

# MUSIC TECHNOLOGY

JULY 1989 USA \$2.95 CANADA \$3.95

PROGRAMMING THE MI

## PHILIP GLASS

*On Philip Glass*

## SYSTEM EXCLUSIVE

*An In-depth Investigation*

## HOWARD JONES

*Extending  
the Boundaries*



### REVIEWS

*Aphex Feel Factory  
Yamaha WX11/WT11  
Opcode's Vision  
Yamaha RX8*





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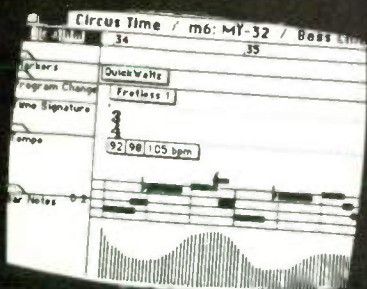
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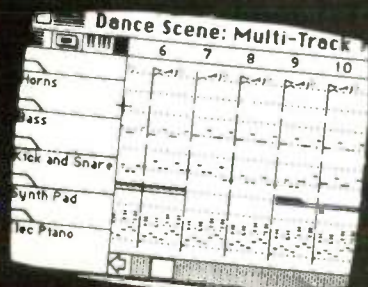


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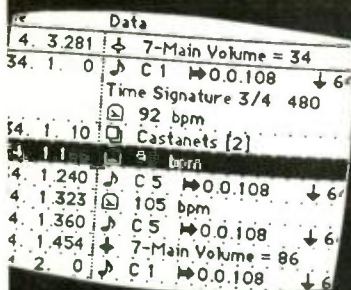
"I am convinced that creativity is essential to the integrity of the Universe."  
- R. Buckminster Fuller



Use Multi-Track window to view and edit all tracks simultaneously.



"What is demanded is a change in our imaginative picture of the world."  
- Bertrand Russell



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"Every perfect traveller always creates the country where he travels."  
- Nikos Kazantzakis

Musicians are creative artists, not number crunchers. Artists select tools that encourage expression – tools that are creative, flexible, easy to understand and use. Portrait represents the next generation of creative compositional software, incorporating standard sequencer features and much, much more.

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JULY 1989



## WHERE ARE THE SOUNDS?

A CRISIS IS lurking in the electronic musical instrument industry. Sales of new products have slowed considerably, several major manufacturers have been forced to reduce their size and there's an overall mood of concern as companies try to determine their plans for an uncertain future. No one's completely sure why things have progressed to this point – some believe that the market has been glutted with too many similar products while others think that many people feel they have enough gear for now, that's it's time to learn more about what they currently have – but nearly everyone in the business recognizes the problem and is suffering from its effects.

There is no simple solution to such a complex problem, but I believe one of the main causes of the slowdown can be addressed. Specifically, I think it's time for new sounds and new methods of sound creation. We've outgrown the current methods of synthesis and the sounds that they can create; they're just not as exciting as they used to be. And because most of the new instruments being unveiled nowadays are simply refinements of existing technologies – nice though they may be – there simply isn't a compelling enough reason to go out and buy a new instrument.

In a sense, the electronic music business has always been driven by new sound generation techniques. In 1983 Yamaha introduced affordable FM synthesis with the DX7 and took the musical world by storm, selling well over 150,000 units and starting an entire cottage industry of electronic music enthusiasts. The reason? The sound, of course; nothing else sounded like the DX7. It was fresh and exciting, and the FM sound generation method hidden within the instrument proved to be very powerful. A few years later, Ensoniq made the magical process of sampling, with its potential of easy access to any sound, available to the thundering masses with the Mirage. While they alone didn't recoup the entire market prize, digital samplers proved to be another big boon to the electronic music industry.

But as I mentioned earlier, FM and sampling have reached a bit of a dead

end. I mean, where do you go beyond a 16-bit stereo sampler? Future developments will be mainly incremental and will probably only occur in the price/performance equation. Similarly, Yamaha must have felt they (and the marketplace) have gone about as far as they can with FM because they recently announced that the V80FD – an instrument that was intended to be their new top of the line FM synth – will not be manufactured after all.

Now, I'm not suggesting that there isn't new sonic territory waiting to be explored with the existing tools. There are undoubtedly many uncharted terrains within the boundaries offered by today's instruments. But to re-ignite interest in electronic sound creation we need to find new worlds of sound.

The most promising prospects for creating these new sonic worlds are several different sound generation methods currently being developed in the research labs of universities around the world (and rumored to be in the R&D labs of some manufacturers): resynthesis, granular synthesis, and sound modeling. An attractively priced instrument that uses one of these or any other truly new method of sound generation could lead to another huge growth period for this industry. One from which both manufacturers and consumers could greatly benefit.

It's time for excitement; it's time for something new. Anyone up to the challenge?

ON A LESS challenging note, MT is pleased to announce the addition of Debbie Greenberg to its staff as Editorial Assistant. Debbie, who recently graduated from Cal State Northridge with a degree in Broadcasting, takes the position previously filled by Dan Rue, who has been promoted to Assistant Editor.

I would also like to extend a personal note of thanks to former music editor Deborah Parisi who is moving with her family to the Pacific Northwest, where she will continue to write for MT on a freelance basis. Her charming presence and late night dedication will be missed. Thanks Deb. ■ Bob O'Donnell

### EDITORIAL

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Yamaha WXII Wind Controller – p68



Rainer Bruninghaus – p64



Aphex Feel Factory – p42

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## MUSIC TECHNOLOGY VOLUME 3, NUMBER 11 JULY 1989

### ARTISTS

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#### Howard Jones

After a several-year hiatus, the seminal one-man synth band is back with a self-produced album and new thoughts on music, technology and the interaction between the two.

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#### Philip Glass

Praised and damned by modern music critics for the last twenty years, Philip Glass has, in addition to popularizing minimal music, composed numerous major works that focus on important social issues. John Diliberto talks with Glass and engineer Kurt Munkacsi about new projects and a recent dance remix.

64

#### Rainer Bruninghaus

This German synthesist on the ECM label is a master of subtle orchestration and musical nuance, blending Euro-contemporary jazz with his classical background.

### TOOLS

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#### Yamaha RX8

No doubt feeling the competition from other manufacturers, Yamaha's newest drum machine is a cost-effective 16-bit affair, with numerous built-in sounds and a few interesting twists.

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#### Synclavier Explained, Part II

The second in our series unveiling the mystery behind this fabled instrument concentrates on two of the most important software components of the Synclavier system: the sequencer and music notation packages.

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#### Opcode's Vision

The long awaited Version 3.0 of the company's Macintosh Sequencer program has a new name and an impressive new list of features including graphic and event list editing and lots more.



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An embodiment of several important musical principles espoused by designer Michael Stewart, this new MIDI box allows you to adjust the feel of sequenced MIDI music. According to Bob Rich, it's a complicated but successful product.

- 54 MicroReviews**  
Under the microscope this month are Steinberg's Twelve, an inexpensive sequencer for the Atari ST, Primera Software's Different Drummer, a generic drum machine pattern programmer for the Mac, and Steinberg's Synthworks M1, an editor/librarian for the ST and the Korg M1.

- 68 Yamaha WX11**  
The latest wind controller to appear from the labs of Yamaha combines everything into a cost-effective single package: controller, synth and effects. As Michael Andreas relates, all you have to do is plug in and play.

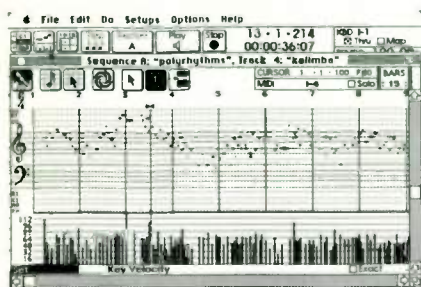
## TECHNIQUES

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Having completed a tour of FM programming, this month's chapter delves into the Korg M1 and explains how to take advantage of the instrument's Combination editing functions.
- 58 Real-Time MIDI**  
Making alterations to a synth's or signal processor's programs in real time via continuous controllers or MIDI SysEx messages offers an entire world of creative possibilities. Ernie Tello explains how it can add life and subtlety to your music.
- 71 System Exclusive, Part I**  
In his never-ending quest to educate the world about the concepts of MIDI, Mick Micro, MIDI Detective ventures with the fat man into the world of Melodia the MIDI Mystic to learn the secrets of MIDI SysEx messages.

## OUTSIDE

Due to unforeseen changes in postal requirements, we were unable to send last month's issue of Outside to subscribers.

You may still receive a copy if you specifically request it. In addition, because of these changes, it is no longer financially feasible to continue with the project. We're very sorry for any inconveniences this may have caused.



Opcode's Vision for the Macintosh - p36



Yamaha RX8 Drum Machine - p14



Real-Time MIDI Control - p58



## TEAMING TALENT AND TECHNOLOGY

Hybrid Arts, the leader in innovative and affordable software, is pleased to introduce the Total Control music computer software system. Each module is a state of the art music computer software package...like a music compositional aid, sequencer, music notation, or editor/librarian. By combining



modules, the system provides the MIDI musician the equivalent of a multitrack recording studio...and more. Because these programs are integrated, you can instantly switch and share data between them, via HybriSwitch. This capability saves valuable time...especially when you're in a creative mode.

Originally developed for the Atari ST and Mega computers, this system provides the tools you need to increase and support your creativity. The individual modules within the system have been designed to allow you, as the musician, the flexibility to develop and enhance your musical ideas...at your own pace...regardless of your technical playing abilities. Total Control is easy enough for the novice and fully capable for the professional. When you compare the price to performance ratio for this system, it stacks as a valuable investment with great returns.

Here is an example of how Total Control works:

### LUDWIG

Let's start with Ludwig, the music compositional aid program. It has been designed to radically develop the germ of a song idea by suggesting and implementing rhythmic and pitch variations to complement the idea played on a MIDI instrument. For example, a simple say five note melody could be developed in Ludwig into a full blown score—with multi parts and harmony.

### EditTrack - or - SMPTE Track

The original song developed in Ludwig can then be manipulated in either EditTrack or SMPTE Track...full feature sequencer programs. In either of these, your new composition can be quantized, transposed, rearranged and even radically altered. The editing functions of these sequencers are far more versatile and accurate than many other MIDI programs.

### EZ-Score Plus

Now lets transfer your sequence to EZ Score Plus. With excellent music notation capabilities, EZ Score Plus will automatically translate your composition to music notation and allow you to print a professional copy of your song score for other musicians, publishers and members of the band.

**Now, what about control of MIDI synthesizers and signal processors used throughout the song's arrangement?**

Enter GenPatch...the universal patch librarian which will allow you to transfer "banks" of sounds or individual patches (programs) to and from all of your MIDI devices. The first advantage this offers is that you can build and access a library consisting of thousands of different sounds and load them into your instruments quickly. This saves you having to learn how to program each of your MIDI instruments.

### Let's go a step farther:

Enter GenEdit...the universal patch librarian/editor. It gives you the capability to use your own original sounds rather than presets. The bigger the MIDI studio, the more essential GenEdit is for you. It replaces the need for individual patch editors for each synthesizer. You can design your own edit window which will control all of your MIDI devices in the same way rather than trying to control each device individually. GenEdit saves valuable time by storing, organizing and editing program/patch data for any MIDI device presently available...or likely to be made available.

Additional modules for the Total Control package are being developed.

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# NEWS DESK

## MT DEGREE

We've received many letters asking where music technology-specific education can be obtained. The answer has finally arrived. Cogswell Polytechnical College now offers a Bachelor of Science

degree in Music Engineering Technology. The program is specifically intended to provide students with skills and knowledge in electronics, computers and music, enabling them to design and construct synthesizers, samplers, and interfaces. Lower division courses will also be offered as a certificate program. Cogswell has proudly announced that their students will be "the first engineers specifically trained to design and develop musical instruments and interfaces." For more details, contact Dr. Ted Kastelic, Dean of the College, or Mr. Eric Peterson, Director of Music Technology. **MORE FROM:** Cogswell Polytechnical College, 10420 Bubb Road, Cupertino, CA 95014. Tel: (408) 252-5550.

## PITCH-BEND BY FOOT

Lake Butler Sound Co. has released a new line of self-contained, battery-powered MIDI footpedals called the CFC-series. Purportedly the first and only such continuous foot controllers around, these pedals come factory-assigned to standard MIDI controller numbers, and are programmable to handle such

tasks as cross-fades between synths, pitch-bends, multi-channel volumes and System Exclusive. Each pedal is capable of handling up to 16 parameters simultaneously. The CFC4, shown here, lists for \$295.

**MORE FROM:** Lake Butler Sound Co., Inc., 5331 West Lake Butler Rd., Windermere, FL 32786. Tel: (407) 656-5515.



The CFC4 MIDI continuous foot controllers from Lake Butler Sound Co. allow MIDI guitarists and others to send a variety of different MIDI messages with their feet.

## MIDI THROUGH XLR

You might remember when MT talked about making MIDI cables from mic cables (December '88, "MIDI Live"). Well, now you don't have to make them yourself. Midia has developed a new product called the MIDIBoost (\$199) that will transmit MIDI signals

over up to 4000 feet of standard XLR cable. MIDIBoost is sold in pairs, one for each end of the XLR cable, to act as an interpreter for the MIDI cable connected to your synth, etc.

**MORE FROM:** International Music Co., 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114.

## KAWAI'S NEW SYNTH

Introducing the brand-spankin'-new Kawai K1II (\$999). Like the original K1, this new digital synth sports a 61-note keyboard, 64 internal sounds, 32 Multis, and 256 digital waveforms. The "II" must, then, stand for the two significant additions to the K1II: a fully functional digital

reverb, and an independent drum section that doesn't yank away from the synth's polyphony. Incidentally, the original K1 and K1r/m modules are still going to be produced, so you can have it either way...

**MORE FROM:** Kawai America Corp., 2055 E. University Dr., Compton, CA 90224. Tel: (213) 631-1771.



Kawai's new K1-II synth includes all the features of its predecessor and adds a built-in digital reverb and a separate drum section.

## THE FAIRLIGHT LIVES

A quick phone call to Australia as we were going to press confirmed the rumors we'd heard floating around the industry: the Fairlight Series III lives and will continue to be supported. While Fairlight (the company) no longer exists and all worldwide branch offices have been closed, company founder Kim Ryrie has regained the intellectual and property rights to the Fairlight CMI hardware and software in addition to starting a new company called Electric Sound and Picture. The new venture, which includes most of the main personnel from Fairlight's Sydney headquarters, will contract the manufacturing of Series III's to an outside firm and develop new software and hardware for the instrument. In fact, a new Rev. 8 software release, with features geared primarily toward film composition, should be available from Electric Sound and Picture by the time you read this. Sales of the instrument and software will apparently be handled directly through the new Australian office.

**MORE FROM:** Electric Sound and Picture, 30 Bay St., Broadway, NSW Australia, 2007. Tel: 011-61-2-212-6111. FAX: 011-61-2-281-5503.

## LOW-END NOTATION

H.B. Imaging, creator of the full-powered Engraver notation program has released a scaled-down, quicker version called Music Copyist (\$199) for the Apple Macintosh. Music Copyist features fast note input via mouse and MIDI keyboard. Lyric input features include automatic center, left and right justification under notes, selectable font, size and style for each syllable, and placement of custom text anywhere on the page. Measure placement features include "Automatic Horizontal Rebalance," and the page size can be adjusted. Each voice can be assigned to a separate MIDI channel or voices can be merged onto a single channel for playback of the score. MIDI patch, pan and volume are assignable to each voice and the music scrolls when you play it back. Because Music Copyist is compatible with Engraver, ready-to-print compositions can be obtained. Music Copyist uses Interlude as its standard font, and supports Apple's ImageWriter and any PostScript compatible printers.

**MORE FROM:** H.B. Imaging, Inc., 560 South State St. #G1, Orem, UT 84058. Tel: (801) 225-7222.



## ATARI LAPTOP

Atari has released the newest computer in their line of STs, the STacy, a 15lb. laptop computer. This light-weight, low-cost (\$1495) little gem comes equipped with 1M of RAM, a built-in 3.5" double-sided floppy disk drive (optional second floppy or hard drive available), 640X400 resolution supertwist LCD monochrome display, keyboard with 10



STacy is the impressive and relatively inexpensive new ST-compatible laptop computer from Atari.

function keys, trackball for mouse control, and built-in battery pack. On top of that it has all of the standard ST ports and interfaces: monitor, serial, MIDI, parallel, floppy, hard disk, RS232C, and game controller ports, plus a DC input jack for external power, should you so desire. There's a lot of meat here for such a small animal.

**MORE FROM:** Atari Corporation, 1196 Borregas Ave., Sunnyvale, CA 94086. Tel: (408) 745-2000.

## NO WALL WARTS

The end has arrived for those "wall wart," space-hungry miniature power supplies. Juice Goose has announced the release of Micropower (\$165), a 1/3XU rack space 9-volt AC power module. Micropower features five 9-volt AC outputs designed to be compatible with most popular micro and mini series rack-type effects units. Using 3.5mm mini plug connectors, the unit provides each output with up to one amp of current, more than enough for most micro units. One final nice touch - the Micropower features a controllable on/off switch, for those units that come without one.

**MORE FROM:** Juice Goose, 7320 Ashcroft, Suite 302, Houston, TX 77081. Tel: (713) 772-1404.

## BEHIND DOOR THREE

Imagine two weeks on the French Riviera, overlooking the Mediterranean in the town of Antibes. Imagine being surrounded by such notable musicians as Chick Corea, Pat Metheny, and Michael Brecker. Sound like a lottery prize? Well, actually it's a seminar - International Music Seminars' third annual gig, running from July 17-30, featuring classes on MIDI, synthesis, sequencing, vocal techniques, and drumming, as well as evening concerts. The seminar costs \$300 per week (6 days and nights), or \$500 for both weeks, not including room and board.

**MORE FROM:** International Music Seminars, P.O. Box 931545, Los Angeles, CA 90093. Tel: (213) 851-3214.

## HR16 LIBRARIAN

Owners of Alesis' popular HR16 drum machine and the Commodore 64 or 128 no longer have to hassle with cassette backups of their songs and sequences. Triangle Audio's HR16 Librarian features a pop-up disk directory, point-and-click loading of files to the HR16, and an in-program disk formatting function.

Also new from Triangle Audio is an editor/librarian for the Roland GM70 MIDI guitar controller and the Commodore 64/128. In the Editor, all parameters are shown on one screen, a channel display shows which channels are in use, individual and groups of parameters can be cut-and-pasted to any parameters within any patch, all system parameters can be edited, and systems can be named. The Librarian

provides help screens for transfers between the GM70 and C64, with an indicator to tell you that data is actually being transferred. Up to 128 patches and 17 systems can be held in memory. Patches are saved in groups of 64, or as a collection of 128 patches plus a system. Groups of 16 systems can be saved separately. Finally, patches and systems can be copied or moved around within banks.

Both the HR16 Librarian and the GM70 Editor/Librarian work with Passport, Sequential, Dr. T's, and compatible interfaces. The HR16 Librarian retails for \$40; GM70 Editor/Librarian retails for \$60. Please include \$2.50 s/h if you order it directly from Triangle Audio.

**MORE FROM:** Triangle Audio, P.O. Box 1108, Sterling, VA 22170. Tel: (301) 526-6224.

## C1 CAKEWALK SHIPS

Twelve Tone Systems is now shipping the Yamaha C1 version of their Cakewalk Professional sequencer, as well as their C1 Cakewalk Live! song assembly/performance program. Cakewalk Professional/C1 utilizes the C1's eight MIDI Out ports and provides 30-frame non-drop SMPTE generation and synchronization as well as smart quantization, keyboard macros, timebases from 48 to 240 ppq, and Standard MIDI File compatibility. Cakewalk Live! allows you to construct playlists of up to 128 songs, and loads your next song as it plays the previous one. The Cakewalk Professional/C1 and Cakewalk Live! bundled package retails for \$349; Cakewalk Live! on its own retails for \$99.

**MORE FROM:** Twelve Tone Systems, 11-A Main St., Watertown, MA 02172. Tel: (617) 924-7937.

## PROGRAMMING THE ST

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# READERS LETTERS

**MT would like to hear from you! If you have any questions or comments about the things you see in MT, please send them to: Readers' Letters, Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.**

## Creativity vs. Equipment

Contributors and readers of your magazine often express the noble sentiment that "creativity is everything, equipment doesn't really mean a thing" when it comes to music. While no one would disagree that creativity is the one crucial, all-important ingredient in good music, I would like to take issue with those who feel "you can do anything if you just set your mind to it."

I recently won a lot of money in a sweepstakes. Before I was struck by this fantastic luck, my equipment setup was a Korg Poly 800II, a Gorilla amp, a Yamaha RX21 drum machine (yes, that little dinky thing), a Tascam Portastudio, my brain and my ears. I am influenced by progressive, intelligent artists who use sound as an integral dimension of their music: Peter Gabriel, The Cocteau Twins, Kate Bush, The Cure, Hugo Largo, Oingo Boingo, Blue Nile, Throwing Muses, David Sylvian, Skinny Puppy, etc. Needless to say, I was frustrated by the limitations of my equipment. But I wrote some great songs and by using my imagination I came up with some OK sounds on the Poly. But the Poly 800II has only a one-track, mono-timbral, step-time sequencer (which I MIDI-sync'd to the RX21). My musical thinking is way ahead of my keyboard skills, so with my only real choice being the sequencer, it was a true struggle to keep my compositions from sounding like dime-store Depeche Mode. In my head, I was hearing rich, elaborate soundscapes with detailed arrangement and beautiful CD sound. But in reality all I had was chug-along kiddie low-end gear. I used to drool over the gorgeous, shiny ads in your magazine, as well as other electronic music publications.

When the sweepstakes came along, the first thing I did after collecting the

money and paying the taxes was head straight to the music store. To make a long story short, I now have a D50, a DX7IIFD with E1, two Akai S1000's with hard disks, a Korg M1R, a Kawai K5M, Roland R8 and Alesis HR16 drum machines, and a Yamaha C1 music computer with Sequencer Plus MkIII software. For sound, I have two Yamaha DMP7D MIDI - automated digital mixers, Roland 24 - and 16-channel keyboard mixers, an AKG ADR68K signal processor, two REV5s, an SPX1000, a Lexicon PCM70, three DSP128+'s, a Dynacord DRP20, and lots of software for everything. I monitor all of this over a couple of Urei 813s (the biggest, smoothest speakers I've ever heard), and a pair of Yamaha NS10s for near-field listening.

For the other members of my band, I bought them everything they wanted. We record live, direct to DAT at a beautiful Annapolis beach house that I have leased for the band to rehearse and live in. We can now afford to spend all of our time on our music (no more dreaded day jobs). I have enough money to support us through at least a year and a half. This is the life.

Has my music changed? Absolutely, and for the better. Now I have access to nearly every sound, texture, and nuance that I can dream of. One listen to the old dinky Portastudio cassettes confirms my theory that even my musical thinking has evolved, because it is no longer restricted by reality. My band is completely mind-blowing now! Have we turned into a techno-weenie band, all bleeps and bleeps android music? No. Am I using the equipment as a crutch or a blanket to cover up uninteresting musical ideas? No. In fact, the better sound has inspired me to dig deeper into my compositional bag to use the equipment creatively to make innovative music.

We have circulated promo kits in-

cluding cassette copies of our DAT mixes. The same outlets that used to turn a deaf ear to our music are now responding. We've even had a few nibbles from major labels. Clubs are receptive. Doors are opening for us and we haven't even gotten our name out to the public at large yet. Big time managers are receptive like they never were before, and we're not doing what would normally be considered commercial stuff.

So creativity isn't everything. We're still pretty much the same band we used to be, but suddenly things are happening for us. So I'm sad to report that money and gear does make a huge difference.

**Chad Clay**  
Annapolis, MD

## Backwards Disks

Hi! Your Akai S950 review (MT March/April '89) forgot to mention that one of the improvements to the floppy drive is that disks can be loaded either conventionally or backwards, as your photo on page 63 shows.

(Unfortunately, I need this feature on occasion. Glad a manufacturer finally recognized that some of us are boneheads.)

**John H. Livingston**  
Birmingham, AL

*Boy, we sure can't pull the wool over the eyes of some of you. Try as we might to pull a fast one, particularly since it was the April issue after all, we just couldn't get away with this one little slip-up. John, you're the lucky winner of this year's catch MT with their pants down contest. Congratulations. I'll put you in touch with Chad, and maybe he'll buy you something.*

*For the record, I'm working on getting the photographer who took that humorous shot more interesting work - in Siberia. - BO'D* ▶

MUSIC TECHNOLOGY

9



# With nine work stations of we'd like to introduce



Forgive us if we sound a little pompous. It's just we find ourselves in a curious position. Over the past several years, everyone and their brother has introduced a so-called "work station." When, to our way of thinking, they really aren't work stations at all.

To us, a work station should have the most sophisticated sequencer available. And in fact, our new W-30 does. It features 16 tracks, microscope editing, full compatibility with both Roland MicroComposers and Directors "S" Sequencing software, to say nothing of the friendliest user interface there is.

To us, a work station should also be designed around a sampler rather than a synthesizer. What this does, more than anything else, is make the system remarkably versatile. It's a whole lot easier to make a sampler sound like a synthesizer than the reverse. And speaking of

sounds, those from the W-30 can be processed through either eight polyphonic outputs or a mix output.

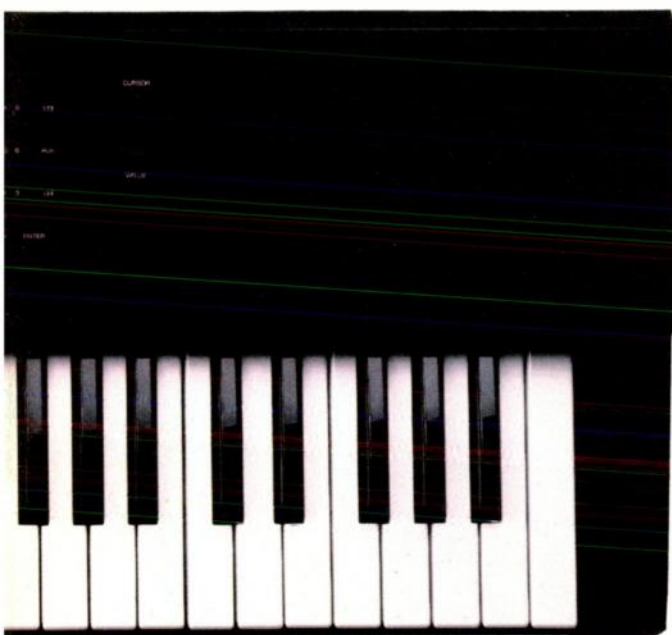
To us, a work station should possess an excellent memory. Which is why we've equipped the W-30 with a one mega-



*Because the W-30 uses the same disks as the S-50 and S-550, you won't need to build a sound library. It already exists.*



# the market, he first.



byte, user-accessible memory (ROM).

And because it comes with the most frequently-used sounds, you won't need to load in a sound disk to begin working.

The sampler section's 512k (RAM) memory is no less impressive. It's actually equal to that of a Roland S-330, and can be used for creating new sounds, or for playback, or for manipulating any of the S-Series disks. As a result, you'll not only be in a position to work with the sounds that are currently hot, you'll be in just as good a position to capture the sounds that will become hot.

Nor does its versatility end here, because the Roland W-30 not only puts



*If you squint you can probably make out the fact that the new Roland W-30 has eight polyphonic individual outputs which allow any sound to be routed individually to a mixer.*

a 3.5" floppy disk drive at your disposal, it also gives you the ability to access additional data by using either a CD-ROM or a hard disk connected to an optional SCSI interface.

Of course, a work station should be able to express itself too. Which is why we've made our 61-note keyboard sensitive to both velocity and after-touch.

And it should be easy to use. Hence, the W-30 uses a large, state-of-the-art 240x60 dot LCD display that's capable of providing more useful information at one time than ever before.

But before we go, let us take this moment to pose a hypothetical ques-

tion. Let's just say that all of the other so-called work stations found a way to include these very same features. They'd be better, of course, but still not comparable to the remarkable new W-30. Because they'd still be missing the most persuasive and motivating feature of all.

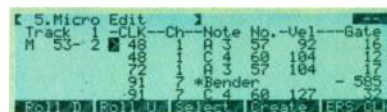
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# Yamaha RX8

## Digital Rhythm Programmer



Photography Melodie Gimple

**The emphasis is on sounds and ease of programming in the latest drum machine from Yamaha.**  
*Review by Chris Many.*

**I**F YOU'RE GOING to introduce a drum machine into today's marketplace, it had better have 16-bit samples, a relatively low price tag and a few tricky features to separate it from the competition. That's undoubtedly what Yamaha had in mind when they planned their new RX8. Offering many of the capabilities found in the company's previous RX5, their newest drum machine makes a stab at the burgeoning low end of the market.

Let's get one thing clear right off: most drum machines are fairly distinctive when it comes to sound. One can readily distinguish the difference between a Roland and a Linn drum machine or between an E-mu SP1200

and a Sequential 440. The same is true for the RX8; it's undoubtedly a Yamaha drum machine. The toms have the same recognizable "chunk" at the top end, the hi-hats sound a bit tinny, etc. The quality of the sound has improved somewhat due to the 16-bit resolution, but don't expect to hear massive differences. At least I didn't. To my ears, the RX8 sounds just like one would expect a drum simulator from Yamaha to sound. That's not particularly meant as a criticism, simply an observation that despite using the buzz word "16-bit," this product still retains a good part of the drum sound akin to earlier Yamaha drum machines. So if you're familiar with the sound of an RX11 or

15, you'll have a good idea of what the RX8 sounds like, just cleaner and less noisy.

### The Sound Lowdown

The RX8 comes loaded with 43 voices: five kicks, five snares plus a rimshot, eight toms (four acoustic and four electronic), open and closed hi-hat, ride cymbal (cup and edge), claps, tambourine, shaker, congas (high muted, high open and low), bongos (high and low), timbales (high and low), agogo (high and low), cuica and whistle. In addition to these percussion voices, several tuned instruments are included as well: bass guitar (pull and thumb slap), marimba and orchestra hit.



The unit itself is simply laid out, with 16 rounded rectangular pads used for programming patterns. The drum sounds are assigned to twelve of these pads, two are used for accent and pitch or for panning adjustments, and the last two are used as Start and Stop/Continue buttons. Above the pads are 26 additional thin rectangular buttons that are used by themselves or in various combinations to access all of the features of the RX8. A small LCD display is placed above these buttons in the top center of the machine, along with two semi inset knobs to the left. These control Volume and Tempo, respectively. The back of the unit contains 1/4" jacks for headphones, stereo (or mono) output plus two individual out jacks, MIDI In and Out (no Thru, hmmm...), a connector for the external DC 12V-15V power jack, and interfaces for both cassette and cartridge storage.

The buttons have a rubbery spring to them, so they're okay to program on. However, you don't have to worry much about playing the pads with different velocities. There isn't a provision for velocity sensing in the key-pads except in the most rudimentary way. This is one of the major drawbacks with the unit as far as I'm concerned and it alone prevents the RX8 from sounding like anything but a drum machine.

The one concession to achieving a variety in output level is the Accent button, which basically allows you to increase the velocity of a note when you press it as you program. This pretty much guarantees patterns with few dynamics, a state of affairs that is not highly prized at this stage of drum machine technological advancement (even in this price range; a comparable unit, the Alesis HR16, has fully velocity-sensing buttons). If you use an external controller, i.e., MIDI drum pads, or a velocity-capable synth key-board, the RX8 will accept and record incoming key velocity data, so there is a way to generate dynamic patterns.

### Features

The RX8 includes all of the basics you'd expect a drum machine to have such as programming patterns and chaining them together into songs, step editing and quantization. So rather than cover each individual feature, I'll try to select the things that set the RX8 apart from other rhythm programmers, or at least that are outside of the standard functions. ►



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► First off, I'll give the machine credit for ease of use. I figured just about everything out with no referral to the manual, simply by pressing buttons and following the structured menu paths in the display that are associated with each one. The manual itself is easy to read and has an improved translation quotient (can it be that there's a new trend occurring here? Manuals that are helpful *and* correctly translated into an English we can understand?). With the complexity that can be found in drum machines these days, it's nice to be able to pick up a unit and, with no prior knowledge, program a complete track with a minimum of hassle and a short learning curve.

Once you learn your way around, there are a number of simple short cuts you can use by pressing the "Job" button and another key in combination. This prevents the user who is familiar with the unit from having to constantly search up and down menus (annoying when you become expert at a machine) and directly access the desired function or feature with a few button strokes. And it doesn't take long to become a facile programmer with this machine, either.

There's a choice between polyphonic and mono playback of notes. This comes in handy when you want rolls and you don't want the voice cutting off every time you restrike the note. In poly mode, it will continue to ring out even while you're triggering the same sound.

Simple effects can be programmed as well through the use of an effects/detune button. Essentially, when you press this button while playing a voice,

**Sounds** *"The quality of the sound has improved somewhat due to the 16-bit resolution, but don't expect to hear massive differences. The RX8 still retains a good part of the drum sound akin to earlier Yamaha drum machines."*

a second, detuned voice is triggered along with it to produce a flanging effect. The amount of detuning is adjustable by the user.

Even though there are only twelve pads available for programming, you can reassign voices and add different sounds into patterns as you go. Although it may not be practical to have all 43 voices included in one pattern, it is certainly possible if that's what you want to do. You don't have to exit from recording to reconfigure voices, either. Just keep the pattern going and press the requisite buttons, change voice assignments and program them in.

One other feature unique to the RX8 (at this price point, anyway) is a reverse button. By pressing this button simultaneously with a sound button, the sample is reversed, making it easy to create backward cymbal effects or, by combining the effect with a normal sample and timing it a little late, an interesting snare.

MIDI assignment of notes is functionally implemented, allowing each voice to be accessed via MIDI. If you're going to play the machine from an outside source, just assign each voice

**Pads** *"The buttons have a rubbery spring to them, so they're okay to program on. However, you don't have to worry much about playing the pads with different velocities because they're not velocity sensitive."*

to the desired MIDI note (it doesn't have to be assigned to one of the twelve keypads on the RX8, thus giving you access to all 43 sounds from one external controller).

Multiple quantization values are allowed within a pattern as well. You can record your basic kick/snare in eighth's, say, and then change the quantization value to program a ride cymbal with a triplet feel without changing the placement of the kick and snare. Unfortunately, the machine's maximum resolution is a paltry 1/4th note, not exactly enough for subtle timing variations.

A feature included on a few machines, and nicely implemented on the RX8 is the Multi button. This takes one sound and lays it out over all twelve pads, varying the pitch on each one. This allows you to program a simple bassline, or a variety of per-ussion tonalities. As long as you're in multi

mode, the entire pad layout responds to pitch, overriding any other sounds you originally set up. As soon as you exit this mode, everything returns to normal. You can also set the pitch range over -12 to +12 semitones (the pitch range is limited to an octave up or down from the original pitch).

I mentioned earlier that the unit has a cartridge port on the back. Don't get too excited, it's not for additional 16-bit drum samples. But it is a convenient method for storing your drum machine songs and patterns. The RAM cards and partition things off in banks of four. This is plenty of room for four

entire memory dumps. There is also the traditional cassette storage. If you've got a sequencer that receives and transmits bulk data, you can store your patterns, songs and voice information via System Exclusive.

There are three sync modes: internal, MIDI and FSK. All work equally well in terms of what they do and the RX8 does respond to MIDI Song Position Pointer.

Stereo panning is fairly complete, with the RX8 permitting you to assign any sound to one of fifteen different

positions in the stereo field. Plus, there are two additional outputs to which you can route a specific sound, making it simple to process a single voice separately from the rest of the mix. You can also determine whether or not you'll want this sound to appear in the stereo field as well.

## Conclusion

In summary, Yamaha has done a good job of translating the RX5 into a more affordable home studio type of unit. Its strong points include an easy to learn and use interface, a variety of high quality 16-bit sounds, a cartridge port for storing songs, patterns and voice assignments (especially handy for live gigs) and a few special effects thrown in for good measure. Programming is very straightforward, although features that allow for humanizing tracks, or offsetting playback to adjust the feel aren't included. The machine's one big drawback, a lack of dynamic key pad programming, can be overcome if you want to program from an external, velocity-sensitive keyboard or other MIDI controller. I can't fault the sound of the drums, but due to the lack of dynamics, you will wind up with a track that sounds like a drum machine if you just program from the pads . . . not that that's necessarily bad, but it's something to take into account.

So, if you like the sound that Yamaha's drum machines make, can live within the framework of an easy-to-use rhythm programmer, and don't quite have the budget for a higher-end machine, check out the RX8. ■

**PRICE:** \$495

**MORE FROM:** Yamaha Music Corp. USA, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9011.

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# Programming Compleat

## PART 6

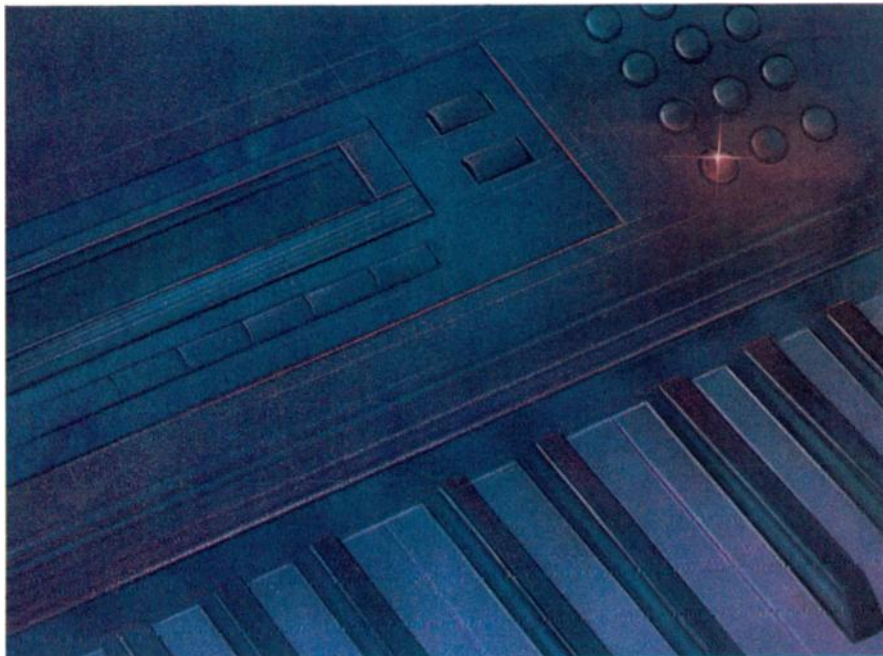


Illustration Rick Lohmes

**Welcome to the fresh new world of programming the Korg M1. This month we take a look at some of the things you can do in the M1's Combination mode. Text by Lorenz Rychner.**

**Y**OU DON'T HAVE to be a synth programmer to get good musical results from your M1. That may even be the main reason why you bought yours: lots of useful sounds right out of the box. But as it happens with most things in life, there comes a time when even the best isn't good enough, and the old devils "what if" and "if only" come knocking on your door. Once that happens, and you start dabbling in the edit modes, there's no turning back: you'll be hooked on programming before you can say "Parameter Value."

You'll discover that the M1 is as programmable as any synth, and that there are several levels on which you can design and re-design sounds. On one of these levels, when editing what Korg calls "programs," you'll be using the good old "analog" oscillator/filter/amplifier sound chain. In this instance, "analog" is meant only as a programmer's approach, going back to the days when all synths used analog circuits in their design. Nowadays, in the age of the computer chip, a lot of

the instrument's internal operation is actually handled digitally, but in many respects the programmer's point of view has hardly changed. So if you know your old-fashioned "analog" (subtractive filter synthesis) techniques, you'll be right at home on the M1 when editing "programs."

On another level, when editing "combinations," you'll be operating more like the orchestrator, whose job is to distribute the notes from a sketch to the right instruments and orchestrate sections to get the desired blend of colors. And on yet another level, you'll be wearing the hat of the producer/engineer who runs the mixing board and the outboard effects, except that all of this happens within the M1 itself. Of course, we haven't even talked about the sequencer, or about the fact that there are enough drum sounds on board to consider the M1 a drum machine. I won't address these issues here, as the subject of this series of articles is the programming of sounds.

In this first of two M1 articles, I'll start with the easier ways of achieving

new sounds. This is accomplished with the Edit Combi mode (in addition to the often overlooked ingredients of good musicianship and musical common sense during performance). Velocity, aftertouch, choice of chord voicings, staccato or legato playing – all of these performance parameters let you reprogram sounds as you play in real time, making changes happen that you prepared during the programming of the sounds. In the next article I'll get fully inside the Programs, where the Edit Program mode gives you umpteen parameters with which to change sounds from the inside. For now, let's jump in and explore the different types of combis: Multi, Velocity Switch, Split, Layer, and Single.

### Getting Started

Select the first of the factory Combis, '00 FilmScore,' and play it all across the keyboard. Look at **Figure 1** and ignore the columns 5-8. Press Combi Edit, and the LCD confirms what Figure 1 shows you: this is a Multi combination, made up of four sounds: '23 Choir,' '45 Tubular,' '27 Strings,' and '01 Piano 16.' In Korg's terminology, individual sounds are called Programs. When Programs are part of a Combi, they are

# An Education for Life

assigned to locations called Timbres. The word Timbre stands for the (up to eight) subdivisions of a Multi Combi. If you look up the list of Combinations that came with the M1 (on a loose double page), you'll find that there are eight spaces reserved for Program or Timbre names, labeled T1-T8. And, lo and behold, the very first listing is wrong: 'Combi 00 FilmScore' is not made up of programs 26 and 27, but the four programs that you just discovered a moment ago.

To select a program in a Combi (after pressing Combi Edit), enter the number 1, press the letter tab below the program number that you want to change, and use the up/down tabs or the slider. You always see all the program numbers, but only one name is displayed at a time in Multi Combis – keep a notepad handy, unless you are using a computer that can show you all the names as in Figure 1.

Play the keys again. Why does the sound change above middle C? Use the Page + (plus) tab to advance to the Key Window Top screen, and you will see C4 listed as the topmost note for the second and the fourth program. This means that the tubular bell and the piano make no sound for keys above C4. What's C4? On Korg instruments, it's middle C (the third C from the left on this five-octave keyboard, or MIDI Note #60). Raise the top key for the tubular bells and piano programs to G9 (press tabs B and D and move the slider), and the sound changes drastically in the upper octaves.

How about raising the volume of these two programs? Advance the Page + tab to the Output Level screen, press tabs B and D and move the slider as you play the keys. Stop when you like the new mix. By the way, while you're in Combi mode, you can always access the output levels of the Timbres in a Multi Combi without pressing the Edit Combi button. Just press the Page + tab, and all levels are displayed. Select the letter tab below the desired timbre and use the slider to change the value. But this shortcut involves a trade-off. You don't get to see the program names, just the words Timbre and Level with the number of the currently selected timbre, so you'd better have the programs memorized to know which one to adjust in a hurry. If you want to see the names, press Edit Combi, then the number 4 once or the Page + tab seven times.

Now press the Page – (minus) tab ►

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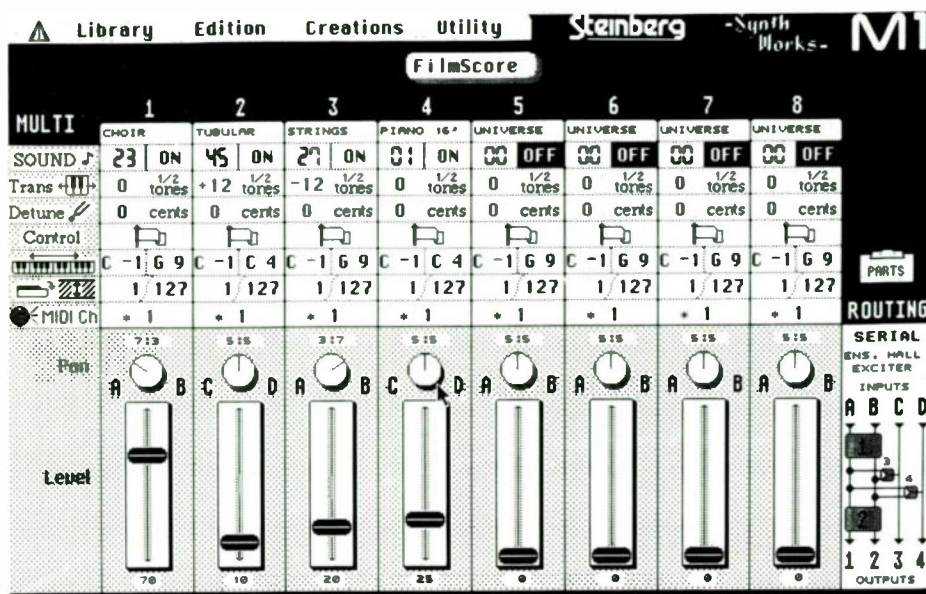


Figure 1. An M1 combination patch chart for 'FilmScore.'

until you get to the Program Select screen (or simply jump there by pressing 1) and change the fourth program from '01 Piano 16' to '19 Pole.' This program has an off-the-wall quality that blends nicely with the tubular bell. And while you're at it, exchange the strings for program '02 Symphonic.' It sounds great at the low octave transposition that it inherits when it joins this Combi. The transpositions of programs in a Multi Combi are set up on the screen that you access by pressing 5 (or keep pressing the Page + tab until it shows up). If you lower the Pole program by one octave (-12 semitones), it seems more atmospheric to me, whatever that means. Play extremely short notes followed by long ones. On short notes you don't hear the Symphonic program because of its own slow attack. This gives you fingertip control over the amount of bass in your sound.

Now compare hard strikes on extremely short notes with soft ones. The main difference is not just in the overall loudness. The color changes drastically as well. The Pole sound almost disappears when you play very short and soft notes. Now play hard and soft long notes and compare. Again, it is not just a matter of loudness. Make a note of such differences - they enrich your music without the need for a program change every time you want a different color just by changing your playing style. This may not always work in a live situation where it can be hard to control the velocity with such precision. But when sequencing, slow the tempo way down so that you can concentrate on the

right velocity and duration of every note. When played back at normal speed, your music will have more life and variety than quick program changes will ever give you.

Replace program '23 Choir' in timbre #1 with '03 Ooh/Aah.' Now you have even more velocity control over the color as well as the loudness, because this new program changes from "Ooh" to "Aah" when you increase the attack velocity. But don't try to play and hold more than two notes at a time - there's a price to pay for triggering this many sounds at once, and that price is reduced polyphony. Before you changed this FilmScore Combi, you could play four notes above C4, or two notes below C4, or a combination of two notes on one side and one note on the other side of C4

for a total of three notes. But now that the top key of the second and fourth programs has been raised to G9, two notes is all you get across the whole keyboard range. Check Figure 2 for the modified 'FilmScore' printout.

## Lead Lines

Let's create a Multi Combi for single note synth lead playing. We'll try to make it adaptable to your playing style, from a light and thin quality with light velocity to a fat quality when hit hard. How do you get a fat quality from an otherwise thin sound? Layer it with itself, but detune the two versions against each other. Then beef it up with another similar program or two, also detuned, and add increasing velocity window threshold values to each program so that the harder you hit a key, the more new sounds you add. Finally, pan the individual sounds wider and wider until you get a full bodied stereo sound. The repeats from the digital delay effect and the room reverb will do the rest. The assumption is that you have your M1 connected as follows: output 1 to stereo left, output 2 to stereo right. You don't need outputs 3 or 4 right now.

Look at Figure 3. The first program (timbre #1) has the simplest setup of all, playing even if you just barely touch a key. It is set to respond to any velocity from 1-127 (shown on the line above the MIDI channel). The program is '08 Pan Flute,' sounding at full volume (level=99) in the center of the stereo picture (panning ratio A:B = 5:5). Timbre #2, which is set to program '18 Flute,' comes in when you play with a minimum of velocity=40. It

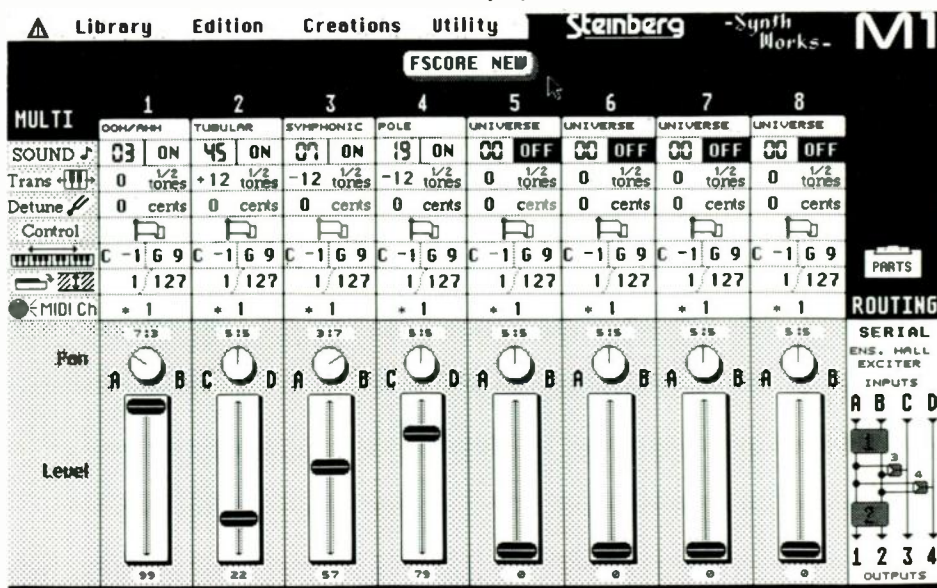


Figure 2. A modified version of the 'FilmScore' patch.



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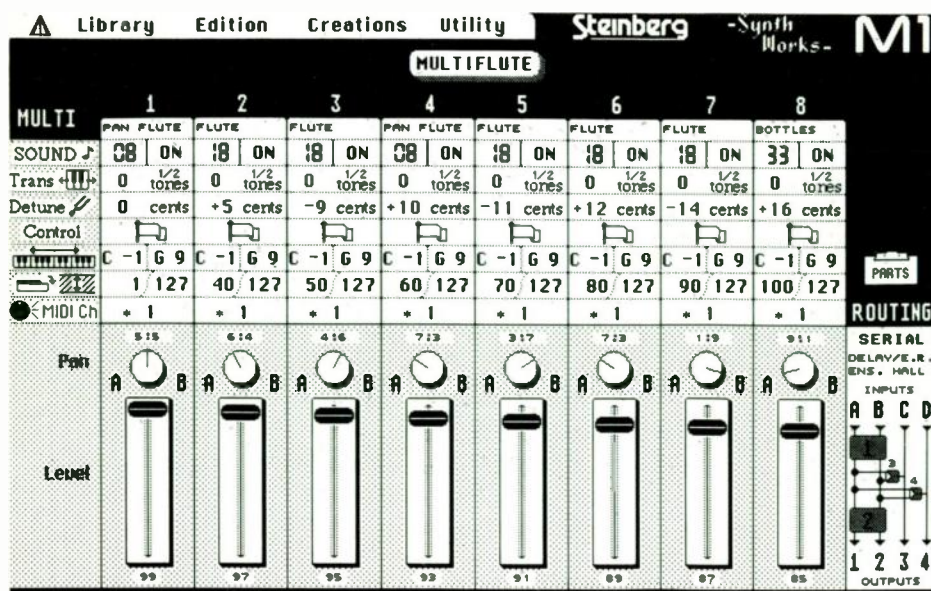


Figure 3. A patch chart for a flute-like lead synth sound.

is detuned slightly sharp (+5 cents, where one cent is 1/100 of a semitone), sounds slightly softer than timbre #1 (level=97), and favors the left stereo side (output ratio A:B is 6:4). Play a little harder (with a minimum of velocity=50), and timbre #3 comes in, playing a slightly flat (detuned to -9) program '18 Flute' at slightly less volume (level=95) and more to the right stereo side (ratio A:B=4:6).

Let's stop right here. These three timbres combine to give you a very nice sound already - test it out by punching the above settings into your M1, leaving timbres 4-8 off on the Program Select screen (Edit Combi press 1). Start from the 'FilmScore' screen and make your alterations, one by one, and change the effects as shown in Figure 4.

When you have a feel for the first three timbres and how they play, look at Figure 3 again. Notice how I assigned the Pan Flute a second time to timbre #4, with a minimum velocity of 60, detuned sharp (+10), panned left, and set to a slightly lower level than the previous timbres. The next three timbres follow the same reasoning, and a very sharp (+16) timbre #8 finishes it off. Why detuned so heavily? Because timbre #8 only plays when you hit the keys extra hard. When a flute is blown extra hard, the pitch tends to go sharp. Listen to Herbie Mann, Jethro Tull, or other improvising non-classical players. Notice also that I introduced the breathy programs ('Pan Flute' and 'Bottles') at the lowest, medium and loudest velocity stages, to simulate the increase in breath noise that you hear from flute players as the

breath pressure increases.

What about the polyphony? Two notes is the maximum when you play hard, and the polyphony increases the softer you play. It makes sense: if you play one single key really hard, you trigger all eight timbres. So you're down to two notes for exceptionally loud musical passages. That's still one more than a real flute can play, and you hardly ever hear flutes in three-part harmony, particularly flutes with a solo character such as this one when played hard. Also note that these programs all play in the same octave, partly because they happen to be individually programmed that way, and partly because I left them at zero semitones transposition while they're active in this Combi.

You can adapt the above Combi to one in which increased velocity brings

in a widening range of sound by selecting and transposing programs at different octaves. Or you can use increased velocity to make the sound wander across the stereo field by using the velocity window top and bottom values in conjunction with the pan settings. And these are just two of many ideas. Like I said earlier - once you start, the programming can become addictive as the instrument feeds you new ideas that you'll want to incorporate in your music.

## Velocity Switches

Now let's explore the one kind of Combi that you won't find among the factory Combis: Velocity Switch. Select factory Combi '01 Pankala,' press Combi Edit and use the up-button to bring up VEL.SW, then press either button G or H to SELECT (confirm) the change from Layer to Velocity Switch. When you press 01, the screen shows you that program '10 PanMallet' is the soft program that plays below a velocity switchpoint (VP) of 63. Let's switch programs. Use the slider and the up/down tabs to set the left (soft) program to '43 Angels,' then press tab F, G, or H and set the right (loud) program to '10 PanMallet.' Play gentle chords in the left hand and energetic melodies in the right, then play hard two-handed rhythmic figures, followed by mellow melodies over rhythmic bass figures. The switching of sounds works like magic. If you're not comfortable with the switching threshold, press tabs D or E to access the VP value and change it with the slider.

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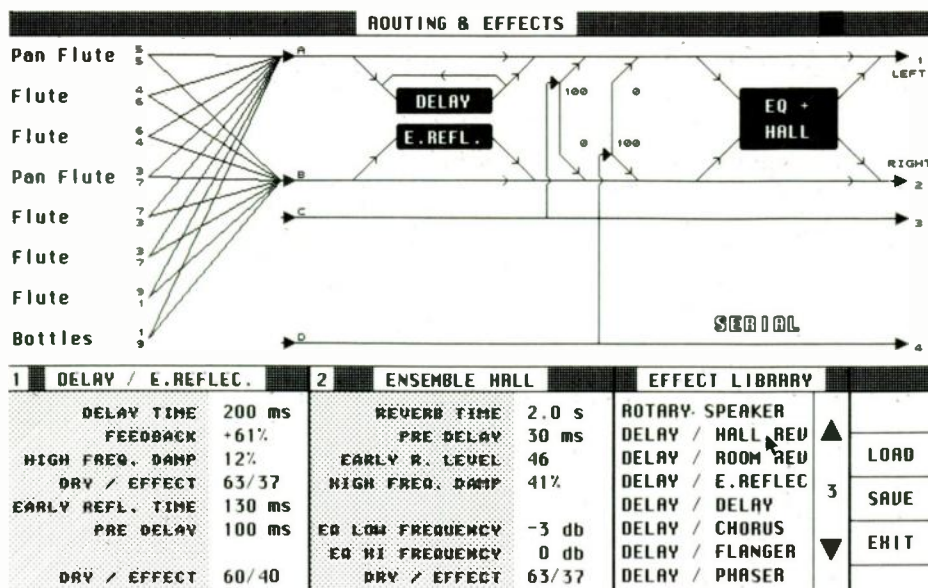


Figure 4. The effects settings for the lead sound.



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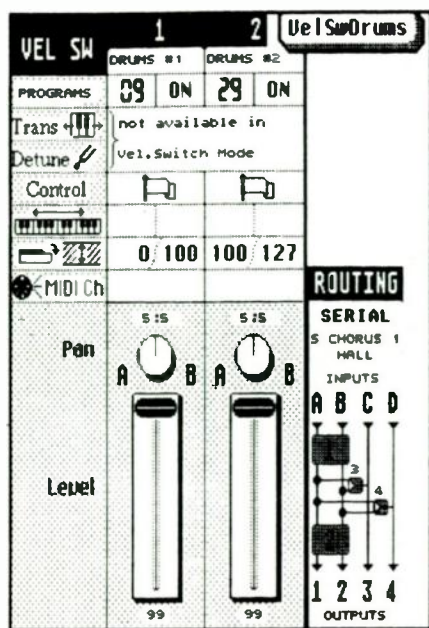


Figure 5. A velocity switched program with two layers of drums.

Just for a laugh, make the soft program '09 Drums #1,' the VP around 100, and the loud program '29 Drums #2' (see Figure 5). Play the same keys hard and soft and listen to the switching sounds. The effects that were right for the previous setup are all wrong now, but I'm sure that you've got the idea about velocity switching. What else could you use it for? Just as with samplers, you could select two related programs of a duller and brighter nature, say two pianos, or horns, and plan it so that the brighter/louder version comes in as you hit the keys above a suitable velocity value. The programming of such brightness and loudness characteristics has to be prepared in Program Edit mode, which I'll go into next month.

## Other Combinations

Check out the factory Combi '39 Bass & Reed' for an example of a Split Combi. Press Combi Edit, then Page +, which displays the screen with the two program names and the split point. Press Page + again to get a more complex screen in which you can adjust the following: the levels for the lower (tab A) and upper (tab E) timbres; the output and panning for the lower (tab B) and upper (tab F) timbres; and the response to the damper (sustain) pedal for the lower (tabs C or D) and upper (tabs G or H) timbre.

In case you're wondering, here's the reason for routing the upper program DoubleReed to C & D. This bypasses the first of the two effect modules in

the serial arrangement (see Figure 6), but it brings the DoubleReed sound back together with the Fretless before they both go through the second effect module for reverb. This applies the fat chorus to the bass only, but both instruments appear to be in the same room with the same reverb characteristics from outputs 1 & 2. If you need the DoubleReed sound separately and dry (unaffected by reverb), get it from output 3 or 4.

The factory Combi '03 Brass 1 & 2' is a typical example of a Layer Combi. No surprises here, just two programs sounding together at every keystroke across the whole range of the instrument, at equal levels and at the same octave. But this wasn't always so. Press Edit Combi, then Page + twice, and look at the right side of the screen. The second program in a Layer Combi can be retuned, to a maximum of  $\pm 12$  semitones (up and down one octave), and in fine steps to a maximum of  $\pm 50$  cents (up and down a quartertone). In this Combi, the second timbre had to be brought down by an octave to match the pitch of the first timbre, since both programs by themselves are an octave apart. Sure, you could retune

but there isn't a single Single to be singled out from among the factory Combis (sorry, I couldn't resist). There isn't much that you can do with a program in Single Combi mode. The program number, the output level, the output panning, and the effects are all that you can adjust. So why would one want to write a program into a Single Combi? Because a Combi takes up very little memory – it doesn't actually store the sound data, just all of the information on how you want that program to behave. So you could have different sounding versions of the same program in various Single Combis, with different effects and output routings, in order to leave more program memory for other sounds, or even more memory for the sequencer. Also, while sequencing, it can be handy to have a program in a Combi if the M1 is set up to respond to incoming program changes by selecting new Combis instead of programs. Let me just say that the word "single," here used for a Single Combi, is also used in Program Edit mode for oscillator assignment.

Until we look at this and plenty more next month (when you'll get a better

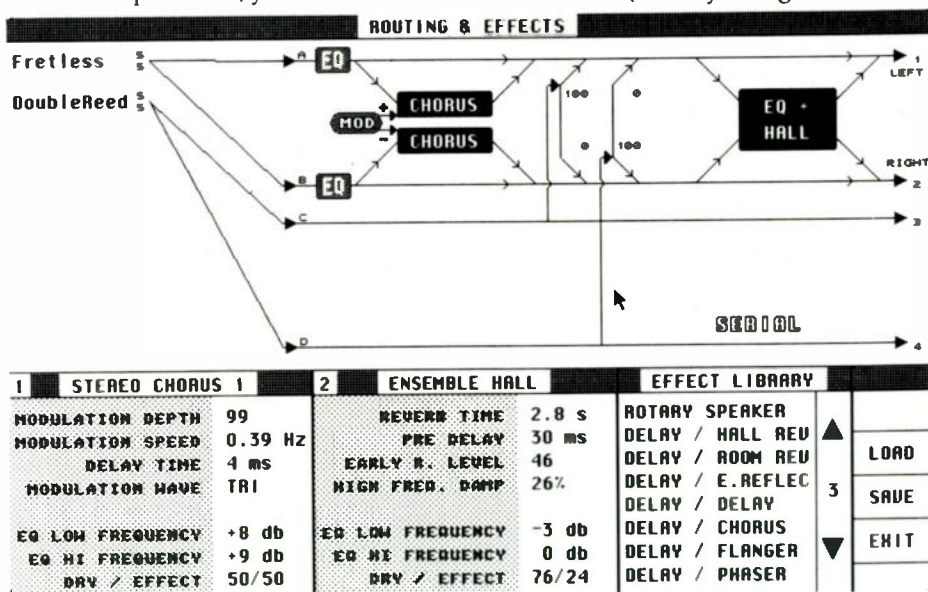


Figure 6. The serial arrangement of effects in the M1.

program '02 Brass 1' permanently to sound an octave lower, but why should you when that would use up another memory location? It makes no sense to store different versions of a program just because of the octave settings, so the Combi parameters can be used to take care of the transposition. I'll show you next month how to permanently retune a program if necessary.

There's also a Single Combi mode (sounds like a contradiction in terms),

idea of the inner workings of individual programs), try to come up with lots of new and fresh ideas for Combis. If you have a blank RAM card or a computer with SysEx storage capacity, store the Combis. If not, write the settings down for future use.

*Footnote: The author would like to thank Steinberg/Jones for the use of the M1 editor/librarian, which helped greatly in the preparation of this article, including the illustrations, and Korg for the use of the M1.*

## MAJOR BREAKTHROUGH IN MUSIC TECHNOLOGY

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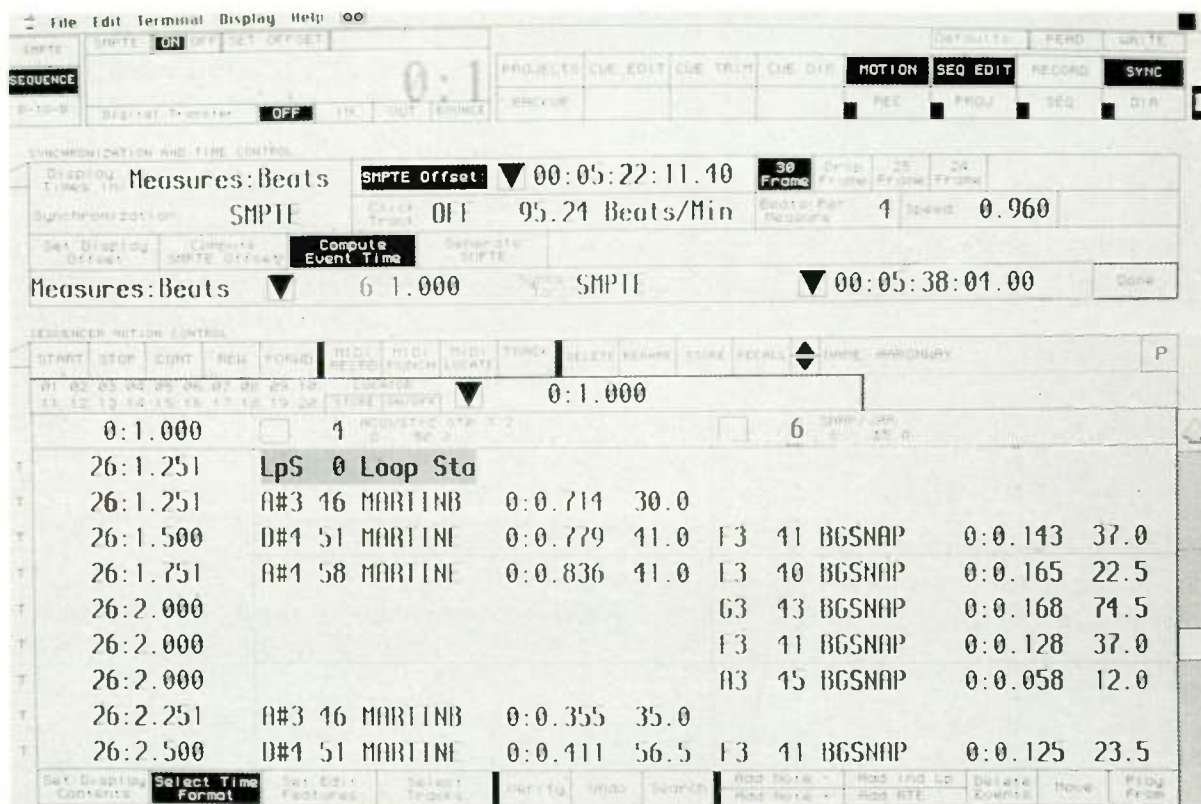
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# THE EMPIRE STRIKES BACK

# THE NEW SYNCLAVIERS EXPLAINED

## part two: sequencing and notation



The Audio Event Editor; note data can be altered to a one millisecond resolution.

Having covered the important hardware options of the system last month, this month the software side of the equation is brought into focus. Sequencing text by Dan Rue; Notation text by Scott Wilkinson.

ONE MIGHT POSTULATE that the marriage of the Synclavier and Macintosh II would beget a Super-Graphic HAL-like sequencer, or perhaps the equivalent of the coveted MIDI-Out-on-your-forehead. At the very least, one might presume that the world's most comprehensive workstation would also include the world's most comprehensive sequencer and notation software. But alas, the reality falls short of these expectations – in some respects. It's not that the Synclavier's sequencer isn't

powerful, because, in fact, it is quite powerful. But it's debatable as to whether or not the sequencer is *pleasurable* (stop snickering, you know what we mean). To be blunt, the Synclavier's sequencing and notation software is *not* extraordinarily intuitive.

In all fairness, the Mac II is a very new addition to the system, and as discussed in last month's segment of this series, "obsolescence" is the dirtiest word in NED's book. As a result, developing a *pleasurable* user-interface without alienating veteran users is

going to take some time. The Macintosh is, at this point, used only as a dumb terminal that displays the user interface, leaving all the work to the Synclavier itself. NED's general plan is to import the user-interface and much of the housekeeping and control chores over to the Mac, freeing up the Synclavier to do more of what it does best, namely making sounds. Additionally, plans for compatibility with third-party Mac software is on the drawing board. So now that we've got the Big Gripe out of the way, let's fly inside the Death Star and get a feel for what it's like composing with the most powerful workstation/sampler on the market.

### The Structure

While significant hardware differences exist between the Synclavier 3200 and ►  
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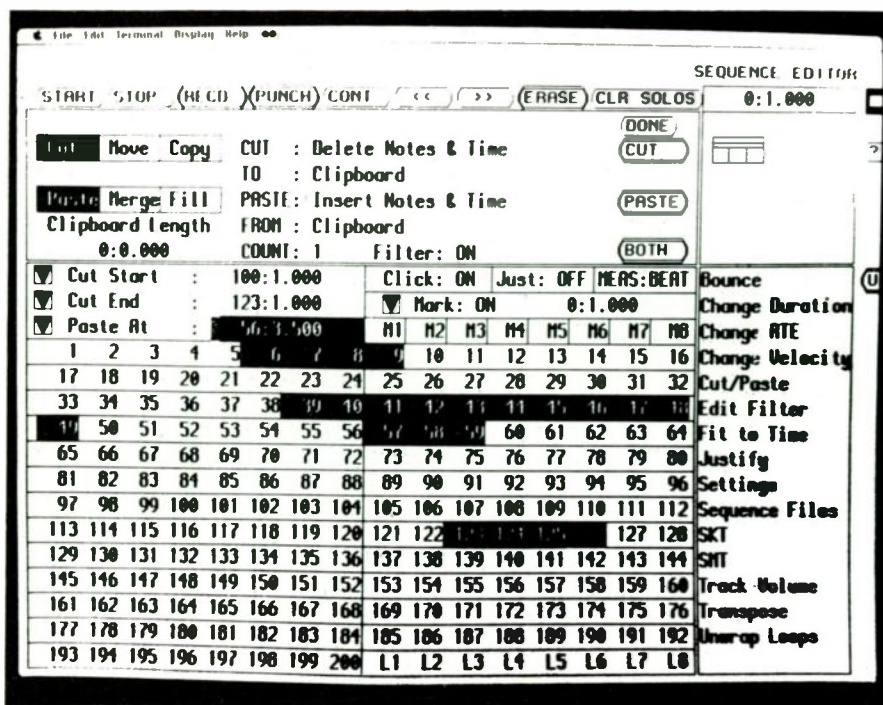


Figure 1. The Sequence Editor; the main sequencing page for both the Synclavier 3200 and 9600 models.

► 9600 models, the software is essentially the same, so the following descriptions apply to both. The amount of memory allocated to the sequencer is truly over-the-top: 200 tracks on which to record, with as many notes as will fit in RAM (the best "guestimate" falls somewhere around eight million notes in a maxed out system). There are eight separate buffers for storing sequence data before committing it to the Winchester drives (greatly increasing the access time and allowing you to try different versions of a sequence).

Needless to say, you are virtually never cramped for memory. On top of that, pointers to all of the timbres you use in your sequences are stored with the actual sequence file and call up the sounds you need along with the note data. While loading a sequence file takes a bit longer than you might expect, the time you save in searching for sounds more than compensates for this extra time at loading.

Once you've loaded a sequence into RAM (or, if you're starting from scratch, chosen and loaded the timbres), you have a couple of ways to record new sequence data. You can control the sequencer from the Synclavier's keyboard front panel (or, for 3200 owners, the software representation of the front panel described last month), or from the Sequence Editor page, called up from the Synclavier's main menu. Two additional pages, the Audio Event List

and the Recorder Display, are used for micro-surgery-type editing, but I'll hold off on those for the moment. Since all of the front panel recording controls are duplicated on the Sequence Editor page (in addition to some further functions), I'll approach the sequencer from there.

### Laying Down Tracks

When you open the Sequence Editor (see Figure 1), you see the motion transport buttons and time display across the top, editing functions at the right, and 200 buttons (the Track Manager Display, numbered 1-200) to enable/disable tracks to record or play. Above the Track Manager are the Locator (Start and End points) and assignable Markers (M1-M8). Finally, above that is the Dialog box in which you actually perform the various editing functions (Cut/Paste is displayed in Figure 1). At the right-most side of the screen are three buttons: at the top is the exit button, followed by the "?" button (calls up the online Help manual), and the "U" button (lets you Undo your last edit).

To record tracks, you simply highlight the tracks (1-200) to be recorded and press the "Recd" button. Recording is done in real time to a click track. While step-time entry is possible (from the Recorder Display page, which I'll explain later), I wouldn't recommend it. This involves dealing with those

hateful (in my opinion) event lists rather than any sort of graphic representation of the notes. Besides, there are enough editing features available to "salvage" just about any real-time performance.

The time display can be shown in several different formats: seconds, minutes, beats (clicks), measures and beats, SMPTE timecode, or feet and frames. To place markers you simply set the correct time to be marked in the window labeled (you guessed it) "Mark" and drag the inverted triangle to any one of the eight buttons M1-M8. Actually, you can assign up to 20 markers throughout your music, but only eight buttons are displayed on this page. To assign and access the others you must be in the Audio Event List.

Once your tracks are laid down and your markers placed, you're ready to edit. To do so, highlight the track numbers you want to work with, and then click on the appropriate function in the right-hand column. Let's take a quick inventory of your options.

### Editing Functions

The sequencer's editing functions should be quite familiar to those of you who have worked with other high-powered computer sequencers – the available options are fairly comprehensive, albeit more or less standard at this point in the development of music technology.

Several of the functions affect the entire selected track: *Bounce* lets you copy all of the notes from one track onto another, *Settings* lets you control the audio and MIDI channel routing for tracks (you can record on all 16 MIDI channels at once), and merging occurs automatically if you're using more than one track per MIDI channel. *SMT* copies a new timbre to a selected track and *SKT* does the exact opposite – it calls a timbre from a track up to the keyboard. *Track Volume* sets the audio volume for each track and *Unwrap Loops* converts a loop's specified repetitions into one long stream of actual data.

The remaining functions work within a specified edit region. Since there's no graphic display of the song, you must select this region with the Locator – quite a drag if you're accustomed to some sort of point-and-click selection method. Needless to say, here's where those markers really become handy (almost necessary).

*Cut/Paste* allows you to copy, paste, move, insert, delete, or merge notes and other data to one of the eight "clip-

boards" or just about any place within the sequence.

*Fit To Time* allows you to compress or expand the time taken by the selected region of the sequence. You have several options here, including "Fit Instantly" (the new tempo takes full effect immediately at your assigned starting point) or "Fit Gradually" (which scales the note-on messages, but not durations). Also, you can choose to scale the durations to coincide with the new note-on times, and decide whether or not the new tempo should be maintained for the rest of the sequence.

*Justify* is NED's term for quantization (sounds like word processing, no?). Justification is set by assigning a "click multiplier" from 4 to 48 per click (remember, things don't necessarily have to be in beats and measures with the Synclavier). From there you specify the percent to justify (1-100%), the size of the justification window, or "range" (-100% to +100%), and the grid offset (-1000msec to +1000msec). As you can see, there's plenty of control here over how much mechanism is injected into your music. I should mention that the Synclavier does not have anything like a "humanize" function whereby you assign a certain amount of randomness to the notes' timing, velocity, or whatnot. But, by carefully specifying the justification percent, window and

grid offset, you can partially quantize and achieve the same effect.

The *Edit Filter* lets you record, ignore or edit any type of data within a specified range. For example, you could split notes on the same track from each other based on definable criteria or enable/disable the recording of Real Time Effects.

*Change Duration*, *Change RTE* (Real Time Effects - aftertouch, pitch-bend, etc.), and *Change Velocity* all do what you'd expect, allowing you to assign flat values, "Add" to the values by a specified amount, "Scale" values by any percent, or "Slope" values gradually.

### Audio Event Editor

Back in the olden days (before light sabres) when the Synclavier came in one size and shape and the Mac II was nowhere to be seen, recording was handled exclusively from the keyboard and the Recording Display. This page displays a single list of events (say, notes or velocities or durations, etc.) for three tracks at a time. While the page still exists on the system for those faithful veteran users, it has for all practical purposes been replaced by the new Audio Event Editor page (see photo at beginning of article).

This is where you perform all of your super-micro-surgery. All recorded data can be listed for each track in

the Audio Event Editor. Because the Synclavier records in real time with a one millisecond resolution, edit parameters are likewise definable within a millisecond. I'm not going to go into the details of this page because essentially no *additional* functions are offered here. Suffice to say that *everything* recorded in the Sequence Editor can be altered minutely here, including note values, start times, velocities, and durations. C-3PO would be proud of the detail you can achieve.

### Music Printing System

As complete and comprehensive as the sequencer is, the new Synclaviers could not justify their reputation as the Death Star of music workstations without offering music transcription and printing capabilities. This software has been developed for several years under the direction of Alan Talbot at NED.

You might expect this software to have a very impressive list of features. And you'd be right. Aside from the quality of the output (which is superb), the system offers a wide range of control over the printed page of music. Unusual or unique capabilities include scores of up to 64 parts and 32,000 pages, transcription of music with tempo changes and irregular tuplets, user-definable notation of syncopation, and justification of the display without affecting the sequence data if you so choose.

Originally designed for the Digital Equipment Corp. VT100 graphics terminal, the software is now displayed on the Mac II screen. Like the sequencing software, the Mac II is used only as a user interface. The software itself runs on NED's custom computer. In fact, the Mac's mouse is used only to select parameters on the screen. It is not used to place musical symbols in the score or even for score cursor control. The user interface is command driven, although there are some menu-driven parameters, particularly in the Edit Mode.

### Entering Music

Music can be entered into the notation software by playing on the Synclavier keyboard (or the digital guitar controller) or issuing commands from the computer keyboard. In addition, sequencer files can also be transcribed. All of these input methods can be used within a single file.

To enter music from the Synclavier keyboard, you would first bring up the Music Notation display. This screen ►  
MUSIC TECHNOLOGY

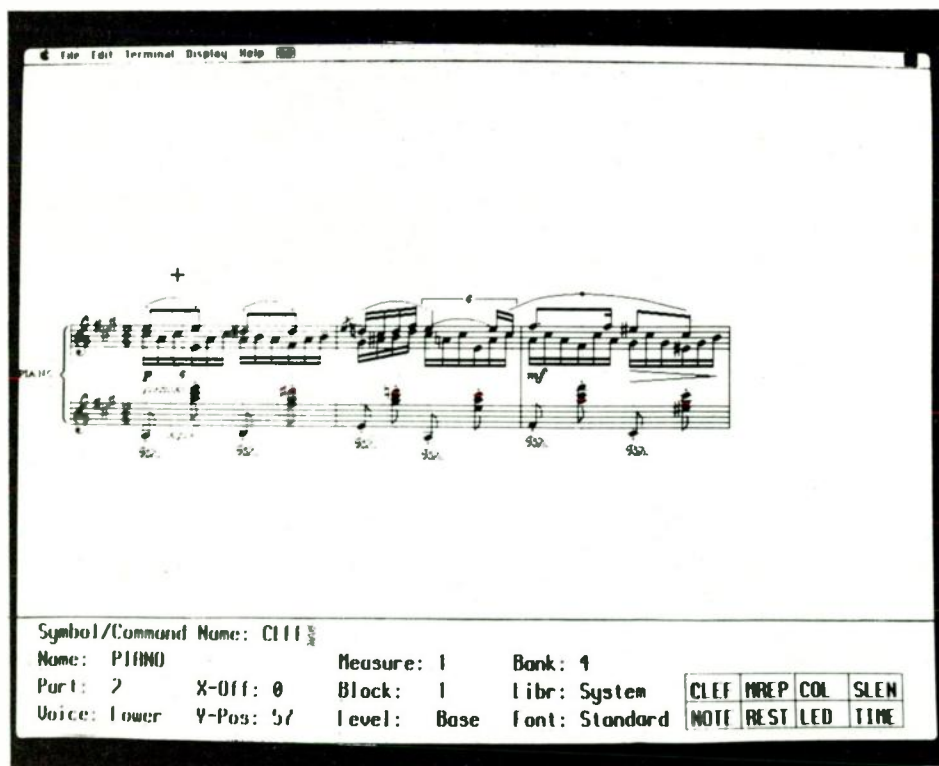


Figure 2. Music Printing Edit Mode; notice the excellent quality of the musical symbols.



► can accommodate up to eight staves at once. The notes you play on the keyboard appear on the screen shortly after you play them. Actually, this is no mean feat – Finale is the only other notation program I know of that even tries to notate a performance in real time. The graphic representation is actually quite crude, but then again, the computer doesn't have much time to draw perfect symbols while trying to notate a real-time performance. This screen is used for real-time entry and rough editing.

Musical symbols can be individually entered into the score from the Music Notation screen or the Edit Mode screen (more on Edit Mode in a moment). The cursor is placed at the desired location and the appropriate command is typed on the computer keyboard.

The transcribed music is visually quantized, or justified with a specified resolution. This resolution determines the number of "edit blocks" into which each bar is divided. For example, if the justification is set to eighth notes, there will be eight edit blocks in a bar of 4/4 time. These blocks are used in Edit Mode to isolate and identify individual musical elements.

## Editing Music

Once music is entered into the notation system, the fine editing is done in Edit Mode (see **Figure 2**). In this mode, the display looks excellent. The symbols are accurately represented on the screen, although you can see only two or three bars at a time.

Many of the commands in Edit Mode are available as single keystrokes on the numeric keypad of the Mac keyboard. The 4, 5, 6, -, 7, 8, 9, and + keys can each invoke six different commands depending on which set of keypad commands is active at the time. The different maps of the commands invoked by these keys are displayed in the lower right portion of the screen by pressing 1, 2, 3, .1, .2, or .3. You can even change the keypad command assignments to suit your own tastes.

Because the score can get a bit crowded at any particular point, it can be difficult to place the cursor at exactly the desired location by sight. The Synclavier solves this problem by providing Edit Lists for each part as well as a Master Edit List. These lists include the names of all symbols located at each edit block and appear in the lower left portion of the Edit Mode screen, replacing the standard para-

meters normally found there. This makes it easy to place the cursor anywhere in an edit block and select the symbol you wish to edit in the edit list.

While the system includes all of the common musical symbols, you can also design your own with the Symbol Editor. This screen presents a large grid representing the pixels of which each symbol is comprised. A smaller window shows you how your symbol looks at its actual size. To create a symbol, you position the drawing cursor with the keypad (which now controls the movement of the drawing cursor up, down, right, left and diagonally) and activate the pixel by pressing keypad 5. Symbols can be stored in a User Symbol Library for use in the rest of the Music Printing system.

I must say that I am quite impressed with the symbol libraries provided with the system. For example, guitar frames (those little representations that appear over the staff in pop lead sheets) can be designed in many ways to accommodate any type of fingering or chord. Unlike many other notation programs, the shape and position of slurs can be controlled to a fine degree. There are even symbols specifically for handbell music!

## Formatting the Score

The format of the score is specified in the Score Menu. This is where you set up the instrument names, bracketing, staff spacing, number of staves per page, and so on. These parameters are represented by rather cryptic symbols, but the degree of control over things like staff spacing, note spacing and part groupings is excellent.

The Part Menu provides more detailed specifications for each individual part. These specifications include clef, transposition and key of the instrument, and the visual resolution. In addition, you can specify whether or not pitch-bend information will be displayed and select one of the three notation modes: Classical, Jazz or Modern. Basically, these notation modes determine how the Synclavier will notate syncopated notes.

The Page Menu is used to specify the overall size of the printed score, how measure numbers will be printed, the number of measures per line, global note spacing and the title and other text that appears on the first page – it even includes a reserved copyright line at the bottom of the first page. This menu also allows you to specify block

rests in parts. If you have five measures of rest in a part, it is much easier to read the part if the section of rests is notated with a thick horizontal line and the number 5 above it rather than five individual measures with whole rests in each one.

## Applications

One of the most attractive features of this system is the quality of the output. The Synclavier outputs PostScript files, so any PostScript device from an Apple LaserWriter to a Linotronic 300 can accept print files from the Music Printing system. The quality of the output from these devices and the excellent formation of the characters and symbols puts this system in the big leagues.

In fact, there is at least one major music publisher using the Synclavier to do most of their music engraving. This includes orchestra, band, choral and lead sheet formats. Believe it or not, this system actually saves them significant money in production costs. Not only that, several of the artists whose music they print have provided Synclavier sequence files to be transcribed directly. How's that for hi-tech?

## The Future

It is unfortunate that the Mac II is used only as a front end at present, because it's so good at graphics and could take this burden from the Synclavier's CPU. The Music Printing system in particular will benefit from the planned transition. Being highly graphical in nature, it would fit easily into the Mac environment. Besides, I find a mouse to be very useful with notation programs.

Basically, the Music Printing system provides excellent quality output and exceptional control over all aspects of music notation. However, like the sequencer, the user interface is not very intuitive and the learning curve is steep. Once this aspect of the software is brought up to date, it will unquestionably become the Death Star of music notation systems.

Next month, we'll look into the Direct-to-Disk recording and synthesis capabilities of the new Synclaviers. Until then, May the Force . . . ■

*The authors would like to thank Sean Callery, Product Specialist at the Los Angeles office of NED for his demonstration of the sequencing and notation capabilities of the Synclavier. We would also like to thank Ted Pine and Alan Talbot at NED's Vermont office for providing a wealth of information on a moment's notice.*





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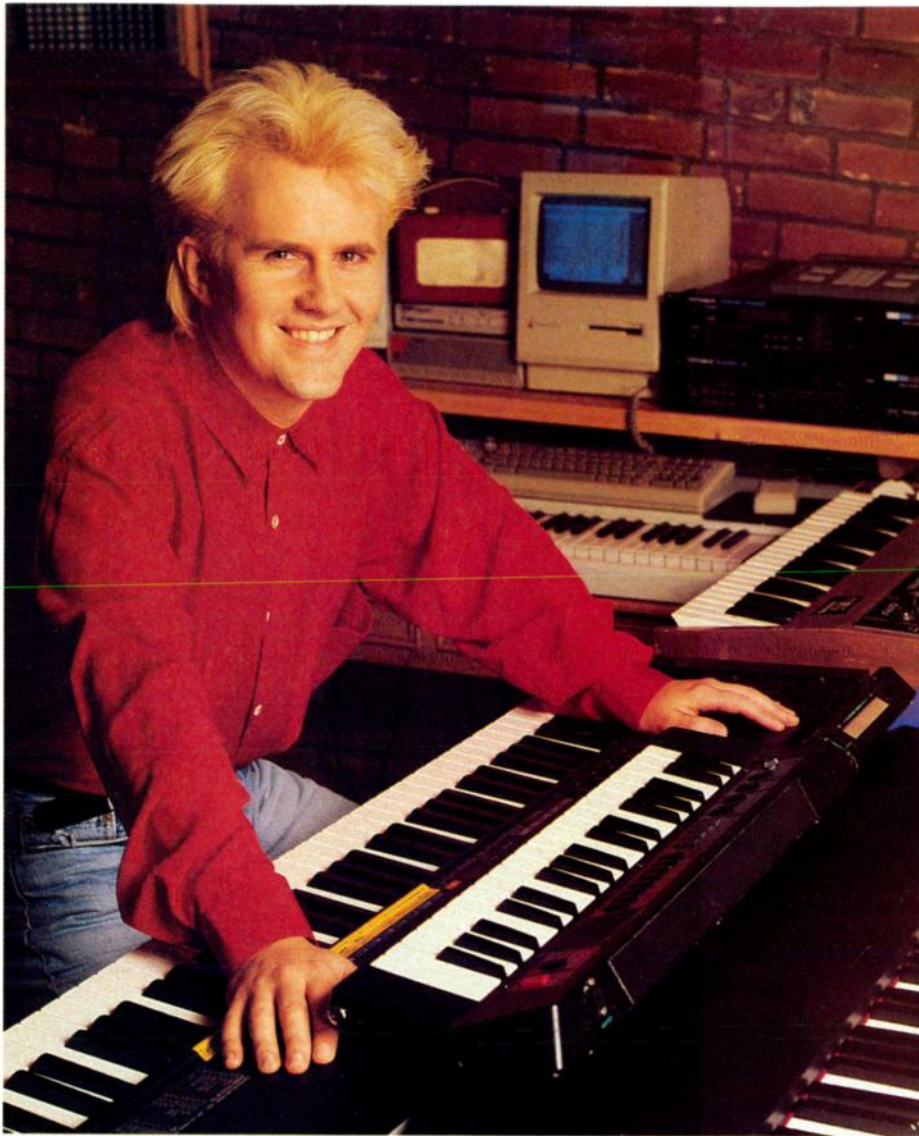
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# HOWARD JONES

## *Crossing the Line*



Photography Simon Fowler

The master of synth-pop is back, combining a variety of musical elements, instruments and feelings into a brand new album.

*Interview by David Ziegler.*

**W**HEN HOWARD JONES released his first album, *Human's Lib*, in 1984, he was literally an overnight success. In the midst of the New Wave of British artists, Jones' hi-tech, all-synth one-man-band act couldn't have been better timed. Coinciding with the rise of MTV, his videos for 'New Song' and 'What Is Love?' received heavy rotation, and he

hit the U.S. pop charts as one of the year's most promising new artists.

He followed through on that promise in 1985 with his second album, *Dream Into Action*. Dropping the one-man format, Jones assembled a full band, including drummer Trevor Morais, his brother Martin on bass guitar, and the backup-vocal trio Afrodisiac. His lyrics focused on unyielding optimism and struck the

Reagan-era right through the heart, bulleting the charts with the hits 'No One Is To Blame,' 'Life In One Day,' and the #1 single 'Things Can Only Get Better.'

Jones' third album, *One To One*, released in 1986, received far less attention, although the first track, 'You Know I Love You (Don't You)' got substantial airplay. Now, after what seems like an eternity, Howard Jones has completed a fourth full album, *Cross That Line*, and the anticipation from his large following of fans is high.

After 18 months in the studio, the final mix of the final song was finished only minutes before Jones, with eyes red-rimmed from fatigue but glowing with satisfaction, picked me up at the train station. "You look like the classic new father," I observed. "How's the baby doing?" A few beats passed as a broad grin spread across his unshaven face: "I'm so excited," he said, triumphantly, "I think it's my best work ever."

The site of Jones' creative hermitage is the town of Maidenhead, located an hour outside of London by rail. It's one of the "ring" towns - a pleasant suburban community with just the right balance of country isolation and city stimulus. On the way to his house, we passed a shopping mall, several sheep grazing in a meadow, a flash music store and a traditional eel pie restaurant, all on the same road. "Nice town," I told him later. "I rarely venture into it," he answered.

The reason becomes obvious as soon as we pull into Jones' driveway. He has his living situation right, too. Instead of a mansion, Jones' digs are the working end of an old estate - a medieval manor house's stables, courtyard and walled Victorian garden. Practical, beautiful and serene. "The studio's in the old cow barn, and the kitchen's the piggery," he quips. "C'mon, let's take a tour . . . or would you rather eat first?" He even has his priorities right, I think to myself.

Over a meatless lunch (Jones is a vegetarian), I'm introduced to his wife Jan, their exuberant son Osheen, and his brother/bassist Martin. Topics of conversation bounce from acid house ("It's Synth-Punk! It has that same late seventies feel!") to the sad news of Roy Orbison's death the day before. After that promised tour of the grounds, we adjourned to the studio for coffee and playbacks of several of Jones' new tunes.



**David Ziegler (MT):** *When the urge to write hits you, the first instrument you reach for is...*

**Howard Jones (HJ):** "... an acoustic piano, at least for the more ballad-y type things. 'Last Supper' was done on a piano, with the rest composed 'at the equipment.' The more abstract ideas don't necessarily start off with a set of chord changes, anyway. Songs grow out of grooves or from experimental sounds or anything and everything all thrown together. 'Those Who Move Clouds' came out of mucking about with a Yamaha KX5 strap-on. It's actually a great instrument and I'd gotten quite used to it from playing it live for two or three years. I see it differently than a 'keyboard' because you're using only the right hand. The left hand is more for manipulating the sound with pitch-bend, modulation and sustain, so you're much more inclined to write single line and arpeggiated parts. That's what I did - I recorded my jamming into Performer, then just chopped it up into the form that became that song. That was another way I never worked before - using Performer as a real-time compositional tool, as a 'tape recorder.' I didn't quantize my playing as it went in, and its resolution [480 clocks per quarter note] is such that what came back was almost perfect. There's a slight discrepancy - a shifting - but to be honest, I'm not really sure I hear it!"

**MT:** *Who's the metalhead guitarist on 'The Prisoner'?*

**HJ:** "Me! That 'guitar' is a D50 preset sound stuck through a lot of horrible amplifiers - a Marshall plus several others, some extra cabinets, and then everything was all miked up. We recorded it at a slow varispeed setting, because when played back at normal speed, it sits in the track better. This trick seems to bring out the midrange punch. And the jet-pack is a sample of a million jet airplanes roaring all over the place.

**MT:** *How did 'Powerhouse' come together?*

**HJ:** "'Powerhouse' started life as a straight R&B tune about 18 months ago. One day, I went 'round to the record company to play them what I'd done, but I wasn't going to play 'Powerhouse' because I wasn't sure about it as a song, wasn't sure it should be on the album at all. Finally, I played it for Rob Dickenson [the head of Warner-Elektra-Asylum in the UK], and he suggested that I put a house-type bass part on it and change the feel completely. He hummed me an idea,

and I could hear it working in my head, so I moved more towards that direction. The result was lots of fun, and really enjoyable. Then we got a guy named Danny Dee, the hottest acid house D.J. in the country right now, to mix it. I think it's really great - it's really contemporary, yet it's still a 'song' in the Howard Jones sense. I still don't know whether it fits on the album, but I like doing lots of different things."

**MT:** *It's another aspect of the current English pop cultural environment.*

**HJ:** "Right. One of the things I wanted this record to be was a record of all the things that happened to me during the

*"The more abstract ideas don't necessarily start off with a set of chord changes. Songs grow out of grooves or from experimental sounds or anything and everything all thrown together."*

last 18 months, to reflect the musical and social issues that circulated all around me."

**MT:** *Dear Diary...*?

**HJ:** "Exactly. It really is a diary, this one. And if I think that way, I find that it's easier to come up with material, because there's no separation between song ideas and my other daily concerns."

**MT:** *What song went through the greatest number of mutations?*

**HJ:** "'Powerhouse.' It went through 20 or more different versions."

**MT:** *Maybe if it hits...*

**HJ:** "Oh, yes! We could do an LP of all the versions!"

**MT:** *Glad to see you still have a sense of humor after 18 months. That's a long haul.*

**HJ:** "That's just how long it took - not because of trouble, but because of a desire to keep the quality level high. Lots of stuff took months to do, but then was eventually thrown out. That's okay; what's there now, I love. I tried all types of new things, too. 'Cross That Line,' for example, is almost a Little Feat-New Orleans kind of shuffle-strut."

**MT:** *Is side two a whole suite?*

**HJ:** "It's the more introspective side, with the more 'music picture'-type pieces. I'm very grateful to Rupert Hine [producer on *Dream Into Action*] for encouraging that. He was always thinking in terms of movies and sound pictures that start from a song's basic theme."

"Have you ever heard of Lovelock's book on the Gaia hypothesis? [James Lovelock, *Gaia: A New Look At Life On Earth*, Oxford University Press, 1987.]

'Guardians of The Breath' is about that. It's such an obvious theory - that the whole planet is one organism that regulates itself, and responds to attack or invasion. One of his key points is that the earth takes action fairly quickly, and that the higher organisms won't survive the changes. Lower organisms can mutate and adapt in one or two generations, but not us... we can't handle extreme changes of climate.

"With 'Guardians of The Breath,' I wanted to represent the idea of Gaia musically, so I thought the best way to do it was to create the impression of being inside a large body, inside a

living, breathing, moving thing. I sampled all sorts of my body's sounds, like skin being rubbed, and finger nails tapping on teeth, hair being stroked, etc. The bass drum and snare are hand sounds, detuned and tuned up respectively. And there's swallowing and breathing, too. Then I sequenced all that and wound up with an amalgamation of slurping and sloshing-about rhythms!

"I also sort of nicked Stockhausen's 'Stimmung' idea of going through all the vowel sounds so the harmonics were created from voices. I sampled all the different semitones in an octave - great long loops of them - so that when they were combined, they were all out of phase with each other and produced beats and sweeps. Then I played chords with that. It took a whole day to do it, but it was totally worth it."

**MT:** *I see you're already rehearsing for a tour to support 'Cross That Line.' What will be in your stage rig?*

**HJ:** "My master controller will be a Yamaha KX88, which I love, and I'll definitely have a Roland D50. I've been toying with the idea of taking my Hammond C3. It feels so good, but I don't know if my roadie would appreciate it. Maybe we could saw it in half! Our keyboard technician has suggested something he's used successfully with another band: put a D50 and a D550 through this custom-built pedal that speeds up the spinning horn in a Leslie cabinet. I'm going to try that setup soon and see if it's Hammond-y enough.

"There'll also be an Emulator ►  
MUSIC TECHNOLOGY



## A HyperCard Hand

"When Howard was working with Chris Hughes, Ross Cullum, Ian Stanley and myself, we came up with many programs for use in the studio," explains Howard's engineer, Mike Roarty. "We used HyperCard for everything from calculating off-sets to Fairlight databases to mini-editors."

"We've contacted Apple UK a number of times, and they've been assisting us with these projects. We first wanted to send operating system commands to the Fairlight from the Mac II and we needed some terminal emulation commands for HyperCard to do that. Then we set up a stack that could send OS9 commands to the Fairlight, for instance, to list directories and to retrieve files from a tape streamer. We're always thinking of new things to do with HyperCard."

"Interestingly, while devising an editor,

we discovered a bug in the Roland JX10. Basically, a sound in the JX is made up of two tones – Tone A and Tone B – and any parameter can be changed in each of the tones. When I wrote a custom JX editor, I discovered that when you send a SysEx MIDI message to alter these parameters, the 'Alter Tone B' message didn't work. What happened was that Tone A was altered. I contacted Roland, and they admitted that there was a problem, although they hadn't noticed it before. They set about to fix it and came back to me with a new chip, but that didn't fix it properly either . . . they only fixed half of it. I'm still waiting for them to correct the errors that are still there within the software of the JX itself. At the moment, I have something that works only 50%." ■

► II+HD. It's road-worthy and solid, and it can call up sounds with MIDI. And since it's companded eight-bit, it's fast, and the hard disk is very economical with memory space. You can get tons of sounds on there, great big long samples, if you need them. With the Emulator III – because it's 16-bit sampling – you can't get much on it. Anyway, the EII's good enough for live.

"My stage/rack system also includes a JX, a Super JX, a TX816, a D550, and a Roland digital piano which I quite like. Then there's a Mac II that'll set up all the patches, and will also provide the sequenced lines and the click for (drummer) Trevor Morais if we're doing a number that's sequencer-based."

MT: You mix everything with a Yamaha DMP7 mixer?

HJ: "Yes, and because it's MIDI we can have a setup change for each song. DMP7s are marvelous. Every time you tweak it to improve the balance, none of your work's ever wasted. It just piles up and you get better and better mixes as you go along."

MT: Aren't they a little noisy, though?

HJ: "I don't think I'd use it for recording, but it's not a problem for live work. There's so much noise in a big P.A., anyway."

MT: Are those Rockmans?

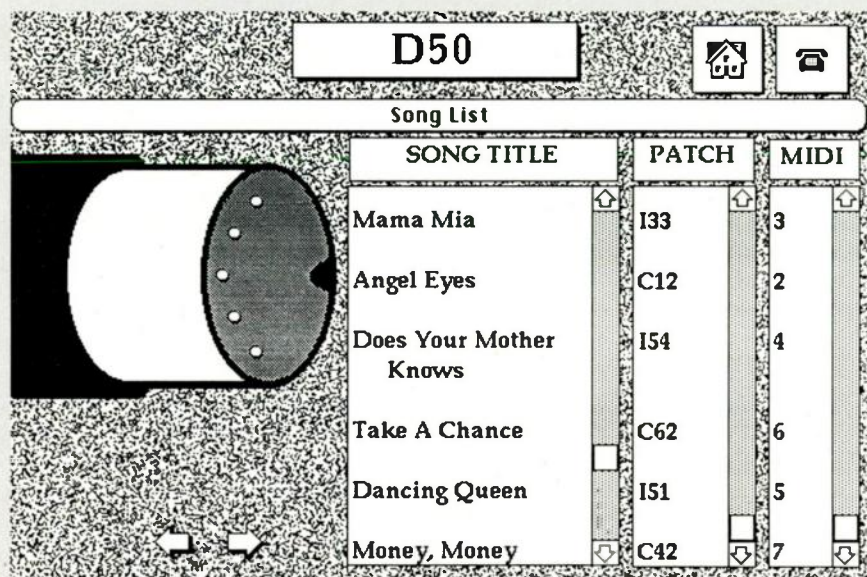
HJ: "Sort of. They're two rack-mounted Scholz Stereo Chorus/Delays. I get my guitar sounds from the TX816 and a D50, and they're great for that fat, crunchy tone."

MT: Your gear looks road-worthy, but are you? I mean, I would think that you'd hate to leave Maidenhead.

HJ: "It can be rather soul-destroying sometimes . . . whipping myself up into that state of high energy that I think the audience deserves. But there's plenty of good things about it. You play and sing every night, and that exercises the body instrument. And you see the people who like what you do. That's so important. I'd never see 'em if I was in here all my life."

MT: We've talked about the Yamaha KX5 and the Hammond organ . . . Is there a piece of new gear that you're burning to run out and buy?

HJ: "It's not that I'm going back to old instruments, it's that I'm getting them MIDI'd. My Minimoog was done a while ago, and I just had my favorite drum machine of all time – a Roland TR808 that I used back in my one-man show days – retrofitted. I want to do that to all my favorite synths – my



A typical "card" from Apple's Hypercard program.

FOR THE UNINITIATED, Apple's HyperCard (reviewed in MT November '87) is a personal software toolkit that gives Macintosh computer users the power to customize, create and manage information using text, graphics, sound, music, voice and animation. HyperCard includes HyperTalk, an English-based programming language that provides users with the ability to design and write their own software.

HyperCard uses as its metaphor a nearly-universal method for storing information: the index card. Text, graphics and sounds are stored on cards that appear on the Macintosh screen (see diagram). A group of these cards is called a "stack." You can make notes, type or draw on them just as you might on paper index cards. You can sort cards, browse among them, or quickly find specific information by pointing and clicking on "buttons."

Buttons do specific tasks, such as linking or connecting one card to another. Buttons can also do many other things, such as dialing a phone, printing a report – even launching other applications.

HyperMIDI, a shareware stack written by Nigel Redmon, contains a toolkit of XCMDs (commands that are extensions to HyperCard) that allows the implementation of MIDI communications to and from HyperCard. HyperMIDI is available from online telecommunication services such as CompuServe and PAN, or direct for \$35 from: EarLevel Engineering, 21810 Barbara Street, Torrance, CA 90503. For more on using HyperMIDI, see "HyperMIDI Programming" in MT February and March/April '89. ■



Jupiter 8 and Juno 60 – get 'em off the shelf and back on line. Rather than acquiring new gear, I want to use them in combination with the D50 and the Fairlight, and mold and shape superb sounds that'll do the job. It's an area that one can spend forever on."

**MT:** *Everything you've played me sounds extraordinarily well-crafted. Did you engineer it, too?*

**HJ:** "Heavens, no! My friend Mike Roarty did all the engineering. He's also a whiz at the Fairlight and all the keyboards. Mike is wonderfully technically minded. He's a HyperCard fanatic too, and his latest thing is an editor for the Super JX [see sidebar, "A HyperCard Hand"]. He's my 'other half' and loves doing things at that level, whereas I don't like to get too far into the technical side because I find myself thinking less about the musical side. I lose the big picture. I don't know what every button does on everything by heart. I often consult my manuals, and I'll ask Mike's help in getting a sound that I can only describe. As much as I love technology, I most enjoy pursuing my compositional interests.

"I met Trevor Horn on an airplane once. He told me that he didn't even know how to work a Fairlight, and wasn't interested in learning either! By taking a naive approach, he could work from his concepts and wasn't limited by what had been done before. Also, when you know how long something is going to take, it puts you off doing it. So I'd rather *not* know how long it might take to achieve a specific result. I'll just say, 'we really need sound 'x' or 'y' for this song,' and if it takes two days, well, it takes two days." **MT:** *MIDI has allowed you to be the writer, arranger, player – and now, your own producer. Would you produce Howard Jones again?*

**HJ:** "Ha! I don't know. I think I'd like to work with a few other people on the next record. Doing it yourself gets a bit claustrophobic, but in a way, that's good, because a project becomes very personal . . . what you think, what you feel, and the way you do it. Ideas don't go through the filters of other people's minds."

**MT:** *Writing and playing complex, orchestrated music can now be a personal, 'solo,' art form, like oil painting . . .*

**HJ:** "And that's what I do like about it. When I work with other people, I'm not terribly pushy about getting my own way, because the reason to work with others is for their input and to learn their way of doing things. It's the

same with listening to other people's records. Do you know Scott Johnson's work? I absolutely love his stuff. His sampling techniques and the way he uses them are very sophisticated. He starts with conversational loops – just everyday speech patterns – then with tremendously good timing, he picks out the notes and builds whole compositions around them. I love it! I love it! I see that Steve Reich is using a bit of that idea in his latest stuff, in *Two Trains*. There's some great thing's going on."

**MT:** *Are you outgrowing pop music, then?*

**HJ:** "No! Never! I just like to be aware of what people 'on the edge' are doing. It inspires and excites me. Whatever

sort of music you choose to be in – it could be unaccompanied tin whistle music – there's no end to the amount of sophistication you could bring to it. It almost becomes irrelevant as to which field you're working in. I don't regard pop music as this kind of simplistic area, because you can bring all sorts of interesting things into the form, and that's what I enjoy doing. That's what all this sampling and synth equipment is *made* for. It's built for experimentation and incorporation, not just for playing a thousand variations of a big snare drum. The gear is expanding the acceptability of new sounds, and I intend to take full advantage of this potential." ■

## Howard's Home Studio

In these days of escalating studio costs, when artists need to go platinum in order to cover expenses, many musicians are going the DIY route. Howard Jones has beaten the battle of studio debts and deadlines by building a nifty recording environment in his home. The following is a conversation about his music palace and how he uses it to get down to business.

**MT:** *No wonder you never go into town . . . this place is stunning! Who designed your studio?*

**HJ:** "We did it ourselves, rather than hire some great acoustic designer. The rooms sound very good, especially the control room, and they're completely sound-proofed and 'sonically correct,' with all the right materials. There's a small vocal/brass room that has a crisp snap to it that's also very good for sampling, and a big rehearsal room down the way that's stone and wood for live drums. And the entire complex is wired up for mics and MIDI straight into the Mac II, the SSL 4000E and the Studer A800. The only problem is the distance between the big room and the control room. If it's raining, our drummer gets pissed off about having to walk back and forth."

**MT:** *You have analog tape machines as opposed to digital ones. Is this because you prefer analog's warm distortion?*

**HJ:** "We went analog, frankly, because of the cost. In terms of sound preference, I can't really say for sure because I've never used a digital multitrack. If I *was* going to go digital, I'd like to have a Direct-To-Disk system like the Synclavier. Not only can it record with fantastic quality, but I'd also

have access to its sound manipulation potential – time compression, for instance – as well as being able to shift whole chunks of live playing or sequenced playing around. Plus, the internal timing of the Synclavier's sequencer aligns perfectly, which is something we can only achieve now by constantly offsetting each individual part. Even with our Fairlight (a 'stock' Series III), by the time a 16-part song written on the RS page gets bounced down to three or four tracks, it's no longer clean – the parts don't hit exactly on the beginning of the bar."

**MT:** *So what are you running on the Mac II?*

**HJ:** "I've done nearly the whole album with Mark Of The Unicorn's Performer (v2.3). It's fantastic. Once you get to know it, you can do everything with it. I've used Composer, as well, when we wanted to have brass parts written out."

**MT:** *How did you compose and demo the Cross That Line project?*

**HJ:** "This album was different from anything I've done before, because I was composing and recording at the same time. Before, I'd demo things and fall into the old 'demo syndrome.' When I'd come 'round to do it 'properly,' I'd lose the basic excitement that was there in the first place. By having the luxury of my own studio, where I didn't have the usual time or money constraints, I was able to try doing both simultaneously. I still had to work fairly quickly, though, because if you labor over a song, you'll lose the excitement anyway."

"'The Prisoner' and 'Everlasting Love' were redone with Chris Hughes, Ross Cullum and Ian Stanley (of Tears For Fears fame), so my originals were sort of their demos. The songs had already been worked out, so what we did was take every constituent part, give it a glorious sound, and refine each detail." ■



► tremely useful for syncing music to film – if your cue is a second too long, just let Vision compress it by the appropriate amount – but it's also a fascinating musical tool. Look up "mensuration canon" in the nearest music dictionary. Time reversal is also available in order to play the selected section backwards.

Note velocities, durations, and controller values can be set to a fixed value, scaled by a percentage, offset by a fixed value, clipped to a minimum and/or maximum, or randomized within a user-specified range. Durations can be "legato-ized," which moves all note-offs to coincide with the next note-on. A repeat-paste function lets you copy selected data any number of times with one action. I've often wished for this in other sequencers. Good work, Opcode.

That's just some of what you can do to whole groups of events. So how do you specify a group? You can just draw a box around it on the graphic screen, or select a start and end time with the mouse, but there are many more options. The full set of criteria for event selection is somewhat dizzying, so let's take notes. You can select a group of notes bracketed by times (bars or beats), or by certain types of events. You can select notes within these brackets according to their note numbers, velocities, release velocities, and durations. A note can be selected if it matches a fixed value or falls within a range of values you specify – or, optionally, if it doesn't match the value or fall within the range. Once the selection is made, any group-edit function (quantization, transposition, time scaling, etc.) will operate only on the selected notes.

And that's just notes. Any other MIDI message (pitch-bend, aftertouch, controllers) can be selected with the same

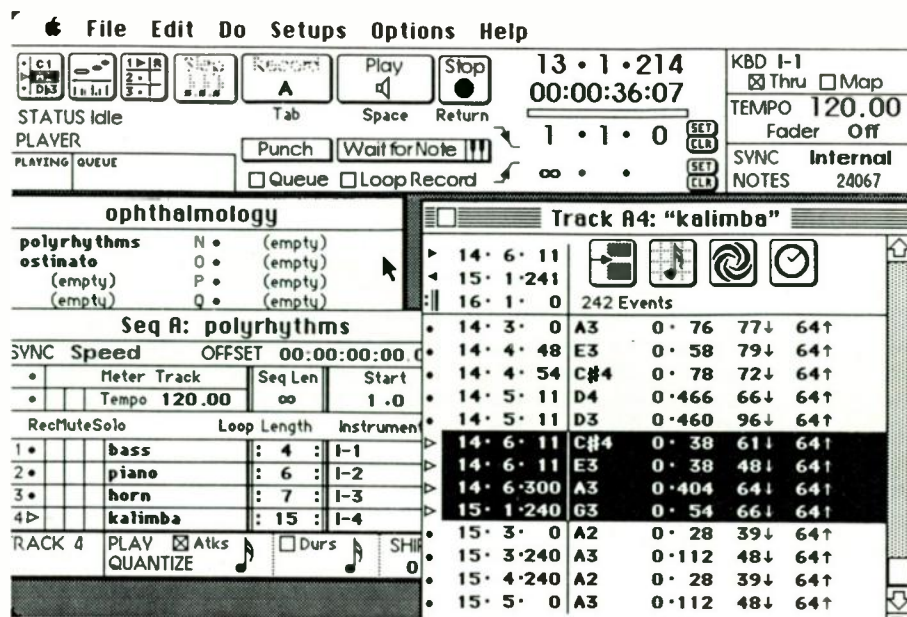
**Algorithmic Variations** *"You can extract the rhythm and/or the melody of a track and use them in what Opcode calls a 'generated sequence' – a little window that allows 'M'-like algorithmic variations."*

detail. Moreover, you can define your selection brackets (the events in time between which the selection is made) in equal detail. You can further restrict the selection to operate on a particular instrument.

It may seem like overkill, but when you have several thousand MIDI events in a file, and you have to isolate some of them for editing, every available tool helps. Say you've changed your drum kit, and every A#4 has to be changed to F4 on the drum track only. Or maybe you've changed the mix on a tricky velocity-crossfaded sample, and you

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The list editor.

need to alter all velocities between 38 and 64 in the middle C octave only on two tracks. Opcode is to be applauded for not trying to second-guess what the "important" musical relationships are.

You can select as many discontinuous notes as you want, one at a time or added to a group selection by shift-clicking on each. If you move to the list window, only those notes selected are highlighted. Very convenient. Finally, Vision records and plays System Exclusive MIDI data. You can edit this data in hexadecimal format only.

### Goodies

So after you've recorded and edited your tracks, are you done? No need to stop there. You can extract the rhythm and/or the melody of a track and use them in what Opcode calls a "generated sequence" – a little window that

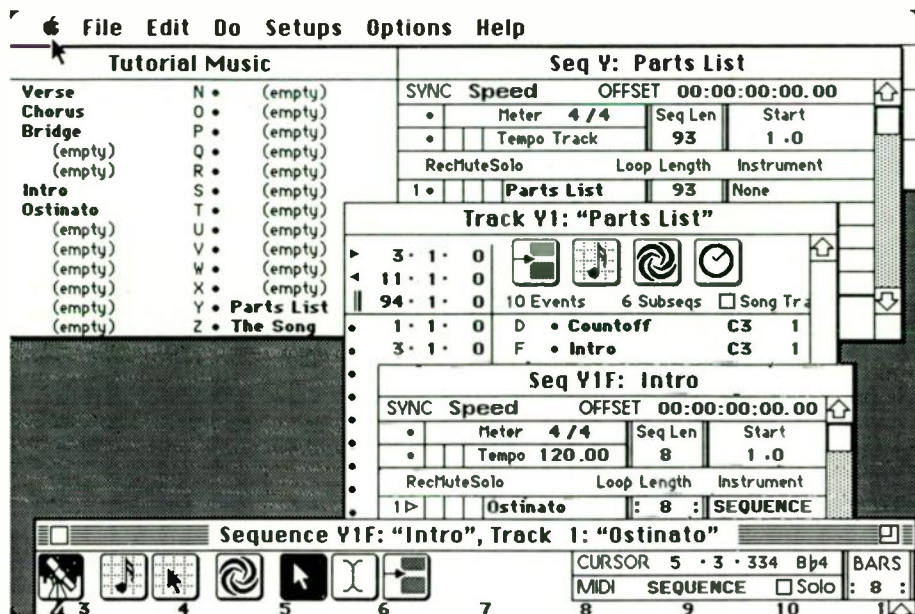
allows "M"-like algorithmic variations (forward, backward, note-alternating, and random) on the melodic/rhythmic elements in various combinations. There's too much here to explain briefly. Let's just say I had a lot of fun with this feature. If you don't want to leave the final result to chance, you can capture all the notes of the generated sequence to a separate track for precise editing.

Here's something *très* hip: 32 on-screen faders (only 20 on the smaller-screen Mac Plus & SE) are available for your mixing pleasure. Each one can be

used to fade the MIDI velocity of an instrument or to send a MIDI continuous controller message on a specific instrument. One fader can also be assigned to control overall tempo. You can move these while music is playing with the mouse or remotely from any external MIDI controller. You can remap any MIDI controller input to any other MIDI controller output (so you could use your mod wheel to control pan position, for instance). In addition, you can record and edit all your moves, giving you automated mixdown via MIDI volume changes. However, velocity-fade moves are not recorded.

I mentioned notation earlier. Vision will read or write files directly in Professional Composer or Deluxe Music Construction Set (DMCS) Format, as well as Standard MIDI File format. Yes, I said read or write. So you can write a piece using standard notation in Composer or DMCS, and play it through Vision, or record it in Vision and print it with Composer or DMCS. I think that a lot of Composer/Performer users who got tired of Mark Of The Unicorn dragging their feet to support MIDI Files (Performer 2.41 does support MIDI Files, at last) are going to be very happy that the Composer/Performer relationship is no longer monogamous.

As far as documentation is concerned, give the manual a "B" and the tutorial an "A-minus." By all means work through the whole tutorial, lengthy though it is. There are many sides to Vision, and you're liable to miss some if you don't take the complete guided tour. Some manual sections are a bit disorganized,



Vision's hierarchical architecture: file, sequence, track, and subsequence.

and there's too much reliance on cross-referencing, but the information's all there.

### Studio 3

Studio 3 is a one-unit rack-mount MIDI interface and SMPTE-to-MIDI converter supported by Vision. Vision will run with any generic MIDI interface, but there are some distinct advantages to linking it up with Studio 3: SMPTE and MIDI Time Code, for example. Studio 3 uses both the modem and printer ports of the Mac independently, permitting up to 32 virtual MIDI channels. There are six separate, configurable MIDI Outs. In its "direct-time lock" mode, Studio 3 can be used with MOTU's Performer. "Jam sync" enables Studio 3 to regenerate fresh SMPTE code from a weak tape.

Very enticing is a switch labeled "audio in." Opcode promises that a future version of Vision will be able to sync to external audio, meaning that you can drive the sequencer's tempo from a live or taped performance. But it's not happening yet.

### Glitches and Wishes

For version 1.0 of a program, Vision is remarkably solid. It hung up on me just once, when I pushed its timing to the limit by playing 16 simultaneous tracks of continuous 32nd notes. Vision kept cranking out the notes, but the keyboard and mouse went to sleep, and I had to reboot the Mac. I also got a "you are running dangerously low on memory" message while working on a 140K file, but then I found that you can set the number of "maximum playable tracks"

from the default of 144 down to 32 in order to free up some memory.

There are a few minor inconsistencies in the user interface, such as the "jump to selection" command not working in both edit windows at once. If you select a note, "jump" to it in the graphics window, and switch to the list window, you're not at the note you jumped to. You have to "jump" in the list window separately. And you have to remember that "select all" doesn't clear the selection criteria. (Good thing, too. Otherwise you could accidentally wipe out a few minute's worth of setup work.) So if your mogrify commands aren't mogrifying as expected, look at your selection criteria.

There's no way to turn one type of controller into another after recording. You can't even cut the data from one

**Note Selection** *"The full set of criteria for event selection is somewhat dizzying. A note will be selected if it matches a fixed value or falls within a range of values you specify – or, optionally, if it doesn't match the value or fall within the range."*

controller type and paste it to another. You *can* remap them during recording using the faders; you just can't change your mind after you're done.

The architecture isn't as open as it could be. I wondered why there are 9 players and 26 sequences. The answer is that 9 numerals and 26 letters are used to trigger them from the Mac keyboard. I think it's kind of dumb to hard-wire functional limitations to the number of available keys. True, these limits are more than enough for conventional songs, but they do sell short the full potential of the sequence-calling meta-

phor. Opcode has simply decided that a sequence is a fairly complicated unit (with up to 99 tracks), not many of which (26 maximum) are needed to make up a piece of music. In reality, it could just as easily be the other way around – in my own music it usually is. I seldom have use for anywhere near 99 tracks, but I often need more than 26 sequences, and I don't care whether I can trigger them from the Mac keyboard. Finally, you're warned not to play more than 16 sequences simultaneously if you have less than two megabytes of memory.

Last gripe: Vision is copy-protected. You can install it on your hard disk, which makes efficient backups and optimization difficult by requiring that you uninstall the program before under-taking these chores. You can also insert the master floppy when you start the program. Most Mac sequencers are like this, more's the pity. At least with Vision you can quit the program and come back to it without inserting the master disk again, as long as you don't turn off your Mac.

### Conclusions

Overall, Vision is a winner. It's the most complete sequencer I've seen yet. It sets new standards in power, versatility, and friendliness for the next generation of Mac sequencers. It's not so revolutionary that it's going to take over the Mac market overnight, but it certainly ups the ante for all the other guys. In the too-short time I've spent with Vision, it proved convenient, capable, reliable, and, above all, rich.

Richness is not something I'm accustomed to finding in a sequencer. More often I feel that I've been put in a small

dark room with sharp objects and trapdoors underfoot. The learning curve is usually like being forced to play Dungeons and Dragons with a silicon idiot-savant. Although there are things I wish Vision could do that it can't, these concern its architecture more than its features. I might like to redesign the room, but it's well-lit and has all the amenities. ■

**PRICE:** Vision, \$495; Studio 3, \$459

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MUSIC TECHNOLOGY

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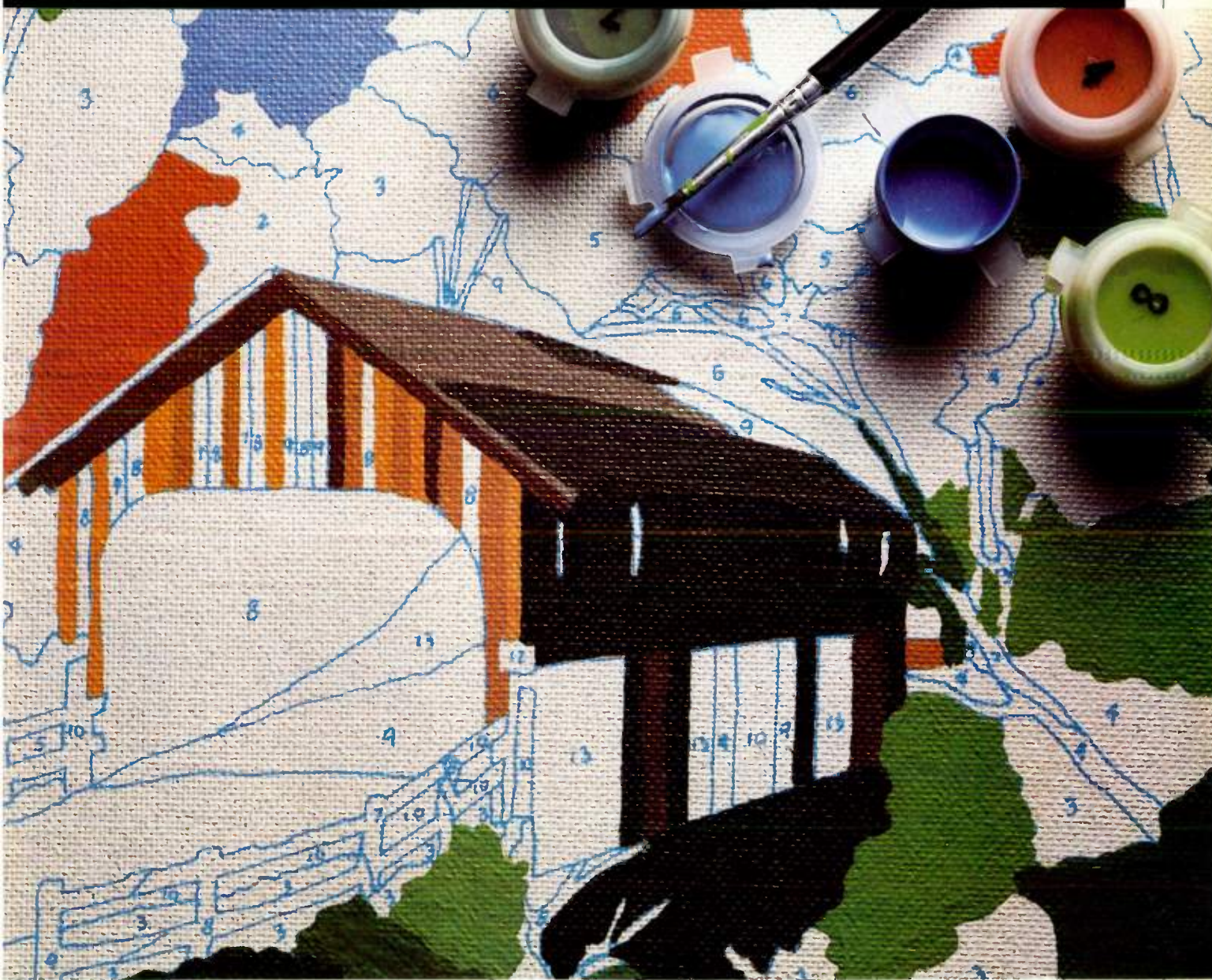
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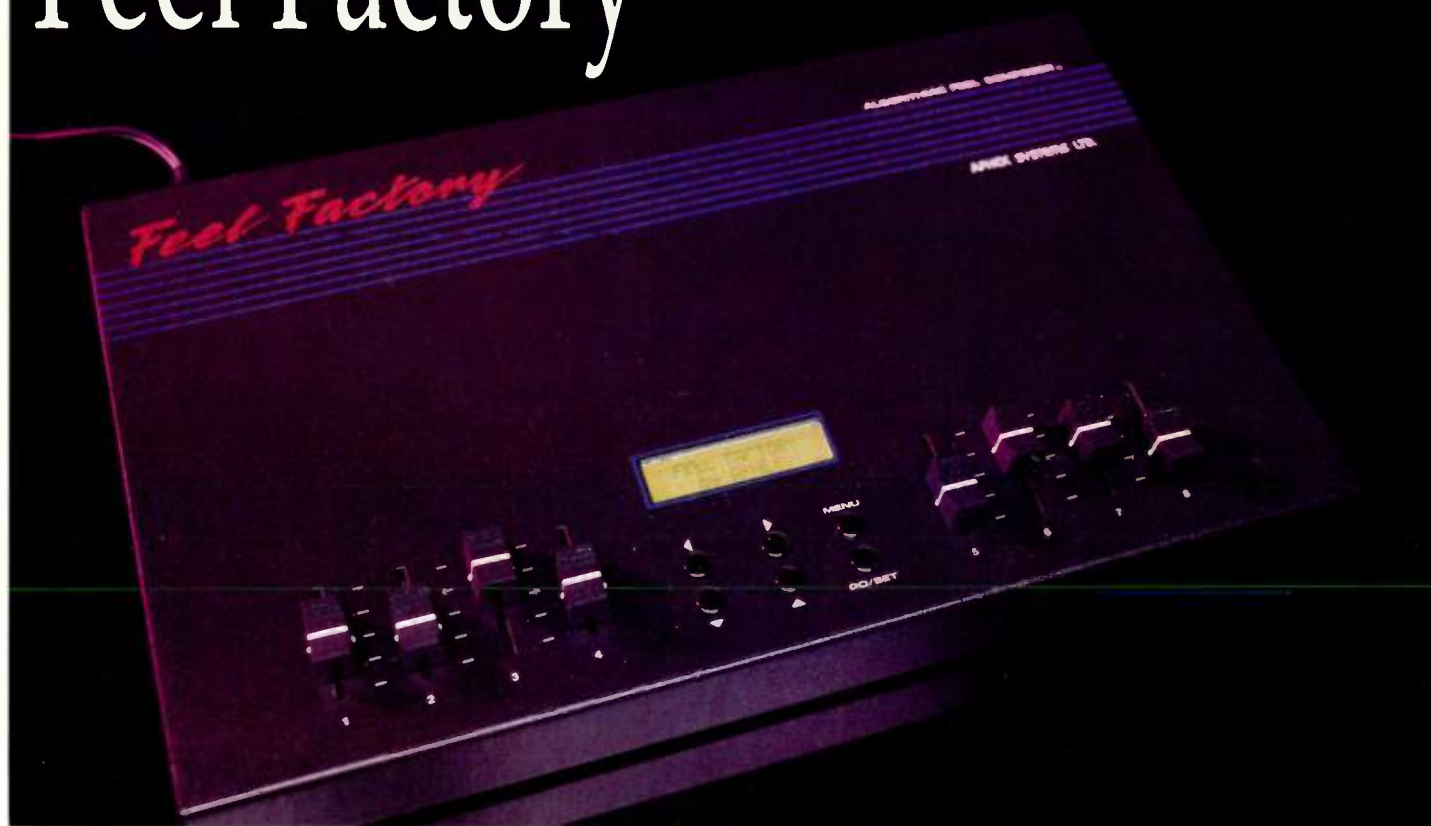
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# Aphex Feel Factory



Photography Melodie Gimple

**The latest enhancement peripheral to come from Aphex is a unique creation that allows you to adjust the timing and dynamics of MIDI sequences to alter the music's feel. *Review by Robert Rich.***

**W**HAT'S THE DIFFERENCE between good musicians and great ones? Michael Stewart thinks that it lies in their "feel." Michael has spent many years trying to capture the essence of "feel," and he's invented several gadgets to help us tweak that ephemeral groove. All of his MIDI processors share a common goal: to breath life into sequenced music. Michael first brought us the Kahler Human Clock (see MT review May '87), which synchronized a sequencer to a live drummer. His latest creation is the Feel Factory, an \$800 groove laboratory that gives the user microscopic control over the "feel" of sequenced MIDI notes.

## In Theory . . .

So just what is "feel?" Here's the basic theory behind the Feel Factory: feel is a combination of timing and dynamics. Imagine a drum pattern in which the

kick drum keeps a steady pulse and the snare defines the feel. Snare-hits that occur slightly ahead of the beat tend to "push" the rhythm, imparting "drive," "snap," or "nervousness" at the extreme. When the snare-hits fall slightly behind the beat, the rhythm tends to sound heavier, "in the pocket," more like an R&B groove.

One factor that probably contributes to feel is called the "precedence effect." When two sounds occur very close together in time (less than about 70 milliseconds apart) we tend to suppress the later sound, hearing the first sound as being louder. The timing of events affects the perception of loudness. It seems reasonable that we could alter the perceived dynamics of a rhythm by changing its timing, and perhaps alter the perceived timing by changing dynamics. The Feel Factory specializes in just this sort of tweaking.

Most musicians probably don't intel-

lectualize very much about "feel" – it's just one of those mysterious parameters that contribute to a musical performance. Some may feel threatened at the prospect of analyzing such musical subtleties. Whether we like it or not, electronic music gives us control over all sorts of parameters that we never had to think much about before. This degree of control formed one of the founding ideals in early electronic music experiments. (One could argue that MIDI has taken a slight backward step from these ideals, inviting laziness through its limited assumptions about the nature of musical information.) Alas, it's very easy to create lifeless electronic music. By thinking a bit about this question of "feel," we can hope to regain some of the control hidden within our technology.

At first I was not convinced that feel was such a predictable and quantifiable entity. As soon as I received the Feel

Factory for review, I tried a little experiment. I entered the values provided in the manual for a "reggae groove." Instead of feeding it a reggae rhythm however, I tried a quantized straight-ahead rock pattern. To my amazement, the groove of my pattern shifted. It sounded more relaxed, with

power switch and 9V power adaptor. There are also two extra ports labeled Mac data and MIDI data that are "reserved for future Feel Factory products."

This list of connectors should give some hints about the capabilities of the Feel Factory. At its most basic level, the

release included with the box I reviewed. There were still some bugs, but ROM upgrades are promised after the initial release of the product. However, I doubt that the Feel Factory will ever satisfy those in need of instant gratification. The learning curve is fairly steep, and it took a few hours before I could get it to do anything useful.

**Feedback** "Once you have a good setup, you can push sliders back and forth while listening to the subtle (or drastic) timing effects in the music. Nothing else that I know of provides such immediate feedback with this degree of subtle control."

a definite, though subtle, reggae touch. When I switched the Feel Factory to an "R&B groove," the reggae feel disappeared. This was hardly a controlled experiment, but it was enough to change my attitudes about the validity of the Feel Factory's approach.

### In Practice . . .

Now we turn from theory to practice. The Feel Factory is a flat metal box designed to sit on a table top, with 8 short sliders, 6 programming buttons and a backlit 32-character LCD display. The rear panel of the box holds all of the communications jacks: 1 MIDI In, 4 MIDI Outs, SMPTE in and out, MIDI clock out, Macintosh serial interface,

Feel Factory can process incoming MIDI data and spew it out of its four MIDI Out jacks. The Mac serial port lets the unit double as a MIDI interface for the Macintosh. (Unfortunately, the Mac interface wasn't working on the box I got for review. It may have gotten fried during shipment, and Aphex assured me that it worked before it left the factory.) The Feel Factory can control an external sequencer using MIDI Sync and Start/Stop messages, with an internal tempo of 60-200 BPM, and it can also stripe and read SMPTE at 24, 25, 29.97 (drop frame) and 30 frames per second.

The Feel Factory's user interface was not completely solid in the early ROM

### Using It

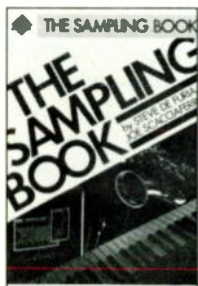
Using the Feel Factory involves two steps. First, you have to set up some feel algorithms and apply them to the appropriate note ranges and MIDI channels. That's the hard part. Once you have defined some presets, recalling and using them is pretty intuitive.

The algorithms themselves provide timing and/or velocity shifts from note to note within a track. Each algorithm provides up to eight values that are used to perform these shifts. These values range from -9 to +9, with each step representing a number that is 3 times the value. For example, a value of +2 will boost a note's velocity by 6, or shift its timing forward by six resolution steps (with an internal resolution of 0.832 milliseconds, this translates into about 5msec).

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- Different types of algorithms apply these values to the timing or velocity of incoming notes in different ways. The three types of algorithms are called "placement," "frequency" and "randomization." The placement algorithm acts on different places within a bar of music. Each of the eight values affect a different 8th note within each bar. Value #1 affects the first 8th note, value #2 affects the second 8th note, and so on. The frequency algorithm measures the time between incoming notes. In this algorithm, the first value affects notes separated by an eighth

(this feature is called "auto null"). If a slider is at the bottom of its range when you turn the power on, it will span 0 to +64. If it's in the middle, it will span -31 to +31. You can adjust these ranges in a utility screen or by turning the power off, moving the slider and turning the unit on. Although a bit confusing at first, the auto-null feature makes sense once you get used to it. I wish the faders were longer, though, and covered the full range.

The sliders control global changes, like shifting the timing of an entire MIDI channel. For more microscopic

**Philosophy** *"It seems reasonable that we could alter the perceived dynamics of a rhythm by changing its timing, and perhaps alter the perceived timing by changing dynamics. The Feel Factory specializes in just this sort of tweaking."*

note, the second number affects notes separated by a quarter note (two 8ths), and so on up to the eighth value that affects notes separated by a whole note (eight 8ths). The random algorithm simply cycles through its values, applying the next number in its list to the timing or velocity of the next note it sees.

By applying all eight values in a placement algorithm, you are by definition processing a 4/4 rhythm. You can reduce the list to correspond to smaller time signatures, or to achieve compound rhythms. For example, applying six placement algorithm values to a 4/4 rhythm could create a 3-against-4 accent. I wish that these algorithms could cycle through more than eight values, however. The eight value limitation makes it impossible to add non-random feels to rhythms larger than 4/4. Most users probably won't be bothered by this restriction, however, because the random algorithm can add life to just about anything.

The eight sliders on the front panel can be assigned independently to timing or velocity, letting you slide notes forward or backward in time or change their dynamics in real time. You can assign a slider to a particular MIDI channel or a range of notes. These ranges can be applied to contiguous notes or separate notes scattered across the keyboard.

A slider can control a range of 127 values, from -63 to +63, but it can only access a range of 64 values at one time. The Feel Factory determines these ranges on power-up by defining each fader's current position as zero

changes, you assign one of the three types of algorithms to each of the eight Feel Algorithm locations. You can assign *two* of these algorithms to each of the sliders (their effects can be additive - a very cool touch), although you can't really control the algorithms from the slider. What you're really doing is assigning two algorithms and one slider to the same MIDI channel or note range. This does restrict your assignment possibilities, but it also makes the assignments a lot easier to understand.

The Feel Factory has three kinds of memory. Online memory chews on MIDI data, with eight slider assignments, eight range definitions, and eight algorithms. Recorder memory saves every change that you make to the Online memory. Thirty-two Preset memories let you store your setups. Rather than saving the entire set of machine parameters, a Preset saves only the changes that are stored in the Recorder memory - all of the changes you've made to the Feel Factory's initial state. When you recall a Preset, its contents are combined with the Online memory, allowing you to combine the effects of different algorithms. The parameters not replaced by the recalled preset remain unchanged. (By the way, you can recall Presets with MIDI program change commands on channel 16, and you can adjust all Online parameters with SysEx.)

This memory scheme allows you to process all 16 MIDI channels despite having only eight sliders. If you set timing values for channels 1-8 then recall a preset that affects channels 9-16, the values for channels 1-8 will still

operate, although your real-time control of the faders will only affect channels 9-16. The intricacies of this memory overlay structure can make the mind swim, but it does have a certain elegance.

## Timing and Sync

You may have wondered how this box can make a note play *before* it was supposed to. The answer is deceptively simple - it delays *everything*. Its nominal processing delay is around 32msec, which is roughly equivalent to a single SMPTE frame. With a time-shift range of  $\pm 32$ msec from its 32msec "center-point," the Feel Factory actually creates delays from nearly instantaneous (with a 1msec processing lag) to 64msec. If effect, the Feel Factory is able to push notes ahead of the beat by pushing them ahead of their delayed neighbors.

This delay raises the following question: if you have a tape already recorded with music and SMPTE, how do you "Feel Factor" a sequence that syncs to this tape via SMPTE without introducing a noticeable time lag? The trick is to nudge your SMPTE start points. Just follow these steps. First, record the sequence without processing your notes with the Feel Factory. You can still use the unit as a SMPTE reader to sync the sequencer to tape while recording, but if you monitor your playing through its MIDI jacks, the delays will wreak havoc with your own natural feel. Then for playback, if you're using a SMPTE box other than the Feel Factory, set the sequencer to start one frame earlier than when you recorded the track. If you're using the Feel Factory as a SMPTE reader, it will automatically start one frame earlier than its setting states. As long as you remember that Feel Factory always reads SMPTE one frame early, but processes MIDI one frame late, you can keep track of your delays and avoid confusion. Note that you won't run into delay problems if all your tracks are sequenced and you run them all through the Feel Factory - processed or not. Its delays are at least consistent and predictable.

Because so many of the Feel Factory's applications involve SMPTE, its internal SMPTE read/write functions will prove quite handy for those without a SMPTE interface. But before you get too excited about its SMPTE capabilities, I should point out that it doesn't actually keep tempo maps or perform some of the other handy housekeeping chores that we have

come to expect from a full-featured SMPTE box. It takes a bit more time than usual to catch up to a stripe, and it's a bit finicky about poorly recorded signals. To avoid the slow catch-up time, the manual recommends striping for each song individually and giving at least 5 seconds lead time before the song starts. I didn't actually encounter any problems while using SMPTE until I tried pushing the limits. Michael Stewart explained that the Feel Factory was not intended to be a full-featured SMPTE interface. To include features like tempo maps would have required extra memory and therefore a higher price tag.

While on the subject of timing, I should mention again that the Feel Factory has a maximum internal resolution of 832 microseconds (equivalent to two SMPTE bits), about as fine as anyone should need. The sliders give full access to this resolution, while the algorithms work at a coarser 3:1 resolution.

## The Future

I think that the Feel Factory has an interesting future. Aphex, and Michael Stewart in particular, wants to see this product become the springboard for a

whole new area of musical development. The algorithms themselves may grow more sophisticated with future ROM updates, possible additions including programmable mod-wheel variations and algorithms that modulate each other. As for peripheral products, the first one I'd like to see would be a screen editor to provide relief from endless button-pressing.

Michael Stewart says he hopes that people will use the Feel Factory not only as a production tool, but as a tool for researching the whole question of "feel." He wants to see people sharing their discoveries with others, and trading Feel Factory presets. If nothing else, the ideas behind the Feel Factory may inspire musicians to listen more closely to some very subtle musical qualities.

## Do You Need It?

Feel Factory is not your simple "plug in & jam" sort of gadget. It takes some time to learn. It invites an analytical approach to timing and dynamics. Some might complain that "feel" should stay in the intuitive realm, and that Feel Factory requires too much pre-planning before you can use it correctly.

However, once you have climbed the steep learning curve required to set up

your own feel algorithms, the actual "performance of a feel" is fairly intuitive. Once you have a good setup, you can push sliders back and forth while listening to the subtle (or drastic) timing effects in the music. Nothing else that I know of provides such immediate feedback with this degree of subtle control. Of course, many sequencers will let you do what the Feel Factory does, but they won't usually let you hear the changes as you make them. To replicate some of the effects of the Feel Factory's algorithms could take hours of individual note editing. Finally, the unit's timing resolution far surpasses that of almost any sequencer.

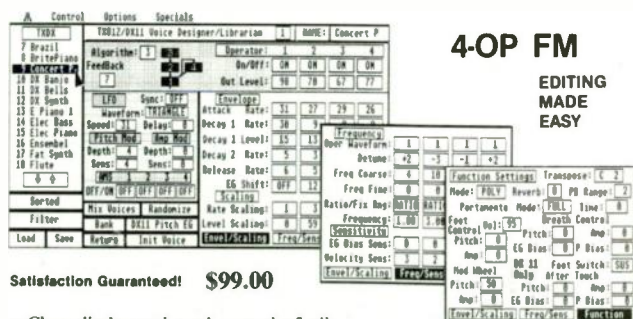
I would not recommend this device for every starving MIDI musician. Get the essentials first – a good synth, mixer, reverb, multitrack or whatever. If you're a good musician, you can get a good feel without the Feel Factory. But if you're looking for that extra something, check it out. This is a learning tool, a research tool, a post-production tweaking tool, and now that I've heard the difference, I just might become addicted. ■

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# FOCUS LINE

**Following up last month's look at synthesizers, this edition of our beginner's column looks at the other important type of sound source in today's musical environment: sampling.**

*Text by Bob O'Donnell.*

**SAMPLING** – *the process of digitally recording sounds that can then be digitally edited and played back at a variety of different pitches.*

YOU'VE NO DOUBT heard the effect on more records and commercials than you care to remember: that stu-, stu-, stutter, -er, -er, stuttering kind of sound. Or perhaps you've perplexedly witnessed an incredibly realistic sounding string section emanating from a keyboard. In either of these extremes, the sound's point of generation was probably a digital sampler – the sonic wonders of the digital age.

Samplers have been touted as *the* answer for electronic music enthusiasts because they can reproduce *any* sound – either acoustic or electronic. Instead of creating sounds from scratch, as a synthesizer must, a sampler simply plays back a digital recording of a sound. All you have to do is sample, or record into your sampler, the sound you want – whether it's your favorite Korg M1 patch, the sound of a hammer hitting a nail, or an acoustic guitar. You can then play the sound on the sampler's connected keyboard or remotely with any other MIDI controller. While this sounds incredibly simple in theory, it's not quite so easy in practice. To explain why, I need to give you a little background on how samplers work.

Like most electronic musical instruments, a sampler is essentially a computer that is specifically designed to work with digital audio signals. In other words, it has an operating system that tells the microprocessor inside the machine what functions to perform. It also has Random Access Memory (RAM) to store the data with which it is working – in this case, sounds that

have been turned into a series of digital ones and zeros. The amount of RAM determines the length and number of samples you can record: the more RAM you have the better. Once you run out of RAM you can save your samples onto a floppy or hard disk, just as you do with computer data, and reload them at any time.

The sampling process works in the following manner: plug a sound source – either a microphone or the outputs from a CD player, tape recorder or instrument – into the sampler's input, put the sampler into a record ready mode and play the sound. The sampler "records" the sound by taking a "sample" of it many times per second. Each sample is converted into an 8-, 12- or 16-bit "word" of ones and zeros representing the instantaneous volume of the sound's waveform at that point in time. These numbers are then stored in the RAM of the instrument. The number of times it looks at the signal, called the sampling rate, generally ranges from about 15,000 (15K) to 48,000 (48K) times per second. The larger the word size and the higher the sampling rate, the more closely the sampled waveform will resemble the original waveform. This is also the reason why 16-bit samplers generally sound better (and cost more) than their 8- and 12-bit counterparts.

The next step in the process occurs when you hit a key on the keyboard (or send a MIDI note message): the selected key tells the sampler to play the sound currently in its memory at the corresponding pitch. To be precise, pressing a key tells the sampler to convert the numbers in memory back into sound at a particular rate that may be higher or lower than the original

sampling rate. As a result, you will hear a faster or slower version of the sound – much like the effect of speeding up or slowing down a tape recorder.

The problem you'll soon discover when you start using a sampler is that you can generally only play a sampled sound over about a one octave range before it starts to sound *very* strange. One way to get around this is to sample the same sound at different pitches – a process called "multi-sampling." Once you do this, though, you have to start worrying about matching the volume and timbre of the different samples – not always an easy task.

With a limited amount of memory (as most samplers have), you can't record very long samples. If you want to hold a sound for a longer period of time than the sample itself lasts, you'll need to use a technique called "looping." Looping plays through a section of the sample data over and over for as long as you hold down a key. In addition to this purely utilitarian purpose, looping can be used creatively to produce very unusual sounds.

Other creative possibilities offered by samplers include the ability to digitally edit sounds into completely unnatural timbres by cutting and merging various portions of existing sounds. In addition, most samplers offer the filters, amplifiers, envelopes and LFOs found on synthesizers to further shape your samples (see last month's *Square One* on synthesis for more).

In the end, a sampler's greatest strength is also its greatest weakness. The process of digital recording gives a sampler the ability to reproduce any kind of sound very easily, but the memory requirements are such that you will be forced into compromises. Nevertheless, if you want realistic imitations of acoustic instruments or a laboratory for conducting your own sonic experiments, there's nothing like a sampler. ■

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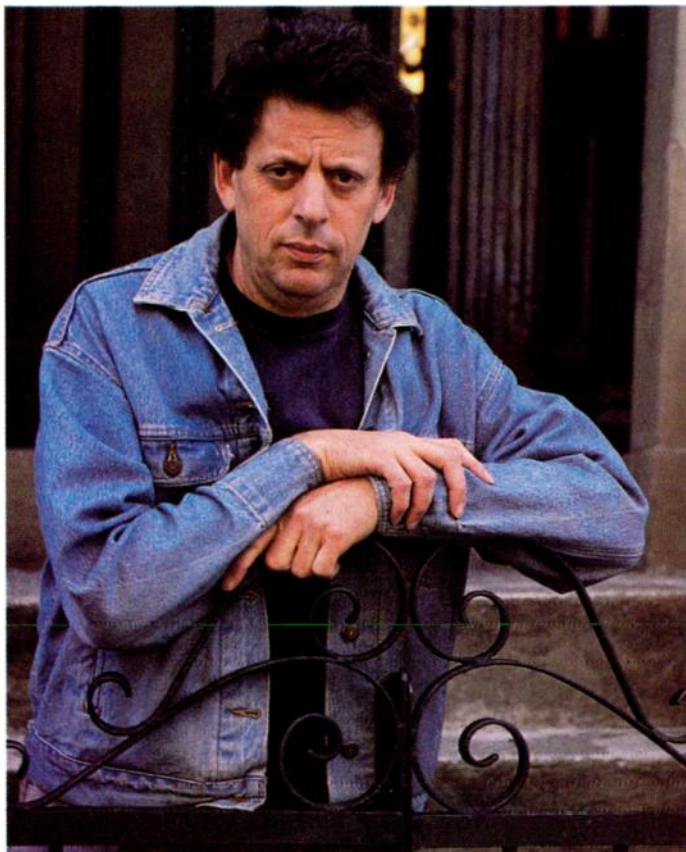
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# 10 ACID HOUSE

## FROM OPERA HOUSE



Photography Kevin Mazur

**Popular contemporary composer icon, Philip Glass continues to push the boundaries of music composition, venturing even into the realm of dance music. Interview by John Diliberto.**

**T**HE MUSIC OF Philip Glass is like a prism on our times. His emergence in the '60s with the avant-garde theater troupe Mabou Mines set him squarely in the counterculture, socially and musically. He formed a marriage of rock technology and texture with Farfisas and synthesizers, and in turn became an influence on rock. His subjects of industrial ruin (*Koyaanisqatsi*), peace and civil rights (*Satyagraha*) and spiritual relativity (*Einstein on the Beach*), are themes that resonate with today's consciousness. To quote from *Einstein on the Beach*, "These are the days my friend, these are the days."

And these days, Glass works at a frenetic pace that shows no sign of abating. He's currently working on another opera with Robert Wilson called *The Voyage*, the subject of which Glass is coy about, except to say it will

have something to do with Columbus. He's also getting ready for a month-long trip to Brazil to work on a piece with '60s poet and cultural revolutionary Alan Ginsberg, reasserting a connection to his ideals from those turbulent times.

"This will be a piece based on Alan's poetry from 1940 to the present," says Glass. "In a way it turns out to be something of a portrait of America. First, the main issues of Alan's poetry are the things that he has always been able to focus on – the issues of our time – which, although at times were not very popular issues, have turned out to be some of the mainstream issues that we are dealing with at the end of the 20th century. Things like ecology, the sexual revolution, the Vietnam war at one point, the impact of Eastern and Western cultures. And Alan kind of experienced that firsthand for a lot of other people. All of

their ideas really come from what he was doing in the '60s and '70s. So at one point, Alan was the great common cultural figure of the '60s and '70s. We see this piece really as an American portrait of these issues that have now become recognized as some of the fundamental issues of our time."

It's been nearly twenty years since Glass released his first album, *Music With Changing Parts*, on his own Chatham Square label. Since then, he's recorded over twenty records, composed film scores, music theater works, operas and dance pieces, and recently published a book, *Music by Philip Glass* (Harper & Row), centered around his opera trilogy. There's been at least one Philip Glass backlash, in which Glass was, somewhat justifiably, criticized for being over-prolific and recycling his own material. Now his earlier works are being reissued, creating a new context in which to view his music.

"In fact, I think one of the good things about doing it is that it does help the audience and even critics to get a perspective on the work," says Glass as he roams around the sparsely furnished combination kitchen and living room of his New York City townhouse. Within a few months he'll have two new records, *1000 Airplanes on the Roof* and the soundtrack to *The Thin Blue Line* documentary, released alongside the 1974 epic, *Music in Twelve Parts*, and a resurrection of his 1979 *Dance Nos. 1-5*.

"When they see older work in context next to newer work, then the kind of comments about the work not changing become rather silly," he chides, "because then you can see that the work changes enormously. You may have to look at it over a five-year period or an eight-year period, instead of a two-year period. You know critics will sometimes look at pieces in the space of two years and say nothing has happened which, of course, is absurd."

But then, few contemporary composers have constructed such a recognizable sound as Glass. The cyclical melodic motifs and the juggernaut rhythms are signature marks, whether composing for his electric ensemble or for orchestras and choirs. A few notes and it's instantly identifiable as Philip Glass.

"When I look at the operas, each of them seems to have its own special harmonic language," asserts Glass, defending against charges that he repeats himself, "whether it's

*Satyagraha* or *Akhnaten* or *The Making of The Representative for Planet 8*, or now the new work I'm doing for *The Voyage*. I've begun working on it, and it has a distinct harmonic and melodic style of its own. I'm not sure that we always make progress the way mathematicians and biologists do. We tend to think that a new scientific vision will sometimes negate an earlier one, but that doesn't happen in music and painting and dance. Our earlier work has the validity that comes with an authentic expression of its time, and we can still hear *The Rite of Spring* or *Billy the Kid* or ballets like that today. They are still interesting to us. They haven't been supplanted by contemporary ballet. And I try to look at my work that way."

Within his sound, Glass has arrived at a variety of shapes, forms and moods that are as distinct from each other as he is from Steve Reich, Terry Riley, La Monte Young and John Adams. He's as much a collaborator as a composer, a multi-media artist whose work spans opera, music-theater productions, acid house remixes and unusual, often non-narrative motion picture scores. In fact, since *Music in Twelve Parts*, composed between 1971 and 1974 and scheduled for issue in its entirety for the first time this year, Glass hasn't written anything that wasn't inspired by the thematic material of another project, be it dance, theater or film.

"Subject matter has been the point of departure for the pieces," agrees Glass, "whether it's a dance piece or a story, like *Satyagraha*, or a film like Godfrey Reggio's, or the poetry of Alan Ginsberg. I don't write abstract music, virtually none. Abstract music are pieces that have numbers like 'Symphony No. 3' or 'Quartet No. 2.'"

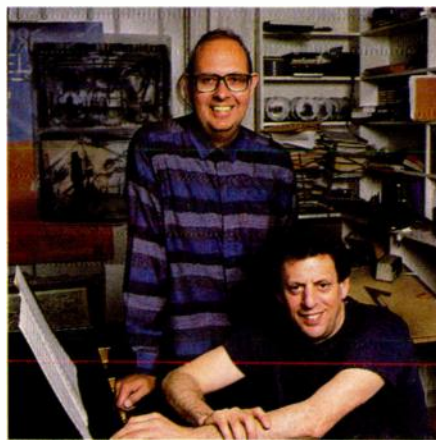
Which is not to say that Glass' music hasn't been attached to unusual, if not surreal projects. His most recent recording, *1000 Airplanes on the Roof*, is taken from a music theater production that details the lone character, "M," as he tries to forget and then remember his abduction by extra-terrestrials. While the album jettisons the wall-to-wall narrative, the theater production is an integration of David Henry Hwang's words, Glass' music and Jerome Sirlin's uncanny, three-dimensional slide projections.

Glass' score bristles with exhilarating textures and melodies that he shifts through an instrumental arsenal that includes voice,

synthesizers, winds and the newest addition, Yamaha WX7 wind instruments that are played by his longtime reedmen Jack Kripl and Jon Gibson. Glass bounces themes from one to the other, creating dynamic contrasts in the juxtapositions, setting languorous reed lines next to staccato synthesizer passages. Glass makes some novel configurations with flutes doubling synthesizers, or the reeds cascading around his almost funky synth-bass patterns on 'Screens of Memory.' A surprise appearance on the album is Linda Ronstadt, singing Glass' wordless vocalese with her pure soprano voice.

There's almost an architectural structure to the music Glass wrote for *Airplanes* that echoes Sirlin's slides of New York city rooftops, storefronts and the psychedelic climax. "We did really work very closely," recalls Glass. "I've really learned how to do that with designers, and he was a co-author too. I had a very rough storyboard when I began writing the music, a visual storyboard. And then I made a work tape for him and he completed the montage of slides to the actual music so we were able to work off of each other's material right through the work process."

This is similar in process to his work with director Godfrey Reggio on *Koyaanisqatsi* and *Powaqqatsi*, two non-narrative films that married Glass'



**Philip Glass along with his engineer, Kurt Munkacsi.**

relentlessly driving music with Reggio's own relentlessly overwhelming images. *Koyaanisqatsi* was cut to Glass' music. Ron Fricke, the director of *Chronos*, was director of photography and editor on *Koyaanisqatsi*. "I talked with Philip Glass ahead of time after we'd viewed a lot of the rushes or he had seen a lot of the footage. His stuff ran mostly in cycles of ten to twenty minutes," he

recalls. "And so I'd say well, let's do ten minutes of this, twenty minutes of that and build it and get it faster as his music does. And then I'd say stop and just do slow motion. And that's how he introduced the organ, that was slow motion. And so we were editing with his scratch tracks, which is just simply a keyboard rendition of it, and we slowly built the film that way by editing to the music."

"The music was mesmerizing to work with as an editor," he laughs. "I remember I was having trouble sleeping at night because I couldn't turn the soundtrack off in my head. I'd hear it over and over again."

*Powaqqatsi*, Reggio's Third World ecological treatise, doesn't have quite that relentless kinetic drive, but its creation was even more integrally connected. "In one case I even went to the point of recording a piece of music before the scene was shot," says Glass. "The opening scene is an open gold pit mine, and I got a hold of some of the Cousteau films of that same place. I knew that we were going to go there and I wrote some music that would be evocative of the place, and we recorded it. We made a work tape. I took the recording with me and we played it for the cameraman while he was shooting. And I also played it for the men in the mine, too."

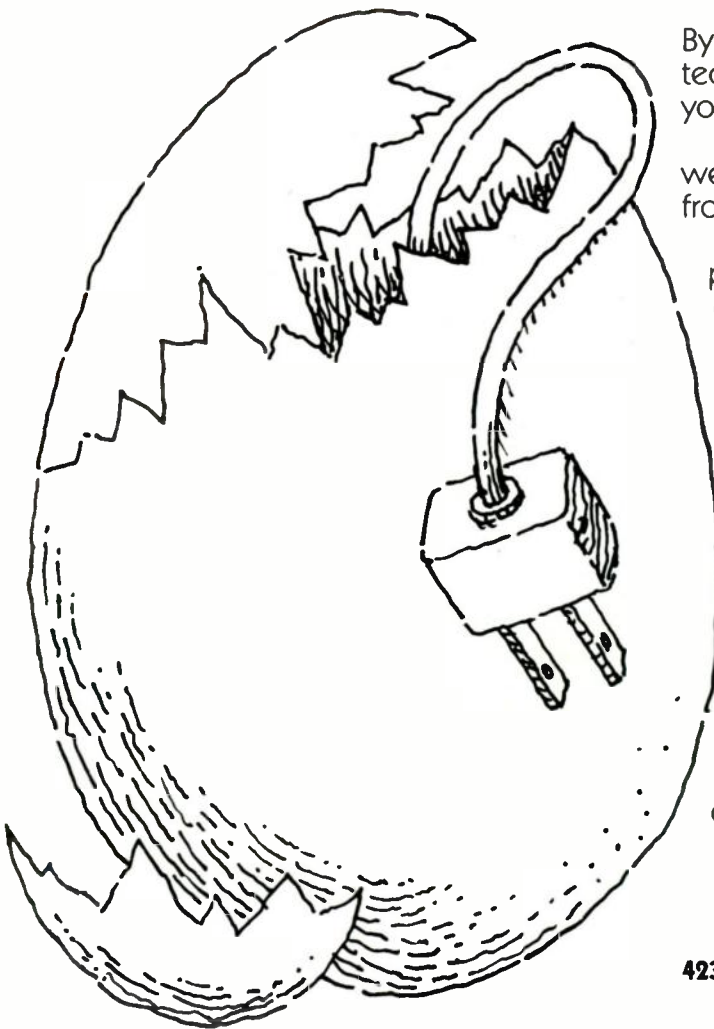
It's hard to imagine these teaming drones of labor stopping to hear anything, but Glass' *Powaqqatsi* score was one of his most varied works to date, incorporating themes and instruments from around the world, including African kora master Foday Musa Suso.

"They were required by the subject matter," he says. "It was a film that was shot in the South Hemisphere – in South America, Africa and parts of India, parts of North Africa – so that one of the things that Godfrey and I wanted to do was to reference the sense of place in the film through the music. So that was actually my kind of assignment, if you want to put it that way. I traveled through Peru and Brazil and Africa. I had been in India numerous times and didn't need to go back on that occasion. But one of the most important things I did was to actually go to those places."

The result was a percussive-based score, using samplers, synthesizers, choruses and winds in a pan-ethnic brew that would find Australian didgeridu next to Middle Eastern percussion. "That's right, we did all



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► that," admits Glass. "I wasn't really looking for any real authenticity. I was really looking for the feeling of bringing some of what, to us, are exotic cultures, and bringing them together in a way."

It's through collaboration that Glass articulates his world view, giving voice and context to his music. He's shaped by his Buddhist spiritualism and his coming of age as a composer in the 1960s, composing for alternative, conceptual theater with Mabou Mines. A science fiction music drama like *Airplanes* isn't a take-off on supermarket checkout counter tabloids, but a revelation of how he thinks about the world.

"It has to do with what we can bear to remember and what we can't allow ourselves to tell other people," says Glass. "The underlying assumption of the piece is that the reality we live in and share is one we construct through the narratives that we exchange with each other all the time. Most of the time, when talking to each other, we are explaining to each other the world we live in. And that collection of descriptions is the world we live in. What this piece is saying is that we edit those experiences when we don't allow ourselves to talk about what really happened to us. We do tremendous damage to our vision of the reality that we live in. When we don't talk about what happens to us and we force ourselves to forget it, then we begin to live in a world of edited experiences. In other words, it's no longer a full version of what we try to imagine or try to reconstruct as a reality."

This thread runs through many of his works, from the avant-garde opera *Einstein on the Beach*, to *Satyagraha* and his Doris Lessing opera collaboration, *The Making of The Representative from Planet 8*. "It has to do with *The Making of The Representative*. It has to do with *Satyagraha*," amplifies Glass. "If you look at the pieces, I've always been really interested in social issues, or the personal society if you want to put it in a very crude way. In other words, the political person or the religious person or the scientific person, as the opera trilogy of *Akhmatov*, *Einstein* and *Satyagraha* (Gandhi) were. Or in the dark – there are the dark portrayals like *The Fall of the House of Usher* and *The Juniper Tree* – which are kind of horror stories. But there are pieces like *Representative* and *1000 Airplanes* that are about exchanging what we share.

There's one line in *The Representative* where she says, 'Do you imagine that you dream your dreams alone, that you dream them yourself. Don't you think that you share them with other people?' It almost could have come right out of *1000 Airplanes*."

**D**espite his extensive use of synthesizers, and his distinctly non-performance approach to recording, in which the record is treated as its own art form and medium, Glass is a surprisingly traditional composer. You'll find no racks of MIDI synthesizers or computers in his home. "I still write with paper and pencil, but that's where the tradition ends," he confesses. "I take the score downtown, and using Michael (Riesman) and Martin (Goldray), or some of the other people, we begin analyzing the piece in terms of what synthesizer or digital technology will be needed to realize it as a record or as

*"When people talk about writing for the public, to me that means the people I see when I play. So I don't mind saying I write for the public, because in fact I do."*

a live performance. In fact, I go to the studio at the end of the day usually. I stop down there around four o'clock and I usually spend an hour or so there."

Kurt Munkacsi has been Glass' producer/engineer since 1970 and shares a large part of the credit for Glass' sound. "He comes to us with a score, and in the score he's notated traditional winds, brass, strings, percussion and that sort of stuff," Kurt explains.

Glass elaborates: "I give a general feeling of the timbre. I'll say, 'This is a string sound,' or I'll make it complicated – 'This is a bassline,' and I may indicate an Arp synthesizer bassline that we all know. Then they have to do it, and sometimes they'll come up with something a little different than I've described. But it will be appropriate. Sometimes they'll do what I asked for. It's never *exactly* what I asked for though, because I'm just giving them words. I'll say, 'This is a flute sound or Farfisa sound,' but then they have to actually develop the sound."

"Then we kind of take it from there," says Munkacsi, describing the process once he, keyboardists Michael Riesman and Martin Goldray, and

programmer/engineer Miles Green start operating. "We talk to him about what the concept for the piece is, and sometimes we'll just execute the piece with acoustic instruments and mix in a few synthesizers to fatten up the instruments, but make it sound like an acoustic recording. Sometimes we'll decide it's going to be an obvious synthesizer piece and go to town on it."

In many ways, Glass has assumed a more traditional role than in the early days when he was a performer in his own ensemble, playing his own music. Over the years, he's given up more and more of the keyboard parts to his other players. He doesn't have synthesizers at home, but he and Munkacsi own Euphorbia Productions, which has a complete complement of synthesizers and computers. Glass approaches it in the way a conventional composer would approach an orchestra.

"If I wanted to spend the time at it,

and I know composers who do, I could, but then I would be writing much less music than I'm doing," explains Glass. "In fact, what I've done is to form a real marriage with the technology that is available to me. And for that purpose, there's something like two or three different people who work specifically on the technology. For example, the *1000 Airplanes* piece – it took two guys working three weeks full-time to do the programs for that piece. They ended up developing something like ninety different synthesizer programs."

But Glass hasn't completely removed himself from performance. In fact, over the last year, between operas, he's been giving solo piano performances. "Perhaps the way I remain different is that I'm still a performer," he insists. "I'm doing solo piano concerts now. And I'm an interpreter of my work, unlike a lot of composers who may simply make an occasional guest appearance. But I probably appear fifty or sixty times a year. So that becomes a major difference, because it means that I'm relating to the music world directly as a performer, and I see the public as a real entity. It's not an abstract idea for me. When people talk about writing

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Glass will soon release an album of solo piano music, including 'Mad Rush,' 'Piano News (Wichita Vortex Sutra)' and 'Five Metamorphoses.' Anyone who has seen Glass perform live will not confuse his chops with those of a concert pianist. "He's not a concert pianist," Munkacsi candidly admits, "but it is interesting to hear him playing his own music, because he actually interprets it quite differently than a lot of people think he does, just with the feeling and emotion he puts in his music."

To ensure a good performance, they recorded Glass direct to hard disk, using Digidesign's Sound Designer II Sound Tools software. "You use a Macintosh II computer and it becomes a hard disk recorder," explains Munkacsi. "He's playing in real time. The whole point is the editing you do on it. You get non-destructive edits with the hard disk editor, so you can try edits and if they don't work you can try something else. The original performance is still intact. Then, of course, you have the variable crossfades and digital equalization, so if you're splicing two takes together and one was brighter than the other, you can match them up."

They've also used computers as sequencers, but they insist that they don't use quantization in the performance. Another Glass recording in the offing is the issue of *Music in Twelve Parts*. Parts One through Six were originally recorded by the ensemble in 1974, but only the first two parts were released. They'll use these original recordings on the new release, but parts Seven through Twelve were recorded by Martin Goldray into a Macintosh. "The Macintosh recorded Martin Goldray's performances, and they're not quantized," Munkacsi emphasizes. "They were sequenced but they weren't step-entered. So the Macintosh is no more than a recorder."

To make the transition from the new to the old, they made a segue splice from 'Part Six' to 'Part Seven.' The only problem was that in 1974, their keyboards were Farfisa organs. So they sampled the Farfis for the new

recording to keep the sound consistent.

For many classical composers, synthesizers are only a substitute, not a replacement for an orchestra, and Glass would probably agree with that to a point. He now seems to work with both nearly equally, with *Akhmaten*, *The Making of The Representative*, *The Fall of the House of Usher* and *The Juniper Tree* all performed by orchestras. But listen closely to Glass' recordings of *Satyagraha* and *Akhmaten* and you'll hear a super-orchestra, reinforced by an array of synthesizers. The question might be asked, "When you have Dennis Russell Davies conducting an orchestral score played by the eighty-piece Stuttgart State Opera Orchestra, why add in synthesizers?"

"It probably would've sounded like fifty, had we not," claims Munkacsi. "The brass is totally untouched and the soloists and chorus are untouched, but the strings and the woodwinds were augmented. And we recorded it with a click track."

Those techniques aren't quite in the opera tradition, but then, how many opera composers produce rock albums by Polyrock, Ray Manzarek, Pierce Turner or, for that matter, do Acid House re-mixes? Another question might be, "Why would a record label ask Philip Glass to do a remix in the first place?" (in this instance, for 'Music Lover' by S'Express).

"We did one re-mix, and we kind of did a straight remix," explains Munkacsi. "We played it for Claudia Stanton, the A&R person up at Capitol and she wasn't too thrilled by it. She thought we should do something more radical. After talking to her we realized that the reason she had hired Philip and me was because she wanted something radical. She didn't want just another dance mix, because we're not dance mixers, anyway."

"So I had another programmer here put on their master tape, and I had him sample all the key phrases in the song, like 'Hey, Music Lover,' in addition to each word and a few other key phrases. Basically, I had Philip take those words and construct rhythms out of them and record several layers of them, and then record the string and horn parts that he had written before for the original mix. I'm not sure you can even dance to it."

Or maybe you just have to dance a little differently.

"I don't really change directions," Glass proclaims, "I more or less expand my horizons." ■

## The Sound & The Fury

*Opinions by Thomas J. Clement.*

WHEN IS A patch not a patch? When it's a sound, a voice, a timbre, a tone, an instrument, a selection, a sample, a waveform, a program, etc. . . .

In the Iron Age of electronic instruments, when keyboard setups were called "stacks" and synthesizers looked like switchboard exchanges for the Twin Cities, there was one thing you could count on. Citizens of the Iron Age spoke pretty much the same language – electric pianos had "tines," organs used "draw bars," synths had "patches." And "timbre," "partial," and "voice" meant what students of acoustics and orchestration knew them to mean, no more, no less. In 1983, all of that began to change.

Nineteen eighty-three was the year Yamaha released the DX7 and brought the secrets of FM to the blissfully ignorant masses. Some balked at the new lingo of FM, but eventually most folks got used to it. Most folks, that is, except Yamaha's competitors, who suffered from what can only be described as FM-envy. The competition realized that not only the sound, but the very language of FM, was fresh. It told the world, "Our way of making sound is way better than the other guy's, and doesn't rely on old-fashioned things like oscillators." Feeling the competitive sting of Yamaha's glove-to-the-face, the other manufacturers must have turned to their designers, marketers, and advertising agencies and said, "Give us new ways to make sounds – and throw in plenty of *Wow!* words, too. Make those words slide-rule sharp, make them sexy, but above all, make them unfathomable!"

Within a twinkling, we were hit with fresh fangled ways to synthesize: Phase Distortion, Vector, Wave Table, Linear Arithmetic, Digital Multi-Dimensional, and more. Each machine featured a foreboding manual sprinkled with shiny new lingo or "digital" versions of old favorites. Manufacturers must have imagined that users would love this. Users did not.

How bad is the Technobabble problem? Let's look at a few examples.

You might suppose that Yamaha is sensitive to the use of jargon after the reception that FM terminology originally received. *Wrong!* Exhibit A: their TX16W sampler. Samples are stored as "waves" which become "timbres" when edited. These timbres are assigned to keyboard "slots" (ranges or "zones"), and 1-64 of these slots become a "voice." Up to 16 voices become a "performance." All of these editing levels are saved in what is dubbed a "setup."

And Yamaha is not alone.

When Ensoniq released the ESQ1, they adhered to tried-and-true idioms.

***"I don't mind that new technology requires new terms. What I do mind is when perfectly good terms are thrown out for something nouveau."***

But they forgot themselves occasionally with the EPS. Here, samples are "wavesamples" and several wave-samples can be molded into one "instrument." Ensoniq also coined a term for what it calls "a configuration of instruments" (is that like a flock of voices or a pride of patches?). It's called a "Performance Preset." Not bad really, especially when compared with what has to be the most awkward techno-term yet, "piles." "Piles" is the ultra-slick tag used to describe how instruments are layered across the keyboard – it's certainly nothing I want any part of.

But it isn't just samplers. Roland has outdone everyone with L/A synthesis. In L/A, two "partials" organized by a "structure" equals one "tone" that, in turn, becomes a "timbre" or "sound" when performance controls are added. A timbre/sound mutates into a "part"

in a multitimbral setup, while the setup itself is bafflingly referred to as a "patch." Whew!

When I think of the long days I've spent trying to figure out the basics of each new piece of gear I get really steamed! I don't mind that new technology requires new terms. What I do mind is when perfectly good terms are thrown out for something *nouveau*, or when every last editing and storage stage has to have some impossible-to-remember name. Save us!

Fair play now. Certain companies always have, or are beginning to, simplify things. As mentioned, Ensoniq usually speaks our language, as does that other reliable "E" firm, E-mu. And Korg, Kurzweil, and Kawai (the "K" companies) for the most part use words and abbreviations most folks should understand: envelope, ADSR, amplitude, layer, split, and multi. Nevertheless, there is room for improvement.

Fellow consumers, if you're afraid of buying new gear because you'll have to learn a whole new dialect, let the synth companies know it. If enough people complain, manufacturers will listen. After all, they aren't in the business of scaring off business. Tell them, the Technobabble stops here!

Coming soon, *Manuals of The Damned!* ■

*Tom Clement is a freelance writer/composer currently consulting for Mac Universe, an all-Macintosh retail outlet in Southern California.*

If there's something in the electronic music industry you'd like to comment on, get cranking on your typewriter, computer, or other appropriate writing utensil, and send your thoughts to: *Perspectives, Music Technology*, 22024 Lassen St., Suite 118, Chatsworth, CA 91311. Please include a daytime telephone number with your submission. We pay \$100 for every *Perspectives* article published.

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# Steinberg Synthworks M1

## An editor/librarian for the Korg M1 and the Atari ST.

*Review by Lorenz Rychner.*

IF YOU'RE LOOKING for something a bit different from run-of-the-mill editor/librarians and you just so happen to need a program for your M1, Steinberg's latest offering may be of interest. Starting off with the librarian functions, this program has a few nice twists. First, in addition to what you'd find in most other offerings—several banks being displayed at once, etc.—the library window can display up to 1000 programs alphabetically, and the library can be subdivided into many groupings, according to names and previously defined "semantic" attributes. The ten function keys call up selected groupings according to generic sound families. Various search maneuvers are possible, according to definable criteria, so for example, you could pull out all of your sounds with the word "horn" in their names in less time than the screen takes to refresh itself.

The edit screen of individual programs (called Sounds) uses graphic symbols in a layout consistent with the two-oscillator design of the M1. Click on an envelope to get the program-mable graph behind which you can call up shadows of other envelopes for comparison and alignment. Included on the screen are eight generic envelope shapes—a nice touch. Envelopes can be dragged across the screen for instant copying. Many other thoughtful shortcuts make editing easy, as long as the user understands the "analog" inheritance of this subtractive programming technique. Once modified, a sound program can be assigned to one of four buffers, A through D, before permanent storage in a bank or in the library.

The program's effects and routing are available graphically and as a text list. Other features for sound creation, too complex for a detailed accounting, let the computer take over: mix & copy, randomizing mask, output (one or twenty sounds), quadratic mixture

(for mixing several sounds), cross-breeding, variations, depth, blind random, and Combi fantasy. Altogether, these features provide lots of playful or useful fun. If you get lost, the well-presented manual (boxed and ring-bound so it opens flat) is duplicated on disk and opens up at the relevant pages when you call for help.

Other nice features of the program include the built-in sequencer, a pop-up keyboard with pitch-bend and velocity control, and its ability to play sequences from Steinberg's Pro24. Also, when a Multi Combi with different MIDI channels is shown on the Edit Combi screen, a special VU mode lets you see which part is playing. Finally, each mouse click can produce a selectable note at the desired velocity.

Data exchange to and from the M1 went flawlessly except for one bug (in the Receive and Save ALL function) that Steinberg is bound to address soon.

Overall, the program is full of handy shortcuts, thoughtful keystroke alternatives, and just plain common sense, with a touch of elegance thrown in for good measure. These and the unique library features make it stand out among the growing crowd of SysEx programs. ■

**PRICE:** \$259

**MORE FROM:** Steinberg/Jones, 17700 Raymer St., Suite 1001, Northridge, CA 91325. Tel: (818) 993-4091.

## Different Drummer

**A generic drum machine pattern programmer for the Macintosh. Review by Scott Wilkinson.**

HAVE YOU EVER wished that someone would write a drum machine pattern editor/librarian for your favorite computer? I know I have. Different Drummer is such a product for the Macintosh from Primera Software. Although it doesn't use SysEx data as a true editor/librarian would, this program allows you to create, edit and save rhythm patterns and songs. You can play them with the

Mac's internal sound source using Sound Designer, SoundCap or Sound-Edit sample files or send the notes in a performance via MIDI to any external MIDI sound source such as a drum machine or sampler.

The program uses several modes to create and play rhythms including Pattern and Song. Pattern mode presents a grid into which notes are entered, a list of up to 10 instruments currently assigned to play in the pattern, and a palette of tools used to create, edit and play the pattern. The grid is divided into measures, beats and sub-beats. These sub-beats determine the rhythmic value (or quantization) of the notes as they are



entered and can range from whole note to 256th note resolution. Notes can be entered one at a time with the mouse or in real time with the numeric keys at the top of the Mac keyboard. Other nice features include various time signatures, accents and tuplets. Each pattern can include up to 30 measures or more, depending on the time signature.

As with most drum machines, a song is a specific sequence of patterns. Songs in Different Drummer can be up to 32,000 patterns long (although this includes the number of looped iterations as well). And speaking of looping, any pattern or group of patterns can be repeated up to 31 times. Loops can also be nested within other loops. It's easy to duplicate patterns for use in different parts of a song and edit a pattern into different versions for musical variety.

The manner in which each instrument will sound is determined by the Instrument Setups. Among other settings in the Mac setup, you can select the sample file associated with each instrument and whether or not one instrument's sound will be cut off by another sound (open and closed hi-hats, for example).

MIDI Setups determine the way in which Different Drummer sends MIDI data while playing. The program is shipped with setups for the Roland

TR505 and D110, Ensoniq Mirage and Alesis HR16. Among other parameters, the MIDI setups let you determine the note numbers and MIDI channel for each instrument.

The only major drawback I found in this program is that its performance cannot be synchronized with other sequencers or drum machines. It does not send or receive MIDI Real Time messages such as start, stop and clock. I'm told by the company that they are planning to include this capability in a future update. On the plus side, the patterns and songs can be saved as MIDI files and loaded into a sequencer that recognizes this format. The program is also MultiFinder compatible.

Basically, I like this program quite a bit. Different Drummer provides a generic, user definable, easy-to-use pattern and song editor/librarian. With the addition of MIDI synchronization and SysEx dumps to popular drum machines, it could spawn a whole new genre of music software. ■

**PRICE:** \$99

**MORE FROM:** Primera Software, 650 Cragmont Ave., Berkeley, CA 94708. Tel: (415) 525-3000.

## Steinberg Twelve

**A sequencing program with notation for the Atari ST.**

*Review by Dan Rue.*

RECOGNIZING THAT NOT everyone needs a completely comprehensive sequencing program, Steinberg has chopped their "big brother" Pro24 sequencer down to the basics, resulting in this inexpensive new package for the Atari ST. What remains is a 12-track MIDI recorder/sequencer with enough editing functions to keep you cranking out songs for quite a while.

**What Twelve Has:** Like Pro24, the main page is designed to emulate a multitrack tape recorder, including very cool VU-style MIDI activity meters for each track. On the main page you assign tracks on which to record, individual track muting or soloing, each track's name, voice number, voice volume, MIDI channel, length in measures, velocity information (adjustments can be "fixed" at one level or "shifted" up or down by a specified ratio), transposition, and quantization (up to 1/32 triplet). In addition, all of your MIDI parameters can be enabled or disabled from this page, including aftertouch, foot controllers, mod wheels, pitch-bend, and velocity. Functions can be controlled with the mouse or from the Atari's keyboard. It's all very straightforward, so even the complete novice is likely to be laying down rough recordings within a matter of a few minutes.

Fine-tweaking edit functions are performed on the Score Edit page, which displays the track in standard musical notation - bass, treble or grandstaff - complete with rests, ties, and key and time signature. Notes are added or deleted by clicking-and-



dragging. The key signature can be altered, and quantization of either notes or rests can also be done from this page.

Finally, since Twelve will let you record complete songs or drum machine-style patterns, there's a Song Edit page where you arrange your patterns into a song by clicking-and-dragging. Song arrangements are arranged in each of the twelve tracks individually, so while the overall song length must be the same for each track, the patterns' lengths can be different. The key signatures, however, must be consistent. Overall, the structural flexibility of this program is pretty impressive.

**What Twelve Doesn't Have:** The main thing featured in Pro24 that was excluded from Twelve is the Grid Edit page where you can set specific values for each note's velocity. Also excluded are *scaling* functions that are used, for example, to gradually increase the note-on velocity or tempo from 80 to 120 (tempos can be different for each pattern in Twelve, but not scaled). You don't have specific MIDI controller maps for aftertouch, pitch-bend, etc.; just on/off settings. On the plus side, Twelve songs are completely compatible with Pro24 and Steinberg's Masterscore professional notation program, so these types of fine-tune editing functions for your songs are possible should you decide to import them over to the big brothers.

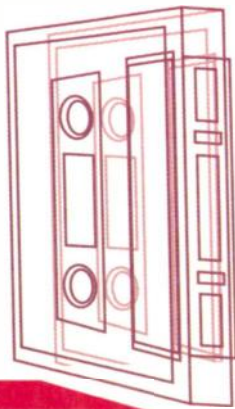
**The Bottom Line:** If you don't yet own a sequencing package for your Atari ST and you think you might like to, Twelve is absolutely worth checking out. At the price, you can hardly go wrong, and chances are that many of you will be perfectly happy with "the basics." ■

**PRICE:** \$89

**MORE FROM:** Steinberg/Jones, 17700 Raymer St., Suite 1001, Northridge, CA 91325. Tel: (818) 993-4091.







## Can money buy musicality? And are saxophones replacing guitars? *Reviews by Yung Dragon.*

I'M TOLD THAT a reader recently wrote in about how a sudden material windfall had enabled him to buy all the equipment he and his band needed to finally create the music in their heads (the argument being that yes, Virginia, the toys you have indeed influence the games you play). I'm sure Stradivarius made the same argument when he started marketing violins – a better instrument allows a better musician to play better (and better realize the ideas in his or her head).

Many of us will go one step further (or sideways) and say that new toys will inspire new ideas that you might not have had otherwise – a certain synth patch or fuzz tone may set the mood for a new melody or line. On the

other side of the coin, some will say that lots of high-ticket/high-tech toys aren't the only path to musical enlightenment – listen to an old blues record for a crushing argument in *that* direction.

But just like giving a computer to a monkey will not increase its chances of writing Shakespeare's lost sonnets, a friendly Santa Claus will not add luster to the uninspired. Case in point? The three tapes submitted (via Federal Express no less, even though I warned everybody I was six months behind) by **George Alpert**. He may be a "successful painter, photographer, and sculptor . . . listed in 'Who's Who In American Art;'" he may own a Roland D50 and RD1000, Prophet VS, Akai S700 and S612 samplers, and a Yamaha RX5 drum machine and TX216 and FB01 modules; and his works (*The Girl From Greece, Sketches of Monument Valley, and Shadows of Egypt*) may be digitally mastered and real-time duplicated to chrome tape, but the end result is still almost two hours of aimless, mostly raw synth string/brass chord washes with little ornamentation, development, or point. They actually put me off listening to readers' tapes for three weeks. Kids – no matter how rich and famous you get, don't let this happen to you.

I don't get a lot of jazz sent in, aside from the occasional piece of fuzak, and I'm not really sure why. Therefore, I was glad to get a pair of tapes by the group **Trapezium** (Todd Barton on EVI, JX10, JP8, S700, and Mirage; Joe Thompson on MIDI'd classical guitar and TX81Z; Mike Vannice on tenor sax and DX7). One tape included a couple of jams – 'Three Vignettes' and 'Timbral Tai Chi.' As the latter name suggests, they float in the land between free jazz and non-rhythmic modern

minimal classical music – a nice sense of frozen time. A bit less satisfying was their soundtrack to the play *Orphans* – there were some more nice floating jazz pieces, but also a bit of corny stuff and some works that bordered dangerously close to New Age (albeit, good New Age) with awkward transitions. Of course, it's really not fair to judge soundtrack music, particularly to a comedy/drama play, without the visuals (and the music got a good write up as being very supportive of the play, so I guess it worked).

So much for jazz, and my bitching and moaning – bring on the guitars and sampled saxophones!

– **Zulife/Zulife**: A four-song cassette EP by Andy Reinhart (vocals and keys), Greg Sulzer (drums), and Matthew Henderson (fretless bass and guitars). Hard pop with a very clean, modern, hi-tech edge. The style feels a bit like the '70s, but all the sounds, particularly the drums and guitars, are all very '90s and sharp. Special award to the strong vocal harmonies and well-understated keyboards. In truth, everything – including the songwriting and production – is strong.



– **Markus/four-song demo**: This cat's got the record-label/ad-company routine down: give short excerpts on one side, and the full length versions of the songs on the other. The style is classy upbeat instrumental that blends ethnic (Latin-ish percussion and Japanese flutes being particularly prominent), New Age (lotsa DX vibes and hollow pad sounds), and light classical (gee – just like his letter said it would . . .) performed on an M1, D50, Kurzweil 1000PX, TX81Z, HR16, and Roland MKS50. The recording quality is *very* sharp (on a four-track cassette!?!),



Trapezium at work and play



Mark Szejbach's cute nephew

with hi-hats in particularly shiny and bright form and well-performed – no mechanical feel here. Well-suited to TV entertainment/travel program backing music. No extreme depth, but very nice overall.

– **Passive Teflon Gravy/Shades of Black** (*Good Gyration*s): Insane, mind-numbing fun by Leo Dombecki (WX7 and TX81Z) and Mark Szejbach (DX11). Kind of an instrumental dance tune with monotonic bass and backing chords, a simple three-chord turnaround, and kooky random-note solos over the top. Stupidly wonderful.

– **Jim Binkley/Jade Guitar**: The premise is good: MIDI guitar, computer-aided composition using the Ravel language (to paraphrase the Byrds, “you should get a computer and learn how to program”), analog and digital sounds from an FM synth (TX802), and pieces of Eastern philosophy liberally sprinkled throughout. The more algorithmic pieces – particularly ‘Dragons on the Mountain’ and ‘Three Programs in the Shape of a Pear’ – work very well. The more Western-influenced normal-rock ones (‘Blue Microbrew,’ ‘Compufunk’) sound noodly and fall well short of their mark. The rest – travelogue-style Eastern New Age pieces – need some tightening and fleshing out. ‘Dragons’ is one of the best things I’ve heard in awhile. Let’s hear the sequel.

– **Hank Crimson/Back From Eternity**: Guitar rock a la Lynard Skynard or late-’60s American rock ‘n’ roll. Instead of a solo voice pushed way up in the mix, the vocals are all multitracked and mixed somewhere in the middle – a technique that works. Excellent, realistic drum programming by Jim Dimino on an HR16 and Hank’s multitracked guitar work is also great. Party music.

– **Paul Solberg/Now & Other Times**: Every now and then, you stumble across a *real* composer. Paul has been performing dance commission works,

commercials, industrial film work, and various solo and band musics for the past 18 years in classical, New Age, minimalistic, and rock styles. His strength seems to be infusing pointillistic, happy instrumentals with a bit of rock ‘n’ roll energy (and the slow stuff ranks as good New Age). Very FM-sounding, by the way. And he actually changes the tempo on the drum machine (an RX11) during the piece!



Paul Solberg

– **Rick Sanford/Frank Discussions with a Liar**: Friendly late 30s/early 40s (age-wise) vocal MOR with the twist that many of the guitar lines are taken by saxophone samples (an interesting sound). Almost entirely performed on an Emax (“with a tiny bit of Mirage”). Extra points for the loose, swinging drum machine programming. The title track breaks form, in that it’s a moody, stately semi-classical instrumental – with perhaps more promise than the MOR tracks.

# FRANK DISCUSSIONS WITH A LIAR RICK SANFORD

– **Mark Velten/Basement Tapes**: Instrumental stuff performed solely on a Mirage and ESQ1. As a former music student at Ohio State University, the material displays a few mental gymnastics (the occasional 17/8 and 10/8 time signatures, a work based on whole tone scales, etc.) and a lot of orchestral timbres, plus the always-dreaded sampled saxophone – but like Rick Sanford, he pulls it off okay, too. Nonetheless, it’s pleasant easy-listening music. A strong first effort with lots of changes and motion.

– **Sean McCoy/four-song demo**: Fun rock/pop with female vocals (by Gwen Cardenas) and a saxophonish synth lead that often reminds me of Zappa’s ‘The Grand Wazoo’ in humor and swing (the instrumentals are medium-paced and nice, too). Sean, a trumpet player, uses an EVI and EWI and comments that “the EWI is difficult, but definitely bridges the gap between wind expression and digital technology.” Drums, an HR16 again, played with an Octapad, and live percussion by wife Theresa Knight add particular fun. Sean threatens that he’s going to get a sequencer soon to tighten up the performances – *don’t you dare!!!* Human feel (and saxophones) rule.

Or at least they should. ■

## Contact addresses:

**George Alpert**, 5702 North 55th Place, Paradise Valley, AZ 85253.

**Trapezium** c/o Todd Barton, P.O. Box 3220, Ashland, OR 97520. Tel: (503) 488-2492.

**Zulife** c/o Contamine World Music, RR2, Box 97, Shady, NY 12409.

**Markus** c/o Mark Vickness/Markus Productions, 1810 Euclid Avenue, #18, Berkeley, CA 94709. Tel: (415) 548-6676.

**Passive Teflon Gravy** c/o Mark Szejbach, 30140 Avondale, Madison Heights, MI 48071.

**Jim Binkley**, 5814 SW Taylor, Portland, OR 97221. Tape costs \$5.

**Hank Crimson** c/o Jim Dimino of UBIK Records/Beyond Productions, P.O. Box 1954, Cambridge, MA 02238. Tel: (617) 451-2303.

**Paul Solberg** c/o Paul Solberg Music, 6660 North Damen, Chicago, IL 60645. Tel: (312) 465-6838.

**Rick Sanford** c/o Dental Records, 225 East 17th Street, #710A, New York, NY 10003. Tel: (212) 475-2845.

**Mark Velten**, 2703 Bristol Road, Columbus, OH 43221. Tel: (614) 792-3455. Tape costs \$6 (Ohio residents: add 5½% sales tax).

**Sean McCoy**, 8335 Burnet Avenue, Sepulveda, CA 91343. Tel: (818) 894-2324.

**Readers’ Tapes** should be considered a forum for saxophones as well as for synthesizers. Tapes are reviewed in the order received. Send your “contrapunctions” and contributions along with name, address, equipment list, and a photo or finger painting to: **Readers’ Tapes, Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.**



# Making REAL-TIME MIDI Real

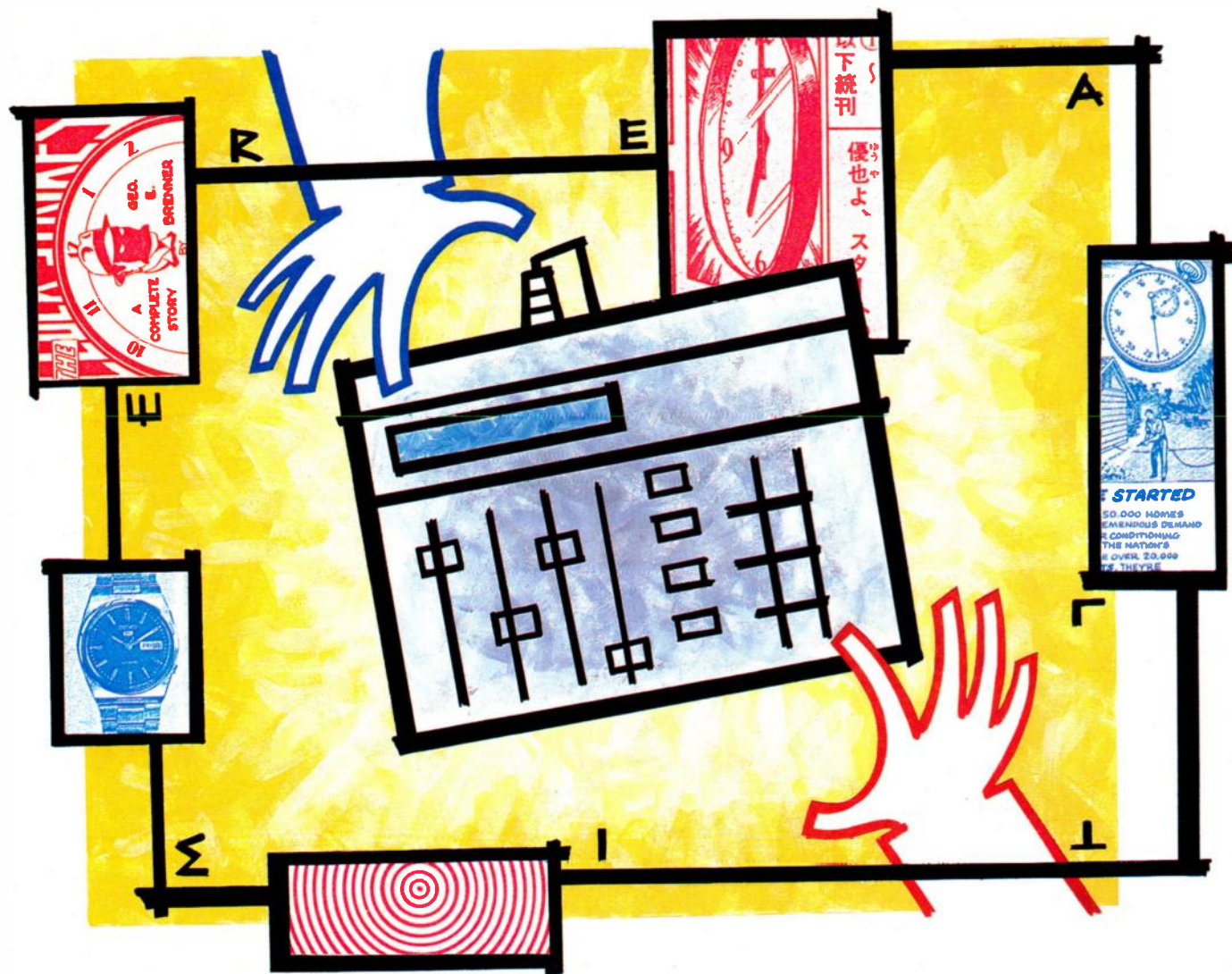


Illustration Clire Goodyer

**Although often maligned for removing the expression from music, MIDI can actually be used to make your music more expressive. Text by Ernie Tello.**

**S**ome people are still having trouble adjusting to how far MIDI has come. Others can't wait until it's gone much farther. Not long ago, I suggested a rather advanced MIDI application to a developer and I found his reply hard to believe. "MIDI wasn't designed for that," he said. You still hear that kind of thing, even from people who ought to know better —

people who ought to remember that the only thing MIDI was originally designed for was layer-ing sounds on different synthesizers. No doubt MIDI will always mean different things to different people.

Those potentially affected the most by MIDI control are probably composers and drummer/percussionists. For example, as Bruford and others are

proving, drummers today can participate in the melodic and harmonic aspects of music just as much as other players have traditionally. And, as we'll see, the composer's job need not end when all the parts are written and assigned to instruments.

Perhaps after reading about the current state-of-the-art for real-time MIDI control, you might find that your

feelings about MIDI have changed somewhat. But individual differences aside, there's no disputing that the things you do to control your instrument while it's making music are at the very heart of your musicianship.

I'm going to talk about using real-time MIDI control to make your performances and sequences come to life. Real-time MIDI control actually means a number of different related things. The basic concept is making changes while music is being played live or while a sequence is running. Ideally, manual real-time control ought to be an extension of how you play your instrument. This gets into personal preference, however, because things like aftertouch are not attractive to all players. There is already an impressive number of things you can do just with the fingers that are playing the music. The fact that both the notes and their articulation are translated into data that can circulate through an entire studio of devices, in ways that can control what these devices do, has awesome potential. On the other hand, there are limitations to MIDI, some well known, others not so well known.

One limitation you may have encountered is that volume is determined by note velocity on many or most instruments. We've come to take this for granted, but it can be a problem for live performances in which you want to play very fast without getting louder as you do. This usually becomes a problem only during riffs involving thirty-second notes or drum rolls. To achieve things like the fast strums in Flamenco guitar music, you have to use a sequencer. In the future, all keyboard controllers will probably replace or complement velocity with real pressure sensitivity to determine loudness.

The changes that can be made while your music is playing create excitement in an arrangement and give it a unique sound. This starts with foot and hand controllers that can be made to do practically anything MIDI allows, with some of the gear that's readily available now.

### Real-time Control of Effects Processing

Hot competition in the area of digital sound processing units is leading to increased sophistication in the MIDI implementation of many of the most recent offerings. New devices like the

ART MultiVerb II, Korg DRV2000, Lexicon LXP1, Yamaha SPX1000 and Alesis QuadraVerb provide some opportunities for real-time control that represent a fresh addition to the toolkit of low-cost MIDI studios.

The MultiVerb II has all the signal processing functions of the original as well as the Dynamic MIDI functions ART introduced on their DR1 Digital Reverb. The DRV2000 allows up to two parameters of any sound processing program to be modulated in real time. When the LXP1 is used with Lexicon's MRC (MIDI Remote Controller) unit, up to eight parameters can be controlled in real time. The Yamaha SPX1000 offers some comparable features to that of the DRV2000, with the added ability to do complete data dumps via SysEx, so that program

*"We are beginning to see effects devices that are sensitive to the notes that they see in the MIDI data stream as they're being played. In other words, they're sensitive to the musical context."*

setups can be saved to disk on other MIDI devices. The Alesis QuadraVerb allows up to eight effects parameters to be controlled by practically any MIDI messages you like. The real-time MIDI control of DSP units like these are of two basic types: allowing outside controllers to manually change parameters at will, and allowing external sequencers or the music itself to control them.

Allowing pedals or sliders on a DX7II to control reverberation parameters on a sound processing unit like the Korg DRV2000 is pretty straightforward. But, far more importantly, we are beginning to see effects devices that are sensitive to the notes that they see in the MIDI data stream as they're being played. Now that's something to wave a big red flag about, because it means that an important new type of MIDI device with sensitivity to musical context has quietly been making its appearance. It's worth spending some time at this point to look into the MIDI implementation of a device like the Korg DRV2000 that operates in this way.

### Multi-Modulation

That's what Korg calls it. Other manufacturers have different names, but it means that certain parameters in the sound processing programs can be controlled by a wide variety of sources in real time as you or your sequencer play. On the DRV2000, external foot-pedals, keyboard sliders or aftertouch,

MIDI note information, and even audio input level can be used to make these changes.

There are basically two different types of control, on/off and continuous, that correspond to the two basic types of MIDI controllers. If you set the Sense of a controller source at 100% on the DRV2000, then it can use switch controllers or aftertouch to set a signal processing parameter to its maximum or minimum value each time you press the switch. If you set it to 50% or other values under 100, then you get a continuous range of parameter values.

On the whole, the way in which the DRV2000 can be made sensitive to MIDI note and velocity information is rather rudimentary. You merely set the Sense scaling number in the same

manner as you would for any other controller. However, the control of effects parameters by MIDI note data is such an important operation that a far more sophisticated implementation would be highly desirable. The fact that a MIDI keyboard is programmable to allow many different sounds on different keys is reason enough to provide a fine degree of control over how such note information influences effects parameters. Even when only one instrument is assigned to the whole keyboard, there are cases when you might want to simulate special reverberation environments such as a piano sound board, the resonator of a guitar or violin, or even a human voice. Such acoustic instruments are sensitive to musical contexts in ways that synthesizers and effects boxes are not (so far).

Also, it ought to be possible to apply more than one controller to the same effects parameter. In that way you could use a footswitch to emulate a piano's damper pedal and, at the same time, have the reverb or echo be sensitive to what notes are played.

### AfterVerb

One type of control that is seldom used involves specifying when certain things will *not* occur. This has some fairly important uses. There are some effects that just don't sound good with a particular piece of music because of the way they react to a few notes in certain parts. Other times, the whole



piece is too up-tempo for the effects to react properly. In cases like these, it is useful to turn the effect off or diminish it for certain sections of the tune. Footpedal control is one standard way of coping with this, but there are times when you want the control to be automatic. There are even times when you want an effect parameter to increase considerably, but only after the music has actually stopped. This is very easy to do with a device like the DRV2000, since it can use the negative sense of the input level from its audio jack as a controller. The result can be a very potent way of making specific effects fade at the end of a song.

## Program Changes

Program change is a form of automatic control that is more than just a convenient time-saving feature. It tends to make the effects program a more or less permanent part of your sound. Of course, synths like the Korg M1 and Roland D50 provide a built-in solution to this problem. However, when outside effects are used, program changes give the result of fusing various programs on different devices into one unified sound. The act of setting up an effects program for each patch or sample you use forces you to decide which of the existing programs is the

best, and sometimes even leads you to create a new program. In any case, the result is predictably the same: your sound improves dramatically.

For this type of automatic program change control to work, your main MIDI instrument must transmit program change data. It is certainly desirable for program changes to be "sendable" while the music is playing. However, on many instruments this capability is designed for use with only one synthesizer at a time. The Yamaha SPX90 has a provision for use with more instruments. It has four different banks for program change assignments, each of which can be set to a different MIDI channel. If you are alternating lead voices between different synthesizers and sharing the same effects device, the appropriate effect for each lead can be easily selected.

Sending program change messages to effects processors is typically used to force programs in the processor to mirror patch changes on a synth or drum machine. If you're careful, you can use it in powerful ways during an arrangement as well. This generally works well in sparse arrangements where there is enough open space to cover the changes. With some units, there is a brief cut in the output before the new effect takes over when a program is changed. In certain types of arrangements, in which there's a lot going on, a lot of instrument and effects switching in the background is possible if there are some instruments "sitting out." If your intention is to do everything on the fly, then it is important to select equipment that can make changes instantaneously without any extraneous noises.

Sending a program change by imbedding program change numbers in a sequence sometimes only allows you to change voices, not performances, on some synths. Other instruments only change their performance setup in response to a program change message. However, if you make the change you want manually on such an instrument while the sequencer is recording, you can usually get the sequencer to perform the change when the sequence is played back. The disadvantage of this method is that your manual change cannot be timed as precisely as an embedded program change number.

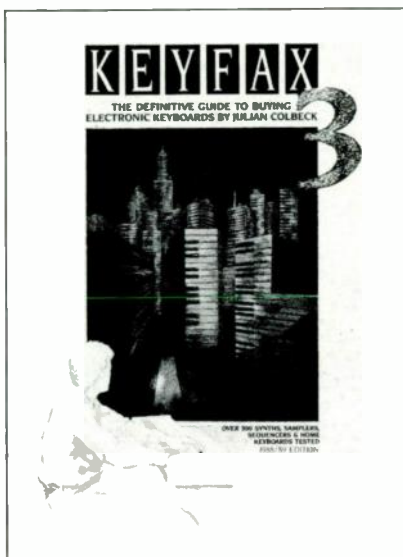
Some synths, like the Yamaha DX7II, have a unique feature that allows you to specify what the instrument will transmit when a program change is

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invoked. This is useful if you are stacking voices and the slaved synth does not have a program change table, like the Roland D50. In that case, you program the DX7II to transmit the data that the slave needs to receive for each program change. The DX7II also has the ability to transmit a program change number selected manually even when no changes are called for in the instrument itself. This is handy when the instrument is being used as a master controller and you want it to keep its current program, but change the program of a slave synth.

With a device like the MIDI Mitigator RFC1 from Lake Butler Sound Co., stored MIDI messages can be sent by pressing various footpedal combinations. The stored messages can be up to 255 bytes in length and include anything in the MIDI spec. One obvious use for the RFC1 is to call up all of the setups for a live show, just by pressing a footswitch. However, there are many other uses for such a versatile MIDI foot controller.

### Advanced MIDI Processing

If you have a MIDI processor such as the Forte Mentor, Axxess Mapper or Yamaha MEP4, some really advanced (and often esoteric) types of real-time MIDI processing are available to you. (See the "Creative Data Processing" article in the April '88 issue of MT for more info on these useful devices.) One important development in MIDI processing is the appearance of "send an example" programming on devices like the Mapper. This means that you don't have to

know the intricacies of hexadecimal MIDI SysEx codes to get the device to send them. By having the synth send its SysEx messages while you are programming it, the MIDI processor can be taught the messages that are involved by example, even if the user has no idea what the message is. A general technique is at work here that has wide areas of application for simplifying MIDI programming.

The MRC controller from Lexicon is an interesting device that taps some of the potential for real-time MIDI control. In addition to being a controller for the LXP1 and PCM70 effects processors, the MRC has the ability to act as a patch editor and controller for six-operator FM synths. This brings the old analog hands-on style of programming to the world of FM synthesis. In addition, the MRC's four soft buttons and four soft sliders can be assigned to send any MIDI controller message.

*"Traditionally, musicians have used their two hands, two feet and their breath to perform music. MIDI has only changed the types of things you can do with them so far, but eventually it will do much more."*

Since there are two sets of MIDI Ins and Outs on the MRC, one set can be connected to a Lexicon effects processor and the other set to a synthesizer or drum machine. This setup works particularly well when you want to take advantage of the FM control or MIDI controller features.

With a computer, the opportunities for real-time MIDI processing are theoretically enormous, but in practice

are limited by the specific software and hardware you use. The Yamaha C1 computer, with its eight MIDI Outs, offers the greatest opportunities here, providing that software makes full use of its built-in features.

Another computer that has special facilities for real-time control is the Apple Macintosh. With the new MIDI Manager from Apple, more than one MIDI program can be running simultaneously under MultiFinder. The output from each one can be merged into a single stream that is sent to the MIDI Out port. The MIDI Manager also supports other mapping functions such as splitting and routing MIDI data among different applications. A graphic interface called the Patchbay will allow users to take advantage of these capabilities, but these tools must be specifically supported by the programs you use. Most of the Mac developers are enthusiastic about this new capability and intend to provide support for it in upcoming releases of their programs.

### Conclusions

Real-time MIDI control can make the entire process of projecting music to an audience subject to minute control specified by the composer. Some compositions in recent years have taken specific advantage of this. The most publicized example of this technique is probably the composition *Repons* by Pierre Boulez of IRCAM. However, groups like Pink Floyd have been doing things somewhat like this for many years. What has changed since these initial attempts is the connection of complex sound projection systems to sequencers and other, more sophisticated controllers.

Traditionally, musicians have used their two hands, two feet and their breath to perform music. So far, MIDI

has only changed the types of things you can do with them, but eventually it will do much more. It also will extend the distances over which music can be made. I haven't heard of anybody having a MIDI jam by telephone yet, but that's probably next. The full potential of transmitting and manipulating music as digital data streams is still in the process of stretching to its ultimate realization. ■



# INPUT OUTPUT

Have a technical question that you can't seem to find an answer for? If so, send it to our team of experts at: Input/Output, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.

**Q** I use a lot of equipment that has the "standard" 3-prong electrical cable connections (Atari, Casio, Ensoniq, etc.).

While cable swapping and replacing power cables is made easier by this standard, one question keeps coming up . . . why hasn't anyone made a three to six inch version of the standard power cord?

When you have a rack full of gear, the space used up by these cables becomes annoying, often pulling out of the units. Has anyone resolved this?

Another thing that bothers me is the physical space used up by "adaptor" power cables, each easily wasting two spots, or, if put on opposite ends of a power strip, placing one out of ground. Can't we go the way of Manhattan - build up, not out?

Thanks for a great magazine!

*Jeff Guenther  
Wayne, NJ*

**A** I couldn't agree with you more Jeff, particularly concerning the huge adaptors at the ends of some power cords. I can understand why manufacturers resort to using external power supplies - that way they can avoid having to get FCC approval, which can often delay a product by up to six months. In addition, it is significantly less expensive and takes up less space in the unit than an internal power supply. Some manufacturers, however, have found a somewhat elegant compromise called a "lump in the line." As found on the Roland MT32 and a few other products, these lumps in the line place the fat power supply somewhere in the middle of the cord's length, so that you just have a normal two- or three-prong plug at the end. I certainly wish more manufacturers would think about

using them. Regarding your first point, perhaps some enterprising entrepreneur will read your suggestion, recognize a need, and fill it. Anyone out there have any other suggestions? - *BO'D*

**Q** Guitars, I understand. Computers, I understand (A.S. degree in Computer Science). Keyboards, I don't understand. I have just bought my first synthesizer, a Casio CZ101, and I don't know anything. How, specifically, would the techniques in Chris Meyer's article "Rehumanize Your Synth" (MT September '88) be applied to the Casio CZ101?

While I did not understand how to make these ideas work on my synth, I did understand the concepts, I think. It was a good article and I would like to see more like it.

Also, where might I obtain patches for the CZ101 for free?

*Joel Blevins  
Auburn, AL*

**A** To refresh everyone's memory, the "Rehumanize Your Synth" article (no relation to the recent "Rehumanize Your Sequences" series, but it does make us wonder about our occasional lack of imagination - either that or our mind set) concentrated primarily on envelope techniques that can be used to add life and movement to synthesized sounds. All of the programming tips mentioned in that article can be applied directly to the CZ101, thanks primarily to its flexible set of eight-stage envelopes for the DCO, DCW and DCA. To give you a specific example from the article, Chris talked about setting fast attack rates to

create a quick "blip" at the beginning of a sound. To create that on the CZ101, you would adjust the DCA envelope so that the rate and level settings for envelope step one are both 99 (their highest setting). Then, you would set the rate for envelope step two to 99 and set the level for that step to about 25 or even less. You could then add more movement to the sound by setting a different rate and (higher) level for envelope step three, say 75 and 75. You could also set the Sustain (Sus) point, or the envelope step at whose level the patch continues to sound while you hold down a key, for step three. Finally, you'll need to set an End point in another envelope stage to create a complete envelope. Make sure you don't set the Sus and End point during the initial two stages or the "blip" effect won't occur. Hopefully, this will give you an idea of how to apply these techniques. You might also want to check out last month's Square One column, which focused on explaining sound synthesis in general.

As far as your other request is concerned, MT has run a few CZ patches in its Patchwork page over the last few years and you are free to punch in those patches. Also, several electronic bulletin board services, such as PAN (the Performing Artists Network) and GENIE offer specific areas for MIDI equipment that often include synthesizer patches that you can download for free. If you're willing to shell out a few bucks, there are several third-party vendors who sell CZ patches - check out MT's classifieds as well as similar sections in other electronic music magazines. The quality of these patches varies widely, so try to listen to them via a demo tape first if you can. As always, buyer beware. - *BO'D*

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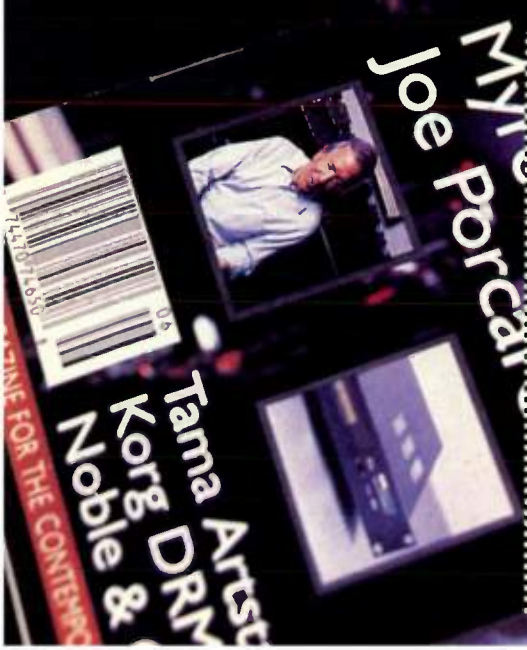
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# The Pursuit of Direct Creativity



Photography: Thomas Rösenberg

**Enter the world of Rainer Bruninghaus, whose mastery of synthesizer subtlety creates a world where things aren't always as they seem. Interview by Peter Freeman.**

**"O**NE QUESTION I'M always asked is why I had no bass player in my own group," laughs Rainer Bruninghaus. "It actually started with my first solo record (1980's *Freigeweht*, on the ECM label). I was trying to get a very different sound; more airy, not so bottom-oriented. At least it came out like that in the compositional concept, and it worked very well in the studio. After that, I wanted to bring the music on stage, so I tried to do the same thing in a live context. I thought it might be difficult, because you're not so sure about things if you have no bass player, but it worked. I was pressed by that to develop different music, because you can't play the same

stuff as you would with a bass player."

It's this kind of thinking that distinguishes Bruninghaus from many of his Euro-jazz contemporaries, both conceptually and musically. Of course, he didn't originate the idea of a bassless jazz group, but unusual instrumentation is just one of the rather unique aspects of his work. Although virtually unknown in America, the German-born pianist/synthesist/composer has gained substantial acclaim throughout Europe and Scandinavia for his polished, inventive playing and composing work with bassist Eberhard Weber in the '70s and '80s, and his own solo albums have also garnered high accolades from the press (notably *down beat* magazine) and public.

*Freigeweht* (pronounced "Fry-ge-veet") on ECM features the brilliant ensemble work of drummer Jon Christensen, trumpeter/flugelhornist Kenny Wheeler and reed player Brynjar Hoff, while its 1984 successor, *Continuum*, finds Bruninghaus in a trio setting with Swiss drummer Fredy Studer and Markus Stockhausen (son of the famed electronic music pioneer Karlheinz Stockhausen) on trumpet. On both albums, Bruninghaus' warm, animated synthesizer parts and stunning classically-inflected piano improvisations rise and fall throughout, lending an uncanny dimension to the music while neatly avoiding stylistic clichés.

One thing that is immediately obvious upon hearing him play is the

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scope of Bruninghaus' musical background. Stylistically, his compositions and improvisation hint at many different sources: shades of Dixieland, Bebop, free jazz and European classical music are clearly visible in his work, as is a distinct 20th century influence. Particularly striking is the apparent ease with which he glides from one stylistic plane to another, somehow never losing his own unique phrasing and identity. This is hardly surprising, given his varied background and lifelong involvement with music. "I started at the age of three, as a free jazz player," he jokes. "My parents put me on the piano, and I immediately started to play. I can even remember trying to find musical forms and so forth when I started, but my real classical piano training began at age nine, and continued until I was eighteen."

**B**OTH ON FREIGEWELT and *Continuum*, his warm, complex synthesizer textures seem to float above the acoustic piano, supporting yet never interfering with the flow of the music. The timbres suggest a multitude of different synthesizers, sometimes exuding an almost vocal quality, and his fast-paced, tireless rhythmic patterns seem at times almost machine-like in their precision. The reality is surprising, to say the least.

"The first real synthesizer I had was the Oberheim four-voice. Because it only had four-note polyphony, I worked very hard on the patches to try to get some complex sounds, tuning the oscillators in different octaves and fifths, and so on. I used every trick I could find," he grins. "I did this even before my first record. For example, on 'Bali' (from Eberhard Weber's *Little Movements*), there is a very fast pattern in the middle of the tune. I did this by pressing four keys with one hand while holding down maybe two keys with the other hand. When I would release some of the keys with one hand, the other keys would immediately sound.

"From this I built up a pattern which continued for a long time, which is probably why it sounds like a sequencer. But in those days, I had no sequencers or anything like that; I was the sequencer. Back then, even more than now, I was very into minimal music. In fact, I always had a conception like that in mind, even



before I heard the American minimalist composers like Steve Reich and Terry Riley. So I didn't mind playing the same phrase for a very long time, without a sequencer. It was sort of a meditative approach, to repeat phrases and create phasing patterns, and so forth. Even though I have access to sequencers now, I like the idea of playing the patterns myself. It's not so mechanical-sounding, and there are subtleties, like slight variations in the tempo, which everyone notices subconsciously. It immediately sounds more 'human.'"

Listening to his work, it's remarkable that Bruninghaus has managed to wrench so many different textures from a single synthesizer, especially one as primitive as the barely-programmable Oberheim 4-voice. In fact, he only recently entered the world of fully-programmable MIDI synthesizers. "The 4-voice was my only synthesizer for about eight years," he states. "I even used it on *Continuum*, but after that I started having technical problems with it, so I got a Rhodes Chroma, which I worked with quite a lot for a while; I really liked the sound of it. Unfortunately, it also developed problems, so now it's sitting downstairs in my cellar," he says wryly. "After all, what can you ever do with a machine that doesn't work half of the time?"

Today, Bruninghaus' equipment arsenal has expanded considerably, to

say the least. It currently includes a Sequential Prophet VS rackmount, Yamaha DX7II, E-mu Emax, Roland D550, Yamaha MEP4 MIDI Event Processor, Simmons SPM8:2 mixer, and an Atari ST with Steinberg's MasterScore notation program and Syn্থworks patch librarians. His new setup affords him an enormous amount of sonic flexibility. However, although he's excited by the possibilities afforded him by his new gear, he finds the design quirks in

*"I started at the age of three as a free jazz player. My parents put me on the piano, and I immediately started to play."*

some of his instruments to be somewhat troublesome.

"The VS is one of my main instruments now, and it sounds so fantastic that I can't believe some of the [design] mistakes in it. For example, I can't read the LCD display unless I am about three feet below it, which makes it difficult for me to use it in my rack. It's very surprising to me that such a well-made machine has this kind of problem; it makes it very difficult to work comfortably. But I like the sound so much that I guess I'll continue to use it anyway," he adds with mock resignation. "I enjoy programming the VS very much because it's very immediate, and you can get nice sounds out of it every



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time you sit down to work with it. I don't find this to be the case with the DX7II, which of course is also a very nice sounding machine. It takes a lot of time, which I sometimes think the creative musician is not able to spend on just programming. You need one or two days just for one patch, which means that you lose time that could be spent writing and orchestrating, among other things."

When asked about processing his synthesizers, Bruninghaus revealed



some interesting insights on the subject. "I think that reverb is quite important for my music, and for synthesizers generally. With acoustic instruments, it's not so much of a problem, because the sound is what it is, so to speak. However, synthesizers can sound very flat on their own, so I try to make them as human-sounding as possible, and I think that reverb helps a lot. When I did *Freigeweht* and *Continuum*, the only effect I had was a little echo machine. I used it mostly to broaden the sound a little bit, and to create a stereo image, although I'm sure that the recording engineer (Jan Erik Kongshaug) added some reverb as well. I think that Manfred Eicher's production had a lot to do with the overall sound. However, I recently got a really nice reverb unit (Roland SRV2000), and a Yamaha D1500 delay, so now I'm able to bring the studio sound on stage, so to speak. I think that my live sound has improved a lot in the past one or two years, largely because of the new equipment."

With the newly-acquired MIDI capability added to his processing gear, does Bruninghaus see any advantages in coordinating MIDI effects changes with program changes? "That's an interesting question. When I first got the reverb and delay, I was very much looking forward to being

able to do that. I think perhaps in a rock group where they play their tunes very similarly each night, this might make sense. For me, however, it doesn't really work, because of the spontaneous nature of the music. If I decide on the spur of the moment that I want to use a certain patch on a synthesizer, and I have the reverb MIDI'd to it, I might end up with a reverb setting that I don't want at that particular moment. So I don't use that aspect of the gear."

Ultimately, however, Bruninghaus still favors the acoustic piano as the most directly expressive instrument. "Even though I am very interested in modern music technology, I still consider myself more of a piano player, because the piano is an instrument where you can express yourself immediately. You have immediate input of your ideas into the instrument, and that's still quite important for me. The synthesizer is just the opposite; you have to plan and develop things one step at a time, which I like also; but I never want to lose the immediacy of the piano.


"It's interesting," he continues, "someone recently asked me to play a synthesizer solo, and it occurred to me that I've never played solos on a synthesizer. I've always used the technology to develop new sounds and new ideas that I couldn't realize on just one acoustic instrument like the grand piano."

Recently, Bruninghaus has become involved in a number of varied projects. Among them are a new trio

*"Synthesizers can sound very flat on their own, so I try to make them as human-sounding as possible. Reverb helps a lot."*


with guitarist John Abercrombie and percussionist Trilok Gurtu, European concert tours with ECM saxophonist Jan Garbarek's group, composing musical productions for Cologne radio, and the soundtrack for a short film by German filmmaker Gerd Haag. He has also composed a requiem for the Rhine that he performed with reed player Paul McCandless and vocalist Lauren Newton. The collaboration was so successful that the possibility of trio gigs with this group is now being considered. In addition to all of this, he's teaching in the jazz department at Cologne University, schedule permitting. Not bad for a man with no bass player. ■

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# Yamaha WX11 Wind Controller

## WT11 Wind Tone Generator

Photography Melodie Gimple

**I**N MY VERY first MIDI wind controller review for MT (December 1987), I waxed rhapsodic regarding the fact that this new group of instruments would free windplayers from worries about reeds, ligatures, barrels, necks and the like. These instruments were going to free us from the setup trap that we all fall into at sometime in our careers (i.e., "I think I prefer the lower register of my horn with this neck, that ligature, and these reeds. But, in the upper register, I think I like . . .").

This innocence was short lived. I've just spent the last several days comparing Yamaha's latest MIDI wind driver (the WX11) to its predecessor (the WX7) and I found myself slipping back into the old habits (i.e., "I like this one's action but then again, that one's

**Yamaha opens its arms to a broader market with a new and powerful wind controller package that combines all the necessary elements – controller, synth and effects – for the price of the original WX7. Review by Michael Andreas.**

got . . ."). The obvious solution is to have one of everything, allowing you to entertain your every whim. But, for those of us unable to afford such luxury, I offer this little walk down WX Comparison Street.

### The WX11 Driver

The WX11 is part of a package that Yamaha is obviously hoping will appeal to a large segment of the wind synth market. Simplified setup and a companion voice generator (the WT11, which is designed specifically for Yamaha's two wind controllers) go a

long way towards overcoming the main objections many players had to the WX7. These objections were mainly that the WX7 required a lot of initial adjusting, and the additional expense of a tone generator and effects rack before you could begin to sound anything like the recording included with the WX7. To reach a larger group of players (students, amateurs, the less technically minded and the less financially flush), Yamaha has put together this very impressive package, with a list price just under \$1000.

Those of you who have played the

WX7 will immediately notice some nice changes on the WX11. The shims are gone, and the little rubber flap (that never worked anyway and which most people pulled off and threw away) is likewise gone. There are no more DIP switches, adjusting pots or rubber airflow adjusters and they even got rid of that little metal loop around the "barrel" (the justification for which I never *could* figure out).

Unfortunately, there are a few features that have been removed (most likely due to cost-effectiveness) that I am sorry to see go. The first of these is the pitch-bend wheel (it really worked great with those trombone timbres); and secondly, the hold key now only sustains a single pedal note – there are no parallel follow or breath controlled modes available on the instrument. However, with an MFC2 Foot controller (optional), all the original follow modes (and more) can be accessed. Also gone is the option of sending Velocity and Aftertouch information to synths that don't respond to Breath Control information, which tends to make the WX11 a Yamaha-dedicated driver.

Not all of the changes to the instrument are in the "what's been deleted" department. The WX11 sports a new look. It is slightly angled just below the "neck," which makes for a much more natural and comfortable playing position. It's also a few ounces heavier and a few inches longer than the WX7, both of which seem to add to the aesthetic quality of the instrument. The MIDI connector has been mercifully repositioned for easier mounting, and the octave key layout has (thankfully) been redesigned. The left thumb now rests on a small mound that offers easier access to the octave keys (WX7 owners should note that there is an update equivalent to this mound in the form of a stick-on thumb rest that can be obtained from a dealer or directly from Yamaha). Although this thumb mound helps maneuvering through the five octave keys, it's still not the ultimate solution to the octave shift problem. Octave key layouts seem to be the bane of all wind controllers...

Some of the new features on the WX11 are radical improvements, the most noticeable of these being that the key action is much more natural feeling. The WX7 key contacts have given way to a plunger/spring arrangement that causes a lot fewer wrong note "glitches" and provides a generally more satisfying and real "feel" to the

instrument. The air-flow adjuster is now preset at a "resistance" level very similar to that of a clarinet or soprano sax. This arrangement also eliminates the weird "hiss" that's particularly noticeable when playing a WX7.

By far the biggest improvement in the WX11, however, is in its setup procedures. Anyone who has played a WX7 knows that adjusting the Wind and Lip Zero and Gain pots is at best an "iffy" proposition. On the WX11, all this is changed. There are basically only two adjustments to make and you don't need that damn little screwdriver for either of them. The Lip Zero adjustment (which adjusts the lip pressure/pitch relationship) is now adjusted by a small wheel located in the "barrel" of the instrument. This is done in con-

within a selected bank), right and left/mono output jacks, and a headphone jack.

Unlike the WX7, the WX11 has no Power Pack. Instead, it plugs directly into the WT11 (a WX7 can also be plugged into the WT11 using its power pack extension cord). Once plugged in, there is a very simple setup procedure for graphically adjusting the driver's Lip Zero setting to an A440Hz pitch (or any tuning between 415 and 465Hz). After this adjustment is made, you select a Performance and start playing. It's about as easy as MIDI gets.

The Performance voices are excellent. Basically, the WT11 is equivalent to a TX81Z or DX11 with built-in effects (the WT11 also has one extra parameter that determines whether the

**Overcoming Objections** *"Simplified setup and a companion voice generator go a long way towards overcoming the main objections many players had to the WX7."*

junction with the WT11's tuning mode.

All other parameters (Loose Lip mode, which requires no lip pressure to play in tune, Wind Zero, which adjusts the breath threshold point, and Wind Gain, which controls the amount of effect that changes in the breath pressure produce) are now controlled by a "setup" key in combination with one of the octave keys. This permits the player to select one of five "sensitivity" settings that combine both Wind and Lip gain functions. Thanks to this feature, making these adjustments becomes a simple artistic choice rather than a feat of technical wizardry. These setup improvements aren't limited to the WX11. The WT11 sound module goes a few steps further towards simplifying matters as well.

### The WT11 Wind Tone Generator

There is no denying that the WT11 is a nice looking piece of equipment. Soft contours, only 10 buttons on its front panel, a 16-character LCD backlit display, a volume knob and WX7/11 In connector. The rear panel has a power on/off button, a power adaptor jack (a DC 15V adaptor is supplied with the unit), a cassette interface for saving Performance parameters (the connecting cable is also supplied), a MIDI/WX Input selector switch (used to specify whether the WT11 will be controlled by the WX7/11 or another MIDI device or sequencer), MIDI In/Out/Thru Jacks, two footswitch jacks (for selecting different Performances

LFO will be controlled by lip or breath pressure). The onboard effects include hall, room and plate reverbs, delay, delay L/R (for a ping-pong effect), stereo echo, distortion and reverb, distortion and echo, and gated as well as reverse gated reverb. All of these effects can be modified with wet/dry balance and time controls (up to 300 milliseconds for the delay effects and up to 10 seconds for the reverbs).

There are three banks of 32 ROM Performances and an Internal RAM bank that is programmable using an outside programming source such as a DX11 or TX81Z. I connected the WT11 to my DX11 and found that editing parameters on the DX11 caused the same parameter to be adjusted in the WT11 at the same time. The Performances are made up from four banks of ROM voices and the sounds supplied with the unit range from the "generally good" to "sublime," with the majority falling into the "very impressive" category. Although the standard Yamaha "step noise" is still there, the built-in effects tend to mask the problem.

All of the functions on the WT11 are trimmed down in comparison to its older siblings. The Edit mode is limited to changing effects, choosing whether lip or breath will control the LFO, and changing the name of a Performance. The Utility function controls the program change table, MIDI data transfers between instruments, WX and master tuning, and memory protect. The WT11 ►

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transmits and receives only on MIDI Channel 1, so there are no channel editing possibilities. Also, there are no Performance or voice editing functions on the unit, which led me down a somewhat frustrating path.

The architecture of the WT11 is such that you can only access Bank I of the Internal voices and performances from an outside source. This is the RAM bank and comes from the factory loaded with duplicates of the Bank A ROM voices and performances. I spent hours trying to transfer the voices from Banks B and C to a DX11 and an editor/librarian program to no avail. I couldn't believe that Yamaha would design an instrument this good and overlook such an obviously major flaw. I was frustrated, tired and confused. Finally, with indignant outrage, I called the Yamaha customer service line. It was then that I found out about the "Secret Mode."

Secret Mode was the answer to my prayers. It allows you to edit any of the performance, voice and effects para-

**WX11** *"It is slightly angled just below the 'neck' which makes for a much more natural and comfortable playing position."*

meters in the RAM bank and access all the ROM data from within the WT11. It does so by providing the means to transfer the voices and performances in Banks A, B and C to Bank I. This allowed me to get at the voices I wanted, but it wasn't easy. In fact, after doing it, I understood why Yamaha has kept it a secret. It could easily turn a novice off to the instrument, and the Secret Mode info sheet is so cryptic that it took a half hour of experimenting and some lucky guesses just to be able to transfer voices between banks. It is best left to the more advanced player/programmer, but just knowing that it exists raised my opinion of the instrument several notches

## Summary

The WX11/WT11 combo is a tidy little package. It could go a long way towards overcoming a lot of players' reluctance to explore the technology and even further towards introducing the technology to a new generation of young players (which is obviously one of Yamaha's goals here). The timbres designed for the instrument are generally excellent, especially the brass performances. Secret Mode notwithstanding, I still feel that it was a mistake not to allow the player easy access to all the

voice banks on the WT11, but this probably won't bother most of its targeted market.

As good as it is (and it is quite good), this package is obviously aimed more towards a sort of upscale Casio mass market than it is towards the professional player. I say this, first, because the instrument was evidently not meant to travel. Unlike the WX7, there is no real carrying case with the WX11 (a faux leather bag is included along with a neckstrap and polishing cloth, but there's no mouthpiece cover) and as nice looking as the WT11 is, a rack-mount version would be more practical for professional use. Documentation for both of these pieces of equipment is quite good (the WX11 comes with a 17-page manual and the WT11 with a 25-page manual).

If you presently own a WX7, I would strongly recommend trying to get your hands on a WX11/WT11 package just to see how your instrument is supposed to be set up. In fact, I miss the WT11 so much now that I've

returned it that I'm considering buying one for my WX7. It's so helpful in simplifying the driver's setup and the sounds are so good that it justifies the expense. Each unit (the WX11 and WT11) can be purchased separately. However, if you purchase a WX11 without a WT11 you will have to buy one of the WX7 power supply packs as well.

I hope that Yamaha doesn't stop here with the development of their wind controllers. There is still the need for a state-of-the-art professional package similar to this one. This package should include a rack-mount version of the WT11 with total voice access and a controller that incorporates the WX11 improvements but retains some of the sophistication of the WX7 (or incorporates some of the MFC2 functions). I would also like to see Yamaha include a breath-controlled VCA input that would allow the player to use the expressiveness offered by these instruments on synths that don't support Breath control. Bring on the WX7II... ■

**PRICES:** \$995 for WX11 and WT11; \$505 for WX11; \$540 for WT11; \$50 for BT7 battery pack for WX7

**MORE FROM:** Yamaha Music Corp. USA, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9011.

*Mick Micro, MIDI Detective in Search of...*

# "THE SECRETS OF SYSTEM EXCLUSIVE"

## Part 1



**Thought you had MIDI licked 'til you had to deal with the dreaded System Exclusive? Call Mick Micro, MIDI Detective – he'll steer you in the right direction. Story by Scott Wilkinson.**

**I** WAS SWELTERING in L.A. – the kind of day that makes you want to crawl into your icebox to look for a frosty cold one. I was just about to give up on any business coming through the door when *he* walked in with a fearless swagger. "Are you Mick Micro, MIDI detective?" he growled.

"That's what it says on the door," I replied. He was fat and ugly and smelled like last week's lasagne – not exactly my type of client. "What can I do for you?" I asked without really meaning it.

He pulled out a thousand dollar bill and pushed it across the desk towards me. Suddenly, I was interested in what he had to say. "I run a small MIDI studio over on the West side. I thought I knew just about all there is to know

about MIDI until someone brought in an MC500 file and asked me to edit the SysEx data for his TX81Z. I was terrified! How am I supposed to figure out all those numbers? What do they mean?! You gotta help me, please..."

I'd been meaning to get the low-down on this elusive System Exclusive stuff for some time now. Getting paid to do it was icing on the cake. But where to start? "Got any leads?" I asked.

"Just one – they say that Melodia the MIDI mystic can answer any MIDI question." Yeah, I thought, but nobody's seen her for over two years. I remembered hearing something about her mysterious disappearance.

I found Melodia's last known address in my database – it was in one of

the sleazy analog areas of Beautiful Downtown Burbank. I grabbed my hat and said, "Don't just stand there like a bowl of silicon jelly, let's get going."

### The Quest Begins . . .

Once inside the seemingly deserted house, we were besieged by a bewildering array of electronic instruments and recording gear. The fat man was over by a Granny Smith computer that seemed to be on, despite the fact that the electricity had most likely been turned off long ago.

Suddenly, he screamed as he was enveloped in a glowing haze that seemed to come from the Granny Smith. A moment later, he was gone! I dashed over to the computer and found myself surrounded by a greenish glow that permeated my entire being. The room began to dissolve as I lost consciousness . . .

When I woke up, I realized that I ►  
MUSIC TECHNOLOGY



► wasn't in Burbank anymore. I was in an infinite matrix of points and filaments that extended beyond my range of vision in all directions. As I looked around, I found the fat man just off to my right. I noticed that he appeared to be *grainy*, as if he had been digitized somehow. Slowly filling with horror, I looked down at myself and found that I had been digitized as well!

"Well, well, look who's dropped in! It's Mick Micro, famous MIDI detective!" The voice came from directly behind us. We whirled around to see a gigantic countenance smiling down at us. The face was beautiful, although seemingly disembodied and floating in the matrix. I recognized her immediately.

"Melodia, what's a nice girl like you doing in a place like this," I asked. "And while we're on the subject, what kind of a place is this, anyway?"

She smiled and said, "Why Mick, haven't you guessed? You've been digitized. You're in the RAM of my Granny Smith computer, so you'd better be nice to me or I'll power down without backing you up." She looked over at the fat man. "Who's your plump partner?" she asked.

"He hired me to uncover the secrets of System Exclusive," I replied. "He suggested we come to you for the answers, so now that we're here, how about clueing us in?"

Melodia shrugged her invisible shoulders and said, "Why not?"

## Secrets Revealed

"As you already know, MIDI messages are divided into two basic groups: Channel and System. The Channel messages represent the characteristics of a musical performance on a particular MIDI channel and are further divided into two categories: Voice and Mode. Channel Voice messages such as Note On, Pitch Bend, Aftertouch, Velocity and the Continuous Controllers specify which notes to play and how to articulate and modulate them in response to a player's performance. Channel Mode messages such as Omni On/Off and Poly On/Off are used to tell synthesizers and samplers how to respond to incoming channel voice messages." So far so good, I thought. Even the fat man seems to be with her.

"System messages do not include a MIDI channel because most of them are intended for all of the units in a system, particularly clock-based devices such as sequencers and drum machines. These messages are divided

into three categories: Common, Real Time and Exclusive. System Common messages such as MIDI Time Code and Song Position Pointer specify where in time you are at any moment. Tune Request tells all synthesizers with an auto-tune function to tune themselves. Since most synthesizers today are digital and not subject to pitch drift, this message is becoming as rare as an 8" floppy disk." I couldn't remember the last time I saw one of those dinosaur disks, that's for sure. (Oh yeah, now I remember . . . it was on the Fairlight!).

"System Real Time messages are used mostly to synchronize sequencers and drum machines. The Start, Stop, Continue and Timing Clock messages tell these devices when to start, stop or continue playing and convey the tempo of the performance. Active Sensing is used to determine if a MIDI cable has been pulled out of its jack by accident and System Reset causes all of the devices in the system to return to their default or power up condition."

At this point, the fat man interrupted. "Yeah, yeah, we *know* all this stuff! What about System Exclusive?" Right away, I knew he'd made a horrible mistake.

Melodia's face grew even bigger as she said, "It's not *nice* to interrupt Mother MIDI!" With that, green bolts of lightning sprang from her eyes and hit the fat man squarely in the CPU. He fell to the grid in a heap.

## SysEx Uncovered

Melodia calmed herself as the fat man sat there like a lump (of course, he *always* sits there like a lump). She continued, "As I was about to say, all of these MIDI messages mean the same thing to all MIDI devices. On the other hand, System Exclusive, or SysEx messages generally mean different things to different instruments. They are used to represent the specific voice and performance architecture of each individual instrument. The designers of MIDI were wise indeed to leave room in the spec for each manufacturer to encode the parameters for each of their products into SysEx messages."

At this point, I was scratching my head. "What you're saying is that SysEx messages represent the way in which specific synths create their sounds. Does this mean that different types of instruments can't share SysEx messages?" I asked.

You catch on quick, Mick. Since different instruments create their

sounds in different ways, the SysEx from one instrument makes no sense whatsoever to an instrument of a different type. For example, a DX7 uses six operators in 32 possible algorithms with all of the associated parameters to create FM sounds. These parameter values would mean nothing to a D50, which makes its sounds by combining samples and synthesized waveforms and processing them through filters, ring modulators and digital effects." This was getting interesting. The fat man was even starting to take notes.

"What about different instruments from the same manufacturer?" I asked.

"It doesn't wash unless the instruments share the same architecture, more or less," she replied. "The DX7 uses six sine wave operators in 32 algorithms while the DX11 uses four multi-waveform operators in 8 algorithms. As a result, they can't share SysEx data. However, the DX11 and the TX81Z use virtually identical architectures, so they *can* share SysEx data."

The fat man had regained his composure and asked, "What good is SysEx, then, unless you have a bunch of the same instruments?"

Melodia chuckled and said, "I'm glad you asked."

## The Plot Thickens . . .

"I assume that both of you use editor/librarian programs on your studio computers to edit and organize sounds for your various synthesizers and samplers." We both nodded in agreement. "Well then, I'll let you in on a little secret." (That's what we're here for, I thought.) "Those helpful programs couldn't exist without SysEx. When you edit a parameter and want to hear the result of your mucking around, the program sends a SysEx message to change that specific parameter value in the instrument. All of the data that defines single voices, voice combinations and entire banks is also transmitted between the instrument and the computer in the form of SysEx messages called 'bulk dumps.'"

"So let me see if I've got this straight," I said. "Editor/librarian programs retrieve the SysEx data from a particular instrument, allow you to alter that data in order to edit sounds and organize banks, and then send the altered data back to the instrument, right?"

Melodia smiled. "I just love a bright guy," she said. "If you weren't so analog, I'd marry you."

I blushed and carried on. "What ►

about samplers and drum machines? Do they use SysEx as well?"

"Absolutely. Practically *all* electronic instruments made today have their own set of SysEx messages. In the case of samplers, SysEx is used to represent the sample data itself in addition to things like loops, envelopes, filter settings and so on. In fact, there's a recent addition to the MIDI spec called the Sample Dump Standard that standardizes the SysEx format for sample files. This allows different samplers to share sample data.

"Messages that conform to the Sample Dump Standard are an example of a certain type of SysEx known as Universal System Exclusive. These standardized SysEx messages can be used to expand the MIDI spec with additional messages that all instruments of a certain type can understand. In the future, a standard format for other types of data such as microtuning tables could be encoded as Universal SysEx so that they could be shared between different instruments."

That made sense. After all, wasn't the whole idea behind MIDI to make different instruments compatible with each other? But I was still in the dark about a few things. "What about drum machines that use only preset sounds?" I asked.

"The SysEx messages for drum machines typically represent the patterns and songs stored in memory. They're used mainly to backup and organize these patterns and songs in a computer. The same is true for sequencers. The new generation of multi-effects processors also use SysEx to bulk dump the effect parameter values for backup and organization. If we're lucky, these capabilities might inspire some enterprising software developer to write drum machine or signal processor editor/librarians."

It was beginning to look like SysEx was pretty useful stuff. Before I could ask my next question, the fat man jumped in (with a bit more grace than the last time, I was glad to see for his sake). "I'm starting to understand this SysEx stuff now, but what does it look like? How do I know a SysEx message from any other MIDI message?" Good question, I thought.

"Good question," Melodia said. "Like all MIDI messages, SysEx messages begin with a *status byte* that is followed by some *data bytes*. Each of these bytes is 8 bits long, although the high-order bit is reserved."

The fat man looked puzzled. "High-►

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## The Ballad of Hexadecimal

If you're not hip to hex, let me introduce you to the most common way to specify MIDI messages. Since all MIDI messages are just streams of numbers, they can be expressed in a number of ways. Binary notation (that is, the 8-bit byte) is somewhat cumbersome, so we midioters often use other number systems. The one most people think of at first is the good old decimal system. In fact, you do see it used sometimes, particularly in MIDI implementation charts (to get the scoop on these charts, see MT Inaugural through January '87 issues for a series explaining them). However, there's another number system that is much better for expressing MIDI messages.

Have you ever noticed that the eight bits in a byte can be divided into two four-bit groups? Well, with their usual penchant for names, computer people call these half-bytes "nibbles." These computer people, what a bunch of cut-ups! Anyway, each nibble can represent any one of 16 possible values, 0 to 15. It would be nice if each nibble could be written as a single digit for a couple of reasons. First, all 8-bit bytes could be written with only two digits. Second, the number 16 abounds in MIDI and throughout the computer world in general. For example, there are 16 MIDI channels that are specified in the low-order (right-most) nibble of channel message status bytes.

Since we humans have developed only 10 numerical digits (having only 10 finger digits ourselves) from 0 to 9, the computer people had to come up with six more digits in order to specify any nibble as a single digit. Their solution to this problem was to borrow the first six letters of the alphabet (A through F) and use them as numerical digits. In this numbering scheme, known as hexadecimal (or hex for short), the numbers are ordered in the usual way, starting with 0 and moving upwards to 9. The next number after 9 is A, followed by B, C, D, E and F (see the chart in **Figure 1** for the relationship between single-digit hex numbers, decimal numbers, 4-bit binary numbers and MIDI channels).

In hex, the number after F is 10, followed by 11, 12 and so on to 19. This is followed by 1A, 1B and so on to 1F. This pattern continues until the highest two-digit hexadecimal number, FF (or 255 in decimal), is reached. Of course, the numbers above F must be represented by more than four bits in binary notation. In fact, two hex digits can represent any 8-bit byte.

You may have noticed that many hex numbers resemble decimal numbers. Some of them are in fact equivalent, such as the number 9 in hex and decimal. However, this is not true in most cases. For example, 10 in hex looks just like 10 in decimal. But these two numbers are not equal. The hex number 10 is equivalent to the decimal number 16. For this reason, hex numbers are usually followed by the letter "H" (they are sometimes preceded by a "\$" instead, but this is less common in MIDI). So, if you want to write the hex number 10, you would write it "10H." This distinguishes hex numbers from decimal numbers.

As far as MIDI bytes are concerned, remember that status bytes (written in binary) begin with a 1 and data bytes begin with a 0. How does this translate into hex? Well, if you look at **Figure 1** again, you'll see that the number 8H is equivalent to 1000 in binary. The hex numbers less than 8H have binary equivalents with a high-order bit of 0. This means that status bytes written in hex begin with digits equal to or greater than 8H. For example, the status byte for Note Off, Channel 1 is 80H. This is the lowest possible status byte. By the same token, the first nibble in a data byte is always equal to or less than 7H. For example, 7FH is the highest possible data byte.

The status byte for SysEx messages is F0H. Since there can be any number of data bytes, there is a special "status" byte at the end of all SysEx messages, F7H. That's all there is to hex. Now, that wasn't so hard, was it? ■

Hex Harrison

Figure 1. Hex, Decimal, Binary, MIDI Channel Comparison Chart

Hex	Decimal	Binary	MIDI Channel
0	0	0000	1
1	1	0001	2
2	2	0010	3
3	3	0011	4
4	4	0100	5
5	5	0101	6
6	6	0110	7
7	7	0111	8
8	8	1000	9
9	9	1001	10
A	10	1010	11
B	11	1011	12
C	12	1100	13
D	13	1101	14
E	14	1110	15
F	15	1111	16

order bit?" he asked.

"The bit farthest to the left as you look at a byte written as 8 bits," she replied. "By definition, the high-order bit is always '1' in a status byte such as 10000000. In a data byte such as 01111111, the high-order bit is always '0'."

"As you probably know already, there are no more than three bytes in most MIDI messages. This includes the status byte and data bytes, if any. SysEx messages are the only exception to this rule. Because voice and bulk data usually represent quite a bit of information, and the exact amount of data varies from instrument to instrument, the length of a SysEx message can't be set in stone. So, SysEx messages can be any length whatsoever. I'll show you what I mean. Look, here comes a SysEx message from the MIDI interface now."

Sure enough, I could see a bunch of bytes heading our way from the far reaches of the matrix. Melodia continued her explanation. "See that first byte? That's a SysEx status byte." As it whizzed past us, I could see that it was 11110000. "Notice that the high-order bit is 1. All SysEx messages begin with this specific byte."

The next byte to pass us was 01000001. "That's a data byte. Notice that its high-order bit is 0. Its meaning is determined by the status byte it follows. In a SysEx message, it indicates the identification number of the manufacturer. That ID number happens to belong to Roland."

By this time, many bytes had passed by us in the matrix. I supposed that these bytes represented the voice data for one of the Roland synths in the deserted house that now seemed so far away. Finally, the last byte flew by. It was 11110111. Melodia explained, "All SysEx messages end with that last byte. It's a special 'pseudo' status byte called EOX, for End of Exclusive message. That's how SysEx messages can be of any length. The end of the message is marked with the EOX byte."

Uh oh, the fat man was whining again. "This is all well and good, but how do I know what SysEx messages mean to particular instruments? I've got clients waiting for me to decipher their SysEx data."

Melodia looked bemused. "You shouldn't try to absorb all of this under a client deadline, bub. It'll give you a coronary. But, just to show you that my heart's in the right place, I'll let you in on how to read a SysEx chart for any instrument."

## Reading a SysEx Chart

"Unfortunately, manufacturers have not agreed on a standard format for publishing the SysEx data for their instruments, unlike their MIDI Implementation charts. Of course, a standard format for publishing SysEx data is not as easy to achieve because each instrument understands a different set of SysEx messages. Nevertheless, the manual for many instruments includes some sort of SysEx chart in the back with the MIDI Implementation chart. If not, you can request the SysEx chart for instruments directly from the manufacturer in some cases.

"Another inconsistency is the fact that the SysEx data in these charts may be written in binary or hexadecimal notation. They may also include some decimal equivalents." If you're unfamiliar with hexadecimal notation, check out the sidebar written by my buddy, Hex Harrison. "As an example, let's take a look at part of the SysEx chart for the Yamaha TX81Z," she said. Suddenly, the chart appeared in the matrix next to Melodia's face (see Figure 2 for a reproduction).

"This particular part of the TX81Z SysEx chart outlines the format for the voice, performance and remote switch parameter change messages." In case you're wondering, if the TX81Z receives a Remote Switch parameter message via SysEx, it acts as if the corresponding front panel button had been pressed." Melodia continued, "These parameter groups all use the same format for SysEx data. Notice that some of the bytes in the message are written in binary and hex.

"Of course, the first byte is the SysEx status byte, followed by the Yamaha ID number. The next byte is the basic receive channel that is set on the TX. The lower case *ns* can specify any MIDI channel number in their respective notations. The next byte specifies the group and sub-group numbers. These numbers identify the parameter group to which this message relates. The lower case letters *g* and *s* are each replaced with a binary digit, 0 or 1, depending on which parameter group is being addressed by the message. For example, if it's a performance parameter message, *ggggg*=00100 and *hh*=00. The entire byte would read 00010000 or 10H." Hey, this was beginning to make sense!

"The next byte identifies the number of the specific parameter within the group. For example, if the message is referring to the volume performance

Figure 2. SysEx format for some TX81Z parameter change messages.

11110000	F0H	Start Sys Ex message
01000011	43H	Yamaha ID #
0001nnnn	1nH	n=Basic Receive Channel
0gggggss		ggggg=Group #, ss=Subgroup #
0ppppppp		ppppppp=Parameter #
0ddddd		ddddd=Data value
11110111	F7H	EOX

parameter for instrument 1 in the 81Z, *ppppppp*=0000111 and the entire byte would be 00000111 or 07H. The final byte before the EOX is the parameter value. Staying with the previous example, if the message is setting the performance volume of instrument 1 to its maximum level, *ddddd* = 1111111 and the entire byte would be 01111111 or 7FH.

"To summarize, sending the message F0H, 43H, 10H, 13H, 07H, 7FH, and F7H to the TX81Z would set the performance volume of instrument 1 to its maximum value."

Melodia was really cooking now, but I was on the verge of information overload. However, the fat man was in

a religious rapture. "This is great! I'm finally beginning to understand this stuff! But how can I use SysEx in the studio? What are the practical applications?"

### Until Next Time . . .

Melodia suddenly yawned and said, "Before I get into that, I need to recharge my Ni-Cads." Melodia's image began to fade away as she said, "Stick around boys, I'll be back next month to fill you in on the practical applications of SysEx. Til then, ta . . ."

With that, she disappeared, leaving me and the fat man to fend for ourselves. I wonder where we can get a cheese burger around here? ■

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# LISTENING LAB

**Choice cuts this month include Jon Hassell, Bomb the Bass and Duran Duran – a gourmet, if eclectic, potpourri.**

## JON HASSELL/FARAFINA

### *Flash of the Spirit*

Capitol/Intuition Records



### *Pick of the Month*

Trumpeter Jon Hassell has always done thoughtful, textured, and somewhat esoteric music and his most recent release is no exception. By running his instrument through a maze of signal processing gear, he creates a very distinctive, floating sound (almost completely devoid of the original trumpet tone due to the extent of the processing) that carries the expression and emotional impact of an acoustic wind instrument, but, with a completely electronic timbre. In this particular outing, co-produced by Brian Eno, Daniel Lanois and Hassell, the trumpeter is joined by Farafina, an eight-piece West African percussion ensemble from Burkina Faso.

The basic concept behind the album is the juxtaposition of Farafina's traditional percussion music with the thoroughly modern sonic musings of Hassell and MIDI percussionist J.A. Deane. To my ears the mixture is a successful one, with the pulsing rhythms of Farafina providing a highly complementary contrast to the more flowing qualities of Hassell's trumpet and keyboard lines.

Speaking of contrasts, the five cuts

produced by Lanois have a decidedly more energetic, driven feel to them, while Eno's five contributions, not surprisingly, carry a more muted, but nevertheless animated, quality. In general, Eno seems to have concentrated more on keyboard and trumpet overdubs – removing much of Farafina's percussion in the process of mixing, allowing the electronic timbres to hold listener's interest. Lanois, on the other hand, lets the percussion ensemble cut through his mixes, providing rhythmic contrast to Hassell and in the process, making the ancient percussion sound perfectly modern. All in all, an intriguing cross-cultural blend. ■ *Bob O'Donnell*

## DURAN DURAN

### *Big Thing*

Capitol

Duran Duran has always been known for their slick videos, big hair and fashion consciousness. *Big Thing* was to be their departure from their bubble-gum image, establishing them as a real rock band. Well, it's a step in the right direction, but old habits die hard. The album opens up with three fast dance tunes that are reminiscent of their last album, *Notorious*, and the Arcadia stuff. The thing that first caught my ear was the use of snare drums on 'I Don't Want Your Love.' In today's world of big drum sounds, the tight, compressed sounds they've captured are refreshing, and perfect for the tune. The record continues with some light songs à la the *Rio* era, another dance tune, 'Drug,' and a couple instrumentals. All in all, this is a very hi-tech album.

Nick Rhodes is behind the keyboards again, and he has matured a little in his voicings and arrangements. There are no blatantly Fairlight sounds as in the past. Piano and strings are the backdrops for the slow tunes. Samples still are prevalent on the dance tunes,

but don't get in the way. Very little of the album sounds sequenced, but with today's programs this could be deceiving.

The album doesn't credit Le Bon or Taylor with any instruments, but I assume Taylor is still handling all the bass playing. The drums are a mixture of live drummers and machines, with the sounds varying from tiny to monstrous. Gates are not over used, nor is the reverb overly indulgent. The guitar work is deftly covered by ex-Missing Persons guitarist Warren Cucurullo. His sound ranges from tight, compressed rhythm, to big, raunchy feedback squeals. He even has a very tasty acoustic solo on the song 'Land' (perhaps the best song on the album). This outing is undoubtedly a step forward for the boys towards becoming respected musicians. ■ *Rick Huber*

## MICHAEL SHRIEVE

### *Stiletto*

Novus/RCA

In today's age of heavy overdubbing and production tricks, it's pretty rare to find an album that was recorded and mixed in just one week – particularly when the individuals involved (drummer Shrieve, trumpeter Mark Isham, guitarists Andy Summers and David Torn, and bassist Terje Gewelt) are perhaps better known for their layered studio artistry. Nonetheless, that's what you get on *Stiletto*. The result is a very clear, unadorned sound that lets you concentrate on what each musician is up to from the very first listening.

Given the lack of overdubs, Shrieve sticks to some pretty straightahead drums (along with some great industrial samples). Isham plays mostly straight trumpet along with a bit of harmonizing (particularly on their cover of 'Las Vegas Tango'). Summers relies mostly on his super-compressed - and - chorused "Police" sound while Torn plays loop-de-loop with his delays and reverb, sounding like an early Adrian Belew gone jazz. Gewelt pins it all down with fretted, fretless, and acoustic basses. Warning – even though the beats are rock, the style is "jazz" in that each person stakes out his own territory and grooves more often than actually playing off each other –but they're all professional enough to keep it understated and clean. An interesting album to study. ■ *Chris Meyer*

## more from

Want to find out more about any product mentioned in this issue of MT? Look no further...

**4000E:** Solid State Logic (SSL), 6255 Sunset Blvd., Los Angeles, CA 90028. (213) 463-4444.

**ADR68K:** AKG Acoustics, 77 Selleck St., Stamford, CT 06902. Tel: (203) 348-2121.

**Apple II/e:** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. Tel: (408) 996-1010.

**Atari ST 520/1040/MEGA:** Atari Corporation, 1196 Borregas Ave., Sunnyvale, CA 94086. Tel: (408) 745-2000.

**Axxess Mapper:** Intelligent Music, P.O. Box 8748, Albany, NY 12208. Tel: (518) 434-4110.

**C1:** Yamaha Music Corp. USA, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9011.

**C3:** Hammond Organ Company, 1060 Thorndale Ave., Bensenville, IL 60106. Tel: (312) 595-6900.

**C64:** Commodore Business Machines, Inc., 1200 Wilson Dr., West Chester, PA 19380. Tel: (215) 431-9100.

**Composer:** Mark of the Unicorn, Inc., 222 Third Street, Cambridge, MA 02142. Tel: (617) 576-2760.

**CZ101:** Casio, Inc., 570 Mt. Pleasant Ave., Dover, NJ 07801. Tel: (201) 361-5400.

**D10/D110/D20/D50/D550:** Roland Corp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

**Deluxe Music Construction Set:** Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Tel: (415) 571-7171.

**DMP7/D:** Yamaha, see C1.

**DRP20:** Dynacord Electronics, 2697 Lavery Court #16, Newbury Park, CA 91320. Tel: (805) 499-6863.

**DSP128 Plus:** DigiTech (DOD Electronics), 5639 S. Riley Ln., Salt Lake City, UT 84107. Tel: (801) 268-8400.

**DX1/DX5/DX7/DX7IIFD/DX9/DX11/DX21/DX27/DX100:** Yamaha, see C1.

**Emulator II/+Emulator III:** E-mu Systems, 1600 Green Hills Rd., Scotts Valley, CA 95066. Tel: (408) 438-1921.

**ESQ1/M:** Ensoniq Corp., 155 Great Valley Parkway, Malvern, PA 19355. Tel: (215) 647-3930.

**EVI/EWI:** Akai Professional, 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114.

**Fairlight CMI III:** Now being supported

by Electric Sound and Picture, 30 Bay St., Broadway, NSW Australia 2007. From USA - Tel: 011-61-2-212-6111. Fax: 011-61-2-281-5503.

**FB01:** Yamaha, see C1.

**GenEdit:** Hybrid Arts, 11920 W. Olympic Blvd., Los Angeles, CA 90064. Tel: (213) 826-3777.

**GM70:** Roland, see D10.

**HR16:** Alesis Corporation, 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: (213) 467-8000.

**Human Clock:** formerly made by Kahler.

**HyperCard:** Apple, see *Apple II/e*.

**Jupiter 8 (JP8):** Roland, see D10.

**Juno 60/Juno 106/JX10 (Super JX):** Roland, see D10.

**K1/m/r/K5:** Kawai America Corp., 2055 E. University Dr., Compton, CA 90224. Tel: (213) 631-1771.

**KX5/KX76/KX88:** Yamaha, see C1.

**M:** Intelligent Music, see *Axxess Mapper*.

**M1/R:** Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

**Macintosh Plus/SE/II:** Apple, see *Apple II/e*.

**Matrix 1000:** Oberheim-E.C.C., 2015 Davie Ave., Commerce, CA 90040. Tel: (213) 725-7870.

**MC500/300:** Roland, see D10.

**MEP4:** Yamaha, see C1.

**Minimoog:** formerly made by Moog Instruments.

**Mirage:** Ensoniq, see *ESQ1*.

**MKS50:** Roland, see D10.

**MSB+:** JL Cooper Electronics, 13478 Beach Ave., Marina del Rey, CA 90292. Tel: (213) 306-4131.

**MT32:** Roland, see D10.

**MTS1:** SynHance MIDI Peripherals (Harmony Systems, Inc.), 4405 International Blvd., Suite B-113, Norcross, GA 30093. Tel: (404) 662-8788.

**MX8:** Digital Music Corp., 5312-J Derry Ave., Agoura Hills, CA 91301. Tel: (818) 991-3881.

**NS10:** Yamaha, see C1.

**Performer:** Mark of the Unicorn, see *Composer*.

**Poly 800II:** Korg, see M1.

**Portastudio:** Tascam/TEAC Corp. of America, 7733 Telegraph Rd., Montebello, CA 90640. Tel: (213) 726-0303.

**PPS1:** JL Cooper, see *MSB+*.

**Pro24:** Steinberg/Jones, 17700 Raymer St., Suite 1001, Northridge, CA 91325. Tel: (818) 993-4091.

**Prophet VS:** formerly made by Sequential Circuits Inc.

**R8:** Fostex Corp. of America, 15431 Blackburn Ave., Norwalk, CA 90650. Tel: (213) 921-1112.

**R8 Human Rhythm Composer:** Roland, see D10.

**RD1000:** Roland, see D10.

**REV5:** Yamaha, see C1.

**REX50:** Yamaha, see C1.

**Rockman:** Scholz Research & Development, Inc. (SR&D), 1560 Trapelo Rd., Waltham, MA 02154. Tel: (617) 890-5211.

**RX5/RX11/RX15/RX21:** Yamaha, see C1.

**S612/S700/S900/S950/S1000:** Akai, see *EVI*.

**Sequencer 2.6:** Opcode Systems, 1024 Hamilton Court, Menlo Park, CA 94025. Tel: (415) 321-8977.

**Sequencer Plus Mark III:** Voyetra Technologies, 333 5th Ave., Pelham, NY 10803. Tel: (914) 738-4500.

**Sound Designer II:** Digidesign, Inc., 1360 Willow Rd., #101, Menlo Park, CA 94025. Tel: (415) 327-8811.

**SP12/SP1200:** E-mu, see *Emulator II*.

**SPX1000:** Yamaha, see C1.

**Studer A800:** Studer Revox America, Inc., 1425 Elm Hill Pike, Nashville, TN 37210. Tel: (615) 254-5651.

**Studio 440:** formerly made by Sequential; PointSource, 1394 Utah Street, San Francisco, CA 94110. Tel: (415) 821-6613.

**Super Jupiter (MKS80):** Roland, see D10.

**Synclavier 3200/9600:** New England Digital, 49 North Main St., White River Junction, VT 05001. Tel: (802) 295-5800.

**TR505/TR707/TR727/TR808/TR909:** Roland, see D10.

**TX7/TX216/TX802/TX816/TX81Z/TX16W:** Yamaha, see C1.

**UREI 813:** JBL/UREI, 8500 Balboa Blvd., Northridge, CA 91329. Tel: (818) 893-8411.

**WX7:** Yamaha, see C1.

**XOr:** Dr. T's, 220 Boylston St., #306, Chestnut Hill, MA 02161. Tel: (617) 244-6954.



## updates & upgrades

Looking for an inexpensive way to add some spice to your MIDI system? Maybe all you need to do is upgrade your existing gear. Check the following list for more.



■ **DSP128 Plus:** DigiTech's digital multi-effects processor has been reduced in price and now includes the FS300 three-button foot controller. The new list price for the package is \$459.95.

– DigiTech (DOD Electronics), 5639 South Riley Lane, Salt Lake City, UT 84107. Tel: (801) 268-8400.

■ **Dyaxis:** The Dyaxis Digital Audio Workstation now features MacMix Version 2.0 controller software, allowing for faster digital mixing, timecode slaving, dynamic real-time offset control, scrub editing, custom keyboard macros for dialog editing, and compatibility with Alchemy, SoundBase, Sound Designer II and Q-Sheet A/V. Also available is a new interface that enables the Dyaxis to be slaved to the Abekas A60-Series digital videodisc system, allowing control of the Dyaxis from the master Abekas controller panel and trackball.

– Integrated Media Systems, Inc. (IMS),

1552 Laurel St., San Carlos, CA 94070. Tel: (415) 592-8055. Prices: \$50 for 2.0 update; Abekas System \$19,950 w/Mac SE; \$15,700 without. Entry level Dyaxis system \$6000.

■ **Studio 440:** Testing has just been completed on a new software version for the Sequential Studio 440. PointSource has announced the availability of Studio 440 PLUS! version 2.20, which adds full MIDI Sample Dump capability to the existing features of the Studio 440. The update consists of two EPROM chips, and complete documentation is included.

Also, PointSource has released a request to all users, asking for feedback on the Studio 440, and recommendations for future upgrades and enhancements.

– PointSource, 1394 Utah Street, San Francisco, CA 94110. Tel: (415) 821-6613. PAN username: MATTYDREAD. Studio 440 PLUS! version 2.20 is available now for \$199. Documentation is only \$5, deductible from software purchase.

■ **Aphex Model 612 Expander/Gate:** As of unit serial number #5371, an improved log detector circuit will be installed, allowing for more consistent decays over a wider dynamic range, and more predictable "hold" resetting, especially with "pulse-like" waveforms. The retrofit kit includes two PC boards, four resistors, and a 12-page instruction manual describing how to install it.

– Aphex Systems, Ltd., 13340 Saticoy St., N. Hollywood, CA 91605. Tel: (818) 765-2212. Owners whose serial number precedes #5371 can buy the retrofit kit for \$25 plus s/h. Aphex will install the retrofit for \$50 plus s/h.

■ **Music Mouse:** Amiga version: a backup disk is now available containing Version 1.03. The new version enables the handling of European keyboard maps, correct compatibility with Mimetics' SoundScape, and the eradication of some minor menu bugs.

Macintosh version: now available is version 2.01, allowing for changeable MIDI channels, real-time display of all parameters, rhythmic treatments, and octatonic harmony. Also, MIDI Terminal 1.0, Aesthetic Engineering's Macintosh MIDI display utility, is available as shareware and included in all copies and updates of Music Mouse. The new version of MIDI Terminal offers MultiFinder and Mac II compatibility, improved file handling, speed and user-selectable filtering, as well as near-real-time English translation display of nearly 60 different MIDI data types.

– Aesthetic Engineering, 175 Duane St., New York, NY 10013. Tel: (212) 925-7049. All "breeds" of Music Mouse now retail for \$79.95 plus \$5 s/h. MIDI Terminal 1.0 is available directly from AE for \$25. Amiga version 1.03 update costs \$8, with registered users' Serial Number. Macintosh version 1.0 registered owners can update to 2.01 for \$15 plus \$5 s/h; 2.0 owners can update for free by sending in their disk.

■ **Tascam 238:** Effective immediately, Tascam's eight-track cassette recorder has been reduced \$500 in price, and now lists for \$1799.

– Tascam/TEAC Corp. of America, 7733 Telegraph Rd., Montebello, CA 90640. Tel: (213) 726-0303.

**Manufacturers:** If you have software or hardware revisions or upgrades that you'd like MT readers to know about, please send info to: Updates and Upgrades, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311; or FAX (818) 407-0882.

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**ROLAND JUNO 106**, very clean, \$350 or trade for MT32 or Roland Octapad. Tel: (714) 650-7833.

**ROLAND SUPER JX10** synthesizer, 76 keys, great master keyboard, sequencer, two RAM cartridges, case, keyboard split, \$1350. Tel: (615) 824-6391.

**VOYETRA RACKMOUNT** synth, w/VPK5 keyboard, fully updated, 400 factory programs, \$1200. John, Tel: (703) 668-6451.

**YAMAHA FB01**, \$200. CS01 mono mini synth, \$50. Tel: (312) 873-7406.

**YAMAHA PSR70**, case, great sounds, rhythms, built-in sequencer, has MIDI, \$800. I'll give 2 Loft MIDI cables. Jonathan, Tel: (415) 376-6783.

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**ENSONIQ EPS** w/8 output expander, 2X's mem. expander, SCSI interface, and 60Meg hard drive loaded with sounds, \$3000. Sean, Tel: (312) 655-2216.

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**PPG WAVETERM B**, last updates available, over 500 samples, \$6800. OB8 w/MIDI, \$800. DMX w/MIDI, \$500. Chris, Tel: (602) 838-4270.

## SEQUENCERS

**HYBRID ARTS SMPTRACK** sequencer for Atari ST w/SMPTE reader/generator, latest update, full user support, \$250 obo. Tel: (212) 362-7512.

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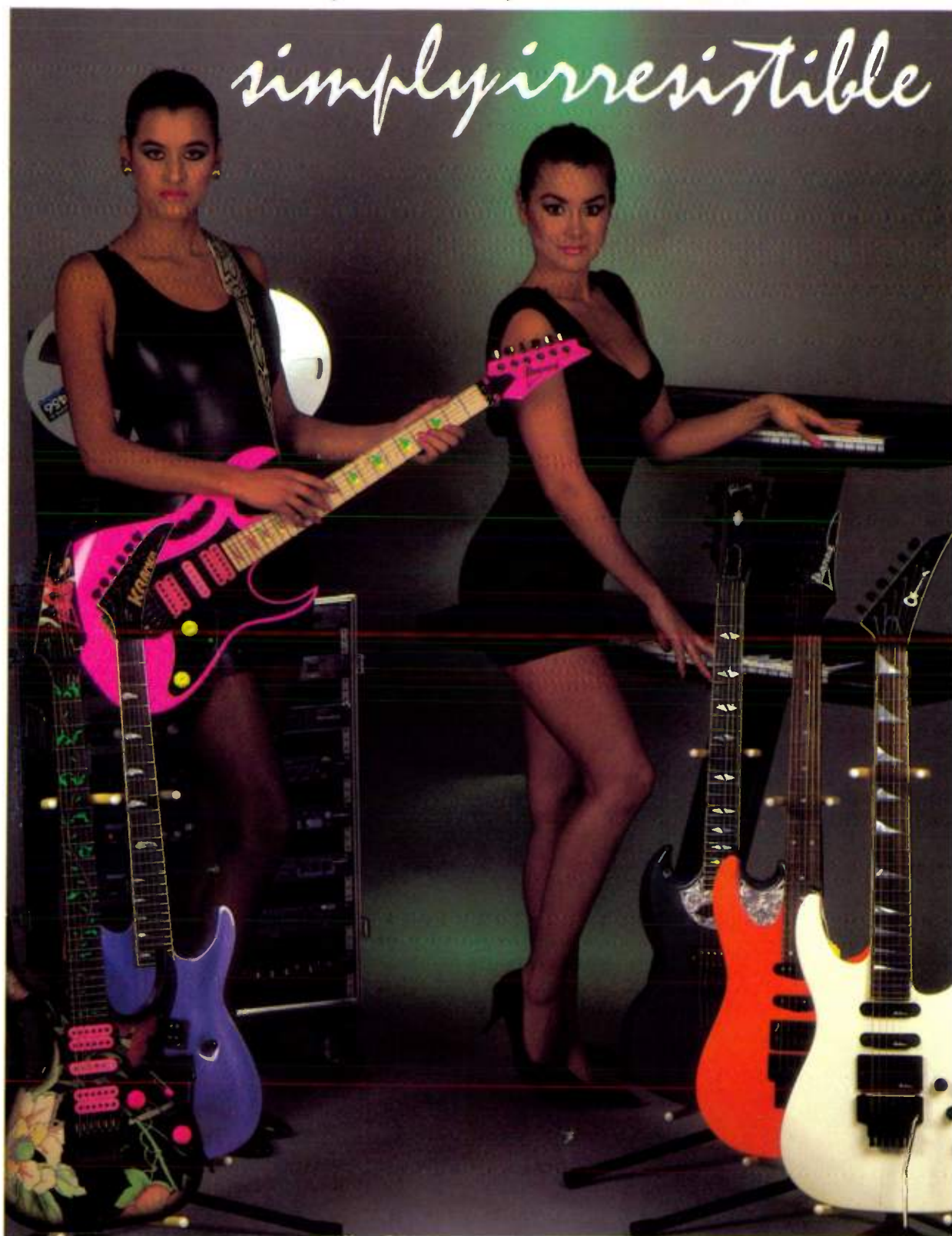
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