's K3 Editor's graphic voice-editing capabilities, a mouse, an MPU-401 MIDI interface, and a Hercules or compatible graphics card is required. A future version will take advantage of the EGA's graphics. The IBM K3 Editor is endorsed by Kawai America and it's available for $99.95 from dealers who sell the K3 synthesizer and K3M module.

Kawai Drum Machine Boasts Great Features and Affordable Price

Kawai has introduced a dynamic new and affordably priced digital drum machine. Dubbed the R-100, the new machine marks Kawai's first entry into the digital drum machine market and incorporates many technological innovations that up to now were available in drum machines 2 or 3 times its low retail price. "The new R-100 has more features at an incredibly affordable price than any other drum machine on the market," said Marty Strohecker, Kawai's marketing associate.

Features on the R-100 include 24 studio—quality sampled percussion sounds in an extremely high resolution format (32 KHz sampling rate, 12 bit companding format), 8 individual velocity sensitive drum trigger buttons, and memory capacity for up to 100 pattern, 100 songs and 10 chains. The R-100 also has complete MIDI implementation including song pointer, real-time tuning of all 24 sounds, key assignment, and velocity control.

Other features include 10 separate programmable outputs (2 stereo, 8 direct), individual programmable tuning on all 24 sounds, individual volume level adjustment on each sound, selectable clock rate, sync to tape, tap tempo, and external foot pedal control of high—hat length.

New R-100 Drum Machine Sounds

A new, alternate set of 24 sounds for Kawai's R-100 Drum Machine will be available in the Spring. The new sound chip, a 4 megabit ROM, can easily be inserted into the existing ROM socket using the provided ZIF adaptor.

The alternate set includes spectacular new percussion samples, and even a Bass Guitar and Orchestra sample. All of the new sounds feature 12-bit companding at 32 KHz sampling rate, just like the original set.

BUTTON	SOUNDS
1	ATOMIC KICK, ROOM KICK, ACOUSTIC KICK
2	ATOMIC SNARE, ROOM SNARE, ACOUSTIC SNARE
3	HIGH ELECTRIC TOM, PURPLE RIMSHOT, CLICK
4	MID ELECTRIC TOM, CLAPS, MELLOW ELECTRIC BASS GUITAR
5	LOW ELECTRIC TOM, FUNK BASS GUITAR, ELECTRONIC SNARE
6	HIGH HAT CLOSED, HIGH HAT OPEN, TYMPANI
7	ORCHESTRA HIT, ROOM TOM HIGH, FINGER SNAP
8	CRASH, ROOM TOM LOW, BRASS HIT

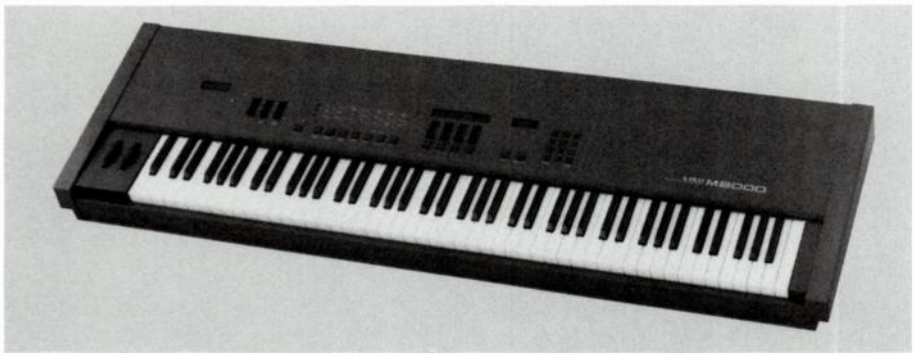
ROM Updates for K3 Synthesizer

This is a reminder to all owners of K3 synthesizers that update operating software is available. To check if you need the new ROM, do the following:

1. Turn on the K3. You should see a 1-01 flash briefly in the red LED readout. If not, you need the new ROM update.
2. Select "Master." Select "Function" (parameter #42). The parameter values of "Function" should range from 1 to 5. If the parameters go to 6, you need the new ROM update.

To order the update K3 ROM, see your local Kawai synthesizer dealer or call our Technical Services Dept. at 1-800-421-8048.

NOTE: *K3M modules do not need update ROM's.*



New MIDI Controller Debuts

M-8000 Brings Unprecedented Flexibility to MIDI Control

With its new M-8000 master MIDI controller keyboard, Kawai is about to give keyboard players unparalleled control over every aspect of their MIDI setup — all from a single extraordinarily powerful and flexible keyboard with 88 full-size, weighted "piano style" keys.

KEYBOARD		88 KEYS (PIANO TOUCH)
PLAY FUNCTIONS		PORTAMENTO, ARPEGGIO, SONG SELECT, TEMPO, START, STOP/CONT.START, SYNC START, LINK
EDIT PARAMETERS		MIDI CH, PROGRAM, TRANSPOSE, DETUNE, VOICE LIMIT, DELAY/PRIORITY, DELAY PARAMETER, VELOCITY SENSITIVITY, PRESSURE SENSITIVITY, ZONE, ARPEGGIO, PITCH BEND, MODULATION, VOLUME, DAMPER, PORTAMENTO, PEDAL, SWITCH, EXT KYBD, REGISTERED PARAMETER, VALUE
CONTROLS	MASTER	VOLUME, VELOCITY SENSITIVITY, PRESSURE SENSITIVITY, KEY TRANSPOSE, PITCH BEND, MODULATION
	CHANNEL	VOLUME (x 4), ON/OFF SWITCH (x 4)
	DATA ENTRY	NUMERIC KEYS (0-9),
DISPLAYS		MASTER DISPLAY (3-DIGIT LED), CHANNEL DISPLAY (2-DIGIT LED x 4)
REAR PANEL		START/STOP, PROGRAM UP, ASSIGNABLE SWITCH, PORTAMENTO, DAMPER, ASSIGNABLE PEDAL, VOLUME
MIDI		MIDI OUT (x 4), MIDI IN, MIDI THRU, EXT.MIDI IN
DIMENSIONS		57" (W) x 16.5" (D) x 5" (H) 1,448 (W) x 423 (D) x 130 (H) mm
WEIGHT		62 Lbs. (28 Kg.)
MEMORY CAPACITY		99
DATA STORAGE		RAM CARTRIDGE (RC-16)

The M-8000 provides storage for 99 separate MIDI parameter setups. During performance, a musician can quickly move from setup to setup, effortlessly controlling a complex combination of synthesizers, sequencers and drum machines.

The M-8000 incorporates a state-of-the-art MIDI implementation with four separate MIDI outputs, programmable independently. Each of these MIDI buses has its own MIDI channel and a host of other MIDI performance parameters that can be assigned to it separately. These include volume, keyboard zone, velocity and aftertouch sensitivity and scaling, transpose, MIDI delay and arpeggio.

Even though only a few "registered" parameters have been newly incorporated into the MIDI specification, the M-8000 has the expansion potential to control 16 separate registered parameters whenever they become defined.

To provide total control in every aspect of a musician's performance, the M-8000 includes both pitch bend and modulation wheels and can accept several footswitches and pedals as additional controllers. Bright LED displays indicate the current status of every parameter and a 10-key pad provides easy programmability.

The M-8000 incorporates state-of-the-art MIDI control in an affordable package.

KAWAI AMERICA CORPORATION

EMI Division
2055 E. University Dr.
P.O. Box 9045
Compton, California
90224-9045

PHOTO: PETER HIRSCHFELD

Fig. 5 *Michel Waisvisz performing with his home-built MIDI controllers, "The Hands."*

piano booth was decorated with dozens of exceptional prints involving an art and music theme. When I asked who had done these, the answer was that these were the product of a competition for high school students. Two booths, however, stole the show. The Stepp booth (**Fig. 2**) was minimalism at its best: a small space, decorated solely in gray, with a constantly playing video demo of the Stepp guitar and personnel to handle questions. While there were no provisions for hands-on demos, the booth itself was striking and very artistic. But unquestionably the booth with the greatest "jaw-drop" factor was Ensoniq Europe. As soon as I stepped in the hall, people were telling me I had to go see the booth.

The Ensoniq Booth

The head of Ensoniq Europe, Felix Visser (a well-respected figure in the world of European musical electronics) had commissioned Dutch avant-garde artist Piet Jan Blauw (see sidebar) to design a booth that would be a work of art. The booth had four major components: an economical stack of Ensoniq gear, played by Peter Vettese (Jethro Tull) for demos, a series of music/light sculptures by Piet Jan, a hidden "office" towards the rear for doing business, and 40 pull-down headphones so that people could listen to the demo in privacy. But what headphones! They were actually U-shaped plastic pieces with speakers that were covered with everything from plastic baby dolls to keyboard keys to random wirings to plastic rats to, well, you name it (**Fig. 3**). When people put on the headphones, it looked like they had all manner of bizarre things growing out of their heads. Going past the booth itself was an experience: there was Peter doing his soundless demo; against a background of sculptures, 40 people stood listening to these crazy headphones, occasionally bouncing up and down in time with the music and laughing out loud; and surrounding them were the spectators wondering what was happening inside those headpieces. Meanwhile, people from Ensoniq Europe took Polaroids of people under their headphones, and gave them away as presents in a little Ensoniq folder. I wonder how something like that would go over at the Chicago NAMM show.

The First International Art Rock Festival

And now, for more music and art: as part of the Musik Messe, there were two nights of avant-garde music concerts. The first night started with a conceptual piece, "The Man in the Elevator," conceived by German composer Heiner Goebbels. Featured players included such well-known musicians as Don Cherry, Fred Frith, George Lewis, and Arto Lindsay, along with Peter Hein, Peter Hollinger, and Heiner Muller. The continuous work consisted of combinations of spoken text, speech over music, improvisation, some really hard-rockin' grooves, some vocals by Lindsay that were basically straight-ahead Bossa Nova, jazz and more. One of the highlights was George Lewis doing a solo piece on what he jokingly calls his "Keith Jarrett Generator," a computer composition program that interacts with the performer's playing. (I made it clear that an article on this for **EM** would be highly appropriate!) This combination of musical styles, thrown together in a melange, sounds like it might be hard to make work—but there were some truly inspired moments and I enjoyed it a lot.

The second act, Anna Domino Band, was not as impressive. But the closer for the evening, Cloud About Mercury, was phenomenal. The personnel (**Fig. 4**) are David Torn (guitar), Bill Bruford (drums), Mick Karn (bass; formerly with the group Japan), and Mark Isham (trumpet/synth). Mark Isham was interviewed in the February 1986 **EM**; Torn and Bruford will be the subject of upcoming interviews. All four are phenomenal. Bill Bruford gets more mileage out of MIDI percussion than anyone else I've heard; his drum solo was melodic and tasteful (and also one of the best Simmons demos you'll ever hear). Mick Karn's bass is fluid and anchors the band solidly, while Mark Isham—generally associated with mellower, new age kinda stuff—surprised me by tearing into some songs with incendiary trumpet work. Yeah! Dave Torn is a guitarist to watch. His use of electronics is exceptional, and none of it involved guitar-to-MIDI. Torn's signature is the use of the Steinberger transposing tremolo, which he uses to create pitch bend effects like what we're used to hearing with synthesizer. He mixes up picking, two-handed tapping, signal processing and clever use of "infinite hold" effects to create something truly new and original. Their album, *Cloud About Mercury*, has just been released on ECM and I'm looking forward to hearing it as soon as possible.

The highlight of the second night's concert was the Touch Monkeys, featuring Michel Waisvisz with his remarkable hand controllers (**Fig. 5**). These controllers use switches, hand position and distance from each other to send out MIDI data to a bunch of TX7s and TX816s—according to Waisvisz, the only units fast enough to process the huge amount of MIDI information generated by the controllers. Here is an intimate association of movement with music; in fact, I was reminded very much of playing feedback guitar, where a loop is formed between

the player and the equipment, and the physical relationship between guitar and guitarist is very important.

One interesting concept is that sonar interfaces (like the ones on auto-focus cameras) interpret the distance between the hands to determine not just dynamics, but loop points on sequences. Thus, it is possible to specify the loop point physically, with hand spacing. Mercury switches and tilt switches, as well as push-buttons under finger control, control other parameters. There were two support people, one to handle dual Atari computers, the other to mix the sound (which came out of 12 speakers in six different locations for hexaphonic sound —also pretty impressive). Michel will be one of the people at the AES conference starting May 1 in Los Angeles at the Biltmore; I think his talk will be worth attending.

The Ultimate Record Store

One other point of interest was a record store I visited in Munich. Above the bins of albums were headphones dangling from the ceiling. Next to each headphone hung the cover of the album being played through those phones. There were about 45 albums available for auditioning at any one moment, and it was a great way to find out whether an album was of interest or not. Maybe before record companies complain too much about declining record sales, they should follow this example. A lot of times in a store I'll be curious about an album, but unless I know what I'm buying, I won't buy it.

Prologue

After coming back from Europe, I was home for a day before zipping down to Los Angeles to attend the CD-I (Compact Disc Interactive) conference sponsored by *Mix* magazine and AIM (the latter are responsible for "seeding" software development for this new medium). This was my first real exposure to what's behind this new technology, and I came away with the feeling that if certain tough problems could be overcome (e.g. generating sufficient products to justify consumer purchase of a CD-I player), this could be the entertainment and educational medium of the 1990s. In brief, CD-I stores sound, music, speech, software, and text on a CD-style disc that can be accessed interactively thanks to the CD-I player's computer. Since each CD-I holds 600 megabytes, that's a *lot* of information. Of course, complex animation or high-quality sound eats up those megabytes pretty fast, but CD-I makes provision for four different quality levels of audio, with lower-fi sound taking up less memory (CD-I accommodates over 20 hours of sound at the speech quality level, which is roughly equivalent to AM radio). Can you imagine this magazine on CD-I? We could have text, sound examples of what the articles are talking about, patches and software to download, and some musical excerpts to help illustrate Robert Carlberg's record reviews. I'm ready! EM

Piet Jan Blauw: Art and Music

Piet Jan's work has already been featured in *Polyphony;* he did the cover for the last issue before the magazine became *Electronic Musician* in June 1985. His philosophy is that art is an ongoing ritual; he calls this process IstArt, which assumes that the process of making art is as important as the final product, and combines elements of fine art, music, and performance. The cycle starts with the creation of artistic objects (usually involving music and light), which he then uses in performance art events to communicate with an audience. The next step in the creative cycle is to take images of the performance to create a new object, which might be a silkscreen or videotape. Often these are then processed with additional elements of light or sound, and the cycle begins again. For Piet Jan, art is a serial, on-going process, not something to be stashed away in a museum but something to be integrated into one's life on a continuous basis.

Piet Jan has a background as a musician, and even there, he couldn't help but add elements to shake up an audience. He came up with a moving speaker box that, over the course of a performance, would move from one end of the room to the other. The effect was just subtle enough to make people wonder whether that box had moved or not.

Fig. 6 shows one of his most playful works, the Frequency Keyboard. As with any electronic keyboard, each key triggers an electronic sound generator—but in this case, the sound generator is one of 36 transistor radios tuned to different frequencies. Piet Jan calls this a "sampler," which is fair enough considering that the instrument basically samples the electromagnetic spectrum. It's a gas to play. The instrument was the centerpiece of a concert that also involved percussion and lighting effects that were controlled both by musicians and, via remote control, from the audience as well.

Piet Jan is currently working on a commissioned work in Amsterdam, and is contemplating doing an exhibition in the U.S. If he does, catch it. This is someone who has really made the connection between art and music.

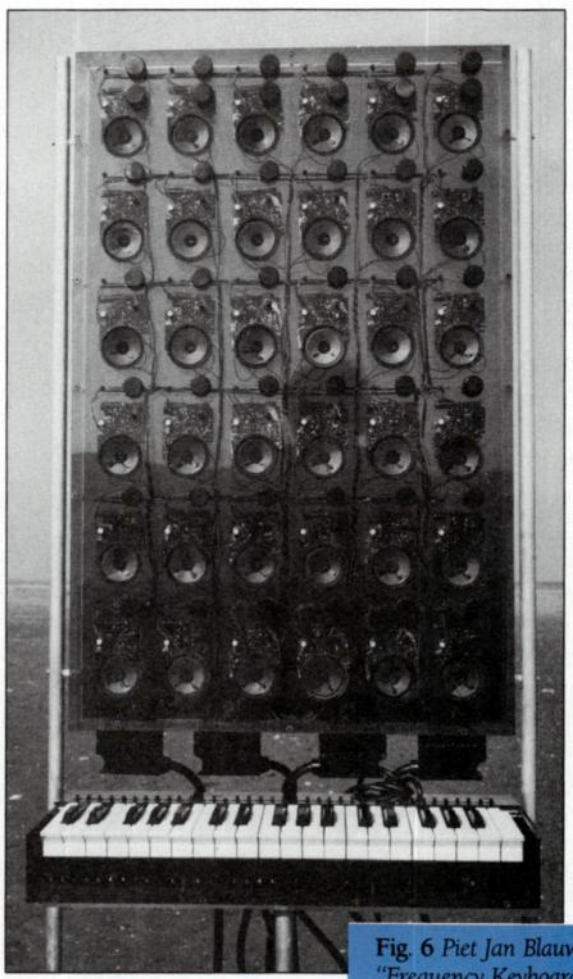


Fig. 6 *Piet Jan Blauw's "Frequency Keyboard."*

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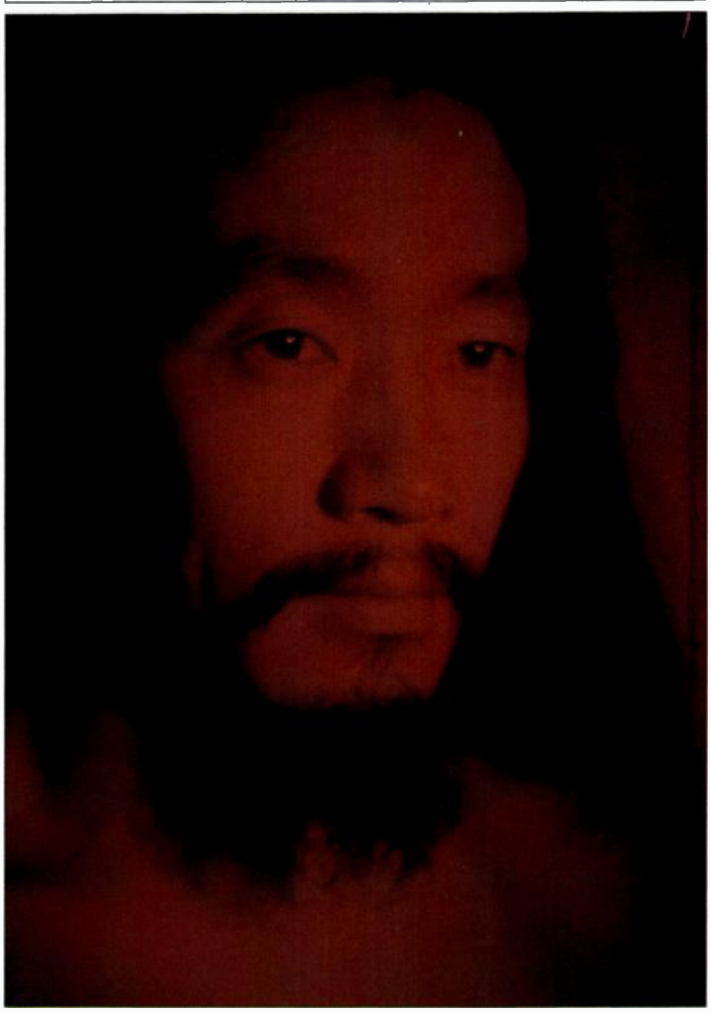
THE KOSMOS, KITARO AND EVERYTHING

BY JOHN DILIBERTO



Over the last 10 years, a gentle, elusive musician named Kitaro has emerged, purveying lush romantic synthesizer themes bathed in Asian trappings. Although his music evokes the ancient arts of Japan, his tools are drawn from today's technology—state-of-the-art Japan, if you will.

1986 drew to a close with the release of Kitaro's first new Geffen recording, Tenku, meticulously crafted on a Yamaha DX7, DX5, minimoog, Korg 700S and 800, Roland Jupiter 8, Prophet-5, Kurzweil, and a Roland SH-3 all linked through a Yamaha CX5M. In addition to a variety of percussion instruments, he also plays an Ovation acoustic guitar and an electric guitar whose manufacturer he could not remember. His studio consists of a Sound Workshop 36 channel board, an Otari 24-track recorder with Dolby A noise reduction, and an Otari 2-track for mixdown, although Tenku was mixed digitally at another studio.

I present these electronic artifacts for you up front because it's about the only technological information you'll get from conversations with this Japanese artist. Hardcore technoids can stop here, because Kitaro espouses the philosophies of a technological primitive. Like Vangelis, with whom he shares a sense of drama and grandiosity, Kitaro displays a willful ignorance of the equipment that helps him create his intricate and subtle compositions. Despite the technology, Kitaro wants his music perceived as a natural development, a harmonious outpouring of his soul, in tune with planetary and cosmic vibrations.

Over the course of some 13 albums, Kitaro has formulated a lush orchestral approach to synthesis that interpolates acoustic instruments and environmental effects into a detailed electronic field. Despite his professed simplicity, Kitaro's sound shaping abilities are formidable, and he extracts delicate shifts of nuance out of his analog synthesizers. The rich, thundering cadences and meticulous Asian melodies have placed him in the forefront of new synthesizer composers.

Born in February, 1953 on a farm in Japan, Kitaro is a self-taught musician who grew up listening to American rock and R & B. He entered his teens at the height of the psychedelic movement, when he

Space music composer or rhythm-and-blues fan? Technology buff or Mr. Natural? Kitaro is all of the above, yet the apparent contradictions seem —like his music— to result in harmony rather than discord.

START

THE ST QUARTERLY

PREMIERE ISSUE

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Summer 1986 Volume 1, Number 1

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started playing guitar. After a few rock groups, he formed The Far East Family Band, along with some other Japanese synthesists like Fumio Miyashita and Akira Itoh. He recorded two albums with Far East, Parallel Worlds and Nipponjin, produced by German synthesist Klaus Schulze. The Far East Family Band tripped through Pink Floyd-inspired psychedelia distilled in synthesized oscillations. In the best cosmic music tradition, Nipponjin was subtitled, "Join Our Mental Phase Sound."

It was with Far East that Kitaro switched to synthesizers. In 1978 he released Ten Kai-Astral Trip (released in US as Astral Voyage) and has been traveling the sonic spaceways ever since, in electronic pan-cultural orchestrations. The Silk Road soundtrack for a Japanese film documentary, several studio releases, two orchestral records and three live recordings have followed, each one brimming with sweet melodies and whirling electronic effects.

Kitaro doesn't talk much about it now, but in the late 1970s he became a follower of Bhagwan Shree Rajneesh, the self-styled "sex-guru" and "guru to the rich" whose exploits in Oregon were widely covered in 1985 and 1986. Despite wearing the Rajneesh red clothes and the Bhagwan pendant in earlier publicity photos, Kitaro now disavows any serious involvement with the guru, a convenient and well-advised stance as his music begins to cross the lines from space and new age cultism and into the mainstream. Despite that, his music remains suffused with a sort of vague mysticism that often seems more image-conscious than he'd have us believe.

When I talked to Kitaro in New York he wore a sweater and blue jeans. With his mustache, inscrutable goatee, and hair streaming down his back, the wizened appearance of this diminutive musician belies his 34 years of age.

He is a disarmingly unassuming musician, whose gentle humor assuaged my initial cynicism. After all, what self-respecting critic wants to admit a tendency towards music associated with someone like Rajneesh? The truth is, the best of Kitaro's music, like that of Bach, Coltrane, and the former Mahavishnu John McLaughlin, transcends its religious roots and communicates to us on a universal level.

Kitaro's English is rudimentary and most of our conversation took place through a translator. As we began, the sounds of New York invaded the room, a marked contrast from Kitaro's home in Japan.

EM: *Do you think you could use some of these natural sounds in your music?*
Kitaro: These are not natural sounds, (laughs). It's too much. My house is on top of the mountains, so it's quiet. I like quiet. But this is New York.
EM: *Some of your music isn't always quiet.*
Kitaro: My music has quiet parts and powerful parts; I need both.
EM: *You use a lot of natural sounds in your music. Waves, wind, birds—do you record them from the environment?*
Kitaro: Yes. Sometimes I go to seaside and take microphones.
EM: *But you also use a lot of technology.*
Kitaro: Yes. I like technology, but also I like acoustic sounds. Only electric music is too much, so I need both.
EM: *Do you find there's any conflict between those two types of sounds?*
Kitaro: No, I feel there's no conflict. I can blend the two quite naturally.
EM: *You use a lot of natural sounds. There have been other musicians who would take sounds from the real world and manipulate*

John Diliberto *is the producer of* Totally Wired: Artists in Electronic Sound, *a weekly program on electronic music produced for Pennsylvania Public Radio Associates and broadcast on public radio stations across the United States.*

them on tape (musique concrete), yet their music is much different from yours and more dissonant. Why do you think your approach yields a more harmonious atmosphere than theirs?

Kitaro: What's natural to me is if somebody listens and is comfortable and natural with the music; that's one of the effects I'm trying to get. But when I use sounds that were recorded naturally, I tend to use them as is. I'm not interested in altering them. A certain amount is fine, but there's a line that if you alter them a certain amount, it is no longer natural. Even when I use synthesizers, I stay away from the use of effects, to try to leave the natural sound to the listener. So it has, for example, a soothing effect—although it's not limited to that example—so it elicits a natural response. It's not dissonant and it's not stressful.

EM: *You use Emulators and a Kurzweil, and those instruments can sample sound from the natural world.*

Kitaro: I'm not using the Emulator because the quality of the Kurzweil is much better. But sampling sounds is some guys taking real sounds. I think real sound is too much, like broken glass. Too much for me. Natural sound is not real sound. Real sound, violins, some violins are real and the sampling violins are different. The sampled violins don't have air, they're not projected through the air so they sound different.

EM: *Are you sampling your own sounds or using the factory samples?*

Kitaro: Both! There are instances where the so-called real sound, ocean waves for example, where you go to the ocean, record it and play it back—it can sound like a flushing toilet and is not pleasant at all. I find that by mixing sounds generated through an analog synthesizer, you can actually get something which to the ear is more natural, what you would expect the waves to sound like.

EM: *We were born about the same time, but I wonder if we were listening to the same music growing up.*

Kitaro: I played rhythm and blues. I liked that. Beatles! I think hard rock was too much.

EM: *Were you listening to any Japanese music?*

Kitaro: Yeah, but I never learned Japanese music. I like it though.

EM: *You use a lot of it in your own music.*

Kitaro: But I never studied it formally. I think my music is New Japanese music.

EM: *What does that mean?*

Kitaro: New traditional! New lifestyle, phi-

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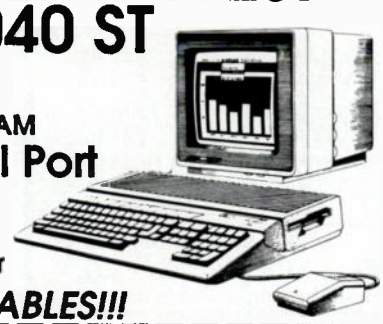

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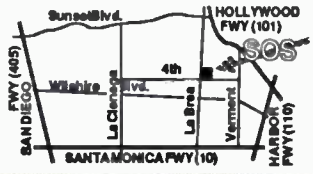

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losophy, new type of music.

EM: *You were in the Far East Family Band. Were you on the recordings* Parallel Worlds *and* Nipponjin?

Kitaro: Yeah! It's a very strange story. The record was recorded in London at Virgin Records' Manor studios. I saw a ghost many times at Manor studios.

EM: *You saw ghosts?*

Kitaro: Yeah, very strange!

EM: *Who was the ghost?*

Kitaro: I was playing billiards. I played alone. But over in a big old chair some guy was sitting. The manor was a 16th century castle and the first owner was sitting looking at me. Wow! I asked the staff, told them I saw an old gentlemen. The staff said "Yes, he's the first owner." I said "Oh my God!" (laughs).

EM: *Those albums were produced by Klaus Schulze.*

Kitaro: Yeah. I like him. He has a technique about how to use synthesizers. I never learned his mind. I learned a lot from Klaus but there are things that are personal to every artist, his psyche, and those are things that nobody else is privy to. So I learned a lot of technical aspects and new ideas but there are some things that remain unique to each artist.

Just watching Klaus compose and perform was a real education to me, just the techniques he employed on the synthesizer. So there was a lot that I picked up from that, but our music is worlds apart. Even in my world, however, Klaus's unique use of the synthesizer was an eye-opening experience.

EM: *What techniques were they?*

Kitaro: More than the specifics of what Klaus did with the instrument, it was his whole approach to the instrument. Klaus's personality had a childlike quality and that led to a very fresh approach to the use of the synthesizer, using the instruments and other equipment in the studio in ways that were totally unconventional. For example, he would take tracks that he had built up to a certain point, play them through a Leslie cabinet, mic the cabinet and re-mix that into the overall piece.

EM: *You didn't have any music lessons as a child or teenager, but you picked up the guitar in high school?*

Kitaro: Yes.

EM: *You were playing American rhythm and blues music?*

Kitaro: Yeah!

EM: *How did you form the Far East Family Band? That was with Fumio Miyashita, right?*

Kitaro: At the time it was a group of people interested in progressive rock and we had a meeting of the mind and it seemed to be a very natural joining of forces. Today, all the members are out doing their own thing.

EM: *The sound of Far East Family Band was very spacey and Pink Floyd influenced. Your music, when you went solo and came out with* Ten Kai-Astral Trip, *moved away from that, the rock aspects of it.*

Kitaro: Although certain comparisons with Pink Floyd may hold true, nevertheless, I feel that the music the band pursued was more inwardly directed and came more from the soul. It was perhaps a more personal expression. When the time came for me to go solo, it wasn't a dramatic change or departure from what I had been doing, but merely a natural progression of the expression of the deep inner self.

"Synthesizer makes a picture, one scene, this is the best. Synthesizer is picture music"

EM: *As you know, there's a development of new age music . . .*

Kitaro: (Laughs) New age, the term is used a lot these days and it's a difficult category, perhaps because it hasn't been defined yet and it's really wide open. But, as a term, I like it a lot. It expresses a philosophy about the music. It's contemporary and relevant to modern society.

EM: *So you feel part of the new musical and social consciousness that's going on?*

Kitaro: I feel a responsibility. Music has profoundly influenced the course of my life. As a creator of music I feel a responsibility towards people who listen to it. Much the way music has influenced me, I feel my music may now influence generations of people whose lives may take whatever direction.

EM: *When did you begin getting into synthesizers?*

Kitaro: In the Far East Family Band. I didn't know how to use the synthesizer,

but the first time I got headphones and I didn't understand what it was, the oscillator, the filters, the amplifier. I just turned it on and sound is coming, wave sounds. I feel the wave sounds. I closed my eyes and feel like seaside. Synthesizer makes a picture, one scene, this is the best. Synthesizer is picture music.

EM: *Do you remember what that first synthesizer was?*

Kitaro: Minimoog.

EM: *Which you still use.*

Kitaro: Yeah! For me it's one of the most important instruments.

EM: *Why is that?*

Kitaro: Obviously there's a great sentimental attachment to the instrument because it did make such an impression on me. But above and beyond that, compared to the current crop of digital synthesizers I feel that the minimoog is capable of a certain depth and quality of sound that simply can't be replicated with a digital synthesizer.

EM: *Do you feel it's easier to be spontaneous with a minimoog?*

Kitaro: Yes. I absolutely agree. There's a certain thing that occurs at the moment that more quickly translates into sound than with digital.

EM: *When you started making this music with Far East and the* Silk Road *and other records, there weren't many other people doing this kind of music—maybe Vangelis, Klaus, Tangerine Dream. What do you think it is that drove you in this direction when there were so few others doing it and it wasn't popular music at that time?*

Kitaro: One of the primary influences to this day is, I have not composed music with lyrics. I wanted my music to be universal and with lyrics that becomes difficult. I wanted to compose music that was on a different plane, that crossed the boundaries of language, and I found that these instruments in combination with traditional instruments gave me the avenue to do that.

However lyrics are not out completely and it's something I'm considering for the future. Maybe you'll hear my voice on a record (laughs).

EM: *Your voice has been on records.*

Kitaro: Yes, you've heard my voice, but not lyrics. One day!

EM: *How did you develop your keyboard techniques?*

Kitaro: I never studied keyboard technique or any instrument formally. I am entirely self-taught. I won't even read an operator's manual that comes with a syn-

thesizer. I learn through experimentation and my keyboard technique is something that's grown out of the time I spend with the instrument.

EM: *Do you practice?*

Kitaro: Yes! Not much! (laughter) I took music classes in school that were part of the normal curricula, but nothing beyond that.

EM: *How do you compose your pieces then?*

Kitaro: When I begin to compose a piece, I start with a mental picture, and it really is a picture, not some abstract idea. For that picture there is a sound that goes along with it and that sound is already in my head before I lay one finger on the keyboard. With that picture and sound firmly in my mind I begin to experiment and try to create that sound.

EM: *Do you compose directly onto the tape machine?*

Kitaro: Yeah! I cannot write a score.

EM: *Each of your albums seems to have a thematic story behind it, like* Ten Kai-Astral Trip. *What is its theme?*

Kitaro: It's religious. I don't know if it's specifically Japanese. There is the now and the present and when you die there are afterlifes. But there are stages of afterlifes. There's a level at which you exist only as a consciousness, and you go on up and there are several levels. At the very top is the level called Ten Kai which is the Astral level, Astral voyage. It's a purely spiritual level of attainment in the afterlife and this is what Ten Kai is all about.

EM: *Speaking of religions, it's my understanding that you are or were a follower of Bhagwan Shree Rajneesh.*

Kitaro: Yeah, I know him. My friend!

EM: *How did that come about?*

Kitaro: I met with this person when he was in India, Poona. It's not true that I am a follower of that religion or belief. I believe it is one of many possible beliefs. I got to know him and it's not that I practice that belief.

EM: *But I remember seeing pictures of you wearing the red that Bhagwan followers wear and the Bhagwan pendant was around your neck.*

Kitaro: Yeah! I know (laughs). It's true at one point I took on the trappings of this belief. But even then I felt that there were other beliefs and ways of life. It was not necessarily a body and soul conversion.

EM: *Do you know Deuter (Chaitanya Georg Hari Deuter, another Bhagwan disciple and synthesist)?*

Kitaro: Deuter! Yeah!

EM: *Were you in Poona at the same time he was?*

Kitaro: I know his studio in Poona, but he lives in the US now. Bhagwan is, I don't know where. I simply heard that Bhagwan was deported from this country.

EM: *Deuter has much of the same spirit as your own music.*

Kitaro: Yes. I'm familiar with it and very much like Deuter's music. In fact there was a time in India where we had a session together.

EM: *I assume* From The Full Moon Story *also has a story behind it.*

Kitaro: The full moon is associated with all sorts of phenomena, but it does seem to affect all living things. There's a change in energy level that affects wolves and also human beings. It's that special energy level during that time of the month, and the things that result from that energy that I tried to capture.

EM: *Your records flow as a continuous piece, but they're actually shorter compositions that you string together.*

Kitaro: I consider one album one composition. On one side of a record or tape, there may be no perceptible break in the record, but they're there, just as in classical work, each section or movement is designed to evoke certain emotions.

EM: *When you did the soundtrack to the TV series* Silk Road, *the images were already given to you.*

Kitaro: It's not so much that the mental pictures were already there to write to. Yes, the *theme* was already there and I had to write to a theme, but it was still my own mental picture. I had the freedom to look at this whole story and say "this is where I feel there's a certain music or mental picture," and sound is born from that. I was able to choose the parts in the story to write to. So the pictures and sound are very much my own.

Kitaro Selected Discography

Astral Voyage (Geffen)
Full Moon Story (Geffen)
Oasis (Kuckuck)
Silk Road Volume 1 & 2 (Kuckuck)
In Person Digital (Kuckuck)
Tunhuang (Kuckuck)
Ki (Kuckuck)
Silk Road Suite-London Symphony Orchestra (Kuckuck)
Millenia (Geffen)
Asia (Geffen)
India (Geffen)
Toward The West (Geffen)
Silver Cloud (Geffen)
Tenku (Geffen)

With The Far East Family Band:

Parallel World (Mu Land)
Nipponjin (Vertigo)

EM: *When I've spoken to the German synthesists like Klaus Schulze and Tangerine Dream, who have influenced you, they talk about having to find their own Germanic voice after World War II, in that up until the '70s they only imitated American and English rock and roll and they were the first generation to find their own voice. Did you feel the same thing in Japan?*
Kitaro: Yes, I see certain similarities and I feel that even the latest crop of young musicians in Japan are still not up to their European and American counterparts from the standpoint of developing and showing some originality and creating a unique sound. Certainly Japan has its traditional music and that's always there in the background, but in terms of contemporary music and to develop this voice you were talking about, it continues to be a problem for Japanese musicians.
EM: *When I think of Japanese music I think of shakuhachi music and Gagaku music which is stately, gentle and not dramatic. Your music is very dramatic. You seen to have more of a western sensibility in that way.*
Kitaro: The drama that you might experience from listening to my music, I don't feel is either Japanese or western. For me music isn't music unless it communicates dreams, emotions, feelings and to do that yes, it has to be dramatic. It's not a question of being influences. It's an effort to communicate something that was born of a dream.

The young Japanese music audience, they don't listen to the traditional music at all. It's really overwhelmingly the western music they listen too.
EM: *You use a lot of western and Japanese music, but also other Asian music, Balinese music. On "Ikara No Mei," you use the "Ramayana Monkey Chant."*
Kitaro: "Ketjak," yes, the "Ramayana Monkey Chant." The first time I heard the "Monkey Chant" was when I was in Bali and it left an immediate impression on me. It had a quality that immediately drew you into it and I became engulfed in it, part of the experience. I recorded it there myself and used it in a composition.
EM: *"The Monkey Chant" goes on for some time and it's a trance performance, I think an exorcism dance....*
Kitaro: I just thought it was fantastic.
EM: *Do you ever take traditional Japanese melodies and use them in your music?*
Kitaro: Not consciously. I'm not aware ever of deliberately taking a melody and using it. But because it's part of me and the music flows from me and my state of mind and time of life, whatever, a lot of it perhaps sounds traditional because that's part of me.
EM: *When you perform in concert you have a group. Are you playing everything in real time or do you have things that are prerecorded on sequencers or computers?*
Kitaro: One or two songs need sequencers. I should play in real time because the concert is live stage. It's not a record. I think that concert and records are different. The same song is different. If the audience wants good sound quality, like a Dolby system, quiet, the record is best. CD is best. The live stage is a feeling, powerful and visual.
EM: *Until very recently a lot of your percussion was hand percussion, but the last few recordings have used a trap drum set and I think that's changed your music.*
Kitaro: I like drums, big Japanese drums.
EM: *You play a Japanese drum in a trance performance.*
Kitaro: This is in August, on the full moon night until next morning, I play drums, whole night at the foot of Mount Fuji. To play this, it feels like Monkey Chant.

At times during this performance, or ritual, I felt that I was no longer conscious of what I was doing and was very much in a trance and lost consciousness for what I was doing for 11 hours non-stop. There are times where I actually fall over, unconscious. I regain consciousness and start up again.
EM: *How do you prepare for this?*
Kitaro: There's no special preparation, especially if you mean diet or special hours. I sit down and I'm offering a prayer in ritual form to Mt. Fuji. In much the same way I'd go through levels of mental preparation for a concert, yes, there is a kind of mental preparation, or spiritual preparation. But nothing specific in terms of any regimen I take on.
EM: *Have you recorded it?*
Kitaro: Recording drums faithfully is one of the most difficult things. I do have a video of it but I have not attempted to use that in a composition, no.
EM: *You have a 24-track studio at home.*
Kitaro: Yes, Otari 24-track recorder, Dolby A noise reduction, Sound Workshop 36-channel board, Otari 2-track mixdown.
EM: *The last album was mixed down in digital.*
Kitaro: That was done in Tokyo.
EM: *You must love using MIDI now with the type of music you do.*
Kitaro: I use MIDI synthesizers, Yamaha MIDI computer, but not often.
EM: *When you're creating a composition like "Romance" from* Tenku, *are you writing*

that in one line at a time into the tape machine?

Kitaro: Yes. Composing and recording is the same process and I lay tracks one at a time.

EM: *Do you have a complete image of what the track is going to sound like or do you build it as you add lines?*

Kitaro: Going back to what I said earlier about the mental picture, at that point the composition is 80% there and laying down the tracks is merely trying to replicate what's in my mind. But in the process of laying down the tracks that composition fills out and expands to 100% and sometimes 200%.

EM: *Do your videos represent the images you have in your mind?*

Kitaro: No. I don't see the videos as an attempt at all to recreate that mental picture. For the person listening to the music, the video, the surroundings . . . my music goes best with natural scenery. *Tenku* is a special case because the video is of my face and is an attempt to visually depict what's inside me. I don't feel the video's off track and I think it's fine for what it is, but it's not necessarily that mental picture I was talking about. Frankly I don't see why videos have to be that.

I see the medium as another way of communicating the music to the listener; the video is an added element in that communication, a session between me and the viewer and the visuals are an additional element in the communicating that's going on. I'm happy with that, even though it doesn't serve the mental picture.

"I swear by the analog synthesizers. I feel that they're capable of producing sounds not possible with digital synthesizers."

EM: *Do you think your music has a function?*

Kitaro: If there is a function to my music, I'd like to think that it's music that helps people look ahead and move on to the next thing in life. I hope the music has the power to give people courage to face whatever it is they have to face in life.

EM: *There's one school of thought, especially in a city like this, that your music is too passive, that it's not part of the real world that people experience. It's all, in Zen terms, all Yin and no Yang.*

Kitaro: First of all I don't agree that my music is merely trance music. Second of all, I feel that in every person's life, music plays certain roles and in every person's life different music can serve different needs, throughout that life. So it's no different from any other kind of music. People who listen to any music do it because it's doing something for them at this time in their life.

EM: *What is the atmosphere like when you're recording?*

Kitaro: It's total concentration and total focusing. Lots of times I'll go days without eating, barely sleeping and the only thing on my mind is the music.

EM: *You're very prolific. I've counted about 13 albums since 1978, not including the orchestral and Best Of . . . albums.*

Kitaro: That's simply the pace at which I work. I know no other way. I've done things with the London Symphony and the London Philharmonic and in the fu-

ture I'd like to do more music that involves orchestra.

EM: *What are your plans for the near future?*

Kitaro: I'm planning to go on tour in August in the United States. I'd like to include, in some locations, a performance with an orchestra.

EM: *I imagine you must be approached by film composers.*

Kitaro: Not a whole lot, but I've done some and I'd like to do more.

EM: *You seem to get a special subtlety of sound-shaping, and bending, gliding nuances—like shakuhachis, but with synthesizers.*

Kitaro: This is one of the reasons I swear by the analog synthesizers. I feel that they're capable of producing sounds not possible with digital synthesizers. I simply remove myself from the standpoint of composer and performer and become a listener. There's nothing fancy.

EM: *Who do you listen to now?*

Kitaro: I do not listen to a lot of music, because I'm always composing. In the process of a day I'll build a few tracks on what I had before and then I'll listen back. During the process of recording I'll get ideas for the next composition. I build on my own creativity, which I wouldn't get if I was listening to other people.

EM: *Your bio says that you came from a farming family and they seem to paint it as if it was a poor family, but I have a feeling that's not quite true. You seem to have been fairly comfortable and traveled quite a bit before you became well-known as a musician.*

Kitaro: No, it's absolutely not the case that I grew up in poverty. In fact, Japan is a country without extremes of that type; you have a very large middle class so I don't think I was particularly well-off or poor. I was able to travel and broaden my education.

EM: *Many of the pictures of you show you with children all around you or sitting in a ritual, meditative pose. Do you think that you might be selling your religion?*

Kitaro: There's no conscious effort on my part to pose or present a certain image of myself. It's merely a result of this music and that's fine. Above and beyond that I don't try to come across in any particular way. I'd love it if I were able to be more of a PR person's dream, and act roles on demand. Maybe I'd be more of a commercial success. But in fact, you're talking to somebody who's inherently incapable of doing something like that. It's not in me. That doesn't mean that somebody putting together a booklet on me might not pick certain poses that conform to a certain image. I don't have much say in that. EM

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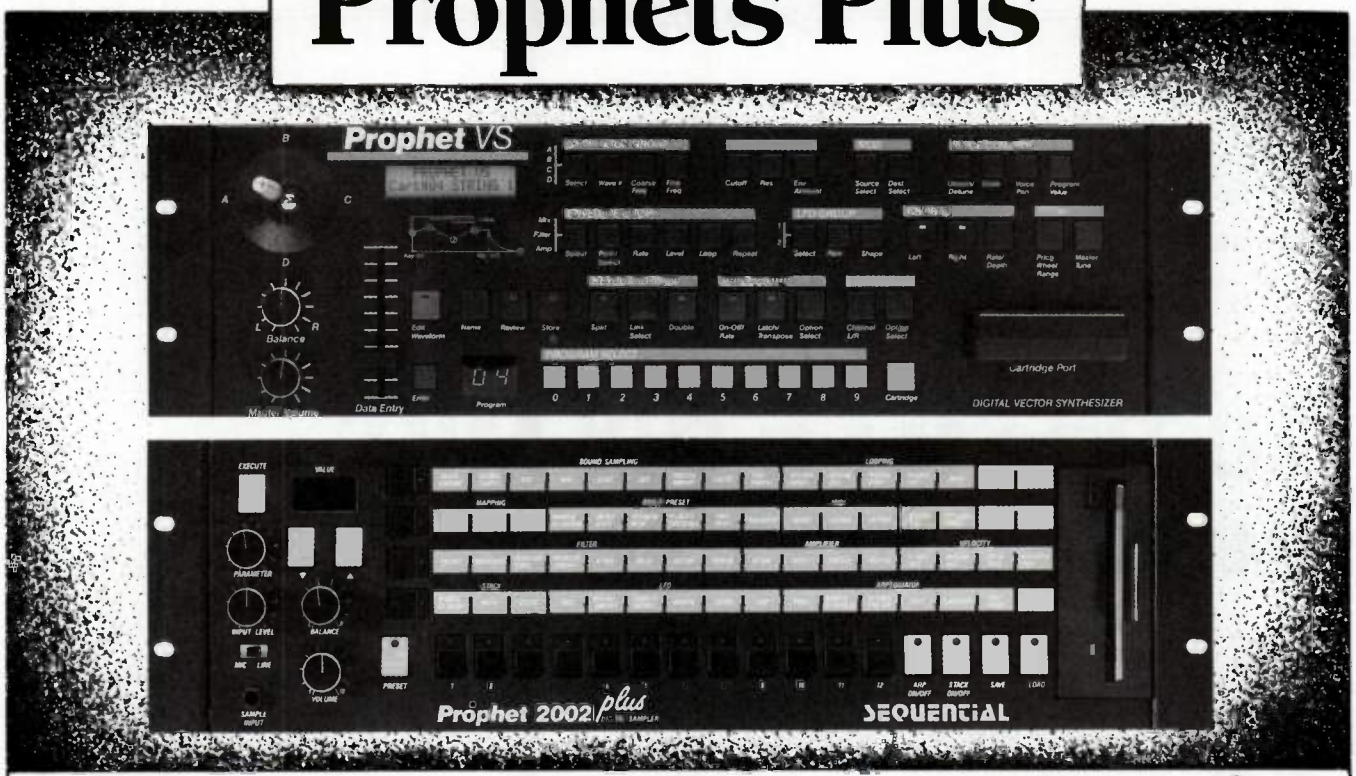

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The great sound of live MIDI direct-to-digital mastering is now available to even home studios. Here are some tips from someone who's already done the legwork.

20 Tips for a DIY MIDI Recording Project

BY PAUL D. LEHRMAN

Early last year I produced *The Celtic Macintosh*, a cassette album of Irish, Scottish and Welsh tunes. It was all electronic, all MIDI, all sequenced. Although it has been debated, I have yet to encounter convincing evidence contrary to my claim that the *Celtic Mac* was the first music album designed for general consumption (i.e., you don't need a MIDI setup to play it back, just a stereo system), entirely produced by a computer controlling synthesizers in real time, through MIDI, with no intervening multi-track tape stage.

Of course, readers of this magazine don't care whether my album was the first of its kind or not—you want to know how it was done and what kind of mistakes I made so you can avoid them yourselves. Fair enough. So what follows are 20 rules and axioms, chosen more or less at random, which I learned the hard way and which I'm happy to share with others who might want to try the same kind of project.

But first, a brief overview of the project. There were three overriding concerns: time, money and sound quality. The project didn't start out to be an album, but was designed as background music for a St. Patrick's Day concert given by a friend—a professional Irish storyteller. I decided to do the music only two weeks before the concert, and also wanted to sell copies of the tape at the show. So the need for *speed* in part shaped my procedures. As far as sound quality was concerned, I ran the output of the synthesizers through a fairly simple mixer and straight into a Sony PCM hooked to a VCR. The results, if I do say so, are every bit as good as I would have gotten at a $200/hour studio. I produced it myself on cassette—vinyl requiring a much larger initial investment—designing the labels and J-cards on the same computer that produced the music.

I used a Kurzweil 250 (on loan from the manufacturer—thanks, guys!), Yamaha DX7, Casio CZ-101, Roland TR-707, Lexicon PCM70 (also on loan, also thanks!), Toa D-4 and D-4E mixers, various amplifiers and monitors, and an Apple Macintosh 512K running Southworth's Total Music (rev 0.99, warts and all), and OpCode's DX/TX editor/librarian.

And now, the 20 tips:

1 *Check out* all *your equipment before you start.* If there's hum or noise somewhere in your system, it will not go away by itself. Although you may be able to tune it out mentally while you're working, it will still be there when it's time for the final mix, and you'll be frantically trying to get rid of it as your deadline draws near. In my case, the reverb program I used while laying most of the tracks was very hissy, but it didn't bother me until it was too late. Lexicon acknowledged there was a software

Author Paul Lehrman

Paul D. Lehrman *is a musician, writer, consultant, and software developer who lives in Massachusetts. His article on starting your own software company appeared in the November* EM. *Readers interested in obtaining a copy of* The Celtic Macintosh, *the tape discussed in this article, should send $10 to LehrWare, 31 Maple Avenue, Suite 1, Cambridge, MA 02139.*

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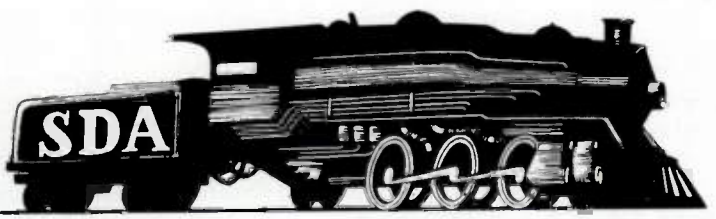

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update available that would fix the problem, but I didn't get it done and so had to use a different reverb program that was quieter—yet didn't sound as good.

2 *Change the settings on your mixer as little as possible when you're laying tracks.* You can't get away with this when you're using acoustic instruments, but you can with synthesizers, as long as you're careful. Leave your faders alone, and do level changes by reprogramming the patches or by using MIDI—either changing note velocities or, if your synths can handle it, MIDI volume. This will save you a tremendous amount of time when you're done, because the mix will essentially be finished as soon as all the tracks are down. Similarly, use minimal EQ—instead do tonal changes by reprogramming patches.

3 *Insert controller-cancelling commands in your sequences often, so you don't have to keep resetting your synths.* You want to be able to start playing a track in the middle for editing and overdubbing, and if you have hanging pitch bends or sustain pedal-ons left in a track, it will be very difficult to hear what you're doing, without going back and manually resetting all the controllers on all the synths. A few extra pedal-offs or pitch bend-to-zeroes inserted into the blank paces in a sequence won't hurt anything (unlike note-ons and -offs, no sequencers or synthesizers that I know of bother to "nest" controller commands, so nothing should get screwed up). Do the same with tempo changes and patch changes, unless your sequencer "chases" them—i.e., it looks "backwards" to find the last such command prior to the current starting point, and then executes it.

4 *Don't change your MIDI wiring halfway through the project, or all of your timings will get strange.* MIDI timing quirks are always going to be a fact of life in multisynth setups, but they can be dealt with as long as they are *consistent*. If there's always a 15 ms delay at the DX7 input, for example, then the track controlling the DX7 can be moved up 15 ms, or you can change your playing style to adapt. If you change the wiring, however, you'll change the timing, and everything will come out just a little off.

5 *Use lots of different audio monitors.* This has been said before, but is worth saying again. We know instinctively how acoustic instruments are supposed to sound, and can compensate for perceived differences among monitors. This doesn't work with electronic instruments, however—they sound *very* different through different amp/speaker combinations, and we have no "built-in" psychoacoustic reference point. To make sure your primary monitor system isn't burying some horrible digital noise or putting out more mid-bass than your synths are, listen—at least briefly—on as wide a variety of speakers as you can.

"This time I lost my temper. So did they. A half-hour screaming session was followed by my going home and remixing the first side"

6 *You don't have to clean up all your mistakes right away, but write down where they are so you don't forget them.* Since a sequencer doesn't care whether you edit a track now or next month, you will be tempted to overlook small mistakes during tracking, so as not to interfere with the flow of your creative juices. That's fine (and it's not nearly as dangerous as that well-known engineer's disease, "we'll-fix-it-in-the-mix-itis"), but note where the flubs are, and keep that piece of paper in a safe place, so down the line you don't waste hours searching for the bad note in a complex chord.

7 *Keep all your alternate takes and patches.* Don't worry about wasting tape—you're not using any, and you can store about 40 sequences or about 1,500 patches on one floppy disk (which shouldn't cost you more than $1.25). The beauty of computer sequencers is that you can (theoretically, anyway) use any take from any session on any day, and mix and merge it with any other take, without worrying about tuning, tempo, room acoustics, or

any of the headaches tape-based studios have to deal with. Take advantage of this! You'd be surprised how often you'll want to go back to something you did a week ago, when you know you can.

8 *Be aware of the quirks of your synthesizers.* For example: a DX7 has to be good and ready to take a patch change or it will make all sorts of disgusting noises. The decay envelope has to be over, and I mean *over,* before you can safely send it a patch change. Also, if you send a patch change closely followed by a note-on, the note will be delayed—not much, but just enough to drive you crazy while you try to figure out why your rhythm tracks aren't lining up. Allow about 75 to 150 milliseconds of quiet time. The CZ-101 is nicer about patch changes (it just shuts up), but it has one weird, undocumented feature: it can receive MIDI data on four different channels, but pitch bend on only one. That one channel, however, is not the "basic" channel; it's the "current" channel. In other words, it's not the channel whose number is next to "CH" on the display, but the one next to "VO." Confusing? MIDI is like that.

9 *Disable any "auto-power-off" switch.* These are only useful when you're running on batteries, which you'd be nuts to do if you're doing serious work. There's nothing more frustrating than finishing a complicated patch edit on one synth, and then going back to hear how it sounds with the rest of the tracks, only to find the rest of your system has shut itself down.

10 *All memory protects should be on.* Sequencers, especially during power-ups and -downs and system crashes, tend to spew out large amounts of MIDI garbage. Murphy's Law says that such garbage will include a perfect system-exclusive header for every synth in your system, and all of your patches will be on their way to Mars.

11 *Be generous with reverb and delay.* Synths don't have the natural resonances of acoustic instruments, and need more processing to bring them to life. Also, if you're working at home, be aware that your space may have more hard surfaces (windows, wood floors, etc.) than a professional control room, and so you'll need to put more wetness in the mix if it's going to sound good anywhere else

12 *Run the entire side of the master tape as one sequence, if you possibly can.* There aren't too many sequencers on the market that will let you do this (i.e., build a 25-minute sequence out of half a dozen shorter ones), but recording in one pass can help a lot if you're working with a PCM converter in the "F1" family and a non-professional video deck. The reason is that when you put the video deck into "pause," so that you can load in the next sequence, it leaves an audible click. You can try hitting "stop" on the deck instead, but because home decks cannot be cued very accurately, you run the risk of having not enough or too much space between selections.

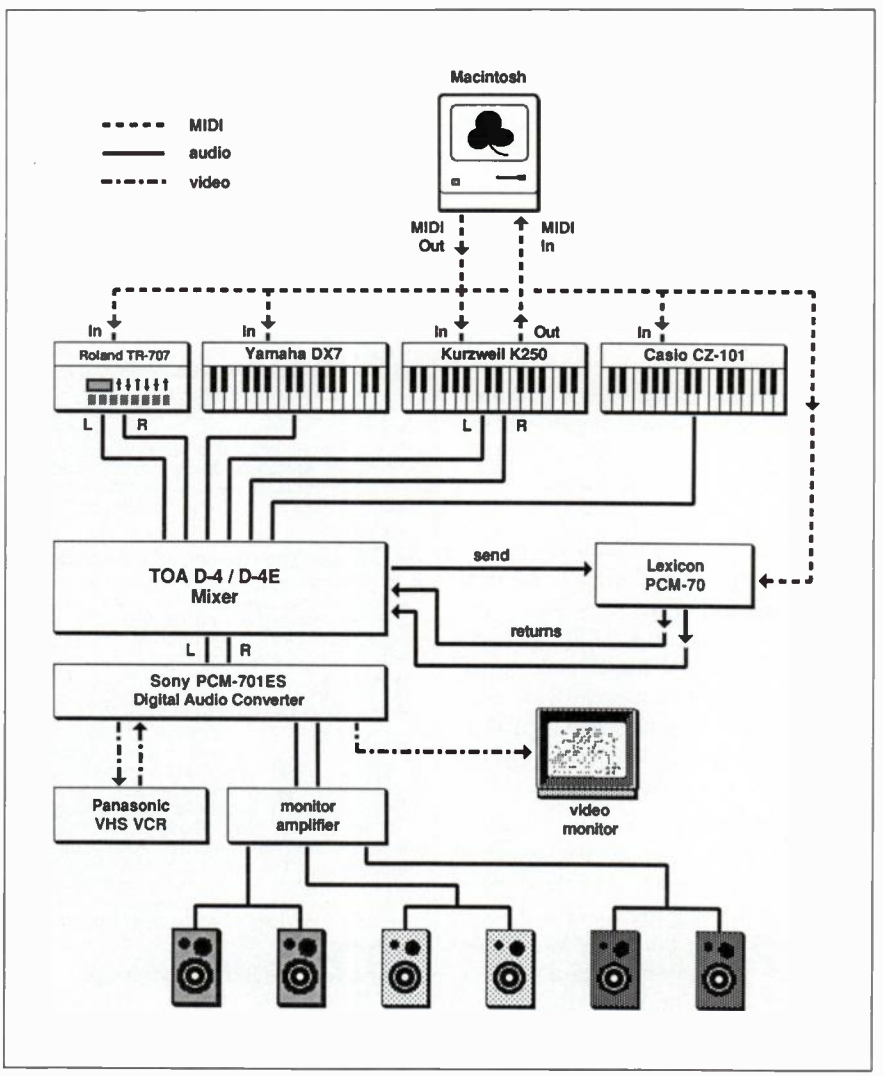
13 *Leave a good ten seconds of silence on the tape before you start the music, and a good ten seconds after it's over.* The F1 needs time to mute and un-mute its D-to-A circuitry, and the tape deck needs time to get up to speed and stabilize.

14 & 14a *Use the best VCR you can get*

"Confusing? MIDI is like that"

your hands on, and yes, Beta is better than VHS. It's a miracle of marketing that VHS is a more popular format in this country than Beta. Beta is technically superior by just about any standard you can think of, and that goes double when recording digital audio. It's easier to cue up, has fewer dropouts and tracking problems, responds faster, and treats your tape a whole lot nicer. With either format, however, you'll have more success if you use a top-grade machine. I used a home VCR without too much trouble, but I was lucky. My recordings are okay, but somehow the deck has changed slightly over the past year so that I can no longer play the tape back on it without hearing a discouraging number of clicks.

15 *Use the best videotape available.* Even the highest-grade consumer tape might have too many dropouts and non-linearities for digital audio (and, unlike audio cassettes, videotape gradings are essentially meaningless, anyway). Use professional tape, preferably a type recommended by someone who works with the PCM format often. It's hard to find, and it may seem expensive compared to consumer tape, but it's worth it—and it's most likely still cheaper than reel-to-reel.



Signal Routing for the Celtic Macintosh—©1987 Paul D. Lehrman

16 *A digital synthesizer makes a lousy alignment-tone generator.* Used to be, you just took the output from the oscillator module on your analog synth, and plugged it into your tape recorder. No more. A DX7 is okay for 1 kHz tones, but at 10 kHz, the waveform bears little relationship to a sine and is very noisy to boot. Also, to keep the level steady requires an extra hand (or a pencil stuck in the keyboard)—an EG 4 rate of "0" doesn't work.

17 *Know exactly where all your signal peaks are.* On the master tape label, write down the selection number, time, and channel for each peak. It will be easier for the duplication engineer to set levels if the hot spots in your music are carefully documented, and this will ensure a better run.

18 *Do your duplicating locally.* Chances are whichever duplication house you choose will not have a lot of experience with electronic music, and they certainly won't know exactly how you want your project to come out. If they're close by, you can get the results of test runs without waiting for UPS, and if worse comes to worst, you can always go in and work directly with the engineer without hopping on a plane.

Here's what happened with *The Celtic Macintosh*. The first cassette run had a mild hum on one channel. The duplicators had just installed their PCM converter, and it wasn't wired correctly. The second run had channel-balance problems. Their limiter was acting up. (I never said I wanted limiting, but what the heck.) The third run was 10 dB too soft.

The engineers, hearing one of my gloriously buzzy Casio patches, decided it was tape distortion and backed off the level until (they thought) it went away. This time I lost my temper. So did they. A half-hour screaming session was followed by my going home and remixing the first side (maybe my dynamics *were* a little too wide....) and their trying run number four. This time, everything worked perfectly, and runs five through ten came out just fine. And all this, mind you, took place in 48 hours.

19 *Use standard-size cassette labels and inserts.* Resist the temptation to do highly individualistic customized J-cards, or labels cut in the shape of your favorite aquatic animal. They'll just add delays, confusion, and cost. Use a pretty color instead.

20 *Don't use Pagemaker to make your labels.* In many ways, Pagemaker is a terrific program. But if you're trying to work up a master sheet of labels or insert cards (like four or eight on a page), it's not the way to go. The rulers are not accurate enough, and when you try to copy and paste multiple items, they tend to come out slightly off. You can, however, use the program to make one *big* label, then have it photo-reduced and copied, and make up your masters by hand.

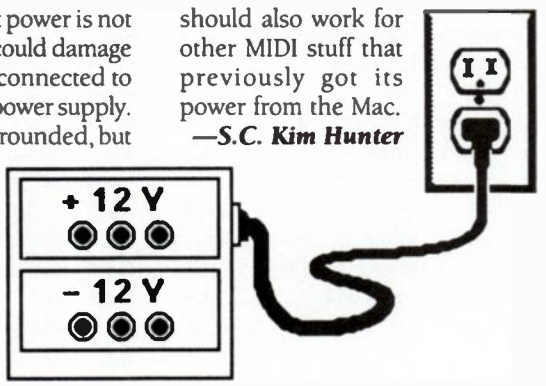
That's it. You'll probably find more tips to add to this list with your next project; I hope this helps. Good luck!

Power For Mac Peripherals

You might be interested in what I had to do to get the MacNifty sound digitizer to work on my Mac when I upgraded to a Mac Plus. The digitizer used the Mac as a power supply, but the Mac Plus does not provide power out of the serial port. I found the power supply for the ColecoVision video game, Model #55416, sold by Radio Shack for $4.95, works just fine with some rewiring. The power supply has -5, +5, and +12 Volt outputs. Only +5 and +12 are required for the digitizer. The special connector for the ColecoVision cable can be cut off and the +5, +12, and ground wires identified with a voltmeter (mine had the wires color-coded as follows: blue=ground, yellow= -5V, white= +5V, and red= +12V. Of course they could be different on different units).

On the 9-pin digitizer cable, pin 2 requires +5 Volts and pin 6 requires +12. The wires connecting to pins 2 and 6 must be yanked out of the connector. This ensures that power is not fed into the Mac, which could damage it. These wires are then connected to the correct wires on the power supply. Pin 1 on the digitizer is grounded, but it should not be yanked out. Rather, the insulation should be scraped off just enough to attach the ground wire from the power supply. For good measure, all the connections should be soldered. To complete the new connection, get an Apple adapter cable from an Apple dealer for $20 to convert from the old 9-pin to the new Mac Plus DIN connector. This should also work for other MIDI stuff that previously got its power from the Mac.

—S.C. Kim Hunter

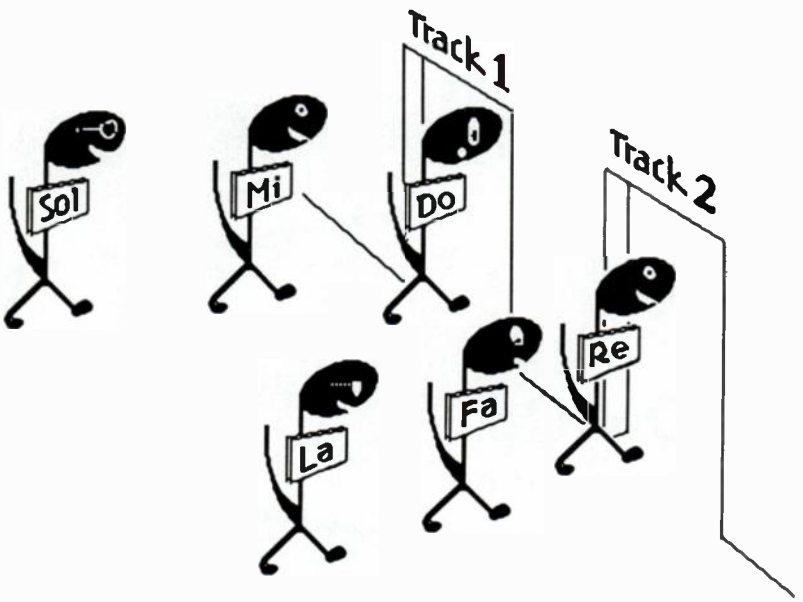


Getting More Voices When Recording

On a recent session, I programmed a particular Kawai K3m sound for a sequenced part. The artist wanted long release times, which, due to the six-voice architecture, meant that new notes would "steal" voices that were still in release mode. This, of course, cut off the end of some of the voices which produced a choppy effect.

Fortunately, since the part was sequenced and going to be dumped to tape, there was a solution. Using the Filter option and Remap Tables in the "Total Music" sequencer on my Macintosh, I bounced the K3m sequencer track over to another track. I then filtered out all the even notes from one track and the odd notes from the other track. During one pass of recording onto the multi-track tape recorder, the odd notes are recorded and the six voices on the synthesizer can handle that load; during the next pass, the even notes get recorded on another tape track. This also can create a stereo effect that is even more dramatic when used in conjunction with the K3m's existing stereo outputs.

The Axxess Mapper can also do the same sort of thing, and other devices probably allow for similar "precision filtering." *—Craig Anderton*



Adding Dynamics by Chaining Sequences

Some simpler MIDI sequencers allow only one group of volume settings for an entire sequence. However, you can get around this and create crescendos, decrescendos, etc. by dividing a musical part into several sequences. Instead of recording, say, a string ensemble onto a single sequence of 16 bars, divide the part into four sequences of four bars each. Next, edit the volume of each sequence, with the quietest one first and the loudest one last. Then chain the four sequences together to make a 16-bar crescendo. This technique is especially effective with brass and orchestral instruments.

—E.A. Holley

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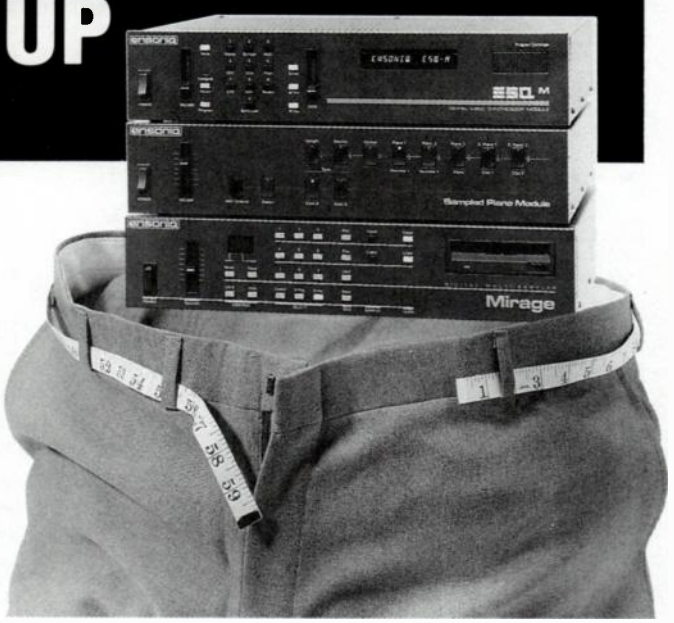

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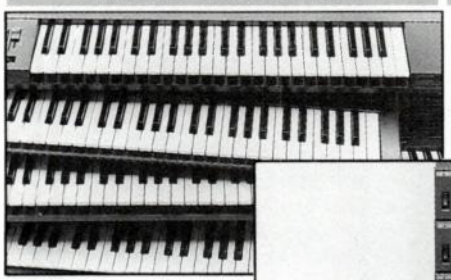

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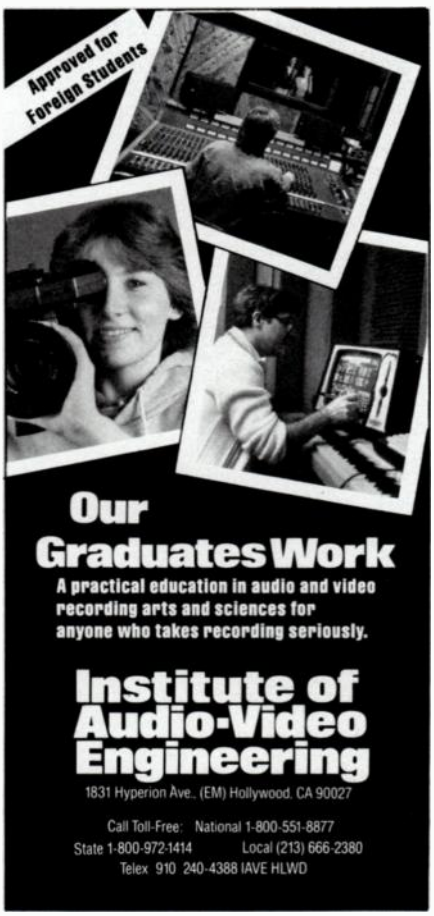

MIDI Parts

Many readers have inquired about sources for specialized parts for MIDI circuits and mods.

▶**Four-conductor MIDI cables**, used to supply phantom DC power to MIDI remote keyboards, and so forth (see "CZ Mods," August '86 EM), are manufactured by Conquest USA. These cables conform to IMA specifications: the shield connects to pin 5 at each end; the plug body is unconnected. Switchcraft plugs and low-capacitance Belden or Canare cable material are used.

The 20-foot sample cable forwarded to me had an incredibly low measured equivalent-capacitance of 8 pF per foot (connector to connector). Compare that to Yamaha and Roland molded cables: 39 pF per foot, and 49 pF per foot, respectively. This works out to a total measured equivalent-capacitance of only 160 pF for a 20-foot Conquest cable, vs. 118 pF for a 3-foot Yamaha cable. (Of course, Yamaha and Roland cables work fine, but cable capacitance is a point of concern for long cable runs.) Mechanically, the cables are sturdy and very flexible; the only possible improvement might be the incorporation of additional strain relief, but the cables are already better than most in this respect.

MIDI cables are available in lengths of 3, 6, 10, 15, 20, 25, 30, 40, and 50 feet, and are offered in eight colors: black, red, white, blue, yellow, purple, brown, and green. Right-angle DIN plugs are available as an extra-cost option. Bulk quantities of raw cable are also available. Prices are reasonable: suggested list for a 20-foot cable is $35.95, but note that such items are heavily discounted. Conquest provides a 10-year limited warranty with all cables through your local music store their cables.

You can order Conquest cables through your local music store or service center. Note: Conquest does *not* sell directly to consumers.

Conquest Sound Incorporated
7319 Duvan Drive / Box 757
Tinley Park, IL 60577

▶**Locking MIDI plugs and jacks, and odd-size DC power jacks** are available from Mouser Electronics. They offer a full line of hardware items, including snap-in and heavy-duty DIN jacks. Their fall '86 catalog lists standard DIN jacks at 18 cents each (100 piece quantities). Write for a catalog.

Mouser Electronics
2401 Highway 287 North
Mansfield, TX 76063

▶**PC900 optoisolators** are available from:

Armada Sound Lab
Box 858
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▶**TIL111 optoisolators** are available from:

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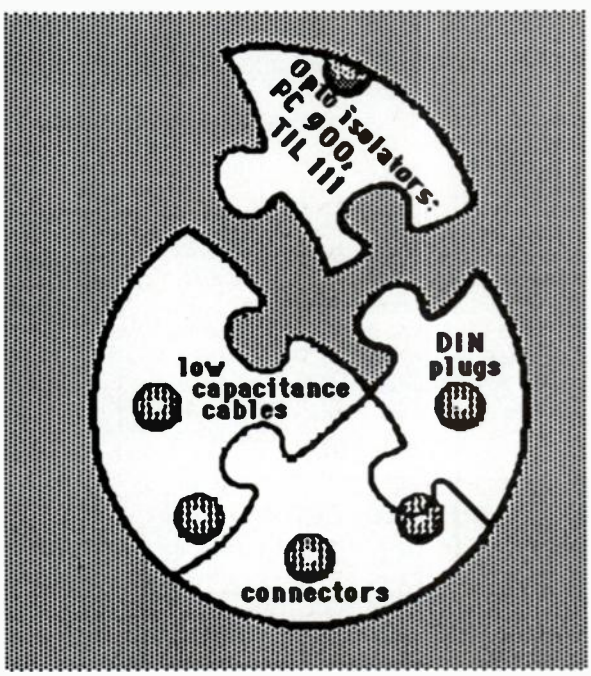
—Alan Gary Campbell



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ALESIS

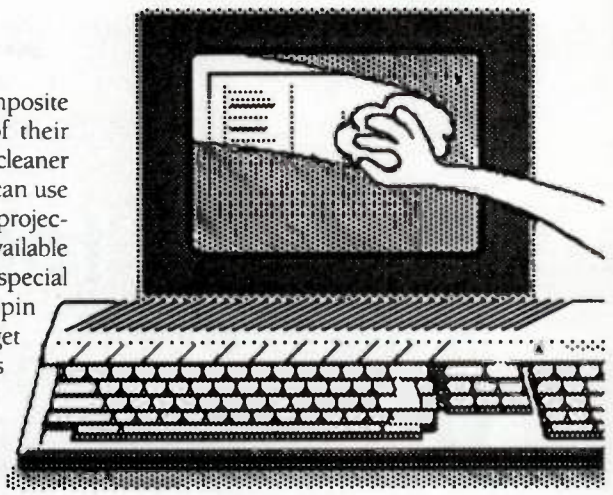
Expanding MIDI Brain

The Aftertouch/ Tape Connection

Keyboard aftertouch, while very useful for adding dynamic expression, is so memory hungry that most sequencers allow you to filter it out completely. But keyboard aftertouch is the easiest and most controllable way of producing the phrasing associated with so many instruments. Realistic saxes, trumpets, and wind instruments are difficult to create without it.

If you need to use keyboard aftertouch in a sequence, but don't have enough memory to support it, you can still use it by synching your MIDI sequencer to a multi-track tape recorder. This works best after you have already sequenced the other instruments first, and recorded the ensemble as an accompaniment track onto your tape. Now, you can use your computer's entire memory to sequence the instrument that needs the aftertouch information. After you have edited the sequence sufficiently, record it as an audio track on your tape recorder. You now have a first generation instrument voice enhanced by MIDI editing and recorded with full dynamics and accompaniment. ***—E.A. Holley***

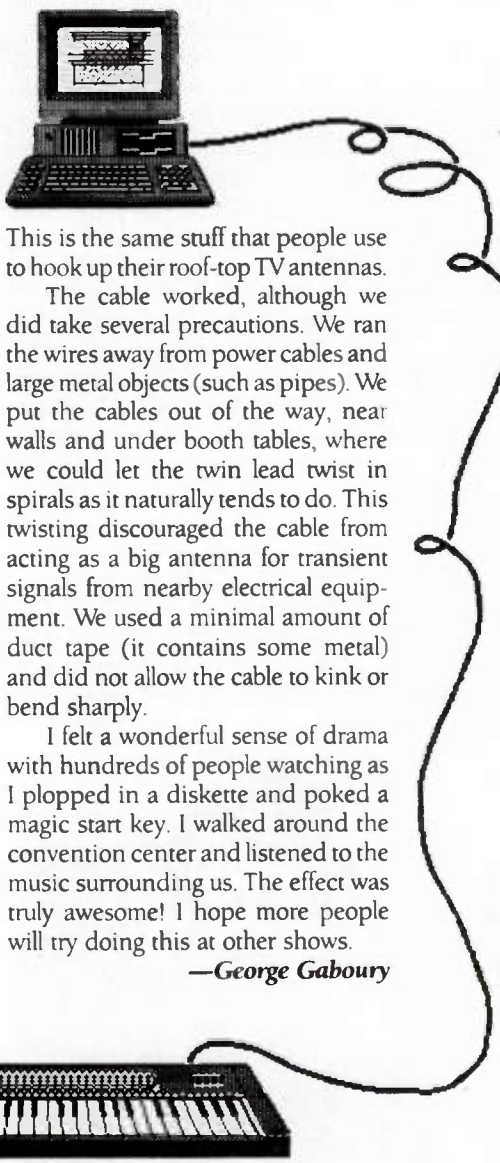
Clean Up Atari 520ST Visuals



Newer Atari 520STs have a composite video output signal on pin 2 of their monitor jacks. This signal is *much* cleaner than the 520ST's RF output. You can use it to feed a decent video monitor, projection TV, or your VCR. It is not available on the 1040ST, and you need a special cable with the hard-to-find 13-pin DIN monitor connector. You can get ST composite video adapter cables for $10 from At Your Service, 2856 Leechburg Rd., Lower Burrell, PA 15068, or call 412/335-4477.

—George Gaboury

Long-Distance MIDI



At the Northern California Atari Expo, one of the main attractions was the Monster MIDI Music Machine (MMMM): a ton of MIDI gear, four video monitors, and an upgraded 520ST driving the system. But that was only the beginning. Roughly 150 feet north, east, and west of the MMMM were three MIDI software vendors, each with their own MIDI equipment and sound systems. We wanted to patch them into our system, but the question was, "How?" The MIDI spec clearly states that thou shalt not run thy MIDI cables longer than 50 feet, or else!

"Or else what?" I asked Chris Meyer of Sequential Circuits. He replied that longer MIDI spec cables (two-conductor twisted pair with shield) have too much internal capacitance, which degrades the MIDI signal into unrecognizable mush.

I put the problem to Malcolm Cecil of Electronic Music Publishing House. He came up with a wonderful solution to use 300 ohm RF twin lead, available from any Radio Shack or similar store. Twin lead has two conductors separated by a centimeter of plastic (for low capacitance) and no shield. This is the same stuff that people use to hook up their roof-top TV antennas.

The cable worked, although we did take several precautions. We ran the wires away from power cables and large metal objects (such as pipes). We put the cables out of the way, near walls and under booth tables, where we could let the twin lead twist in spirals as it naturally tends to do. This twisting discouraged the cable from acting as a big antenna for transient signals from nearby electrical equipment. We used a minimal amount of duct tape (it contains some metal) and did not allow the cable to kink or bend sharply.

I felt a wonderful sense of drama with hundreds of people watching as I plopped in a diskette and poked a magic start key. I walked around the convention center and listened to the music surrounding us. The effect was truly awesome! I hope more people will try doing this at other shows.

—George Gaboury

When it comes to visual editors for samplers, what you see is what you get—and that makes it a lot easier to optimize and modify your sample library.

"Vision" for the Mirage

BY DON SLEPIAN

Up until now, I've had to live with three basic questions when using the Mirage: how can I modify a specific sound in the Mirage's memory; how can I make a looped sample sound just the way I'd like; and how are my parameters set? In answer to these questions, Ensoniq Corporation has released a visual editor called "Vision," written by Turtle Beach Softworks, for the Mirage digital sampling keyboard and the IBM PC family of computers (PC, XT, AT, and 8088-based compatibles). Priced at $349.95, and available through authorized Ensoniq dealers, Vision is a valuable aid for the Mirage/PC owner who wants to sample and/or modify existing samples. Vision has given me a powerful way to answer all of the questions mentioned above, and made the normally aloof and hostile MS-DOS musical environment somewhat more friendly. How? Vision opens a visual window into the Mirage that greatly enhances one's comprehension and mastery of the Mirage in particular and digital samplers in general. If you like to try-before-you-buy, a working demo diskette is available for $10 from Turtle Beach Softworks, PO Box 5074, York, PA 17405.

Product Summary

Product: Vision Visual Editing System
Type: Visual sample editor
Price: $349.95
Software Developers: Bob Hoke and Roy Smith
Manual Author: Bob Hoke
Hardware Requirements: Any PC-DOS PC/clone with minimum 320K memory. Any of the following graphics adapter cards: IBM Color, Enhanced or 3270 PC, Hercules Monochrome (or compatible) or TECMAR. Octave-Plateau OP-4001 or Roland MPU-401 with MIF-IPC MIDI Interfaces.
Distribution: Purchase from authorized Ensoniq dealer, manufacturer or software dealers.
Manufacturer: Turtle Beach Softworks, PO Box 5074, York, PA 17405; ☎ 717 / 741-4972.

MAPPING AROUND THE MEMORY

The first issue to be addressed when working with Mirage samples is finding one's way around the memory, so that samples can be modified and customized. Without this ability, you are stuck with using your sample library exactly "as is," and cannot begin to develop your own collection of unique sounds to express your music. To modify sounds in the Mirage, you must know to which wavesample (abbreviated "WS") the machine is currently set, and which WS is "home" for the sound you want to play with. Transoniq Hacker author Clark Salisbury, in his excellent tutorial series

Don Slepian has recorded the album Reflections *on the Audion label, distributed by JEM Records. When he is not surrounded by Mirages, he plays alto recorder and classical guitar.*

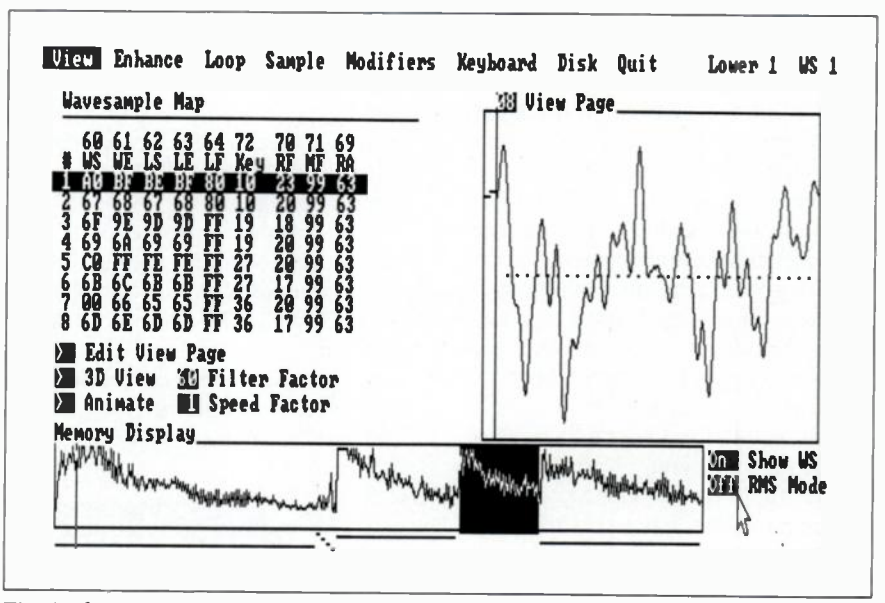


Fig. 1 *The Vision View Screen*

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"MASOS For The Masses," describes a clever but laborious way of doing this "blind" (i.e. with the Mirage alone). (MASOS stands for Mirage Advanced Sampling Operating System and is the operating system software that one uses when sampling a sound into the Mirage.) The Vision program provides a view screen (see **Fig. 1**) that displays the WS memory of the entire keyboard and highlights your current location. Like a map in a car, it makes life much easier. Additional functions allow you to scrutinize as little as a single page of memory, and see changes in frequency, amplitude, and phase simultaneously in a 3-D display (see **Fig. 2**). Carrying our car map analogy a little further: you know where you are and you can find where you want to be, but you can also stop the car and talk to the ants on the side of the road. The Vision program gives you much of the display power of a lab-quality oscilloscope.

YOU CAN'T WIN 'EM ALL....

I have only two criticisms. I found installation to be a bit difficult, and I think a

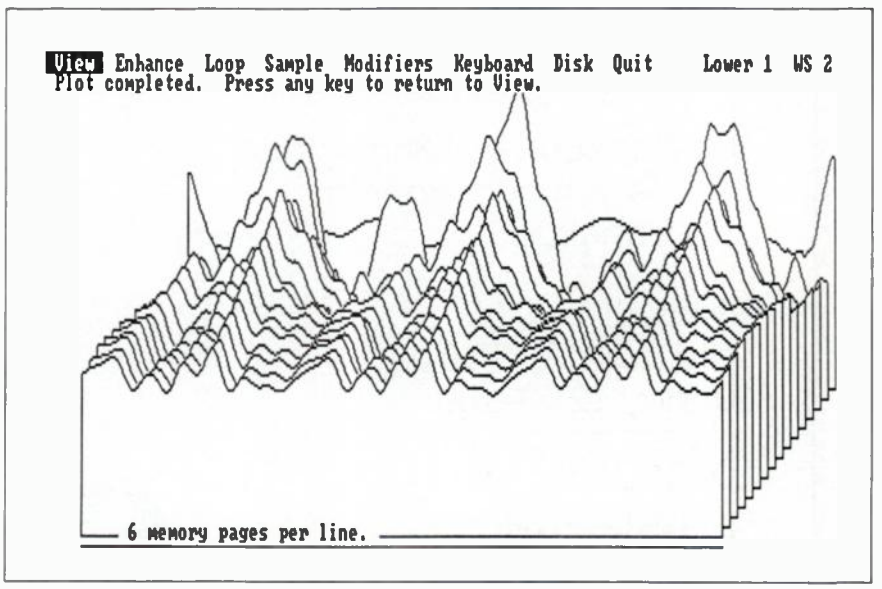

Fig. 2 *Three-Dimensional Screen*

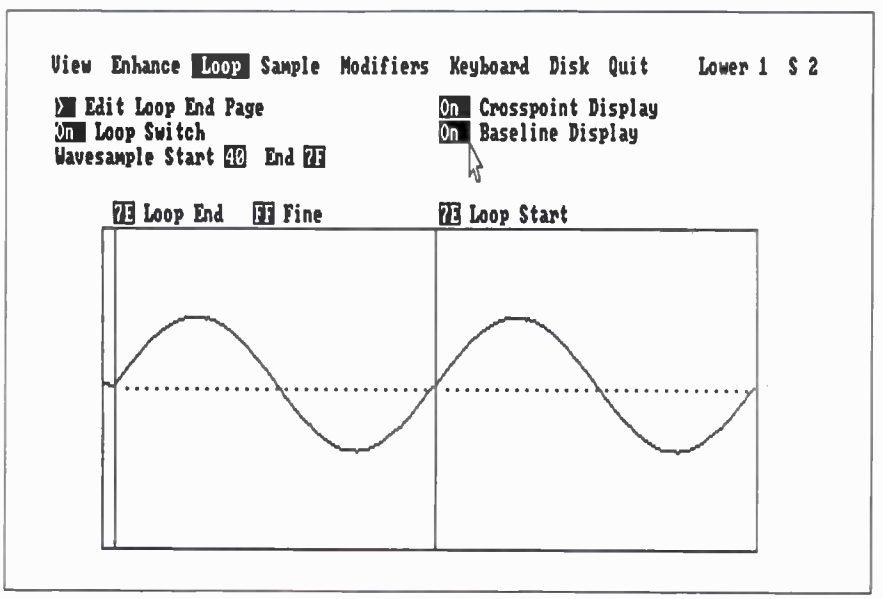

Fig. 3 *Loop Screen*

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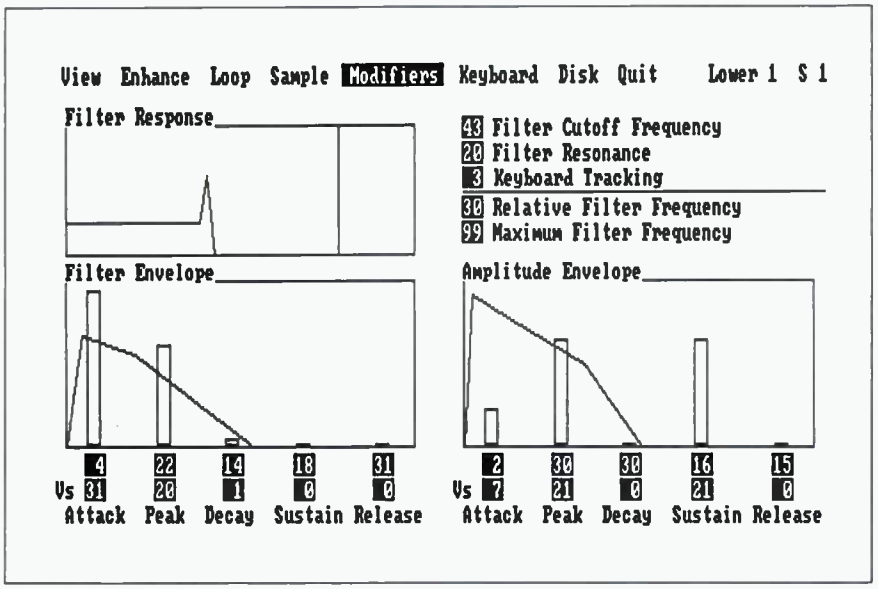

Fig 4 *Modifiers Screen*

"common mistakes" feature would improve the manual. Fortunately, the Turtle Beach people were available over the phone and quite helpful. In addition, the program will not run on a PC with just a monochrome monitor card. An IBM, Hercules, or similar graphics adapter card is required. Most serious systems include such a card, but it would be nice if a large subset of the program ran without it, to meet such situations as an Amiga computer with an 8088 "Side Car" adapter, or some strange clone with no slots. This is a small point though, since this program will run on the majority of the PCs and compatibles that have been produced.

SampleScope™

SampleScope™ lets the Akai ® S-612 owner visually and more precisely set splice points, edit samples and perform signal processing to get "no-bump" loops. Samples can be spliced with a precision 256 times greater than when using the Akai's manual mode alone. Samples are saved to a 5-1/4" floppy disk using the Commodore 1541™ disk drive or the optional Akai MD280 disk drive.

The program requires a working understanding of the Akai S-612 Sampler, a Commodore 64, 64CSX64 or 128 with one 1541 disk drive and monitor, a MIDI adapter (either the Sequential Circuits™ Model 242 or the Passport™ Model C-64 MIDI interface), two MIDI cables and an Atari® type joystick.

Almost all SampleScope operations are handled by joystick control. Users can look at the entire sound sample at different magnifications while editing, including the sample loop-point and end-point. The sample may be freely edited or changed. A special processing feature lets the user improve the overall sound sample dynamics. Once you start using this program, you'll find it to be an indispensible tool for getting the most out of your Akai Sampler. Musicians can now see what they're doing and do it precisely.

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Moving Up(date) In The World

I have worked with and reviewed Vision version 1.1. Version 1.2 should be out soon, and registered users of Vision 1.1 should contact Turtle Beach or your Ensoniq dealer for details on an inexpensive update.

New features in Vision 1.2 include:

✓ Return to DOS. Resets colors to white on black on MS-DOS computers.

✓ When editing the wavetable, your cursor position is now saved and restored each time you edit (whether from the loop or the view page).

✓ The view page number is automatically set to the start of the wavesample when the WS is selected by using function keys 1 through 8.

✓ It is now possible to perform a printout of any graphic screen if you have an Epson-compatible printer.

✓ You are warned if you are going to overwrite an existing file.

✓ New enhance functions have been added (Rotate Current WS, Interpolate Current WS).

✓ Animate All Memory has been removed and Speed Factor has been added in its place. This function controls the resolution (and thus the speed) of animation. This was added to allow users with regular IBM PCs or clones to have the animation speed that AT users have.

✓ MIDICOM now uses DOS function x31 to terminate and stay resident, instead of INT x7 (which, IBM admits, fails under certain circumstances).

✓ It now uses version 3.0C of the graphics driver now which supports new graphics adapters that were not available before. Call or write to Turtle Beach Softworks if you are interested in a list.

Loopland

The second issue is loops. Without a visual editor, it is very difficult to produce exact and predictable results from this important sampler function. If you make or trade "raw" samples, or if you re-loop factory or commercial "polished" samples (which process can give you entirely new sounds), you have already encountered this problem. Vision, with its loop screen (see **Fig. 3**), allows me to customize exactly the kind of glitches I'd like to hear in

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my loops. With the ability to see and fine-tune the beginnings and ends of loops, I've produced loops that have gentle little "pings" that sound like unique delicate reverb ambience, loops that produce complex polyrhythmic echoes, and loops that accent the sample with percussive low frequency thumps. When the need arises or a rare mood strikes, I can quickly and easily produce absolutely glitch-free loops.

CONTROLLING PARAMETERS

My last issue is one of parameters. The Mirage gives the musician control over 100 parameters. If the old ARP company had produced the Mirage, their "human engineering" concepts from those simple and innocent times would have given us a control panel with 100 sliders, clearly marked and placed in boxes, showing the signal path. But then, a Mirage like that would be the size, weight, and cost of three ARP 2600s. A more modern approach would be a keyboard with *no* control panel but rather, like mixing consoles of the future, a "virtual" panel that would only show up on a computer screen under a program's control.

Ensoniq, whose staff is made up of musicians, made a wise compromise between these two extremes with their simple and inexpensive 24-button panel. The Mirage can operate by itself, but visualizing the parameters is as difficult as blind-voicing a DX7. Vision's modifiers screen (**Fig. 4**) displays envelopes and parameters to simplify the voicing process greatly.

So, while Vision solves the major difficulties of Mirage sampling and synthesis, it also opens up new possibilities. Its interpolate function can enhance the apparent bandwidth of existing samples. There is a command line at the top of every screen in Vision that displays your current screen location and lists all other possible screens. You can move from screen to screen without losing the position of your cursor in any given screen. These two features make this program far more "Mac-like" than the PC norm.

The documentation is quite good. In fact, using the Vision program is a very quick and effective way to learn completely the concepts embodied in the Mirage. Since MASOS functions are made clear and easy to perform, it encourages the kind of playful experimentation essential to the mastery of this new technology. EM

Did you have trouble with your music teacher? Whether you're learning music theory for the first time or just want to refresh your memory, there may be a computer in your future.

Listen: Ear Training for the Mac

BY GEARY YELTON

For over two and a half years, there was no commercial Macintosh software specifically for music education. Sure, there were exquisite music printing programs, patch librarians galore, and wonderful MIDI sequencers, but nothing for music dictation or theory. Imaja has changed that with *Listen*.

Listen teaches melodic and harmonic ear training. It plays 28 preset sounds from the computer's sound generator, and best of all, it has MIDI input and output. *Listen* works by playing notes and chords on your MIDI instrument, which you then try to play back. You can even play the Mac sounds from your MIDI keyboard. Just in case you aren't equipped with a MIDI instrument and a MIDI adapter for your Mac, you can also use the mouse to play an on-screen piano keyboard or guitar fretboard.

It sounds simple, but the inevitable result of regular, interactive ear training is a sharpened sense of pitch and harmony. When you're trying to learn a song by ear, you'll learn it more easily. When you're improvising with other players, you'll respond to changes more quickly. When you hear music in your head, you'll play it or notate it faster. *Listen* is a music educator's dream and a Mac musician's salvation.

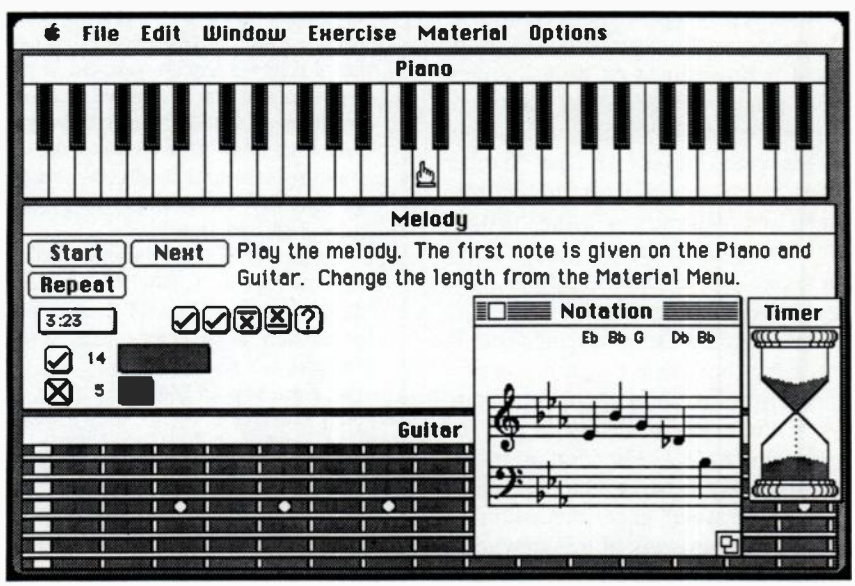
Product Summary

Product: *Listen*
Type: Interactive, ear training software
Software Developer: Gregory Jalbert
List Price: $69
Hardware Requirements: Apple Macintosh, optional MIDI interface and MIDI instrument.
Manufacturer: Imaja, PO Box 638, Middletown, CT 06457 ☎ 203 / 347-5909.

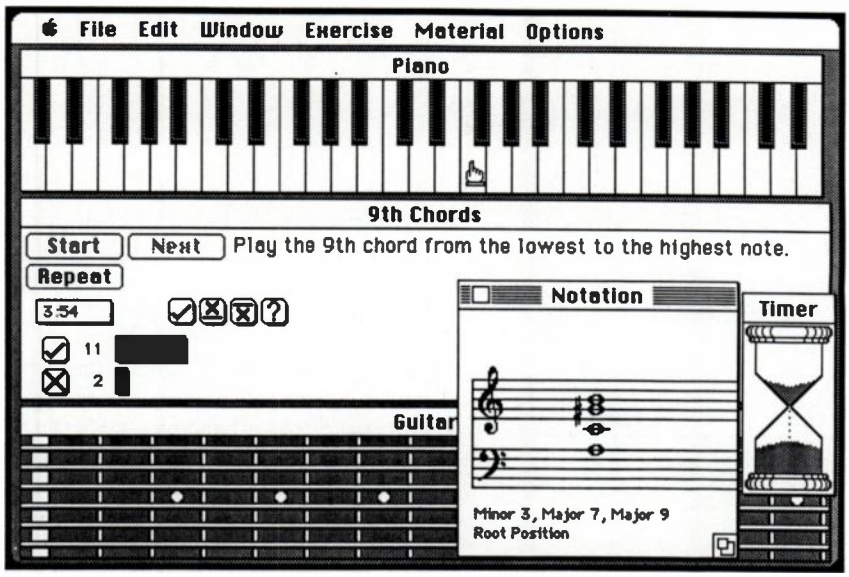
Overview

Listen has 12 separate exercises, from matching single notes to taking melodic dictation, from guessing chord quality to picking the exact notes out of chords. You have some control over the level of difficulty by defining the highest and lowest notes in each exercise. Several exercises also let you change keys and select which notes are included, and which pitch is the tonic. This means you can define any kind of mode, natural or synthetic, and any kind of scale. For example, a scale can be chromatic, diatonic, pentatonic, whole tone, or whatever you indicate. Chords can be limited to a single inversion or any combination of inversions.

As you work your way through an exercise, a bar graph keeps track of how many responses are correct and how many are wrong. An optional timer tells you how many seconds have elapsed since the exercise began. A control panel can be summoned to change the Mac's volume and vibrato depth, the length of time it takes to respond to your input (the pace), and the duration of each note or chord played by the computer. There's a button to repeat any drill if you need to hear it more than once. Otherwise, it's repeated only when you give the wrong response. A smiling face cursor appears when you're correct, and another cursor expresses disappointment. For most ex-



Geary Yelton is a MIDI evangelist and desktop publishing consultant from Atlanta, Georgia. A composer of electronic music for film, video and live performance, he is the author of The Rock Synthesizer Manual.



ercises, the first note is highlighted on the keyboard and fretboard displays.

EXERCISES

Let's take a quick look at each available exercise. The simplest is "single note" dictation. *Listen* plays a note within a range you define, and you try to play the same note. If you miss one, it's repeated. Get it right, and *Listen* moves on to the next note. The "two-note melody" exercise shows you the first note, and you have to play the second note. "Growing melody" tests your memory by playing one note, then two, then three, and so on, and you have to play them back in the same order. Each time you give the correct response, another note is added. "Melody" is straight melodic dictation, where the computer plays a melody and you play it back. Menu options let you choose the length of the melody and which notes are excluded. Melodies can range from one to 255 notes long. This exercise is good for improving both pitch recognition and melodic memory.

Two notes are played together in the "intervals" exercise, and one of the two is highlighted. You respond by playing the other note. Another, "interval naming," is a multiple choice exercise, requiring that you only click on the name of the interval, whether a major 3rd, a minor 6th, or whatever. "Triads" plays three-note chords, and you have to play each note in its proper order, beginning with the lowest. Seventh chords are covered in an exercise identical to "triads," but with four tones instead of three. You can select which inversions are included, from root position to first, second, and third inversions.

"Triad chord quality" asks whether a chord is major, minor, diminished, or augmented. You identify each chord's inversion in another multiple-choice test, "triad inversion naming." The "7th chord quality" exercise lets you indicate if a 7th chord is major-major, major-minor, minor-minor, half-diminished, or fully diminished. Finally, "7th chord inversion naming" gives you four buttons to choose the correct inversion.

CONCLUSIONS

Many Mac musicians and music educators have been waiting a long time for something like *Listen* to come along. Was it worth the wait? Well, it does what it's supposed to do, and it realizes one of the greatest potentials of interactive MIDI. It trains your ear in a sophisticated, if unstructured, fashion. There's no particular order to any of the exercises. Coupled with a decent theory text or software, however, *Listen* could become the foundation for meaningful self-education.

For the non-MIDI user, it's nice to have such a variety of computer-generated sounds. A few of the more complex timbres, though interesting, make pitch recognition difficult if not impossible.

Does *Listen* really improve your ear? Positively. Thanks to its user-programmable skill levels, *Listen* is useful not only for music students, but for professionals who wish to keep up their music dictation chops. The only additional exercises I would suggest are complex jazz chords for the advanced user, but that's getting a bit beyond basic ear training. Congratulations and thanks to Imaja for fulfilling an obvious need. At $69, *Listen* is certainly priced right. Now if someone would just write a music theory coaching program. EM

Hold the Presses!

A new revision of *Listen* was recently introduced that features quite a few significant enhancements and improvements. A "pitch set" dialog box lets you select from many preset scales with any tonic, including harmonic and ascending melodic minor scales, whole tone, pentatonic, diminished, jazz altered, and chromatic scales, plus all seven natural modes.

New exercises in *Listen* 2.0 include 9th chords, 11th chords, 13th chords, and random chords. A *tuning exercise* provides two tones and a scroll bar to tune one to the other. A *notation window* with a grand staff can be called up to display the answers to melodic and chord exercises. A *timer window* shows the elapsed time since an exercise began, and a user-selectable beat-the-clock hourglass limits your response time. If you like, a new drill plays as soon as the previous one is answered correctly. You can also designate notes on your MIDI instrument to take the place of the start, repeat, and next buttons.

The difficulty level can be changed in many new ways, thus letting you concentrate on your musical strengths and weaknesses. When "hints" is enabled, an X above a straight line means your response is too high and an X below a line means it's too low. Drills may begin with the same tone every time, with any tone in the specified range, or with any tone in the pitch set. You can request no notes shown in chord exercises. It's also possible to make your answers inaudible, so you can't guess as easily. Turning on the command to arpeggiate intervals and chords makes it easier to pick out difficult answers. You can even ask for the answer before you guess—in other words, you can cheat!

Setting up the options is simpler with the "auto-select materials" command; this makes all the appropriate dialog boxes appear in succession whenever another exercise is selected. *Listen* 2.0 can teach you a lot more than the original. In fact, almost every new feature is a welcome addition to an already fine ear-training program.

Aftertouch: Modulation added by exerting pressure on a MIDI keyboard key after it has already been pressed down (i.e., at the bottom of the key travel). This modulation typically modifies the filter cutoff, degree of LFO modulation, level, etc. Also called pressure sensitivity.

Clock: The master timing reference used in an electronic system. The clock typically emits a fairly high-speed stream of voltage pulses or software timing messages.

DIN sync: A type of clock-based synchronization method that, in addition to providing pulses that occur every 1/24th of a quarter note that serve as a system's common rhythmic reference, sends a start/stop signal that tells a slave unit when to begin synchronizing to the timing pulses. (Deutsches Industrie Norm, DIN, is a European standards committee.)

Formant: A naturally occurring resonant peak found in the frequency response of instruments that is a factor in giving an instrument its characteristic sound.

Frequency spectrum: A range of vibrations. For example, the audio frequency spectrum spans the range of approximately 20 to 20,000 Hz (cycles per second). The AM radio frequency spectrum spans from approximately 560,000 to 1,650,000 Hz. The frequency spectrum can also refer to the graphic representation of any frequency distribution, such as the frequency response of a given instrument.

FSK: Acronym for Frequency Shift Keying. Early synchronization systems recorded on/off clock pulses on tape; FSK sync systems recorded two alternating tones rather than on/off pulses. These two tones are decoded by a unit receiving this synchronization signal and used to set the tempo. Since tape is more suited to recording audio tones than clock pulses, FSK sync generally works more reliably than recording clock pulses.

International Parts Specification Standard: A system of specifying electronic parts' values used throughout the world and in **EM**. This standard avoids the unnecessary use of zeroes, decimal points, and stating Ohms (Ω) or Farads (F) when implicitly understood. For example:

USA	Int'l
1.5 kΩ	1k5
2.2 MΩ	2M2
10μF	10μ
0.01μF	10n
3300pf	3n3
0.00228μF	2n2
10pF	10p

where:

k = kilo = 10^3 Ohms
M = Mega = 10^6 Ohms
μ = micro = 10^{-6} Farads
n = nano = 10^{-9} Farads
p = pico = 10^{-12} Farads

Therefore, 100 nF is equivalent to 0.1 μF; and 20 nF equals 0.02 μF. Be *sure* that when ordering parts based on construction articles in this magazine that you understand the difference between, say, a 20 nF cap and a 20 μF capacitor. Don't expect a parts clerk to know what a nanofarad is.

Low frequency noise component: A non-tonal element of an instrumental sound that exists in the lower range of the audio spectrum. It can be synthesized with a tunable noise generator.

MIDI: Acronym for Musical Instrument Digital Interface, a standardized protocol for transfer of musically related data between computers and/or musical instruments containing computers or similar data-processing circuitry.

MIDI sync: MIDI inserts rhythmic reference data in the MIDI data stream every 1/24th of a quarter note. Devices synchronizing to MIDI sync decode this message and advance their internal clocks 1/24th of a quarter note for each message received.

Resonance: With filter circuits, resonance increases the filter gain at a particular frequency. With maximum resonance, a filter will go into oscillation.

SMPTE time code: Originally developed by NASA as a means of accurately logging data and later adopted by the Society of Motion Picture and Television Engineers, SMPTE time code labels each frame of a videotape by recording a unique piece of digital data on that frame. For American (NTSC standard) television and video, each second of SMPTE time code is divided into 30 frames (the standard number of frames that pass by in one second of video; the standard frame rate for films is 24 frames per second, and for European television and video, 25 frames per second). Each frame is further divided into 80 subframes, with each subframe being 0.417 milliseconds long. A typical time code location might be 00:10:08:29:(76), which you would read as 00 hours, 10 minutes, 8 seconds, 29 frames, and 76 subframes into the tape. The SMPTE time code emanating from a SMPTE generator can be recorded on tape and played back into a SMPTE time code reader, which precisely identifies where you are on the tape. This data not only helps synchronize audio to video but can also synchronize two or more audio recorders or electronic musical instruments together.

Sync: Short for synchronization, the process of making sure that all rhythmically oriented devices in a system respond to a common rhythmic reference. This rhythmic reference is usually either SMPTE, MIDI, FSK, clock pulse, or DIN sync.

VCA: Voltage Controlled Amplifier. An element that varies gain in response to the voltage applied to a control voltage input.

Velocity-sensitivity: The ability of a MIDI keyboard to measure the time it takes for a key to go from the key-up to the key-down position. Since this is a function of how hard a key is struck, the velocity data is frequently used to control dynamics with a sound-generating device. EM

—from page 16, RELEASED & REVIEWED

Jon Hassell, *Power Spot* (ECM 1327); **Harold Budd, *Lovely Thunder*** (Editions EG 46). (Hassell)/(Budd) has been doing essentially the same music since his first album *(Vernal Equinox)/(The Oak of the Golden Dream)* (ten)/(15) years ago. The intervening (four)/(five) albums have grown more sophisticated in their (neo-ethnic percussion)/(echoing acoustic piano) and synthesizer work, but (Hassell's strange moaning trumpet)/(Budd's quiet keyboard meditations) and dreamlike development remain a relative constant.

Richard Lainhart, *These Last Days* (O-Town 02; cassette). Four pieces (C-45) showing the diverse talents of Lainhart. The title track is Reichian phase-music for percussive synthesizer and drumbox, followed by a similar track on vibraphone only. Side two opens with an 18-minute meditative drone and closes with a piano solo. Each piece has its own quiet charm. $8.50 postpaid, 7 Fordham Court, Albany, NY 12209.

Free World, *Free World* (Vinyl Siding 4907). Interesting little synth/drumbox tunes, heavily interwoven with radio and TV dialog from the '50s. It's not entirely serious, but with digital synthesis (DX7) and recording (PCM) it's more than just a joke, too. In fact, most of the music is quite innovative on its own terms, using a lot of unique synthesizer sounds, competent guitar work and catchy drum programs. Vinyl Siding Records, PO Box 159, Jewett City, CT 06351.

Another Day, *Uh-Oh* (Vinyl Siding 4906). David Brian (vocals, synthesizers, LinnDrum) writes a fair tune, though nothing much separates *Uh-Oh* from the morass of other synthpop on the radio. From the looks of them, the group probably spends more time primping than practicing. Style is everything.

Square Wave, *Square Wave* (cassette). Square Wave is the synth duo of Tim Boone and David Price, together exploring abstract soundscapes of every description. Variety and imagination are their compass points, and they make no concessions to popularity. It's kind of refreshing to hear two such intrepid explorers avoiding the pitfalls of synthpop so completely. 10518 Maplegrove, Dallas, TX 75218.

Morgan Fisher, *Water Music* (Cherry 68). Former Morgan/Mott the Hoople/British Lions/Lol Coxhill keyboardist Morgan Fisher is now calling himself "Veetdharm Morgan Fisher" and dedicates his album to the Bhagwan Shree Rajneesh. Side one is made up of two long improvised meditations on DX7/TX116/TF1 with a long Frippertronic digital delay. Side two achieves much the same peacefulness on grand piano with bowed guitar (B1) or windchimes (B2). It's a beautiful, if rather inconsequential, set.

Kent Jordan, *Night Aire* (CBS 40386). I picked up this album after hearing a track ("Stardance") on the radio—ethereal flute over some lovely Synclavier. The rest of the album is similar, with a little unobtrusive bass and drums on most cuts. The pieces aren't particularly strong melodically though, and after a whole album of it the music seems so laid back that it's almost flattened out. Some nice textures, though.

Shadowfax, *Too Far To Whisper* (Windham Hill 1051). Apparently fighting their "granola Muzak" reputation, Shadowfax has moved substantially into progressive jazz-rock, sounding more like Steps Ahead or Skywalk or their own recently released first album, *Watercourse Way*.

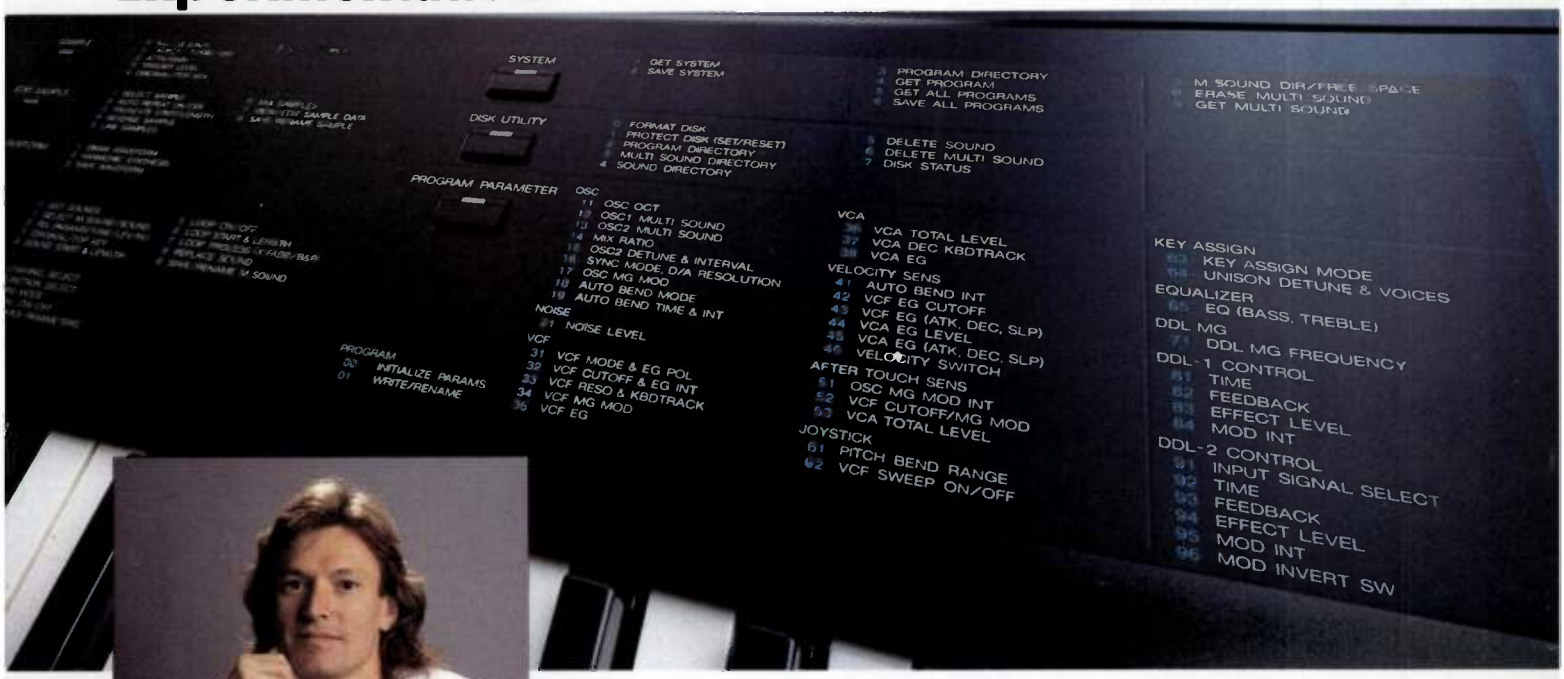
Delay Tactics, *Any Questions?* (Multiphase 005). A couple of years ago Jim Aiken called this album "Enoesque instrumental rock," and I've been more or less looking for it ever since. Well, a copy finally turned up—and I guess I'd describe it a little differently. Walter Whitney, Carl Weingarten and David Udell set up patterns, using a digital drumbox, plucked guitars and a lot of overdubbed Frippish volume pedal guitar, which then continue for four or five minutes before fading out. Some of the textures are quite nice; some of it might even pass for backing tracks for *My Life in the Bush of Ghosts* (without the "found vocals"), but it's nowhere near as developed as Eno's solo material, sorry to say.

Steve Roach/Kevin Braheny/Richard Burmer, *Western Spaces* (Innovative Communications 87.101). When three masters of meditative electronic music come together—sometimes singly, sometimes in duets, sometimes all three—the result has to be more varied than any one of them alone. *Western Spaces* does not disappoint. It's full of ravishing digital textures in billowy intermissions from the real world.

Advertiser Index

Why should a sampler and a synthesizer be combined?

Experimentation.



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Steve Winwood
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DDD-1

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*There's always an exception or two, isn't there? The Ensoniq Sequencer Expander Cartridge and Input Sampling Filter can't be used with the Mirage-DSK. However, the cartridges can be used with the Mirage Digital Multi-Sampler ($1195 US).

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