

# MUSIC TECHNOLOGY

JUNE 1989

USA \$2.95

CANADA \$3.95

## WORKSTATION PREVIEWS

*Roland W30, Peavey DPM3*



## NEW ORDER

*Alternative Technique*



REVIEWS

*Yamaha V50*

*Oberheim Cyclone*

*Sansui WSX1*

## JERRY GOLDSMITH

*Composing Star Trek V*

## THE SYNCLAVIER EXPLAINED

*An Inside, In-depth Look*

# Cold-Blooded Power



**Heat is the number one contributing factor in amplifier failure.**

**But the 7300 stereo power amplifier keeps cool under the most strenuous conditions.**

Its 16 metal output transistors have a total device power dissipation of 4,000 watts . . . and its dual-speed fan and oversize heat sinks insure hours of continuous performing capability.

For power, it's conservatively rated at 200 watts per channel 0.05% THD into 8 ohms and 300 watts into 4 ohms.

In the bridged mono mode, the 7300 can cruise in excess of 600 watts into 8 ohms.

Plus, it's loaded with features, including complete protection circuitry. And it's easily biampable . . . using an optional APX 4th-order Linkwitz-Riley filter network with 24 selectable frequencies.

The 7300 is constructed with a sturdy aluminum-steel chassis to survive those bumps and bangs on the road. And it's UL-approved.

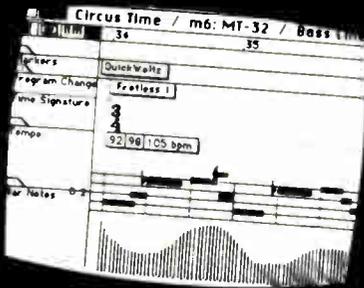
Give your local EV dealer a call today. And check out the coolest amp in the business.

For more information call or write  
Electro-Voice, Inc., 600 Cecil Street,  
Buchanan, MI 49107,  
616-695-6831.

In Canada: Electro-Voice  
Division, Gulton Industries  
(Canada) Ltd., P.O. Box 520,  
Gananoque, Ontario  
K7G2V1, (613) 382-2141.



Electro-Voice®  
  
a MARK IV company

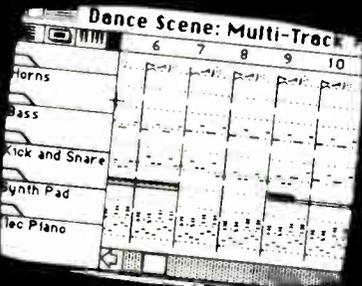


Select from multiple graphic staves with optional numeric views.

# Portrait



"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.

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.

**(No engineering degree required)**

See and edit your music using either event lists or graphic and numeric views.

**(No foreign language courses required)**

Tell Portrait how you set up your MIDI studio, and Portrait will let you change channels and patches by name, not just by number.

**(Not just your basic sequencer)**

You'll find all the features you've come to expect from a professional quality sequencer in Portrait. And we've added features you've only dreamed about until now, including a recording buffer that's always active and lets you place the new music in any track you choose, and editable/searchable event markers.

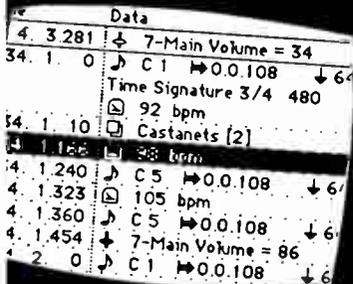
No other Mac sequencer gives you real-time editing, which enables you to change mix, orchestration, note and controller values while the music plays, and a page-turning option that lets you view the changes as you make them.

**(Step into the next generation)**

Ask your dealer for a demo – you'll find it easy to select the newest set of creative tools – Portrait. \$495 from Resonate.



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



Edit with event lists (single-track or multi-track) when you need pinpoint accuracy.



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



**Resonate**  
 PO Box 996 Menlo Park, CA 94026  
 415-323-5022 FAX: 415-323-1827

## DO I REALLY NEED A WORKSTATION?

TO SAY THAT the "W" word has become *the* buzzword for the musical instrument industry in the late 1980s is a bit of an understatement. People have begun to bandy the word about like crazy (I admit to being rather guilty myself) and manufacturers are responding by producing more combination boxes. Everywhere you look, you're bound to see more workstations – or at least products that attempt to put everything in a single instrument, even if they don't actually use the "W" word in their title. Hell, in this issue of MT alone we've got previews of two synth workstations, a review of another one, a review of a recording workstation and the first part of a series on the oldest surviving digital audio workstation. Maybe we should've called this our special Workstation Issue. (Naaah...)

Now I have to admit that when I first heard about and began to understand the "workstation" concept I thought it was a good thing that could prove very beneficial to MIDI musicians of all economic, social and religious persuasions. I mean the thought of having everything you need to make a completely orchestrated and "finished" piece of music in a single box was very enticing. Well, I've changed my mind, for a couple of reasons.

First, I've realized that no single box is going to be capable of doing it all, regardless of its cost. You're always going to find certain limitations in a piece of gear that will make you want to use another dedicated piece of equipment. Without exception, every single piece of workstation-like gear appearing in this month's MT – the Sansui WSX1, the Peavey DPM3, the Roland W30, the Yamaha V50 and the New England Digital Synclavier – all have some inherent limitations that prevent them from being entirely self-sufficient. Second, by trying to offer everything you need in a single box, they preclude one of the most enjoyable aspects of owning a MIDI studio – putting together your own customized system. Admittedly, sometimes putting a system together is a real pain that takes up too much of your time, but there's definitely something to be said for carefully planning the purchase of each component and putting together your own "componentized" workstation

environment.

If you are on a tight budget, on the other hand, I do realize that a workstation-type instrument can be a cost-effective solution. Also, if you do a bit of travelling with your gear, there's a lot to be said for sticking a single keyboard under your arm as opposed to some type of controller and a rack full of stuff. Just don't expect miracles from a single box – at least, not yet.

Some of you may be shaking your head at a comment I made earlier. I mean, the Synclavier, limited? Are you crazy? Well, I had never really spent any time with this legendary workstation, but we recently had the pleasure of hosting a 3200 system here at Music Maker for a week and once the mystery surrounding it was unveiled, I have to admit a certain disappointment. Don't get me wrong, the Synclavier is an amazing instrument, but it's not *that* amazing. Take a look at the new series on this high end wonder for more details.

In the end, perhaps we really are better off with a bunch of interconnected, dedicated pieces of gear. I certainly feel like I am.

YOU MAY NOTICE a few alterations to the masthead this month – we've added a few people here at MT. First off, as mentioned briefly in last month's issue, we're proud to announce the addition of Scott Wilkinson as Technical Editor. Scott, who currently sits on the executive board of the MMA (MIDI Manufacturers' Association), worked as a product specialist at Roland for several years before taking on a number of freelance writing and editing assignments. Most recently, he has edited a series of Setup books for Hal Leonard Publishing on several popular pieces of MIDI gear and written a book on microtonality. Scott's experience adds another dimension to MT and I'm looking forward to his contributions.

I'd also like to point out our new staff photographer, Melodie Gimple. Melodie, who comes to Music Maker after several years as a freelance photographer in the L.A. area, is replacing Rose Rounseville, who is regrettably leaving to be with her beloved in England. I and all the MT staff wish Rose the best of luck in her UK adventure. ■ *Bob O'Donnell*

### EDITORIAL

**Editor:** *Bob O'Donnell*

**Music Editor:** *Deborah Parist*

**Technical Editor:** *Scott Wilkinson*

**Associate Editor (UK):** *Tim Goodyer*

**Editorial Assistant:** *Dan Rue*

### Photographers:

*Melodie Gimple, Rosemarie Rounseville*

### Editorial Consultants:

*Amy Ziffer (Recording)*

*Michael McFall (Percussion)*

### Specialist Correspondents:

*David Bradwell, Travis Charbeneau, Yung Dragon,*

*Peter Freeman, Bill Lewis, Mihai Manoliu, Tom*

*McLaughlin, Robert Rich, Lorenz Rychner, Ernie*

*Tello, Simon Trask*

### ART STUDIO

**Director:** *Stuart Catterson*

**Deputy:** *Sam Master*

**Art Assistants:** *Alan Beeson, Sam Gilbert, Darryl*

*Tooth, Hilary Reed, Emma Parsons, Chris*

*Brennaud*

**Photography:** *Melodie Gimple,*

*Adam Jones, Eddie Malluk, Rosemarie*

*Rounseville*

**Illustrations:** *Clive Goodyer, Toby Goodyer,*

*Sophie Lawrence-Jones, Rick Lohmes*

### PRODUCTION

**Production Managers:**

**Editorial:** *Trish Meyer*

**Advertising:** *Melissa Phelan*

**Production Coordinator:** *Debbie Poyser*

**Production Assistant:** *Chris Williams*

**Production Manager (UK):** *Mike Stapleton*

### ADVERTISING

**Advertising Sales Manager:** *Brent Heintz*

**Classifieds:** *Kathy Soran*

### ADMINISTRATION

**Accounts Receivable:** *Stefanie Mann*

**Circulation Manager:** *Debbie Miller*

**Subscriptions:** *Tiffany Sepe*

**Staff Assistant:** *Carol Dean*

### MUSIC MAKER PUBLICATIONS, INC.

*Executive Officers*

**President:** *Terry Day*

**Publishing Director:** *Dennis Hill*

**General Manager:** *Alan Goodes*

© Copyright 1989 Music Maker Publications, Inc.

Cover photography *Andrew Cullin*

MUSIC TECHNOLOGY (ISSN 0896-2480) is published monthly at: Music Maker Publications, Inc., 22024 Lassen Street, Suite 118, Chatsworth, CA 91311. Tel: (818) 407-0744. FAX: (818) 407-0882. GENIE: Musicmkr.LA. Subscription rate: \$25.00 per year.

Second-Class Postage Paid at Chatsworth, CA and at additional mailing offices. Postmaster: Send address changes to: Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.

EUROPEAN OFFICE: Music Maker Publications Ltd., Alexander House, Forehill, Ely, Cambridgeshire, CB7 4AF, England. Tel: 011 (44) 353-665577. FAX: 011 (44) 353-662489. (Ad Manager: Rona Tait)

## MAJOR BREAKTHROUGH IN MUSIC TECHNOLOGY

Los Angeles, CA - Hybrid Arts, a leader in music computer technology, has again made history with the introduction of ADAP II...the direct to hard disk digital audio recorder/editor. ADAP is the acronym



for Analog to Digital Audio Processor. In short, ADAP is a digital mastering device and audio work station, a 16 bit stereo sampler, a visual non-destructive sound editor with sample precise accuracy, a MIDI module, a SMPTE trigger, full EDL (Edit Decision List), a cue system and much more.

ADAP delivers all the advantages of digital audio recording at a very affordable price. Among the extensive list of outstanding features, ADAP offers the user the ability to edit, manipulate and process sound without any loss of fidelity. And, by storing your original tracks in memory, you can perform multiple edits, add new sounds or sweeten...completely non-destructively.

ADAP has more speed, power and versatility than any tape-based system or even other digital recorders saving you valuable time, energy and money. For example, matching audio to visual hits via SMPTE can be performed instantly because ADAP responds in real time.

These features can be fully realized when performing editing functions. ADAP offers independent left and right channel editing. Multiple edit windows allow you to transfer sounds between files where they can be combined and manipulated in a variety of ways without clicks, glitches or other unwanted noises. One feature that you're sure to appreciate is being able to see the X-cursor which displays its exact position in

real-time or SMPTE code during record or playback. ADAP gives you the ability to drop and name markers at any point. These markers are your edit points and can be referenced quickly and accurately with auto-locate for editing or playback of specific ranges. The zoom feature allows you to 'zoom-in' on any part of the sound file wave form or amplitude display for precise editing. This close-up view of the sound enables you to move your markers with microsecond precision. The cut, copy, paste, and insert time are valuable editing functions that give you complete control.

ADAP's optional AES/EBU digital interface and direct to disk capability makes it one of the few systems available for R-DAT editing (48 kHz sample rate) where the audio is kept completely in the digital domain. When compared with devices costing many times the price, ADAP stands

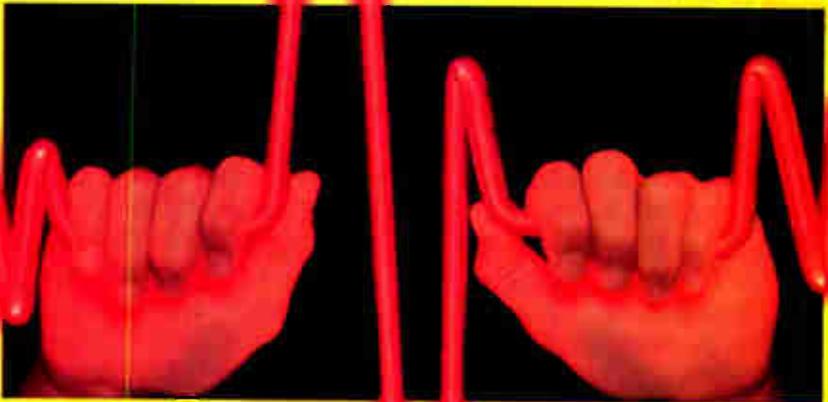
up as one of the most flexible, capable and advanced systems available.

Here are just a few of the possible applications: For film/video post-production...ADAP is unsurpassed in speed and ease for effects editing, background looping, dialog, dialog fill or electronic Foley. For recording studios...it's used as a one shot sampler to fly in vocals, retune sections of music or create extended mixes. For musicians & sound designers...it's a high quality MIDI performance sampler and digital synthesizer. For radio stations...it's the ultimate commercial spot production system.

ADAP is available as a stand alone product or can be supplied to order in a variety of turnkey system configurations.

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

# HANDS - ON SOUND



## ADAP II THE DIRECT TO HARD DISK DIGITAL RECORDER & EDITOR

*Now you can manipulate sound like never before...ADAP gives you the power and the speed. Professional quality too...over 50 minutes of stereo digital audio at 44.1 kHz.\* A 'must-have' tool for recording studio, post production, broadcast, sound design, live performance or other demanding applications.*

- ▼ Immediate, sample precise, non-destructive editing
- ▼ Multiple windows with cut, paste, insert time and channel independent editing
- ▼ CD-ROM support, DAT editing & CD quality mastering
- ▼ Versatile SMPTE cue list triggering and implementation
- ▼ Variable recording and playback rates
- ▼ Lightning fast operating system

*All this and more...at a price that's music to your ears!*

*\*With our 760 megabyte drive*



**Hybrid Arts, Inc.®**

11920 W. Olympic Blvd. ▼ Los Angeles, CA 90064 ▼ Main Office: (213) 826-3777



Synclavier Explained - p18



Rehumanize Your Drum Patterns - p42



Yamaha V50 - p56

## STANDARDS

Newsdesk .....	7
Readers' Letters .....	10
Perspectives .....	27
"Keyboardism" and the quality of digital samples are some of the points disputed by MT reader Daniel Goode in this month's Perspectives corner.	
Square One .....	28
For those readers who are new to the world of music technology, Bob O'Donnell explains this month what exactly a "synthesizer" is, and how these new instruments go about producing sounds.	
Readers' Tapes .....	32
Listening Lab .....	52
Recommended listening for June includes Joe Sample, Midge Ure, Paula Brion, Harold Budd, Inner City, and others. Let the music play ...	
Updates & Upgrades .....	61
Patchwork/Patchware .....	62
More From ... ..	73

## ARTISTS

- 48 New Order**  
Straddling the line between techno-dance and alternative underground music, New Order is enjoying their greatest commercial success to date. The band discusses their new album, *Technique*, working with Quincy Jones, and self-detonating musical equipment.
- 74 Jerry Goldsmith**  
You've undoubtedly heard the music of Jerry Goldsmith, setting the backdrop to countless movies over the past few decades. Deborah Parisi talks with Goldsmith about the making of the *Star Trek V* soundtrack, and coping with mountains of MIDI devices.

## TOOLS

- 14 Oberheim Cyclone**  
The demand for real-time performance MIDI control has become increasingly intense. Oberheim is meeting that demand with this versatile sequence-arpeggiator from their Perf/x line.
- 18 Synclavier Explained, Part I**  
We've all heard of the Synclavier, but just what is embodied in the most powerful workstation on the market? Our new series gets down to the nitty-gritty, with a focus this month on the hardware, sampling and performance aspects of the Synclavier.
- 39 Preview: Peavey DPM3**  
The time has come for Peavey to jump head-long into the biz of making synthesizers. The DPM3 is their first offering, and Dan Rue takes a preview look at the synth-to-be.
- 47 Preview: Roland W30**  
When a company the size of Roland comes out with a new full-power workstation, people take interest. Bob O'Donnell looks at their up-and-coming W30, and disputes the concept of a sampler-based workstation at all.

# C O N T E N T S

- 54 MicroReviews**  
Basic sequencing and algorithmic composition are made affordable with Dr. T's Keys! for the Atari ST. From Hip Software comes a new music theory, graphic educational tool for the Macintosh called Harmony Grid; and Musicode's TX81Z Voice Developer for the Atari ST and Yamaha's 4-op synths is an impressive editor/librarian. All are briefly reviewed in these pages.
- 56 Yamaha V50**  
One of the big unveilings for Yamaha at the winter NAMM was this 4-op FM synth workstation, complete with 16-voice polyphony, sequencer and drum machine. Now the product is on the streets and the review is in.
- 70 Sansui WSXI**  
Sansui joins the workstation craze with this six-track, multideck cassette recorder. Bill Lewis reviews this novel product, which lets you do multitrack recording and mixing down to two-track all in one package.

## TECHNIQUES

- 34 Programming Compleat, Part V**  
We move on this month to the wide world of multiple waveform FM-style synths, focusing on the Yamaha DX11 and TX81Z, Korg DS8 and the Casio VZ1.
- 42 Rehumanize Your Sequences, Part V**  
In the final chapter of his series, Travis Charbeneau confronts a new monster in the arch-battle against the Mechanical Man who lives in your computer sequences: boring drum patterns.
- 64 Fun in the Waves, Part II**  
Basic synth waveforms can turn your sampler into a whole new beast. Tom McLaughlin details the steps to go through in this second half of our report on creating and sampling your own wavetables.

## OUTSIDE

### Microtonality

Despite popular misconceptions, using microtonality is not just for the way-out and way-weird musician. Scott Wilkinson gives an overview of microtonal temperaments, and some of the more useful applications in pop, rock, jazz and classical musical settings.

### The Other Side

Chris Meyer decries the dangers in dissenting from the written MIDI specifications, and the growing trend amongst manufacturers of "concealing" MIDI and SysEx specs for their products.



Jerry Goldsmith - p74



Roland W30 Preview - p47



Oberheim Cyclone - p14

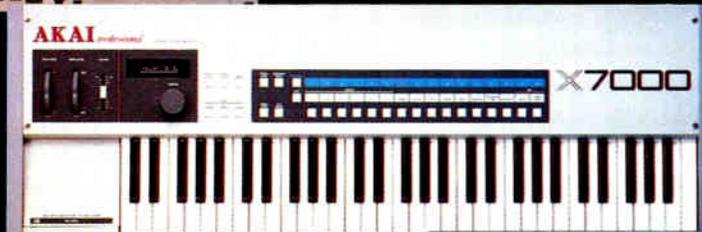
# AKAI

## Family of Samplers Specs. and Prices for Everyone



### S700 Sampler

A 12 bit sampler which can hold up to 16 sounds. Also available with battery backed memory to allow you to save your sounds, even after you turn the power off.



### X7000

Identical to the S700 in a 61 note velocity sensitive keyboard.



### S900

The industry standard. A 12 bit, professional sampler with 8 voices and 32 samples. Now, a new hard disc interface allows rapid access to a massive sound library.



### S950

Successor to the S900. Features expandable memory, increased sampling frequencies, improved signal to noise ratio, optional digital interface and high density disc drive. Can also continue to play while loading new sounds.



### S1000

New flagship of the AKAI sampling line. Stereo 16 bit CD sound quality with expandable memory (up to 8 Meg.) 320 character LCD window allows graphic display of waveforms, envelope shapes and more. Available optional interfaces will include: SCSI, AES/EBU, RDAT/CD and Atari/Supra hard drive.

*See your nearest AKAI dealer  
for the sampler of your dreams.*

Creative at Heart

**AKAI**  
professional

P.O. Box 2344 Fort Worth,  
Texas 76113-2344 U.S.A.  
Phone: 817-336-5114  
FAX 817-870-1271  
Telex: 163203 IMCTX UT

# NEWS DESK

## DO-IT-YOURSELF

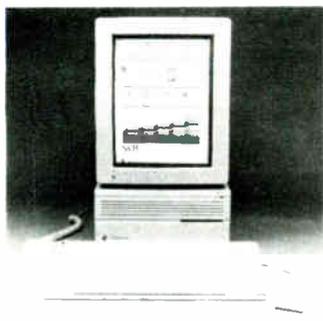
If you're a Macintosh owner and music aficionado, and you've always dreamt of programming your own music software, then we've run across a book that might interest you. *MIDI*

*Programming for the Macintosh* by Steve De Furia and Joe Scacciaferro runs through an introduction on MIDI as well as programming the Macintosh for aspiring software programmers. MIDI

coverage includes descriptions and explanations of both hardware and software MIDI devices, detailed summaries of the messages and data formats laid down by the current MIDI 1.0 Specification, and resource codes. Macintosh subjects include explanations of the Mac user interface, program design, and Mac languages and tools, then dives head-first into the basics of programming the Mac's ROM-based Toolbox in

BASIC and Pascal. Using lots of examples and short subroutines, functions, and procedures to explain specific tasks and applications, De Furia and Scacciaferro have written a very comprehensive introduction to programming MIDI software for the Mac. Page count, 400; \$22.95; with a disk featuring MIDI/Mac code examples, \$37.95.

**MORE FROM:** M&T Books, 501 Galveston Dr., Redwood City, CA 94063. Tel: (415) 366-3600.



## NEW MAC

Yes, it's Mac-Attack time again. Apple has expanded their Macintosh line to include the new Macintosh IIcx computer. The IIcx is the long rumored "smaller Mac II" and its 12.25" x 14.5"

footprint does squarely fit that description. It looks a bit like a baby Mac II. Very cute.

As far as technical spec-stuff is concerned, the IIcx is nearly identical to the IIx. It features the super-fast 68030 processor and a 68882 math coprocessor, both of which run at 16MHz. The biggest difference between the two is that the IIcx has only three Mac II- and IIx-compatible NuBus slots - plenty for most users.

Software-wise, the IIcx is compatible with Mac II and IIx software. On the floppy disk front, the IIcx features Apple's high-capacity 1.4Meg SuperDrive floppy drive (first

seen on the recently released SE/30) that works with Apple File Exchange software to allow the system to read and write MS-DOS files "effortlessly" (got any friends with a Yamaha C1?).

Unfortunately, although Apple listened to users regarding features they'd like to see in a computer, it doesn't look like they consulted them on price. A basic IIcx with 1Mb RAM (expandable to 8Mb) costs \$4669, with a 40Mb hard disk it's \$5369 and with a 80Mb hard disk and 4Mb RAM it's a whopping \$7069. All prices are without keyboard and monitor.

Speaking of which, Apple

also unveiled two new monitors of their own. The 21-inch Apple Two-Page Monochrome Monitor (\$2149; video card, \$599) is a full two-page display, and the 15" x 11.3" Apple Macintosh Portrait Display (\$1099; video card, \$599) offers a full-page monochrome display. Both new monitors operate at a quick 75Hz refresh rate. Finally, the NuBus-compatible Macintosh II one-bit Monochrome Video Card (\$199) is now available for use with monochrome monitors.

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

## SCORING WITH AMIGA

There's been a lot of software coming out for the Commodore Amiga lately, and Dr. T's Copyist Professional (\$275) is a welcome addition. Copyist Pro utilizes such Amiga implementation as pull-down menus, scroll bars, and multitasking. In addition, the program can transcribe and export files via KCS format, standard MIDI files, or SMUS. Data is input with the mouse or the keypad, and the layout is flexible, so you can manipulate your symbols, notes, text or what have you in any way you so desire within a page. Musical symbols include Treble, Soprano, Alto, Tenor, Bass and Percussion clefs, guitar chord grids (up to 9 strings, 9

frets), 16 staff scores, including orchestral percussion, all key and time signatures, slanted and horizontal beams, and with a 4-point adjustment of slur curvature. Copyist Pro will generate smooth slurs, ties, dynamics and beams, even on a dot matrix printer (Epson FX and LX, HP Inkjet, HP Laserjet Plus, II and HP Deskjet also supported). Depending on the printer you've got, you can use up to six different styles of text on a single page. As far as editing goes, you can insert and delete notes, rests, bars, symbols, text and pages, adjust stem directions, quantize the timing or duration of each track separately or four sections of individual tracks by measure.

You can map any track to any staff or split a staff into a grandstaff. Finally, the manual is extensive, including tutorials and an index. The program requires an Amiga 500, 1000, or 2000, with Workbench 1.3 (included with Copyist).

Also new from the good Dr. is the FX Pack-1 (\$129) for the Atari ST, a graphic editor/librarian for the Lexicon LXP1, Yamaha SPX90/90II, DigiTech DSP128, and ART MultiVerb; and the VZ-Rider E/L for the Casio VZ1 and Atari ST (\$129) or Amiga (\$149). Created by the "Caged Artist," these programs are fully MPE (Multi-Program Environment) compatible, and they accept data via point-and-click mouse maneuvers, keypad, or Dr. T's "Virtual Slider," which uses the + and - keys. A special feature in the FX Pack-

1 is a pop-up Delay Calculator, for figuring out delay times from beats-per-measure. The VZ-Rider will let you audition any sound from the bank-mode, and all edits instantly update the instrument. Notes can be played from the computer's screen by playing the right mouse button, which has an adjustable pitch scale, including Major, Harmonic Minor, Lydian, Enigma, Pentatonic and others. MIDI merge, solo, and rechannelize features are included, Undo and Compare/Copy keep you from saving something you'd rather not, and any parameter value can be copied onto any other with the click of the mouse.

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

FOR ALL INSTRUMENTS

# We guarantee YOU will hear in Perfect Pitch!

## And we'll even make you this bet...

*Maybe you still believe it's beyond your reach.*

*But Perfect Pitch is as easy as naming colors!*

**P**ERFECT PITCH is your *natural ability* to recognize any tone or chord BY EAR.

You may not realize it, but this powerful hearing tool is *already in your ear*. You just need to discover it!

**Try this:** Have a friend play a tone for you. Without looking, *can you name it?*

With Perfect Pitch you can!

Now have your friend play a chord. Is it G major. . . D Major. . . F# major?

Perfect Pitch can tell you *immediately*.

In fact, with just a few ear-opening instructions, we bet **YOU** will begin to name pitches by ear—*regardless of your current ability*—and we can prove it!

### Why you need Perfect Pitch

Isn't it ironic that you work with pitches *constantly*, but can't recognize them by ear? Unless you're *intimately familiar* with the sound of each tone, how can you expect to produce your best music?

With Perfect Pitch you feel at *home* with all tones because *you know each one by ear*.

You can even *sing* any pitch straight from memory!

With hearing this good you can:

- Find the tones you want *by ear*—instead of searching by hand!
- Copy chords straight off the radio!
- Identify the key of a song *by ear alone!*

And much more!

Perfect Pitch is the one hearing skill that gives you command of the entire musical language.

Why? Because *all music is composed of pitches*. Your full potential to play by ear, improvise, compose, arrange, perform, and enjoy music is **ROOTED** in your ability to *hear and evaluate pitches*.

Even with years of training and a ton of expensive equipment, the bottom line in music is this: *your success depends most on your ability to hear*.

Perfect Pitch *maximizes* your hearing so your creativity can soar.

Your performance automatically improves, your confidence grows, and every song you play takes on a whole new dimension of richness and enjoyment.

### Shattering the Myth

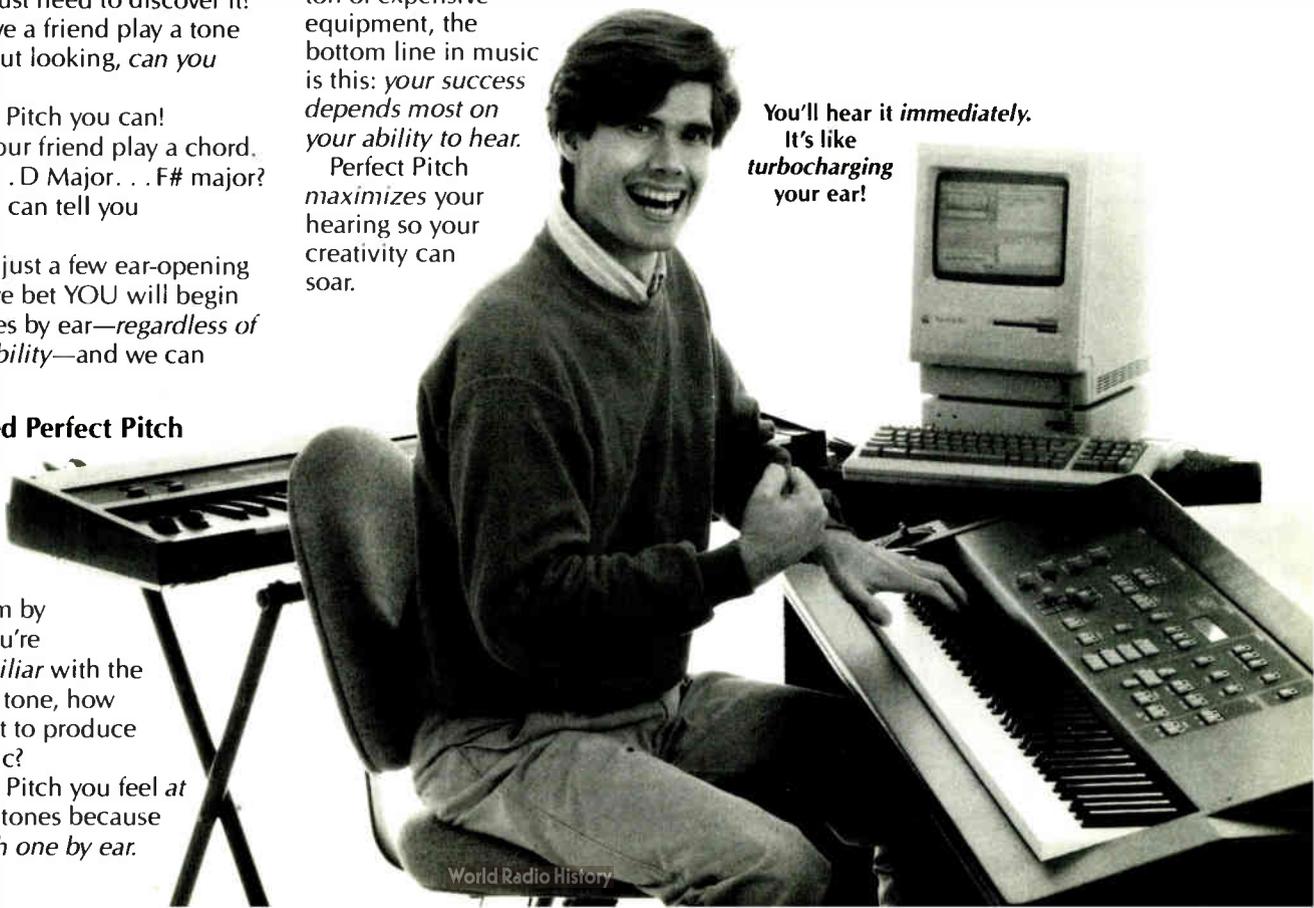
Most musicians were told at some point that only a select few are born with Perfect Pitch. Not true!

**David L. Burge** revolutionized that idea when he showed how *easy* Perfect Pitch is *once you know how to listen*.

His **Perfect Pitch Ear-Training SuperCourse™** is now regarded by top educators as the #1 course all musicians must hear. It's used by band members, rock stars, jazz artists,

You'll hear it *immediately*.

It's like *turbocharging* your ear!



music schools, colleges, and musicians in over 50 countries.

### "Color Hearing"

According to David Burge, Perfect Pitch is *Color Hearing*. This means that each pitch has its own "sound color" which your ear can learn to recognize.

exact pitches, Relative Pitch tells you how tones combine to create a total musical sound.

The information on this 90-minute tape is worth many times its \$14.95 value, but it's yours **FREE** just for *trying out the Perfect Pitch Ear-Training SuperCourse™!*

## Join thousands of musicians who have already taken the Perfect Pitch course:

- "It is wonderful. I can truly hear the differences in the color of the tones." *D. Pennix*
- "In three short weeks I've noticed a vast difference in my listening skills." *T. Elliott*
- "I can now hear and identify tones and the key in which a song is played just by hearing it. When I hear music now it has much more definition, form and substance than before. I don't just passively listen to music anymore, but actively listen to detail." *M. Urlik*
- "I heard the differences on the initial playing, which did in fact surprise me. I think it is a breakthrough in all music." *J. Hatton*
- "It's like hearing in a whole new dimension." *L. Stumb*
- "Although I was at first skeptical, I am now awed." *R. Hicks*
- "I wish I could have had this 30 years ago!" *R. Brown*
- "A very necessary thing for someone who wants to become a pro." *L. Killeen*
- "This is absolutely what I have been searching for." *D. Ferry*
- "Learn it or be left behind." *P. Schneider...*

Color Hearing does *not* mean you associate *visual* colors to tones (like red to F#). Instead, your ear learns the distinct *sound* quality, or *color* of each pitch.

It's easy—and you don't even have to read music!

### Here's the Bet:

Order the **Perfect Pitch Ear-Training SuperCourse™** and listen to the first two tapes.

We bet you will *immediately* hear the Perfect Pitch colors that David explains to you. These pitch colors will enable you to start naming tones yourself—by ear!

If you don't hear the pitch colors *right away*, we lose. Simply return your course for a *full refund*—and *keep the valuable bonus cassette we'll send with your order FREE.*

Your bonus cassette introduces **Relative Pitch**—the ability to hear pitch *relationships*. David demonstrates how Relative Pitch and Perfect Pitch work together: Perfect Pitch tells you

### The Bet Continues...

We bet you *will* hear the Perfect Pitch colors—and be excited! But your first taste is only the beginning. With just a *few minutes* of daily listening your Perfect Pitch will naturally unfold.

Try out the simple listening techniques in your **Perfect Pitch Handbook** (included). You must be completely satisfied with your experiences or simply return the Course within 40 days for a full refund, *no questions asked.*

If you choose to keep your Course, listen to the remaining two cassettes for special follow-up instructions. *Whatever you do, you keep the bonus*

*cassette on Relative Pitch as your FREE gift!*

Is this offer stacked in your favor or what?

### How can we make this daring offer?

We've been able to guarantee David Burge's Perfect Pitch course for years—because IT WORKS!

Experience has shown us that 99% of musicians *do* hear the beginning stages of Perfect Pitch—*immediately!* The rest usually hear it after listening a little more closely.

With this instant success rate, it's no wonder we get so few returns.

### Will YOU hear in Perfect Pitch?

**We guarantee you will.** Experience Perfect Pitch *yourself* at NO RISK and find out how it can work for YOU!

*Call now (515) 472-3100 to order your Perfect Pitch Ear-Training SuperCourse™ (with FREE bonus tape). Or clip and mail the order form NOW!*



The **PERFECT PITCH EAR-TRAINING SUPERCOURSE™** is for all musicians/ all instruments, beginning and advanced. *No music reading skills required.* Includes easy handbook with 4 audio cassettes, plus *free bonus cassette* on Relative Pitch.

**O.K., YOU'RE ON!** Prove to me that I can hear in Perfect Pitch. Send me David L. Burge's **Perfect Pitch Ear-Training SuperCourse™** on a *trial basis.*

I will listen to the first two cassettes. I must *immediately* hear the Perfect Pitch colors or I may return the Course for a full prompt refund and *keep the bonus tape on Relative Pitch, FREE.*

Or I can use the handbook and continue the Course on a 40-DAY TRIAL BASIS. I must feel I am gaining valuable hearing skills and *be* completely satisfied with my experiences or I may return the Course within 40 days for a full prompt refund (*but I keep the bonus tape just for trying out the Course.*)

If I decide to keep the Course I may listen to the remaining two cassettes for additional advanced instructions.

Enclosed is \$65 plus \$4 shipping.

I'm not ready to order yet. Please send me a Perfect Pitch Report with more info. Enclosed is \$1 (credited towards Course price if I should order later).

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Make check or money order payable to: **American Educational Music.** Canadians may remit bank or postal money order in U.S. funds.

Please allow 3-5 weeks for delivery. For 1 week delivery from our warehouse add \$2 (total \$6 shipping) and write *RUSH!* Foreign orders (except Canada) add \$5 (total \$9 shipping) for air service. U.S. funds only. Iowa residents add 4% tax.

Please charge my  

CARD # \_\_\_\_\_

EXP. DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

Mail to:  
**American Educational Music Publications, Inc.**

Music Resources Building, Dept. ME2  
1106 E. Burlington, Fairfield, IA 52556

### For fastest service:

Call our 24-hour Order Line NOW and charge your Visa/MasterCard:

**(515)472-3100**

# 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.**

## DX/D50 Dilemma

After purchasing a DX7IIFD about a month ago, I started to read *Music Technology* and other keyboard magazines. I've been very disappointed to see that almost all mags are centered around the Roland D50. I would like to know, did I buy an out-of-date keyboard? It seems that everyone is talking about L/A synthesis and that FM synthesis is a thing of the past. Another problem is the sounds. Yamaha only has four cartridges for the DX7IIFD at the current time. These cartridges cost \$130 and that's a lot compared to the D50 cards, which are about \$60.

If I got E! for the DX would that help? All in all, I would like your opinion on which keyboard you would buy and why.

**Chad G. Felgner  
Toledo, OH**

*First off Chad, we can't make any specific recommendations of particular products, although, to be honest, it wouldn't make any difference in this case because both the DX7IIFD and the D50 are excellent synthesizers. They do have different types of sounds and some people prefer one type of sound over another, but you can't go wrong with either one. Moving onto your other comments and questions, I'm not really sure what you mean by "mags are centered around the D50." Yes, we have run D50 patches in Patchwork and reviewed D50 patches in Patchware, but we've done the same for FM equipment. In addition, we certainly wouldn't be running a multi-part article ("Programming Compleat") explaining how FM works and how to create your own sounds with it if we thought it was a dead topic. (For the record, this programming series will switch to D50-style programming next month.) Also, on a more philosophical note, no synthesis method is ever completely "out of date."*

*Some may become more popular or "fashionable" than others, but as long as you can find musically useful applications for older technology, then it will never be useless or outdated. Look at the huge resurgence in old analog synths and drum machines that many thought were gone forever.*

*As far as sounds are concerned, there are probably more sounds available for the DX7 series of synthesizers than for any synthesizer ever made. Many were done for the original DX7, but they will all work for the DX7II. Also, most patches are not being sold by Yamaha themselves but by third-party vendors - check previous editions of MT's Patchware column and classified ad sections as well as your local retail music store for more info on who to contact for more sounds. To address the question of cartridges, yes, the ones for the DX7IIFD are more expensive than the D50 memory cards, but you have one thing on your instrument that many D50 owners probably wish they had - a disk drive. Floppy disks are very cheap (about \$2-\$3) and can store many times more patches than any cartridge. Many companies sell their patches on disk, so all you have to do is pop it in and load the sounds. Finally, Grey Matter Response's E! board for the DX7II (reviewed in MT May '88) will add some very useful features to the instrument, including an expanded internal patch memory, a basic sequencer, and multi-timbral operation, which means the ability to play multiple sounds (or timbres, hence the word) at the same time. - BO'D*

## World Music

As someone who has been promoting the concept of world music for over a decade as the leader of Ancient Future, a world music ensemble on Narada/Sona Gaia/MCA Records, I was pleased to see a national music magazine tackle the subject in John Diliberto's article, "Towards a Global Music."

I have a few insights to add. In general, categories are an aid to marketing, but are a hindrance to creativity. Corporate greed, target marketing, restrictive radio formats and an addiction to trends and fads have led to artistic stagnation in the '80s. It is ironic that today one of the most popular categories is '60's music. Why? Political and social factors encouraged creativity at that time.

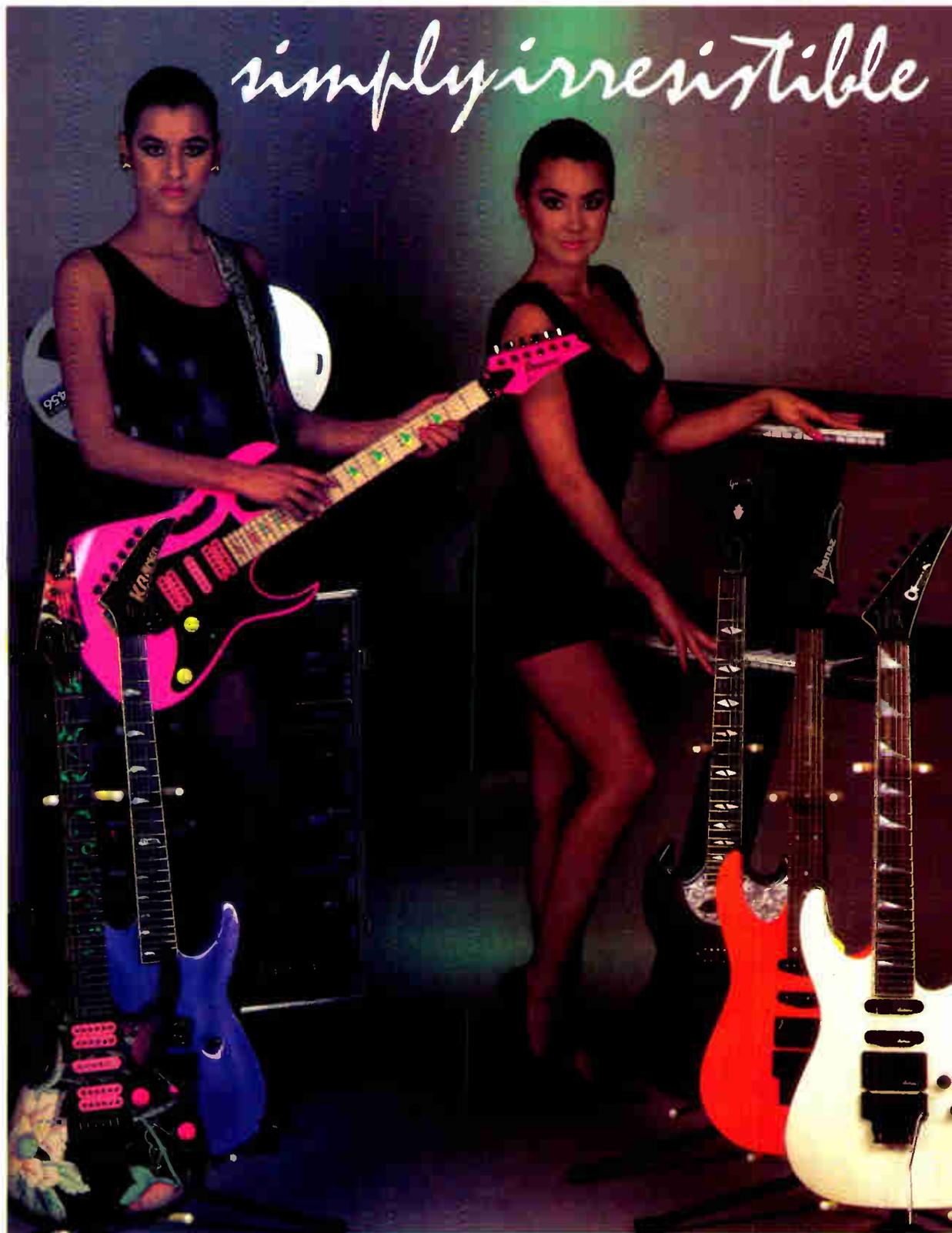
Which is why the term "world music" is so hip. It's a very broad category. I think I can live with playing only music from the planet Earth, at least until I meet some extra-terrestrial musicians. What the term really implies is that we need to start thinking globally - politically, environmentally and musically. The artistic possibilities opened up by combining musical ideas from the great traditions of the world are endless. In the field of world music there is no excuse for artistic stagnation. There is always something more to learn. This is where the excitement in music is today.

I maintain a database of musicians who are working in the world music field, and am always open to hearing from those interested in this field of music.

**Matthew Montfort  
Ancient Future  
P.O. Box 264  
Kentfield, CA 94914-0264**

*Matthew also mentioned that he has written a book on the traditional musics of Africa, Bali and India that addresses many fundamental issues in the World Music movement. Entitled "Ancient Traditions - Future Possibilities: Rhythmic Training Through the Traditions of Africa, Bali and India," (Mill Valley: Panoramic Press, 1985. ISBN 0-937879-00-2), it can be ordered by contacting him. BO'D*

**OUR SERVICE, SALES, & SELECTION ARE**



**rolls  
music  
center inc.**

**1-800-336-0199**

1065 West Broad Street Falls Church VA 22046 In VA 703-533-9500

**GUITARS AMPLIFIERS KEYBOARDS DRUMS PERCUSSION  
SOUND SYSTEMS DJ SYSTEMS SIGNAL PROCESSORS  
MULTITRACK RECORDING LIGHTING SYSTEMS**

This Irresistible Poster (20x30") can be Yours for \$9.95 plus \$1.50 shipping, VISA or MC. 1-800-336-0199

World Radio History

# ORIGINAL FORMULA.



Since its release, the Kawai K1 has brought thousands of musicians fast relief from the pain of paying high prices for great sounds. Now there are two ways to enjoy the sound formula that has the critics raving—the original Kawai K1 and the

new enhanced-version Kawai K1II.

Either one gives you the multi-timbral power of 64 internal Single sounds or 32 Multi combinations of Kawai's Sampled Digital Waveform technology—256 digital waveforms, combined to produce rich

and soothing analog-sounding tone colors blended with bright and powerful digital textures.

To this incredible sonic formula, the K1II provides the extra-strength ingredients of a full function digital reverb with fully adjustable

# EXTRA STRENGTH.



parameters. Plus, the K1II also strengthens your tracks by adding a separate drum section that is active independently of the other voices—to play 8 multi-timbral instruments plus drums. Of course, the K1II costs a little bit more than the K1, but a lot less

than the cost of an out-board reverb or drum machine.

Avoid the pain of paying high prices for great sounds. Whether your set-up calls for the original K1, or if you need the extra strength of the K1II, you can count on

Kawai to provide fast relief to your whole system.

**KAWAI**  
DIGITAL  
INGENIOUS!

Kawai Digital Products Group, 2055 E. University Dr., P.O. Box 9045, Compton, CA 90224 (213) 631-1771. Kawai Canada Music Ltd., 6400 Shawson Dr., Unit #1, Mississauga, Ontario, Canada L5T1L8.

©Kawai America Corporation, 1989

# Oberheim Cyclone

## MIDI Performance Effect



Photography Martin Gibson

**F**OR MANY MUSICIANS, the name Oberheim is synonymous with classy, indeed classic, analog synths like the OBX, OB8 and Matrix 12. It may seem surprising, then, that Oberheim is now producing a series of small, unassuming gray boxes that make not a sound between them. Collectively known as Perf/x MIDI Performance Effects, the Cyclone, Systemizer (see review in *MT February '89*) and Navigator operate solely within the realm of MIDI data. The Cyclone, which basically functions as a MIDI arpeggiator/sequencer, makes a bold move into the area of composition.

For those who might be unclear on the concept, an arpeggiator is a device that automatically plays all of the notes

**Thought arpeggiators were a thing of the past? Oberheim wants to prove otherwise with their very sophisticated new offering.**

*Review by Simon Trask.*

currently being held down on a keyboard in a sequence rather than simultaneously. For example, if you hold down the notes of a C chord, an arpeggiator will play through the individual notes C-E-G one at a time in a particular order. The speed and order in which the notes are played (as well as lots of other options in the case of the Cyclone) can all be programmed by the user.

### Access to the Cyclone

The Cyclone's operations are con-

trolled from nine low-profile buttons on the front panel. Eight of these buttons perform double duty in Play and Edit modes, while the ninth acts as Play/Edit mode selector. A Clone (hence the name Cyclone) consists of the notes you've recorded into memory and/or are playing "live" from the keyboard. The term refers to the fact that the Cyclone makes a copy of these notes that it can then process according to all the parameter values you've set. In many cases, this involves real-time processing of incoming notes - no mean feat.

For cost reasons, Oberheim has provided the Cyclone with a meager two-character LED window. Consequently, you have to get used to abbreviated names for each parameter, which is a real pain when you're learning to use the Cyclone. What's more, this limitation has led Oberheim to employ a rather odd and confusing convention for displaying tempo values.

The matrix-style parameter access that Oberheim has chosen for the Perf/x series is a definite success, helped by the fact that the Cyclone remembers which parameter you last selected for each of the 15 edit function groups in the matrix display. Once you've thoroughly familiarized yourself with the layout of the Cyclone's parameters, you can edit its Programs quite rapidly.

## Creating the Cyclone

The Cyclone has 16 preset Programs and 16 user Programs (the latter number is expandable to 84 with a memory upgrade). Oberheim has logically developed the arpeggio/sequence connection by allowing you to record and store a separate sequence in each of its user Programs (each with a maximum of 32 events within up to 64 beats). The sequence is stored in a Record Buffer (logically enough) that can be switched off or assigned to transmit on any one of the MIDI channels 1-16.

In addition, two keyboard zones and an additional Control zone are available per Program. Each keyboard zone can be assigned to an independent range on the keyboard and, like the Record Buffer, can be turned off or assigned to transmit on any MIDI channel. By turning off a keyboard zone and switching the Cyclone's MIDI Thru function on, any notes played within that zone will be echoed "straight." In this way you can, for instance, play a solo in zone two while arpeggiating a sequence of notes in zone one and have the Record Buffer repeatedly play a bassline.

Like the other two zones, the Control zone can be assigned to any area of the entire MIDI note range (in fact it can overlap the other zones). The Control zone includes an associated programmable Base note from which notes in Live Trigger mode (see below) will be played back at original pitch. Repeated playing of the Base note will step through the Record Buffer sequence at its original pitch, while

playing other notes in the Control zone will transpose the sequence according to the note played.

Three methods of recording sequences into the Cyclone are available: Recorded Rhythm, Live Trigger and Pulse. The first is familiar real-time sequence recording. Your performance can be quantized to any resolution from quarter notes to 96ths (64th note triplets). Drum machine-style recording is also possible.

Live Trigger recording is actually good old step-time. You can record a single note or a chord per step, advancing to the next step by pressing a silent note within the Control zone. The quantize value determines the step value. The catch with Live Trigger recording is that you can't insert rests.

Pulse recording is distinct from the other two methods in that notes are "added in" consecutively no matter when you play them. The sequence of notes and rests cycles at the current pulse rate (which can be any value from a quarter note to a 96th note). Rests are selected by pressing a silent note in the Control zone.

Using Pulse recording, you can generate additive rhythms à la Philip

*"You can play a solo in zone two while arpeggiating a sequence of notes in zone one and having the Record Buffer repeatedly play a bassline."*

Glass by dropping in a note or rest on each pass through the sequence. Once you've recorded a Pulse sequence, you can adjust its playback rate by setting a different pulse timing. A special case of Pulse recording is triplet quantization. Here, all of the notes you play will be squeezed into one beat, each being given an equal duration within the beat (thus six notes in a beat would be a sextuplet).

Another recording feature is called Chord Hold. With this function, you can play any series of notes (up to 32 notes) and they will sustain until you turn off Chord Hold. You now have a chord that you can trigger from the keyboard at any transposition and in any "live" rhythm using Live rhythm triggering from the keyboard Control zone. Incidentally, all these recording methods preserve the input note velocity, but no performance controls (pitch-bend, aftertouch, modulation and so on) are recorded.

Arpeggiation is possible only with

Clone switched on. In Recorded Rhythm mode, any notes you hold down on your keyboard will be arpeggiated in the rhythm of the Record Buffer sequence (if there is one) at the current tempo. The Record Buffer needn't be on, which means that you can play arpeggios with or without an accompanying sequence.

In Pulse mode, the notes will be arpeggiated at the current pulse rate (which is synchronized to the current tempo). By playing notes in both zones, you can create two independent arpeggios that need not have the same number of notes (although they cannot pulse at different rates).

Two crucial parameter settings are available that determine how the notes you hold down on the keyboard will be played: Order and Mode. There are nine possible ways for the Cyclone to order the notes it receives. Forward, backward, forward-backward and backward-forward all preserve the order of the received note collection. Up, down, up-down and down-up process the notes in MIDI note-number order. Finally, random order can be specified.

The Mode parameter is a bit more unusual. It determines *how many* notes should be played at each Recorded Rhythm or Pulse position. Here the number of notes can be based on recorded note-groupings, set to a fixed number (1-8), specified as proportional to the total number of source notes divided by a number from 1 to 8, or chosen at random from a range between one and a specified number (again, 1-8).

These parameters affect Record Buffer sequences and notes from the keyboard zones alike. So, if you want a sequence to be played as recorded, any accompanying real-time arpeggios you trigger from the keyboard will have to be "as played" also. Incidentally, you can step through a recorded note sequence with each successive key-press within the Control zone by selecting Live Single or Live Poly keyboard triggering.

The Cyclone has several Auto functions that automatically generate various effects. Auto Xpose allows you to create a series of up to eight sequence transpositions for each Program. Each transposition (known as a Stage) can be played up to 128 times. You can also set up a "recursion interval" for all Stages that allows you to add a fixed transposition amount for each repeat. For instance, if you specify ►  
MUSIC TECHNOLOGY 15

► a semitone up, each repeat will be played a semitone higher than the previous one.

Auto Double allows you to add up to eight extra notes to each played note. You can define the pitch of each extra note relative to C3 (middle C), allowing you to build a chord around the played note(s). What's more, each of the extra notes can be assigned to its own MIDI channel, thus expanding the sonic possibilities of your chord. At its simplest, you can use Auto Double to create an octave effect, but the flexibility is such that a broad range of possibilities are placed at your disposal. As you've probably gathered by now, that's what the Cyclone's all about.

Auto Mutate provides yet more ways of twisting the notes you put into the Cyclone, allowing you to "warp" note-on velocity, tempo and pulse-duration in a spontaneous manner using channel aftertouch, pitch-bend or any MIDI controller (0-97). Some experimentation is needed to get the most useful results out of this feature, but it's an interesting addition to the Cyclone's features.

## Behind the Cyclone

On the rear panel of the Cyclone are MIDI In and Out jacks in addition to four ¼" jacks that Oberheim refers to as "pedals" but that are in fact footswitch inputs. The Cyclone detects footswitch polarity on power-up, so that you can use whatever pedals you have lying around.

In addition to these four physical inputs (referred to as local pedals), you can assign up to four incoming MIDI controller numbers (00-95) to act as Cyclone controllers. In this way, you can use any assignable footswitches and front-panel switches on your main MIDI keyboard to control selected Cyclone features. Local and external pedals three and four can be programmed for each of the Cyclone's user Programs, while local and external pedals one and two are applied to all Programs.

One of the key features in the Cyclone's flexibility is the fact that you can edit any of its parameters while a Program sequence is playing and/or the Cyclone is arpeggiating the notes that you're holding down on your master keyboard. By using the Cyclone's pedal functions, you can let your feet, not your fingers, do the walking by programming local and external pedals to select any parameter

and that parameter's value. Also, you can program the pedals to select a parameter and, with successive presses, increment or decrement its value. Alternatively, you can set a pedal to simply call up a parameter, allowing you to adjust its value when you please.

This "pedal control" allows real spontaneity in performance. For instance, you can switch the Auto Doubling and AutoTranspose effects in/out, switch to a different note-order or playback mode, or switch a zone in/out: Another pedal function allows you to control tempo by tapping a footswitch (the tempo is averaged over three taps). For recording purposes, you can assign local pedal one to transmit an audio metronome click on every quarter-note. Also, by assigning Chain to a global footswitch, you can step through the Cyclone's Programs in Chain order.

## Syncing the Cyclone

The Cyclone acknowledges the outside MIDI world with the ability to generate and receive MIDI clocks and Start/Stop data. Alternatively, the Cyclone can be set to respond to a non-MIDI sync signal (24, 48 or 96 PPQ) via its pedal two input.

When the Cyclone is set to read an external clock signal, its sequences and arpeggio rate are synchronized to the incoming tempo. If the Cyclone is generating MIDI clock, the tempo of an

*"One of the key features in the Cyclone's flexibility is the fact that you can edit any of its parameters while a Program sequence is playing."*

external MIDI sequencer or drum machine will be slaved to the Cyclone's internal tempo. This is straightforward enough, and it works extremely well – except for one problem. When MIDI clock send is enabled, the Cyclone transmits a MIDI Start command every time a new Program is selected on the unit (whether from the Cyclone itself or via MIDI). The consequences of this are fairly obvious. Each time you select a new Program, the slaved sequencer is sent flying back to bar one. Unfortunately, very unfortunate.

Finally, you can transfer all of your Program data via SysEx, which means that it's easy to make back-up copies and extend the standard 16-Program capacity.

## Verdict

My attitude towards the Cyclone is ambivalent. On the one hand, I found the process of getting to grips with it to be very time-consuming and frustrating. Yet, paradoxically, there's something very attractive about this device – particularly when it allows you to do stupid things like pulse 96th-notes at extreme tempos or play back a Hold chord at the same time as you're recording it. Don't limit yourself to keyboards, either. Try hooking up a drum machine to the Cyclone's MIDI Out – the results can be very interesting. In other words, if you want to be manic with your MIDI, the Cyclone can accommodate you.

Perhaps the most impressive aspect of the Cyclone is the way it allows you to edit every possible parameter while it's spewing out MIDI data faster than a speeding bullet. And, if you should ever have problems with stuck notes (something I never encountered), there's a panic button that sends out Note Off messages for every note on every channel.

Although you can push the Cyclone to extremes in terms of its real-time processing with no problem whatsoever, it did very occasionally crash as a result of certain "real-time" edits made during performance (such as changing zone limits or switching out the Cycle facility – not things you'll necessarily want to do often). None of these crashes happened with any consistency, which perhaps doesn't bode well for live use.

The Cyclone will handle everything from straightforward arpeggios to "systems" rhythms to New Age-ish synth loops to dislocated dance rhythms to out-and-out free improvisation. Perhaps its one weakness is its inability to handle different rhythms (as opposed to different pitch sequences) concurrently – you'll need to use it in conjunction with a sequencer if you want to do such things.

The Cyclone is an intriguing device, but not particularly intuitive to use. I wonder how many people will be prepared to spend the amount of time necessary to become familiar with it. On the other hand, if you're prepared to put in the time, the Cyclone might just end up becoming a friend for life. ■

**PRICE:** \$299

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

Make **MUSIC TECHNOLOGY** an integral part of your **MIDI studio**.

Subscribe now and you'll also receive **OUTSIDE**, the monthly mini-magazine. Or just ask for a sample issue of **OUTSIDE** and see what you're missing!

**SUBSCRIBE NOW!**  
**SAVE 30%**

off the newsstand price  
12 issues for only \$25.00

**(818) 407-0744**  
or mail the attached card

---

Music Maker Publications, Inc.  
22024 Lassen Street, Suite 118  
Chatsworth, CA 91311  
Tel: (818) 407-0744  
Fax: (818) 407-0882

## **KEEP IN TOUCH WITH TECHNOLOGY**

*with a Subscription to Music Technology*

YES! Please send me 12 issues of Music Technology at the special rate of only \$25.00 (that's 30% off the newsstand price of \$35.40).

Please send me a sample issue of **OUTSIDE**, preferably issue # \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Bill Me     Payment enclosed\* or charge my

VISA     MASTERCARD    Card # \_\_\_\_\_

Exp. Date \_\_\_\_\_ Phone (    ) \_\_\_\_\_

Signature \_\_\_\_\_

\* Checks payable to: **Music Maker Publications**. For postage paid, attach card to envelope. Non-US subscriptions must add \$12.00 additional to cover postage and must be paid in U.S. Dollars via International Money Order. Please allow 6-8 weeks for your first issue. MT689

---

## **KEEP IN TOUCH WITH TECHNOLOGY**

*with a Subscription to Music Technology*

YES! Please send me 12 issues of Music Technology at the special rate of only \$25.00 (that's 30% off the newsstand price of \$35.40).

Please send me a sample issue of **OUTSIDE**, preferably issue # \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Bill Me     Payment enclosed\* or charge my

VISA     MASTERCARD    Card # \_\_\_\_\_

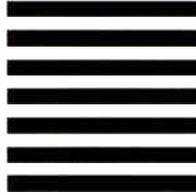
Exp. Date \_\_\_\_\_ Phone (    ) \_\_\_\_\_

Signature \_\_\_\_\_

\* Checks payable to: **Music Maker Publications**. For postage paid, attach card to envelope. Non-US subscriptions must add \$12.00 additional to cover postage and must be paid in U.S. Dollars via International Money Order. Please allow 6-8 weeks for your first issue. MT689



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

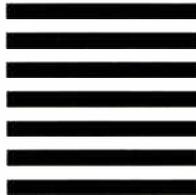
FIRST CLASS PERMIT NO. 318 CHATSWORTH, CA

POSTAGE WILL BE PAID BY ADDRESSEE

MUSIC MAKER PUBLICATIONS, INC  
22024 LASSEN STREET, SUITE 118  
CHATSWORTH, CA 91311



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 318 CHATSWORTH, CA

POSTAGE WILL BE PAID BY ADDRESSEE

MUSIC MAKER PUBLICATIONS, INC  
22024 LASSEN STREET, SUITE 118  
CHATSWORTH, CA 91311



*If you want the best:*

**Reviews** – telling you what gear cuts it and what doesn't;

**Interviews** – with the most creative, well-known artists;

and **Applications** features – telling you how to make music with all your equipment;

*Then there is only one choice:*  
**MUSIC TECHNOLOGY.**

---

Music Maker Publications, Inc.  
22024 Lassen Street, Suite 118  
Chatsworth, CA 91311  
Tel: (818) 407-0744  
Fax: (818) 407-0882

## 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.

Exclusively distributed in the U.S. by:  
**IMAGINE MARKETING CO**  
 PO Box 1400 • 3000 Birch St., #200  
 Brea, CA 92622 • (714) 528-2122

## THE MODULAR MUSIC SOFTWARE SYSTEM



**LUDWIG™**  
Compositional Program

**SMPTE Track™**  
Sequencer Program

**GenEdit™**  
Universal Patch Librarian/Editor

**EZ Score Plus™**  
Music Notation Program

Get TOTAL CONTROL. Each module is a state-of-the-art music computer software package. They function independently or in unison as part of the system...like a music compositional aid, sequencer, music notation, or editor/librarian. By combining modules, TOTAL CONTROL provides the MIDI musician the equivalent of a digital multi-track recording studio...and more. HybriSwitch is the key. It allows you to quickly access any module without 'quitting.' This saves valuable time and increases your capabilities.

Additional modules for the TOTAL CONTROL system are being developed...watch for them to be available soon.

Exclusively distributed in the U.S. by:  
**IMAGINE MARKETING CO**  
 PO Box 1400 • 3000 Birch St., #200 • Brea, CA 92622 • (714) 528-2122

# THE EMPIRE STRIKES BACK

# THE NEW SYNCLAVIERS EXPLAINED

*part one: hardware, sampling, performance*



**The first Synclavier shipped in 1977. Now, in response to numerous dedicated British post-production and generalized American Macintosh-based systems, the uncertainty at Fairlight and the upstarts at WaveFrame, New England Digital has summoned the Fourth Coming of the Synclavier – the 3200, 9600, and PostPro systems. *Text by Chris Meyer.***

**M**ENTION THE WORD “Synclavier” to your average music tech-head and they’ll immediately think of the Rolls Royce of music workstations. They’ll think of famous rock stars such as Sting. They’ll think of more money than you or I could afford in our lifetimes combined. But now we’re in the late ‘80s, the Synclavier is over a decade old, and there are several stereo 16-bit samplers and Macintosh-based hard-disk recorders available that we *can* afford (not to

18 JUNE 1989

mention ultra-elegant software-based sample editors and sequencers). For those with super-tweak tastes, there’s the brand new platform called the AudioFrame that the Best and the Brightest in Boulder have recently assembled (see *Future Possible: The AudioFrame Explained* in MT September-December ‘88). As a result, it has become fashionable to sneer at the Synclavier and call it a dinosaur.

Nonetheless, New England Digital has installed over 600 of the systems. It’s still grudgingly considered the

most complete system you can buy today and, if anything, sales seem to be picking up. There must be something to it. And indeed, even though you might find fault with any single section of the Synclavier, it’s simply hard to match it in overall capability, thoroughness and system integration. And by the way, New England Digital now has a very good leasing program, so you or I *could* own a Synclavier – if you planned to make any money back from it.

Therefore, in the next three months

we'll be going over the newest breed of Synclaviers and you can decide yourself if the ends justify the means. In this installment, I'll discuss the hardware and sampling basics. Next month, we'll talk about sequencing and notation. In August, we'll finish up with some of the old and the new – the synthesis option (yes, Virginia, the Synclavier really was originally a keyboard-based synthesizer) and the Tapeless Studio/PostPro multitrack hard disk recording systems. Although the Tapeless Studio package can be added to either base Synclavier system, we'll hold a lot of details of that system until then. It won't be the same as owning one yourself, but hopefully we can go beyond the brochures to explain what makes this thing tick.

## Hardware

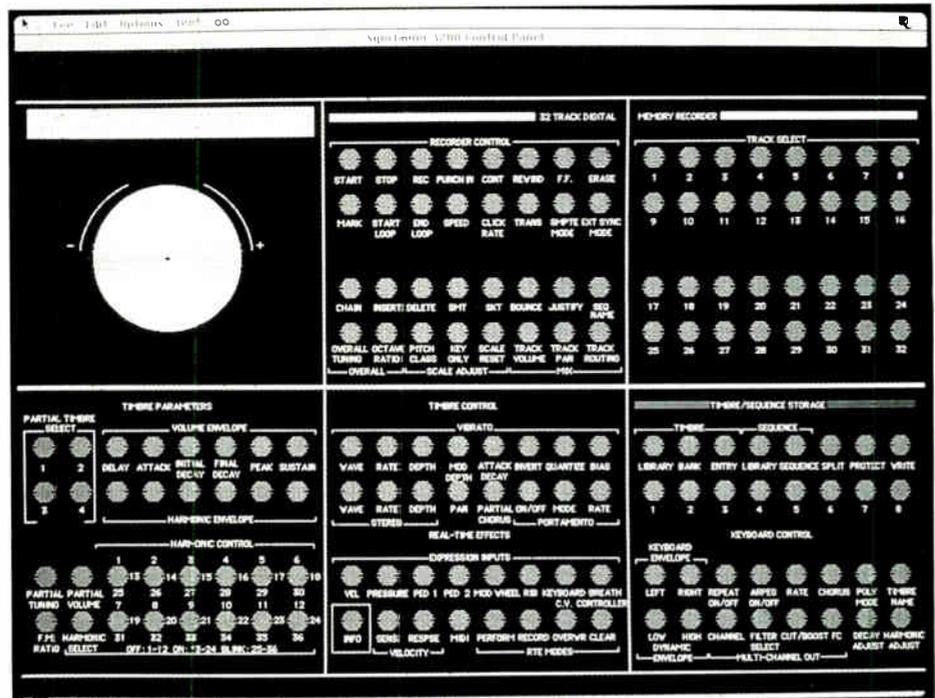
The last thing anybody could ever blame New England Digital for is planned obsolescence. The original Synclavier had a multi-button front panel and continuous rotary controller just like their highest-end system does today, and all along the way NED has tried to make upgrades as smooth as possible for their existing customers.

Although this has no doubt been an enormous boon to those faithful early customers, some of this dedication to evolution has arguably hampered the Synclavier. Add-ons often meant using the existing buttons and functions in non-intuitive ways, and the hardware sometimes has taken a globbed-on appearance. Sampling was particularly hard to add, because the original system was synthesis-based. Also, sampling was only monophonic for a couple of years before polyphonic sample playback became available. However, the new systems feature some clean "modularization" and re-packaging of hardware that allow the Synclavier to be neatly split into multiple systems and easily expanded.

The main control processor or the brain of the system, if you will, is the NED-designed "Able" 16-bit computer, better known to some as the "Model D." Based on a RISC (Reduced Instruction Set Computer) architecture, this latest iteration of the NED CPU features 256 times the memory capacity of the previous Model C, and the ability to keep track of up to 396 voices and 128 channels of MIDI data before losing track of timing (the Model C could only handle 40 voices). It runs the control programs and manages the user interface. Conver-

sations with the various pieces of user interface hardware – the Synclavier keyboard, Mac II graphics workstation, the new Controller/Editor/Locator hardware interface, the MIDI module, the guitar controller interface, etc. – is performed over RS422 serial links. These links (called "DAWN," for Digital Audio Workstation Network) pass information such as motion con-

from the Mac II to the Synclavier itself. Unfortunately, applications running on the Mac II cannot take advantage of the Synclavier's built-in SMPTE and VITC synchronization capabilities. Although there are no current cross-links that I am aware of, NED hints that Mac-based applications will be able to edit Synclavier sound files and exchange sequencer files eventually. The Mac II



The Synclavier 3200 includes one Mac-generated screen that replicates the front control panel of the Synclavier keyboard.

rol, system status, and file management from one part of the system to another.

Using its current software version, the Model D actually draws almost all of the graphics you see appearing on the Mac II's high-res color screen. As part of the "let's not alienate the old users" program, a graphic representation of the hardware button-and-rotary-controller panel is even recreated on the Mac, and can be accessed via trackball (this is the only screen currently being controlled by the Mac – see accompanying photo). Future plans include putting more of the actual user interface burden on the Mac II, but all of the actual sound production will stay on the Synclavier side (forget the early rumors – there will be no Mac II cards).

Using a Mac II allows Mac-based MIDI programs to run simultaneously with the Synclavier under Multifinder. These programs can drive the Synclavier by running MIDI cables

comes with all systems (3200, 9600, and PostPro) complete with 2Mb of RAM and a 20Mb hard disk. The 3200 comes with a 16" monitor; the 9600 and PostPro come with a 19" monitor.

The main sound processor is the Polyphonic Synthesizer, whose purpose in life is to play up to 32 channels of sampled audio out of RAM – synthesis requires a different card. Sampling voices can be added four at a time, synthesis voices (a combination of additive and FM) can be added eight at a time, and RAM can be added 4 or 16Mb at a time up to a maximum of 32Mb for the 3200 and 96Mb for the 9600. A 3200 can have up to 32 sampling voices, but cannot have any synthesis voices. The 9600 can have from 32 to 96 sampling voices and from zero to 32 synthesis voices with a combined total of 96 sampling and synthesis voices max. Multichannel outputs may be added eight or 16 at a time for the 3200 and 9600. The PostPro comes with eight outputs that

can be expanded to 16 in groups of four.

RAM cards for the Synclavier used to be outrageously priced – over \$10,000 for a 4Mb card. Not surprisingly, bootleg memory cards started to appear. All was fine for Luke Skywalker and the rebel forces until one stupid owner left a bootleg card in a machine to be serviced. This discovery was followed by a stern memo from NED that the next revision of software (NED is excellent about updating their customers, by the way) would self-destruct a system if it detected an alien board. No system ever self-destructed, but by the same token official RAM boards have come down drastically in price since then.

Mass storage is truly massive for all systems. The 3200 comes with an 80Mb hard disk; the 9600 comes with a 320Mb drive. Both can handle multiple 320Mb hard drives, a Kennedy tape drive, and a 2 gigabyte WORM (Write Once/Read Many) optical drive. The PostPro comes with an 80Mb drive for the “system,” and a minimum 50 minutes of record time at 50kHz/16 bits (we’ll get more into that in a few months). Connection to the external storage is done over SCSI. Connection between the control processor and the *two* central audio processors in the PostPro system is also performed over SCSI. You can chain hard disks out to the limit of SCSI.

An additional processing board for the Synclavier has just recently become available – the DSP card. Using the now-famous Motorola 56001 DSP chip (as used by Digidesign, NeXT, WaveFrame, etc., etc.), it will be the driving force behind future slick sound modifications. The first application – time compression – is described below.

### The Ins and Outs

So, how does the outside world speak to these units? For starters, the 3200 and 9600 come equipped with a 2 in/8 out MIDI card. This card may be added to the PostPro as an option. Also on the horizon is MIDI<sub>net</sub> – “an 8 in/8 out MIDI processor featuring simultaneous processing on all channels with any combination of available algorithms (filtering, channelization, echo, transposition, merging, keyboard mapping and scaling) married to a 16 in/16 out patchbay.” You can stack as many of these 16×16 patchbays as you like onto a system. Considering that they’re touting the 3200 as the ultimate MIDI

control center, this will be a welcome addition.

The 9600 comes with the famous 76-key piano-response poly-pressure keyboard first seen in the Sequential Prophet t8, along with the traditional button panel and rotary encoder carried over from the very first Synclavier. For those wondering what NED was going to do for a keyboard now that Sequential is no more and Pratt-Reed doesn’t make synth keyboards anymore (well, I was wondering), NED informs me that they have recently received a patent on a new keyboard design that looks the same on the outside, but is totally different on the inside. Look (inside, I guess) for it this Fall.

The Synclavier has synced to SMPTE timecode for some time now, and after some initial timing problems with their sequencer, they report that their SMPTE interface has recently won a Monitor Award for technical excellence from the ITS (International Teleproduction Society). A VITC (Vertical Interval Time Code) SMPTE interface is also now available that will allow video editors to crawl frame by frame through a paused video with the Synclavier in tow.

Fine – but how do you get sound in and out of these beasts? NED prides themselves on having some of the highest sound quality in the world. You can sample in mono or stereo in 16-bit linear format at almost any rate from 1 to 100kHz. Audio input enters all three systems through a custom Analogic ADC that runs at up to 200kHz – two channels are multi-plexed through one ADC. Input anti-aliasing filters are not the latest oversampling digital variety, but actually good of passive inductors and capacitors, which don’t add nearly as much noise as op amps, and rival the low distortion levels induced by some digital designs. The output DACs are 16-bit linear with a 12-bit amplitude envelope for pretty smooth dynamic shaping. There are no output filters of any kind for sound reconstruction or alteration. Apogee input filters (the current faves in the digital multitrack world) will be offered as an option “in the imminent future.”

Why bother with sampling rates higher than 48kHz? Well, you actually gain something by distributing sampling noise and distortion over a wider (and mostly inaudible) frequency range. Also, it takes some of the load off the anti-aliasing filters, and it means

you can transpose downwards over an octave without having to worry about imaging and clock noise. Yes, the Synclavier is still a variable-clock system, as opposed to the newer fixed-clock systems like the WaveFrame.

Because voices running at variable clock rates cannot be mixed cleanly in digital, submixing is actually done in the analog domain. You can buy “multichannel outputs” in increments of 8 or 16 voices for the 3200 or 9600. The PostPro comes with eight standard and can add outputs in increments of four. There is also a digital I/O card available that complies with SDIF (Sony 1630), ProDigi (Mitsubishi), and AES/EBU standards. If the PostPro is locked to SMPTE timecode and house sync (a very stable clock that runs at twice the frame rate – common equipment in all video studios for aligning equipment) and the house sync speed changes, the speed of the digital transfer stays in step.

One curious aspect of the new Synclaviers is how stereo imaging is done on the 3200 as opposed to the 9600. The 9600 has an analog panning circuit after the DAC – nothing special. What’s different is that the 3200 actually uses two voices (one left, one right) playing identical information to create a stereo field. The relative loudness of the two voices determines the stereo position. The two voices are locked tightly enough to avoid phasing problems (I listened for it myself). This approach eats up voices twice as fast, but some users have actually reported that the 3200 sounds better since the signal is going through one less analog stage (the panner) than the 9600 on the way to the outputs.

So is digital mixing out of the question from NED? No, although they’re rather sly about the answer – when asked at a recent AES show where their digital mixer was, they replied something to the effect of “we have no related product announcements at this time.” When I recently asked the question a different way, the reply came back “New England Digital is developing technology to address all aspects of an integrated digital recording environment.” We’ll just have to wait and see.

### Sample Editing

All of the high-end samplers I’ve worked with or seen demonstrated do not have sample editing features as sophisticated as the earliest versions of Sound Designer, Sound Filer, or ▶

Alchemy – let alone the most recent super-powerful versions. Sound Designer itself came into being because the main people in Digidesign (then called Digidrums) looked at the Fairlight and were appalled by the relatively primitive sample editing features as compared to what they thought could be done. Such is life, I guess.

The Synclavier's sample editing isn't actually all that bad. You have a wide range of view resolutions, a scrub wheel for locating sections of the sound, and all of the common reverse/cut / paste / extract / delete / exchange / combine / extract mono / crossfade / copy / fill / loop / scale / normalize / reverse / mix / invert commands you would expect from a competent stereo sample editor. You can even trim out DC offsets that may have existed in the original sample. All previous edited versions of the sound are stored in sample RAM as long as there's memory available.

Nonetheless, some things are still a little clumsy. For example, you have to type in values for some edit functions

**SAMPLE-TO-MEMORY SOUND EDITOR**

Current Filename: JTFTR--1 JET, FIGHTER - CT-114 Tutor, Pass Overhead  
 Rate: 50.0 kHz Length: 13 156 920 Secs Left: 0 809 volts  
 Crossfade: 5 ms Cursor: 1 980 000 Secs Right: 0.181 volts

A) Display	D) Show	H) Unlabel	L) Left	P) Caption	T) Dot Mode
B) Modify	E) Zoom	I) Center	M) Symbols	Q) Mark Off	U) Zero ---
C) Store/Recall	F) Search	J) Mark Start	N) Print	R) Lock	V)
X) Modify II	G) Label	K) Mark End	O) Help	S) Unlock	W)

Current Catalog: W0:

A screen from the Synclavier's sample editing software page.

and you cannot audition a loop before committing to a crossfade or discard the remainder of the sample past the end point. The Synclavier has an autoloop-detect function, but even the manual only claims 50% success. If you

didn't land the loop points just right based on sight, you have to retrieve the last version of the sample and try again. This is an area where further Mac-based screen developments will be very welcome (or let's hope that the



## BILL'S MUSIC HOUSE

Guitars & Basses  
 Drums/Percussion  
 Amplifiers  
 Home Recording  
 Replacement Spkrs.

Signal Processors  
 Brass & Woodwinds  
 PA Systems  
 Lighting  
 Guitar Accessories  
 Percussion Access.  
 Banjos & Mandolins  
 Keyboards

Used Instruments  
 Microphones



Since 1965

VISA MASTERCARD DISCOVER AMEX

TOLL FREE **1-800-828-0023**



IN MD: 1-301-747-1900 FAX: 1-301-747-5203  
 733 FREDERICK ROAD • BALTIMORE, MD • 21228

## TX81Z/DX11 VOICE DEVELOPMENT SYSTEM™

For any Atari ST

**4-OP FM**  
EDITING MADE EASY

**Satisfaction Guaranteed! \$99.00**

- Clear display and total control of all aspects of your TX81Z/DX11
- Quick, smooth, easy and powerful operation
- High resolution sequencer w/overdub, multi-channel recording and MIDI Standard File import/export.
- Automatically loads Voice, Micro Tune and Effects data with selected Performance.
- Banks and Libraries with sorting and filtering
- Quick Edit, Randomizing, Voice Mixing (w/8 edit buffers)
- Print-out all screen data, patch data, etc. These features and more make this the most comprehensive voicing program available!

NOW AVAILABLE:

**DX21/27/100**  
VOICE DEVELOPMENT SYSTEM

← Identical Program (w/o TX81Z features)  
**\$69.00**

**ORDER DIRECT!**  
**(619) 469-7194**

Check or Money Order  
 \$3.00 shp/hndlg  
 CA: add 7% sales tax  
 Non-U.S. orders:  
 US Dollars by  
 International M.O.  
 add \$8.00 shp/hndlg



5575 BALTIMORE DR., SUITE 105-127, LA MESA, CA 92042

TX81Z/DX11/DX21/DX27/DX100 are registered trademarks of Yamaha Corp.

Synclavier can eventually cope directly with Sound Designer or Alchemy).

Sounds are stored in directories that more closely resemble the IBM school of file management rather than the friendly Macintosh interface that is preferred today by so many. Soundfile names are also pretty short and semi-cryptic. On the other hand, search functions are available and entire sets of multisamples can be called up with just one name. In other words, the filing system in antiquated but functional and thorough.

As mentioned above, a 56001-based DSP card is now available, but the only currently implemented DSP function is time compression. And it's a weird time compression algorithm at that. It seems to have been created more for dialog editing or as an abstract exercise in redundant data compression than for music. (To be fair, many, many people use the Synclavier for dialog editing and the like). As opposed to uniformly compressing or expanding the sound, it looks for bits of silence, such as a pause between words, or repeated data, such as a vowel sustained too long, or a pure sustain portion of a musical sample, to remove. How much it removes from any one place and how large the spaces are between extractions are partly under algorithm control - there are three algorithms that are mainly differentiated by their speed and precision - and partly under user control, such as what's the largest segment to remove, and a guess at what the pitch of the sound is. Since a DSP board was not installed in the unit we got to play with, we didn't get to try this out.

The next application being developed for the DSP card is sample rate conversion - already a feature of higher-end sample editing software and an amazingly useful function in E-mu's EIII. Hopefully, other applications such as digital filtering are to follow.

## Performance Control

As I am typing this, I have beside me a 1981 ad declaring the Synclavier II to be the most powerful, most performable synthesizer ever made. Kind of quaint, when you think that today the Synclavier is primarily a sample-based system. But when you start to work with one for awhile, you realize that the old synthesizer framework proved to be a good home to slot samples into. I confess I'm as quick as anybody to call the Synclavier a dinosaur. But I'm also willing to admit that all sampler

manufacturers could stand to steal some ideas from NED when it comes to animating a sample upon playback.

Each key can play up to four samples (previously known as "partial timbres"). Each sample can have a different velocity response curve and range. All partial timbres are started in perfect phase synchronization, making things such as velocity crossfades really workable. The lack of phase locking on most semi-pro samplers results in horrible phase cancellations if the sounds are similar at all.

Each partial timbre can be affected by a wealth of modulations. For starters, there's a standard ADSR volume envelope, with delay and *real exponential decays* - very natural-sounding. Attacks can be up to 15 seconds long; decay and release can be up to 30 seconds long. There are six vibrato waveshapes, including random, adjustable from 0 to 50Hz, and each can be inverted. Vibrato depth can be up to two octaves deep and it can be quantized to act in steps as opposed to a smooth glide. Vibrato attack can be up to 10 seconds long. Tremolo (amplitude modulation) is just as versatile, and tremolo can be synchronized for effects like Leslies or vibes. Tremolo, by the way, is also a perfect example of how the old button panel has become counter-intuitive - for example, you use the "stereo wave," "depth," and "rate" buttons to access tremolo. More Mac screens . . . Portamento can be up to a minute long, and is smooth.

Partial timbres (individual samples) can be tuned against each other in 0.1Hz increments. The Synclavier creates chorusing by playing two samples for every partial and allowing detuning between the doubled samples in FM-type harmonic intervals (frequency multiplication factors) from 0.000 to 10.000. Stereo positioning of each partial can be specified and modulated by keyboard position or a number of LFO waveshapes - including the ability to synchronize panning motions to keystrokes. And yes, you can set up the nominal volume levels for each partial, along with positional crossfades across selectable sections of the keyboard.

All of this would be fun even if you couldn't modulate them in real time. But you can. Called "real time effects," you can patch velocity, pressure, either of two pedals, mod wheel, ribbon controller (yes, the 9600's keyboard has one), breath controller (yes, the

9600's keyboard has one), and keyboard position to modulate the envelope parameters, partial tuning and volume, all vibrato and panning parameters, portamento rate, chorus depth, envelope amount, and even the parameters of the Synclavier's built-in arpeggiator (yes, Virginia, even the Synclavier has a built-in arpeggiator).

Anyway, that's the basics of the new systems. As promised, next month we'll look into making some music with the Synclavier, and the following month we'll look into some of the more unique functions of the Death Star - multitrack hard disk recording and FM/additive synthesis. May the Force . . . ■

*The author would like to extend his personal thanks to Ted Pine of NED for answering a long list of questions in great detail under absurd deadline pressures. Ted, I owe you a beer. - CM*

## Price List

*Below is an abridged price list for Synclavier systems and options (prices for the Tapeless Studio and PostPro systems will appear in the third installment). Prices shown are valid when ordering options at the same time as a core system. Options ordered as upgrades tend to cost about 10% more.*

- **Core 3200 System:** Includes CPU, two channels of ADC, Mac II with 16" color monitor and internal 20Mb hard disk, 80Mb system hard disk, high density floppy disk, 2 in/8 out MIDI interface, SMPTE reader, sound library, software, documentation: \$42,900
- **Core 9600 System:** Includes CPU, two channels of ADC, 76-note keyboard with button panel, Mac II with 19" color monitor and internal 20Mb hard disk, 320Mb system hard disk, high density floppy disk, 2 in/8 out MIDI interface, SMPTE reader, sound library, software, documentation: \$104,900
- Four voice sampling card (for 3200): \$1500
- Four voice sampling card (for 9600): \$5000
- Eight voice synthesis card (9600 only): \$5000
- 4Mb RAM card: \$5000
- 16Mb RAM card: \$16,000
- Eight-channel output card: \$5000
- Sixteen-channel output card: \$10,000
- Optical disk: \$29,500
- 320Mb hard disk: \$12,500
- Kennedy tape backup: \$5750
- DSP module: \$7500
- VITC (software and firmware): \$1000
- VITC (reader): \$3000
- Music Engraving Option: \$1250
- Edit list conversion software: \$500
- Sound Ideas library (optical): \$1750
- Denny Jaeger master Violin Library (optical): \$12,500

# MMT-8

## MULTI TRACK MIDI RECORDER

### ALESIS



# 100% Feel.

If you think sequencers are stiff and machine-like, and hard to use, think again, because the Alesis MMT-8 Multi Track MIDI Recorder will change your mind. The MMT-8 perfectly reproduces what you play. And does it on 8 separate tracks so you can record as fast as you write. Keys, bass, lead lines. Verse, chorus, bridge. Punch in. Punch out. It's so easy it will actually inspire your songwriting.

And you don't have to 'think MIDI' when you're bursting with a great song or groove. Just hit Record and start playing. After you've laid tracks, you can edit any note, transpose any part, build layered orchestrations, shift the timing of each track... the MMT-8 will let you do anything you want. Except lose the feeling.

The MMT-8 is at your Alesis dealer right now with the number one drum machine in the world, the Alesis HR-16. The MMT-8 is a powerful sequencer, a tireless song-writing companion, a faithful music recorder. And an unbelievable value. What a great idea. A machine with 100% feel.

**ALESIS**  
STUDIO ELECTRONICS

**LOS ANGELES:**  
Alesis Corporation • 3630 Holdrege  
Avenue • Los Angeles, Ca. 90016

**LONDON:**  
Alesis Corporation • 6, Letchworth  
Business Center • Avenue One,  
Letchworth, Hertfordshire SG62HR



Rock at its hardest. The Roxy, L.A.

**YAMAHA** **V50**  
DIGITAL SYNTHESIZER





## THE DIFFERENCE BETWEEN BLOWING IT. AND BLOWING THEM AWAY.

There are no second takes when you're playing live.

With that scary thought in mind, we designed the ultimate live performance synthesizer.

The Yamaha® V50. Instead of your keyboard, drum machine, sequencer and effects being all over the place, we put them all in one place.

You've got an 8-timbre, 16-note polyphonic synth that gives you access to over 10,000 FM voices. A drum machine with 61 sampled sounds. An 8-track sequencer that stores up to 16,000 notes. And digital effects like reverb, delay, distortion and gating.

All at your fingertips.

To simplify things even more, the V50 has dedicated keys for functions you use a lot. And it'll store performance setups on a floppy disk.

So all you need to think about are the chops at hand.

Call 800-333-4442 for the name of your nearest Yamaha V50 dealer.

For under two thousand dollars, it blows everything else away.

# YAMAHA®

Yamaha Corporation of America, Digital Musical Instrument Division,  
P.O. Box 6600, Buena Park, CA 90622. In Canada: Yamaha Canada Music Ltd.,  
135 Milner Avenue, Scarborough, Ontario M1S3R1.



# Aphex Humanizes MIDI

For well over a decade Aphex has been devoted to making music sound better. Now, we are making it easier with a new line of MIDI products. Products that allow the *human* to make music without having to think about the demands and limitations of machines. Products that will return the human touch to MIDI music and are surprisingly affordable!

**Studio Clock SMPTE to MIDI Converter/Tempo Mapper** with advanced Human Clock Algorithm™ that puts the musician in command of the machine.

**Impulse™** The fastest analog to MIDI triggering system available ... "fires" up to ten times faster than competing systems.

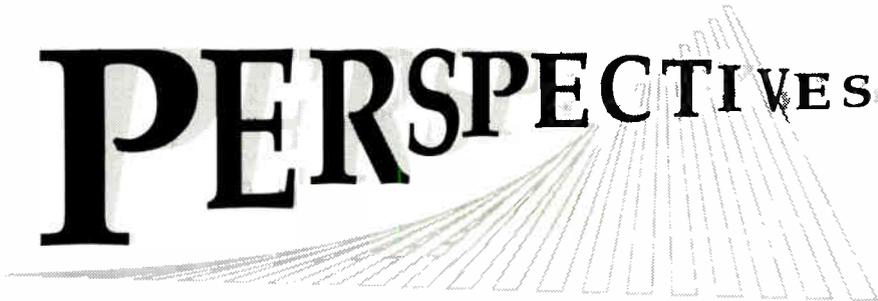
**Feel Factory™** creates "feel" by manipulating the timing of MIDI events and velocity in real time. MIDI channels and note ranges can be assigned to eight faders for simultaneous adjustment. Plus, feel algorithms which emulate the way real people play can be preset and recalled.

Get a *feel* for MIDI at your favorite Aphex dealer today.

Aphex Systems Ltd. • 11068 Randall Street  
Sun Valley, CA 91352 • (818) 767-2929

© 1989 Aphex Systems Ltd.

# PERSPECTIVES



## The Perils of the Digital Fallacy

Opinions by Daniel Goode.

AS A COMPOSER and performer who has taught electronic music since 1971, I have some rather deeply-felt perspectives that relate to the changes in technology that I have experienced over some 20 years in the field. Namely, I'm worried.

I'm worried about what I would call "keyboardism" – the attempt by the digital synthesizer industry to define all music making, hence music *thinking*, from the point of view of the keyboard. One of the great lessons of the 20th-century's revolutions in music is that *sound*, not 19th-century harmony, is the prime material of music. Harmony of whatever kind, time, place, or style is a special case, a special kind of sound. What keyboardism does is obliterate that great conceptual leap forward by making the generating gesture of all sound the action of a finger pressing a key. This inevitably results in a generalized piano/organ region of thought, even if any conceivable type of sound is used, or envelopes are varied. At least in the early days of analog synthesizers, keyboard interfacing was not primary; you did most of the work by twisting dials and *listening* to the results. You were composing *sound*, not familiar keyboard patterns from black and white keys with a little timbral spice added from the synthesizer's waveforms. But this did not sell models. So the keyboard, a familiar icon worldwide, became the primary interface with the composer/performer, and it carried on into digital-land.

The appearance of wind controllers and pitch-to-MIDI boxes is the beginning of a positive development, but only to a small degree because the mechanical quality of the interface is still there, putting the mind to sleep with the ease of sound production. And so far neither technique knows

how to translate the most interesting part of the wind sound: the *non-periodic* part – especially the rich, irregular, sensual attack transients. What you have is just another mechanical trigger for the usual presets so that the non-keyboardist can buy into the digital market.

I'm worried about the CD as the standard of sound for recorded music. Just recently I heard a preview of a CD featuring the recording debut of a young, prize-winning cellist performing some short classics. It was embarrassing – this did not sound like a cello. There was a strange "distortion" (I use quotes because the digital sound queries what "real" is) of the accustomed cello spectrum, emphasizing the second (or 4th?) partial, as if the cellist were always playing octave harmonics with himself, resulting in a strangely boxed-in kind of sound. This had followed another CD of Schubert's *6th Symphony*, which had none of the natural blend that Schubert's warm sound must have to be warm. An uncritical announcer on the classical music station let it pass unnoticed.

Similarly, I'm worried by the assumption of looped periodic waveforms as the standard of sound. The technique of sampling is a blinkered attempt by manufacturers to advertise to the young and innocent of any age that you can easily get a true sonic picture of the "outside" (i.e., acoustic) world.

The trouble with sampling is not in the difficulty of getting a good sample or making a seamless loop, but in the memory limitations of getting a long enough sample. In the days of analog equipment, simply recording a sound for processing was all you had to do – your sample could be as long as your tape. This meant that all the natural

variations in waveform, all the non-periodic moments – all the things that give acoustic instruments and natural sounds their life – were simply recorded with the sample. No home computer has the memory to do this, so digital samples have to be short. As soon as you loop the sample you are creating an artificial sound, one which the ear, when not distracted, can easily hear as a repeating waveform, be it a few seconds or a minute. The barrier between the outside world and our digital world is thus impenetrable.

When the limitation of sampling is combined with that of keyboardism you get what I call the "Frogs-In-Any-Key" syndrome, named after a piece by Laurie Anderson which uses a chordal accompaniment of sampled frogs. Again, the temptation is always to think of natural sounds not as *themselves*, but as keys and scales. This is a degradation of possibilities, not an expansion. Perhaps a conceptual breakthrough to memory limitations is around the corner, I don't know. A more difficult breakthrough will be in the minds of designers and marketers of digital equipment. ■

*Daniel Goode is the Director of the Electronic Music Studio at Rutgers University, New Jersey.*

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. If you're working on a word processor, we accept submissions on IBM PC-compatible, Macintosh, or Atari ST disks in text-only/ASCII format; or via GEnie (our address is Musicmkr.LA). We pay \$100 for every *Perspectives* article published.

Please note: The opinions expressed in *Perspectives* are those of the author, and do not necessarily represent the opinions of the editorial staff or publishers.

# SOUND SCIENCE FACETS

The third chapter in our column for absolute beginners focuses on synthesizers and how they work.

Text by Bob O'Donnell.

**Synthesis** – the process of creating sounds using various interconnected electronic components.

SOUND IS A rapturous, intoxicating part of the daily lives of modern musicians. Its impact surrounds and bombards us with all sorts of fascinating aural events. Interestingly, it seems that the more interesting sounds you hear, the further attuned you become to listening for even more interesting sounds.

One of the main reasons for this fascination with sound is the enormous growth and popularity of synthesizers. With their ability to produce tremendously seductive and awe-inspiring sounds, these instruments have had a phenomenal impact on how we listen to other sounds and, in fact, how we put sounds together to create music. In some cases, synthesizers are used to replicate or recreate the sounds of acoustic instruments (and they do so with varying degrees of success), while in many other cases synthesizers are used to create sounds that are uniquely and identifiably their own. Either way, they have established themselves as instruments with which to be reckoned.

## The Basics

Synthesizers, or synths for short, can basically be thought of as general-purpose sound generators. Through the use of the various components that make up a synth, a wide variety and range of sounds can be produced. A piano, on the other hand, can be thought of as a single-purpose sound generator – it creates a single type of sound, or timbre, although it offers nearly infinite variations of that basic

timbre. This leads to a very important point: although synthesizers can produce a much wider variety of sounds than most acoustic instruments, they generally don't offer the subtleties and slight variations that we often take for granted in acoustic instruments. This is a long-standing complaint about synths, but it's still true, despite the level of complexity and sophistication that many of the newer instruments currently possess.

Part of the problem relates to what's controlling the sound generating circuitry of a synthesizer. In most cases, this controller is a plastic keyboard that "tells" the internal guts of the instrument how fast a key was pushed down and whether or not additional pressure, or aftertouch, is being applied to the keys. A synthesizer need not have a keyboard on it, however. Rack-mounted synthesizers such as the Roland D110, Kawai K1r, etc. are generally identical to their keyboard counterparts in sound and features. The only difference is that they must be "played" by an external MIDI controller, such as another MIDI keyboard, a MIDI guitar system, a MIDI wind controller, MIDI drum pads, etc.

The level of expression that any synthesizer is capable of producing is determined in part by the controller used to play the instrument – whether it's actually part of the instrument (as with most keyboard synths) or an external controller (for MIDI control). By the way, older synthesizers don't have MIDI, so it is clear that synthesis is not necessarily related to MIDI directly. The development of more complex synthesizers just happened to occur at the same time as the growth of MIDI.

Another point worth mentioning early on is that synthesizers aren't always used to create traditional musical sounds. They're often used to produce sound effects or other complex timbres that are interesting all by themselves. (If you get a chance, listen to the Digital Native Dance sound on Roland's popular D50 synth to see exactly what I mean). As a result, some electronic music made with synthesizers concentrates more on how sounds evolve rather than traditional melodic or rhythmic ideas.

Now, things get even more interesting because there are several different *kinds* of synthesizers. If you've read the ads or other articles in this or any other issue of MT, you may have discovered that synthesizers come in a wide variety of sonic "flavors": analog, FM (frequency modulation), L/A (linear/arithmetic), wavetable, additive and others. (A different, but related, type of instrument is the digital sampler, which will be covered next month.)

Fundamentally, however, all synths do the same thing: produce sounds electronically. The *method* of creating sounds differs among various instruments (hence the many types) and, as a direct consequence, these instruments each have a unique sound. In other words, a brass sound on an L/A synth like the D50 will be unlike the brass sound produced by an FM synth, like the DX7. Also, it is these different methods of synthesis that account for the character of the sounds each instrument can create. To the untrained ear, many of these differences are very subtle, but after you have been exposed to synthesizers for a while you will often be able to determine what type of instrument produced a

particular sound – hence the constant references to “bell-like” FM timbres, or “fat” analog sounds. Before getting into details, however, you need to have a basic understanding of sound and how it’s created.

## On Sound

As you will read in any text book on acoustics or synthesis, all sounds have at most three basic characteristics: pitch, volume and timbre. To synthesize, the most important of these by far is timbre (although you may be surprised by how much volume can affect one’s perception of a sound). Thus, the pitch and volume of a string section sound isn’t as important as the fact that it is a string section sound or that it’s a particularly *good* string section sound (or patch, as synth sounds are often called). “Good,” of course, is subject to intensely personal tastes.

But what exactly makes up a string section sound? Well, thanks to the work of a certain French scientist by the name of Jean Baptiste Fourier, it was discovered that all sounds, regardless of their complexity, are actually made up of simple individual components called *harmonics*. When several harmonics are added together, they create a single complex sound. Because of the way your ears and mind perceive sounds, you can rarely hear the individual harmonics of any given sound. Instead, you perceive the combination of harmonics as a single sound with a particular timbre. As it turns out, the pitch and amplitude, or volume, of these individual harmonics determine the timbre of a sound. Consequently, if you change the pitch and/or amplitude of a given harmonic, you will actually change the sound’s timbre. Another way to remember all of this is that pitch and volume characterize a sound on both a macroscopic and microscopic level.

A patch (or voice, or timbre – unfortunately, synth manufacturers have not settled on a word to describe a single synth sound) is defined by the values of an instrument’s different synthesis parameters. (Incidentally, the word “patch” is a leftover from the days of the old modular synthesizers. Sounds were created by connecting different discrete modules together with patch cords – hence the name “patch.”) The numbers that are used by the synthesizer’s various components to create the sound are usually called patch data.

Because different types of synthesizers have different types of voice components, the patch data is generally not compatible between different types of instruments (although it may be compatible between instruments of the same family, such as Yamaha’s DX11 and TX81Z). Consequently, you cannot put a great Korg M1 patch into an Oberheim Matrix 6 because the two instruments use two different methods of synthesis. You might be able to create similar patches on the two, such as a flute sound with a realistic “spit” at the very beginning, or attack, of the sound, but it would require a fair amount of work, to say the least.

Theoretically, any synth can create just about any kind of sound, but practically, some are better suited for certain types of sounds than others. (This is one of the many reasons why people often buy several different types of synths.) For example, analog synths are often used to create warm string and brass sounds, while digital wavetable synths are often preferred for more biting, realistic sounds. Nevertheless, there is *no* simple dichotomy between analog and digital synthesizers. First, almost all synthesizers currently being produced and sold are digitally controlled, even analog synths like those produced by Oberheim. Second, most new synths generate their sounds in one of several variations on the digital theme. There’s no such thing as a generic digital synth (there is, however, such a thing as a generic analog synth). The analog vs. digital question simply refers to what type of circuitry is used to generate the sound. Many manufacturers prefer digital, because it offers them more possibilities for precision and control, although others prefer analog because of the characteristics of its sound.

Anyway, applying our previously explained sonic theory to reality, you’ll find that most synthesizers are set up to create and control various combinations of harmonics. With the exception of additive synthesizers, instruments do not generally use this terminology, but that’s basically what’s going on inside. Each type of synth goes about the process of synthesis in a different manner, so now it’s time to take a look at how each method works.

## Synthesis Methods

Analog (also called subtractive) synthesis starts at the top with a sound full of harmonics and lets you work your way down to the timbre that you want.

**Son of FX**



ORGANIZE YOUR RECORDING, COMPUTER AND RACK-MOUNTABLE EQUIPMENT IN AN ATTRACTIVE, MOBILE WORK STATION.

**SON OF FX FEATURES:**

- Two adjustable shelves for multi-tracks, drum machines, computers and more!
- Holds up to 10 rack “spaces” of equipment.
- Shown with optional “Rack Drawer”

ASK YOUR DEALER FOR A DEMONSTRATION  
CALL OR WRITE FOR FREE BROCHURE

**FOUR** DESIGNS COMPANY 6531 GROSS AVENUE • CANOGA PARK, CA 91307  
(818) 716-8540 OUTSIDE CA 800-544-3746

**RACK**



ECONOMICAL 19” RACK MOUNT “FURNITURE” FOR THE PROFESSIONAL OR HOME STUDIO.

**FX RACK FEATURES:**

- Holds up to 18 “spaces” of equipment.
- Attractive black textured vinyl laminates
- Shown with optional wheels

ASK YOUR DEALER FOR A DEMONSTRATION  
CALL OR WRITE FOR FREE BROCHURE

**FOUR** DESIGNS COMPANY 6531 GROSS AVENUE • CANOGA PARK, CA 91307  
(818) 716-8540

**TUNER HELPER™**



A MULTIPURPOSE MIC STAND BRACKET TO SECURE YOUR PERFORMANCE ACCESSORIES.

**TUNER HELPER FEATURES:**

- Mounts any guitar tuner at the perfect viewing angle
- Ideal for midi-controllers, effects boxes, drum machines, etc
- Also holds headphones, tamperbars, cables and more
- Attaches instantly to any mic stand

ASK YOUR DEALER FOR A DEMONSTRATION  
CALL OR WRITE FOR FREE BROCHURE

**FOUR** DESIGNS COMPANY 6531 GROSS AVENUE • CANOGA PARK, CA 91307  
(818) 716-8540 OUTSIDE CA 800-544-3746

**RACKRATE**



A UNIQUE PRODUCT DESIGNED TO SAFELY TRANSPORT YOUR VALUABLE RACK MOUNTED EQUIPMENT.

**RACK RATE FEATURES:**

- Holds up to six “spaces” of equipment 11.5” deep
- Threaded steel mounting rails w/padded handles
- Lower weight, greater strength, lowest cost

ASK YOUR DEALER FOR A DEMONSTRATION  
CALL OR WRITE FOR FREE BROCHURE

**FOUR** DESIGNS COMPANY 6531 GROSS AVENUE • CANOGA PARK, CA 91307  
(818) 716-8540

**FOUR DESIGNS  
PRODUCT INFORMATION  
CALL 1-800-544-3746**

**Say you saw it in  
MUSIC TECHNOLOGY**

The first component in an analog synth (or, for that matter, nearly *any* synth) is called an oscillator. The oscillator generates one out of two or three basic waveforms (the most common ones are called "sawtooth," "triangle" and "square" waveforms, referring to their shape when depicted in a graph). Each one has its own collection of harmonics. The harmonic content of the waveform is then adjusted by the synthesizer's other components, most notably the filter.

The filter is the most important component of an analog synthesizer. It acts as a type of tone control by removing, or subtracting, certain harmonics from the sound. The final stage in any analog synth is the amplifier. It controls the volume of the sound coming from the other components. You can create a surprising number of different sounds with this relatively simple method of synthesis, but the problem is that it's hard to maintain precise control over certain harmonics. As a result, analog synths are not very well suited to recreating complex acoustic sounds. Typical analog synths include the Oberheim Matrix 6/6R/1000 series, the Roland JX10 and alpha Juno series, and most older synthesizers.

Additive synthesis takes exactly the opposite approach; it works its way from the bottom up. You combine various harmonics and adjust their pitch and amplitude to create the sound that you want. Because of this approach, filters are generally not found on this type of synthesizer. Additive synths are very well suited to recreating complex acoustic sounds, but the process of programming each individual component is extremely tedious. Kawai's K5 is the only commonly available additive synthesizer in today's market, but several synthesis software programs, like Digi-design's SoftSynth, offer additive synthesis features for digital samplers.

FM synthesis is somewhat related to additive, but it offers one very important difference: frequency modulation of harmonics. In frequency modulation, the waveform of one sound generator is used to modulate, or change, the frequency of another oscillator regularly over time. Since the frequency of the *modulating* oscillator is usually in the audible range, the frequency of the *modulated* oscillator changes very rapidly (typically 20 to 15,000 times per second). This results

in some very interesting timbres.

Most additive synths offer a large number of oscillators to provide the individual harmonics, but FM synths generally offer only four or six oscillators (called operators in Yamaha parlance) to fulfill the role of sound generators. With frequency modulation, however, even two operators can produce a complex sound that would require many individual harmonics. Hence, FM has a kind of head start on additive synthesis. The problem with FM is that it is difficult to figure out exactly what harmonics are being created by the modulation process. So, even though you can produce very complex sounds with relatively few oscillators, you don't have the fine degree of control that you do with additive synths. FM synthesis was popularized by the Yamaha DX7 and that company's line of DX products. A different, but related version of FM is used in Casio's VZ1 (see this month's "Programming Compleat" for more). A simplified and well-disguised version of FM is also used in Casio's CZ synths.

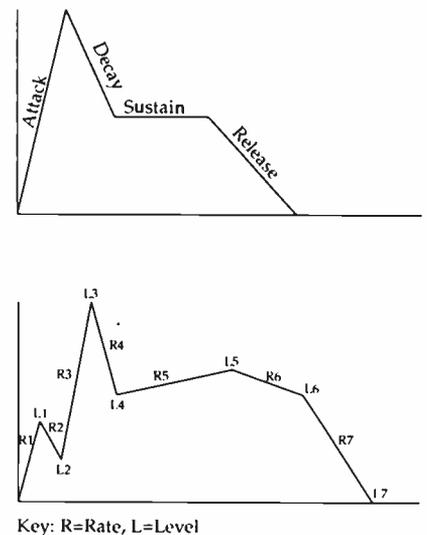
Linear/Arithmetic (L/A) and wavetable synthesis techniques are very similar to analog synthesis but instruments that use this method offer more initial waveforms for each oscillator to choose from. Basically, manufacturers realized that to get more complex sounds out of the familiar subtractive synthesis method, you need to start with more complex waveforms. Most wavetable synths actually use sampled, or digitally recorded, waveforms in addition to the standard waveforms found on analog synths. Sampled waveforms have very complex but fixed combinations of harmonics that can be adjusted with filters and amplifiers like those found on subtractive synths. Roland's L/A synths include the D50 and MT32. Other popular wavetable instruments include the Ensoniq ESQ1, Kawai K1 and Korg M1.

### Changes in Time

Up until now, I've only talked about sounds from a static point of view. Sounds in the natural world are always changing, which makes them interesting to listen to. All synths have methods and components to add movement to their sound. The most common of these motion inducers are envelope generators (EGs) and low frequency oscillators (LFOs).

Envelope generators are like automated knob turners - they adjust

the level of different sound parameters, including timbre and volume, in a programmable manner over time. Older synths have envelope parameters called ADSR, which stands for attack-decay-sustain-release. Many newer instruments have more flexible EGs with independent control of rates and levels (see **Figure 1** for a comparison of the two). In both cases, a particular shape is created that represents how the level of a parameter controlled by an EG, such as a sound's overall volume, changes over time.



**Figure 1. Two envelope shapes that show the differences between traditional ADSR envelopes (on the top) and the more flexible rate and level type of envelopes (on the bottom).**

LFOs perform similar duties by regularly varying the level of a particular parameter in a repeating, cyclical fashion. Neither of these components actually produce a sound of their own, but they are used to control elements that do affect a synthesizer's sound. Put to creative use, EGs and LFOs can add a great deal of life to a sound.

So, once you put all these disparate elements together, you have a machine that is capable of producing a wide variety of interesting, complex sounds. In a sense, synthesizers are like sonic tool boxes: once you understand the basic elements of sound, you can use the various components of a synth to recreate acoustic sounds or create brand new sounds. They are clearly very impressive (and expressive) instruments that can literally open a new world of sonic opportunities. Don't be afraid to jump in. ■

# MUSIC SOFTWARE

**SATISFACTION GUARANTEED!**

**THERE'S JUST ONE NUMBER TO CALL WHEN YOU WANT THE MOST COMPLETE SELECTION OF MUSIC SOFTWARE ANYWHERE!**

# 800-442-MIDI

**In California please call 818-501-6929.  
48-hour delivery direct to your door.**

**C-LAB**  
SOFTWARE

STEINBERG

*SONUS*

Bacchus  
SOFTWARE SYSTEM

**Dr.T's**  


**Intelligent Music**

MAGNETIC

BLANK  
SOFTWARE

*Opcode*  
systems, inc.

 **PASSPORT  
DESIGNS**

 **Hybrid Arts, Inc.**

**WILLY  
BEACH  
SOFTWARE**  


**Magic**

**DRUMWARE**  
Sound Quest

 Roland

*Twelve  
Tone*

**digidesign**

# *Music Solutions*

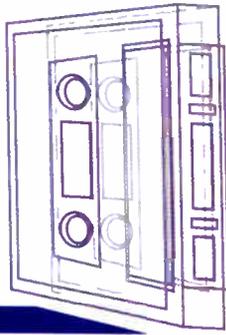
14760 Ventura Boulevard, Sherman Oaks, California 91403

**New Extended Hours for East Coast Customers!**

**HOURS: 7:00am to 6:00pm PST Monday thru Friday, 10:00am to 5:00pm Saturday.**

**OUR POLICIES:** We accept MASTERCARD and VISA with no added surcharge. Your credit card is not charged until we ship. All orders will have a \$4.00 shipping and handling charge added. In most cases orders will be shipped Federal Express Standard Air. California residents please add 6.5% sales tax.

**RETURNS:** All returns require a Return Merchandise Authorization (RMA). Phone 818-501-6929 to receive your RMA.



**This month's Zen Ten includes classical, jazz and progressive-tinged rock, as well as some embarrassing sampler abuse. Reviews by Yung Dragen.**

COMPUTERS DON'T DEAL well with random input. They'll either groan and die, give an outrageous answer, or simply go "beep" and ask you to try again. One of the big advantages humans are supposed to have over computers is that they *can* deal gracefully with unexpected input.

When I first heard David Horan's demo tape, I responded like a computer. Side one consists of instrumental remakes of pop songs; side two consists of handfuls of bars snipped from 14 of the 60 songs he's written (he hasn't named them, by the way – they all just have numbers). David has a liking for organ timbres and D550 presets, the melody lines tended to be undermixed, there are no vocals or strong lead lines, and most of the recordings are a bit lifeless in general (later addition of a Simmons Portakit brought a noticeable improvement in the drum patterns, by the way). Beep, groan, etc. – can anyone conceive of a worse tape?

After two days of intense meditation, my human side reappeared – this guy is simply doing this as a hobby. He admits to having no musical skill, has little free time, and is self-taught. A couple of the fragments (#54 in particular) show some promise. So, advice? Either develop your leads or bring in a guest; work on development (even try stringing various combinations of your pre-existing fragments together for starters); compare your covers with the real thing to analyze the differences up close (in particular, the Cyndi Lauper tune you covered is simple, but carries so much more power than your version – listen for tricks like the big snare on the last beat of every measure); get your wife to sing on some tracks (you say she's an excellent vocalist); buy David Bell's tape below.

Those of you who complain that you  
32 JUNE 1989

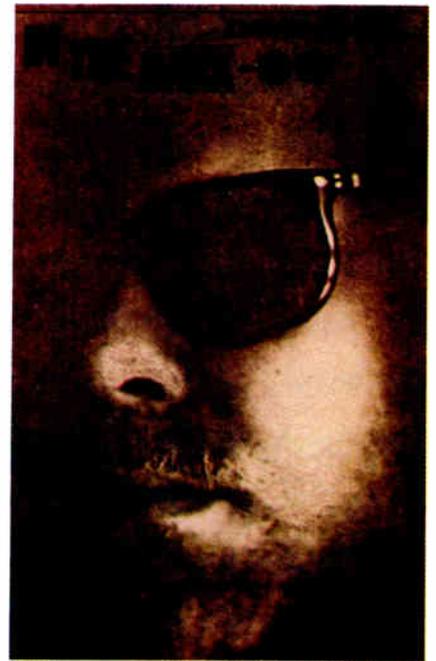
don't have enough equipment, listen up: Brad Reitz used just a Roland S50 sampler and a mastering deck to create his tape *Sort of Like . . .* It's pleasant, airy instrumental music with a jazz tinge. It suffers a bit from occasional episodes of "I've got a sampler and I'm going to use it" (breaking light bulbs, fuzz chords, etc.), which Brad himself brings to a head on the humorous 'Dancing Babies.' A few more dynamics would also be nice, and some of the samples are rather out of tune with each other (especially in the unison section on 'Half Past Four') – something that the Roland factory samples are notorious for. But overall, a lot can be learned from this release, and it's great background music.

Walter Dana musically brings up some interesting issues with his latest tape of original classics, including 'Synthphony (Opus 38),' 'Yanko the Musician,' 'Winter Song,' and 'Polish Dances (Opus 32).' Walter's compositional skills are certainly not in doubt – he was one of Poland's most famous composers before he moved to the US (he's in his late 80s now, by the way, and still composing). His music is playful with a touch of drama and musical scenery (although the 21-minute long 'Sonata' movement of 'Synthphony' goes through so many sections and changes that one could say it wanders). It's just that his equipment lets him down. He multi-tracked 'Synthphony' with a DX9, and despite numerous patch changes and great accompaniment, the lead melodic voices just sound too thin, wah-wahish, and electronic. The DX11 on 'Yanko' and 'Winter Song' does him a bit better, but you still get a feeling of two-dimensionality.

So, are his performing skills in doubt? No – the all-acoustic-piano 'Polish Dances' show a remarkable sense of dynamics, timing, and some

outright chops. Obviously, here's a man who can play, but the equipment just hasn't grown up enough to meet him on his own terms. Maybe one of those sampled-sound units from Roland, Kurzweil, or E-mu would help the timbre problem (and by the way, Walter, you've indeed licked the noise problem – way to go).

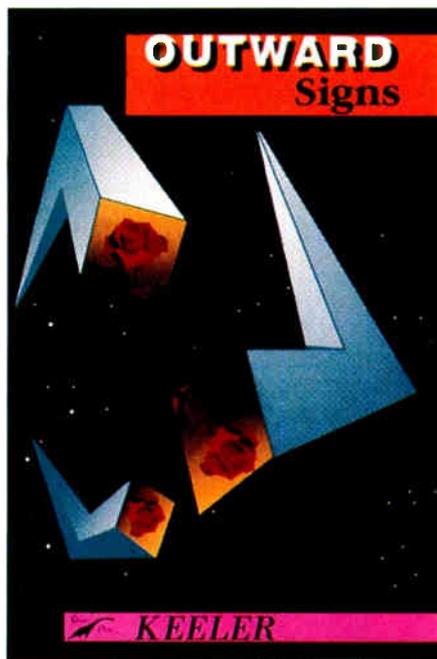
Onwards and upwards:



– David Bell/*In the Dark*: Easily some of the best instrumental rock I've ever heard. This is no low-energy effort – some of the drum sounds and lead voicings in particular cook, and there's a nice reggae feel to several of the songs. Understated voicings where appropriate and numerous patch changes are technical highlights (along with the fact that an ESQ1 was the only synth, and that it was all recorded in real time with the help of several drum machines).

– Craig Holiday/*six-song demo*: A nice blast of roughed-up modern pop with progressive edges (later Starcastle is a

slight reference). Slinky guitar leads by Craig plus some tasty keyboard and percussive ornamentation are some of the highlights (thank Greg Rector and Peter Gianossa respectively for help – the three different bassists all perform well, too). Only negative comments: recording was a bit overloaded in spots, and the drum programming is a bit jerky – the songs seem to progress beat by beat or bar by bar, as opposed to flowing (which makes it a bit fatiguing to listen to). Nonetheless, high marks overall – *I'd go see them play live . . .*



Keith "Keeler" Walsh

– **Keeler/Outward Signs:** Start with something that once remotely resembled a typical rock song structure, add a heavy dose of quirkiness (sometimes, just for quirkiness' sake), and execute with low-tech electronics and a fair number of cheesy sounds. Each Keeler release (not to mention his group efforts with Port Said and Other Skies) are known to be different from each other; here's perhaps one to avoid.

– **Capacity 99/Next Stop Tokyo:** Good popular vocal rock with big percussion, heavy Minimoog bass, and good horn lines by the duo of Martin Peabody and Duane Dykstra. The songwriting needs just a little tightening, and the mix some work – too often instruments are competing with each other (pick what part of the frequency spectrum each instrument is supposed to occupy, and transpose or EQ accordingly), but the sounds are great. In answer to your direct questions, Martin, get a condenser mic for the trombone, add a

little slapback to the vocals to kill the dead sound, and try applying a slight amount of bright "small" or "medium room" reverb to the overall mix. And send your address, so others can get this tape.

– **Krypton/Welcome to Ecstasy 1:** From the man who brought you that Dr. Demento fave, 'Let's Blow Up the Tow Truck.' One-man silly pop with sparse drum machines, synths, sampler, and vocoder. One of the advantages of novelty music is that people tend not to expect actual skill when it comes to composition, vocals, and musical phrasing. This tape unfortunately falls into that one laugh/no substance category.

– **Markus McDowell/three-song demo:** Another one-man band doing up-tempo modern pop/rock (albeit, with a slight '70's anthemic/progressive feel). He pulls it off pretty well, too – the drum programming is particularly good (the hi-hat pattern on 'Jeremiah's Song' is really catchy, for example), along with all the backing parts. On the negative sides, the faux lead guitar/horn synth lines are too "perfect" to be believable; the vocals need to be mixed a bit more forward. Background vocals were done with samplers – good trick. High marks for song structure and orchestration.



Markus McDowell

– **Vernal Equinox/New Found World:** Electronic music of a '70's style, before New Age poured honey all over the genre. Lots of analog percussion, stringish synth chords (mixed well in the background), repetitive monophonic sequences, nice melodies, and ambient sounds. More understated than self-indulgent (as some of the '70's acts were wont to be); a cross between New Age, Trans Europe

Express-era Kraftwerk, and underground faves, the Nightcrawlers (they also name Eno and Tangerine Dream as references). Great music to drive to. And I'm also happy to find someone else who will still admit to owning a PAiA modular synth!

Despite the overall positive tone this month, I got a creeping feeling that too many people are using some bits of technology just because they're there, and that technology may still have a ways to go to meet people who *can* play the "real" thing. Both old sermons, true; but can anyone convince me that there is any musical direction for both the majority of musicians and musical instrument manufacturers out there? ■

## VERNAL EQUINOX



NEW FOUND WORLD



Timothy Rempel - synthesizers  
Steven J. Brenner - synthesizers

### Contact addresses:

**David Horan**, 10 Cook Lane, Marlboro, MA 01752. Tel: (508) 481-9536.

**Brad Reitz**, 11614 Taos Lane, Houston, TX 27070.

**Walter Dana** c/o Dana Publishing Company, 824 83rd Street, Miami Beach, FL 33141. Tel: (305) 865-8960.

**David Bell** c/o System One Productions, 109 Yaupon Drive, Morehead City, NC 28557. Tel: (919) 726-7345.

**Craig Holiday**, Tel: (617) 661-5819.

**Keeler** c/o Great Orm Productions, 496A Hudson Street, Suite D-35, New York, NY 10014. Tel: (201) 434-0595.

**Capacity 99** c/o Martin Peabody, no address or number given.

**Krypton**, P.O. Box 14106, Minneapolis, MN 55414.

**Markus McDowell**, 398 Otono Court, Camarillo, CA 93010. Tel: (805) 987-9932.

**Vernal Equinox** c/o Atomeum Dawn Records, P.O. Box 114, Station C, Kitchner, Ontario N2G 3W9. Tape costs \$12.98 (Canadian) incl. P&H.

**Readers' Tapes** should be considered a forum for ideas as well as music. Every tape submitted (that doesn't get lost) is reviewed in the order received. Send your contributions (written or aural), along with name, address, equipment list, and a photo or illustration to: **Readers' Tapes, Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.**

MUSIC TECHNOLOGY

33

# Programming Compleat

## PART 5



Illustration Rick Lohries

**Y**amaha has enjoyed a virtual monopoly on FM synthesis since it was first formulated by Dr. John Chowning at Stanford University. (One important exception is New England Digital's Synclavier – see the article on the Synclavier elsewhere in this issue.) But other implementations of the same theories have come forth from other sources, no doubt well-scrutinized by the corporate legal eagles before their market release. This month, I conclude the subject of FM programming by looking at some products from Yamaha and other manufacturers; products that employ FM synthesis in formats other than the standard six sine wave operators I've described so far in this series.

### Early Days

All along, there have been two product lines from Yamaha that use FM, differentiated mostly by the number of operators. The classic DX7, as well as

### Our focus this month rests on multiple waveform FM synths – the Yamaha TX81Z, Casio VZ1, and others . . .

*Text by Lorenz Rychner.*

the early DX1 and DX5 instruments, and all of their successors (TX7, TF1, DX7s, DX7IID, DX7IIFD, TX802) have six sine wave operators in 32 algorithms. The first instrument to have only four operators (in 8 algorithms) was the DX9. This instrument was soon followed by the DX21, DX27, DX100, and the FB01. Like the six-operator products, the operators in these models could only produce sine waves.

As you've seen in this series over the past few months, the magic of FM allows one sine wave to modulate the frequency of another sine wave, resulting in almost any waveform you'd care to mention. It is a very powerful programming system, and yet many users have missed the familiar waveforms that all other synthesizers have traditionally included: sawtooth and

pulse waveforms, the latter being either fixed as a square wave or adjustable in its pulse width. Other synthesizers have often included triangle and sine waveforms as well. On most instruments with more than one oscillator, one of these waveforms could be linked to another by cross-synchronizing the oscillators, and further sound colors would result. It wasn't long before Yamaha answered these requests for ready-made waveforms in a unit that is still very popular (particularly with wind synth players): the TX81Z.

### A Plethora of Waves

Each of the four operators in the TX81Z (reviewed in MT July '87) and in the later DX11 (reviewed June '88) and new V50 (reviewed elsewhere in

this issue) can be assigned to play one of eight waveforms, no matter whether the operator is functioning as a modulator or a carrier. This opens up many possibilities, some of which surpass even the "grown-up" DX models. The eight waveforms include a sine and a slightly weakened square. The other six waves have enough variety to be meaningfully different from each other. Their harmonic contents are listed in the owner's manual for those who like to see what they hear. By the way, the limitation of four operators in eight algorithms is not the only thing that differs from the DX7. The four-operator instruments have many other programming parameters that are less elaborate. The EG only has one level and four rates, keyboard level scaling is much simpler than on the DX7, and there are fewer frequency tuning positions available.

If you're near a TX81Z or DX11, how about cooking up a blend of four different waveforms for an extra rich sound, with "inside movement" coming from Detune, no FM, and the most nasal of the four colors coming in at the end of every note? Start with Utility Mode to get to "Init Voice?," press Yes twice, and press the Parameter tabs until you get to the algorithm screen where you select Alg. 8 (it shows the four operators side by side). Now advance the Parameter screens to the waveforms and assign the waveforms in the following manner: Op1:W2, Op2:W3, Op3:W6, Op4:W7. So far, you can only hear Op1 (which sounds like a clarinet, its waveform being somewhere between a triangle and a square).

**TX81Z:** *"With multiple waveform FM you can easily get fat and complex sounds with just two operators that, on the sine wave-only DX, would require two or even three modulators above a carrier."*

Move to the Detune screen and set the operators to something like -3, +3, -3, +3, then go to the Out (Output Level) screen and set all operators to 90. Set Feedback to 6 and go to the "Edit EG?" screen. Press Yes and give Op4 a low number, around 6 or less. This delays the nasal buzz from Op4 until after all of the other operators have risen to full output at maximum attack speed. On the Frequency screen you have the option of raising or lowering the level of any of the operators, thereby affecting the blend. And you can always adjust the mix in the Out screen. This is a lot of

fun, and it adds up to more than you can do on many "analog" synthesizers, but it isn't FM. So let's set up a voice where you can test the effect of FM with these complex waves.

### FM with Complex Waves

Change the algorithm to #5 and set the Output Level for Op1 to zero (which also kills Op2). You'll be working only with Ops 3 and 4 for now. Set Feedback to 7 and verify that both Ops 3 and 4 are tuned to a Freq. Coarse value of 1.00. Now go to the waveform screen and set both Ops 3 and 4 to W1. Tap the keyboard briefly and all you hear is the sine wave from the carrier, Op3. As soon as you hold a key, the slow Rate 1 value brings in Op4, and the sound distorts badly. Reduce the Output Level of Op4 to somewhere near 70 and you hear the familiar sawtooth wave. Note that there is no such typical sawtooth among the available waveforms. You still have to make your own with FM. Now reduce the Feedback to zero and return to the waveform screen.

Assign all eight waveforms to Op4 and play the sound resulting from each one. Try to memorize what they sound like. If you're the methodical type, you might want to record the sounds, perhaps with a voice cue stating something like "carrier output 90, modulator output 70, tuning both at 1.00, no feedback." Then switch Op3 to W2, and repeat the procedure. Advance Op3 to W3 and repeat the procedure again until you've heard all 64 combinations. Anytime you change an Output Level or a Frequency value, you get a whole new set of flavors. And

if you add Feedback at values of 5, 6, or 7, the number of variables increases yet again. You can easily get fat and complex sounds with just two operators that, on the sine wave-only DX, would require two or even three modulators above a carrier.

### Stockmarket FM

Not too long ago there were lots of reports that Yamaha had bought up Korg. While that proved to be incorrect, there is a financial interest in place. As a result, the two companies have combined their buying power for items that neither manufactures in-

house (like the actual keyboards, etc.) One side effect of this new situation was the acquisition by Korg of some FM technology from Yamaha that Korg presented in a little gem of a synthesizer called the DS8 (reviewed in MT July '88). It never made a huge splash, being somewhat overshadowed in the hype department by other product announcements at the time.

The DS8 is essentially a subtractive instrument in a generous configuration. Each of the two oscillators has its own filter and amplifier envelope, which makes each patch a layer of two sounds. Splits and layers of two such patches are possible and configurations up to 8-way multitimbral make it a versatile MIDI instrument. The keyboard is velocity and aftertouch sensitive, has Local Off, and makes a good controller at a modest price, usually way under \$1000.

But how does it sound and what's this FM business? It sounds neither as full as a digital "analog" (read "subtractive") synth like Korg's own DW8000, nor does it have the crystalline power of the DX7. But when used as a blender and enhancer, it is very musical. Oscillator 1 can play one of four waveforms: sawtooth and square in regular and extra bright versions. Oscillator 2 can play a sawtooth or square wave, blending its signal with that of Osc. 1 after each has completed the signal path through their separate filters and amplifiers. These filters and amplifiers each have independent envelope generators.

This isn't FM, just as the first setup on the TX81Z (using algorithm 8) wasn't FM. But Osc. 2 can be set to a third position called Crossmod, in which it becomes the modulator of Osc. 1 (which becomes a carrier). If you're used to the DX, in which only carriers can be heard individually, you'll be surprised that Osc.1 makes no sound of its own in this configuration. Only Osc. 2 can be heard solo when in Crossmod. The "analog" parameters still influence the sound, but now they have a more drastic effect. Spectrum imitates the classic Resonance, Ring Modulation adds a metallic flavor, and Keyboard Tracking balances the timbre across the range of pitches. The fact that the carrier, Osc. 1, plays one of the four complex waves accounts for a lot of energy that must be carefully adjusted to avoid distortion. This FM setup is no threat to the DX, but a patient programmer can get a lot of subtleties out of it. ►

# Sam Ash<sup>®</sup>

## "Music Dealer Of The Year"

Voted by Members Of The Music Industry In The  
"Third Annual Music & Sound Awards"

Respected by musicians, studios and industry professionals alike,  
Sam Ash is the kind of store you like to deal with:

- Helpful, knowledgeable musician sales people.
- Tremendous selection of instruments, sound & recording equipment, computers and software, MIDI & home keyboards ... 16 million dollar inventory.
- Consistently Low Prices!

### Sam Ash<sup>®</sup> MUSIC STORES

MUSIC • SOUND • COMPUTERS

10 Branches in and around New York City

## 1-800-4-SAM ASH

New York State

## 1-718-347-7757

©1989 Sam Ash Music Corp.

# 650 Key Music Contacts... 45¢ Each!

Now use your Macintosh or IBM to **contact over 650 key people** in the industry with **MusicContacts!** You get names, addresses, phone numbers, and music specialties of major A & R execs, producers, publishers, and radio program directors... all in our complete database management system! And all for just \$295! Order now and we'll include **FREE** book - *How to Get a Record Contract*.

Send in the coupon below, and start making valuable contacts today!

\*Works with any Mac, or IBM compatible computers

To order send \$295  
(plus \$4 shipping/handling)

TO:

R & D Music Software  
6393 Penn Ave. Suite 307  
Pittsburgh, PA 15206

Or Call (412) 241-4262

(PA residents add 6% sales tax)

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ St \_\_\_\_\_ Zip \_\_\_\_\_

MasterCard \_\_\_ Visa \_\_\_ Exp. Date \_\_\_\_\_

#: \_\_\_\_\_

Mac \_\_\_ IBM \_\_\_

Signature \_\_\_\_\_

# MUSICCONTACTS<sup>™</sup>

The Software for Musicians Who Want to be Heard

## ► The New Wolf in Sheep's Clothes

Trust Casio to shake things up just when you thought you had a handle on the situation. They did it with the CZ101, taking the wind out of the sails of anyone who thought the DX7's four EG rates and levels were a big deal. Try eight rates and levels, and six complete EGs on the tiny CZ101, enough to think about for a Sunday afternoon spent programming by the pool, with headphones and suntan lotion (life is tough in California, but hey . . .).

So when Casio announced the VZ1 (reviewed in MT September '88), we listened. And we didn't hear or see the words FM, algorithm, carrier or modulator. The synthesis on the VZ1 is called the iPD Modular Sound System, where iPD means interactive Phase Distortion. It works like this (all Yamaha FM vocabulary is used for comparison only, not quoted from Casio literature). There are eight sound generators on the instrument, each with a waveform selector for its DCO (Digitally Controlled Oscillator) and a DCA (Digitally Controlled Amplifier) that controls the loudness of the selected waveform by means of an 8-stage envelope (eight levels and eight rates). Each DCO/DCA unit is called a Module. Available waveforms are sine, two kinds of noise, and five pre-filtered variations of the basic sawtooth (from a heavily lowpass-filtered to a full-bodied bright one). Connoisseurs of Casio CZ instruments will have noticed that I haven't mentioned the DCW (Digitally Controlled Waveform), which acts like a lowpass filter. There's no user-programmable filter present on the VZ1.

The eight sound-generating Modules are permanently grouped into four pairs called Lines. M1 & M2 form Line A; M3 & M4 form Line B; M5 & M6 form Line C; M7 & M8 form Line D. The user has three choices for combining the Modules into Lines: Mix, Ring, and Phase. The Modules' signals can be merged in a straight audio mix that simply blends the two sounds together. They can also meet in a ring modulator, where the sum and the difference of their harmonic frequencies are added to the two signals. This usually results in rather metallic flavors. In the Phase combination, one module's signal (the lower numbered one in each pair) modulates the frequency of the other (which acts as the carrier) in the FM process that Casio calls Phase.

With the Detune parameters, each

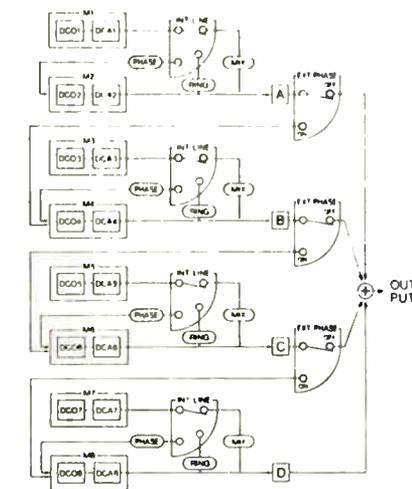
Module can be tuned to a fixed pitch that will be constant no matter where on the keyboard it is triggered, or to a variable pitch "ratio" that is relative to the keyboard that is expressed as "Harmonic level in comparison with the standard frequency." In Casio's terminology, standard frequency means the expected pitch of a given key, subject to global octave and de-tune settings. The parameters for the ratio tuning are polarity (+ means higher than the key played, - means lower), octave (from 0-5), note (in half-steps from 0-11), and fine (from 0-63). It comes as no surprise that a Harmonic value of 1 corresponds to the true pitch of the key you're playing. It also stands to reason that Modules with an extreme Detune value of many octaves may not be heard over the whole range of the keyboard if their pitch is simply too high in its transposed position.

If we want to relate all of this to the DX7, the VZ1 establishes a modulator/carrier relationship with independent EGs and six octaves of transposition control. This is precisely what a coarse frequency ratio setting of 31.00 with a maximum fine frequency setting achieves on the DX. And, unlike the DX, the VZ1 modules have a choice of waveforms, and their envelopes are twice as detailed.

But what about the combinations of operators that are available in the 32 algorithms on a DX? There are no algorithms on the VZ1, but the FM routing doesn't stop at the level of Modules. The product of a pair of Modules, called a Line, can act as the modulator of the higher-numbered Module in another Line. Confused? Check this out. Modules 1 & 2 form Line A. Using the Phase setting, you've set up M1 to modulate M2. Or maybe they're simply mixed, or ring-modulated. It doesn't matter - consider their final product to be the signal from

**VZ1:** "The user has three choices for combining the Modules into Lines: Mix, Ring, and Phase. In the Phase combination, one module's signal modulates the frequency of the other in the FM process that Casio calls Phase."

Line A. Let's go to Line B, consisting of M3 & 4. You set up M3 to modulate M4, which now acts as a carrier. Just as carriers on the DX can be influenced by more than one modulator at once, so can M4 be modulated by M3 and the total product of Line A. This process is called External Phase. (See Figure 1 for



**Figure 1. The voice structure of Casio's VZ1 synthesizer, showing the various FM-like modulation routing assignments.**

a diagram of the VZ1's voice structure.)

Careful specification of relative levels is important in these complex setups, just as it is on the DX (where you have to watch the level of the modulators). The DCA EG Depth and the Level values are not the only parameters that control this. Velocity sensitivity can be adjusted 0-31, with eight different response curves. Keyboard Follow is a variation of Yamaha's Keyboard Level Scaling. On the VZ1, you define up to six points (keys) on the keyboard and set the levels from 0-99. Other goodies like positional crossfade, inverse tremolo and amplitude sensitivity need to be considered as well.

The VZ1 readout offers graphic displays of many parameters and most screens bring up a list of related parameters with their values. Parameters are grouped into three overall areas called Menu 1, Menu 2 and Menu 3. The groupings are printed right on the panel and an instant on/off feature lets you solo any Module or Line

combination during the editing process. Casio did a great job of simplifying matters (complete with a commendable owner's manual) considering the complexity of the instrument. But as you can guess from the sketchy descriptions above, you have to be an organized type of person, with paper

and pencil at hand, to work your way through the creation of an entirely new sound. Until some clever people bring out editing software for the VZ1, most users are likely to stick with the useful selection of factory sounds.

Does this FM implementation work? Single patches don't sound like a DX7. Not much, anyway. If anything, they sound to my ears more like the CZ series from Casio (which isn't a bad thing). But its strength is in the layering, like a wedding cake fit for royalty, because the eight modules, forming four pairs in Lines A-D, are only the beginning.

Combination Mode lets you recall up to four single patches and arrange them in splits, layers, velocity splits or positional crossfades with different output configurations (mono/mix or left and right). Some of these combinations reduce the polyphony from 16 to 8, or even to 4. Patches from the internal memory can be freely mixed with patches from a RAM card. The combinations are stored in the Operations Mode. For MIDI users, up to eight patches can be recalled to play on individual MIDI channels as a Multi-Channel MIDI Performance, with selectable polyphony assignments.

## Software FM

For those of you who want to turn your samplers into FM instruments, there's always the SoftSynth program from Digidesign for the Atari ST and Apple Macintosh computers (Mac version reviewed in March of '87). How would you like to design your own algorithms? SoftSynth lets you do this, and then some. You can use it as an additive tool by assigning relative amplitude levels as well as amplitude and pitch envelopes to the different harmonics. You can also use the harmonics as modulators and carriers in the FM mode. Either way, you'll come up with weird and wonderful sounds that you can name, store and transfer to your sampler.

So there's no end to FM as a programmer's tool. Last month we mentioned the successors from Yamaha, one of which (the four operator V50), is reviewed elsewhere in this issue. The V80FD takes over the DX7 line (except for the TX802, which is still alive). Next month, we'll move on to PCM/single cycle hybrids like the Roland D50, Kawai K1 and Korg M1. There's plenty of good stuff to work on there. See you then. ■

# Buying a Keyboard?

## KEYFAX

THE DEFINITIVE GUIDE TO BUYING  
ELECTRONIC KEYBOARDS BY JULIAN COLBECK



OVER 300 SYNTHS, SAMPLERS  
SEQUENCERS, & HOME  
KEYBOARDS TESTED

Then we've got the perfect companion.

KEYFAX 3. Julian Colbeck's definitive guide to buying electronic keyboards.

KEYFAX 3 is the latest, 1988/89 edition of "the electronic musicians' bible," and it's the best ever! Hundreds of electronic pianos, synthesizers, samplers, home keyboards and sequencers are listed. For each model there's a spec sheet, an overall rating, and an in-depth analysis of its capabilities. The reviews are straightforward, detailed, and accurate, and instruments are grouped together by category to make comparisons between models easy. It's a formula that's proved successful for thousands of musicians, so order your copy of KEYFAX 3 today. Just clip the coupon and pop it in the mail, or give us a call. Either way, don't go shopping without it!

# KEYFAX

Save yourself a trip to the mailbox -  
order by phone: (818) 407-0744.

Check enclosed for \$ \_\_\_\_\_

(Payable to Music Maker Publications)

Charge this order to my:  MASTERCARD  
 VISA

Account Number \_\_\_\_\_

Cardholder's Signature \_\_\_\_\_ Exp. Date \_\_\_\_\_

Mail this coupon to:

**Music Maker Publications**  
22024 Lassen Street, Suite 118  
Chatsworth, CA 91311

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Phone \_\_\_\_\_

Please send me \_\_\_\_\_ KEYFAX3

book(s) at \$19.95 each:

California residents add 6% sales tax.

Los Angeles residents add 6.5% sales tax.

Please add \$2.50 for postage & handling.

(Foreign orders, add \$6.00)

PLEASE ALLOW 6-8 WEEKS FOR DELIVERY.

PRE-PAID ORDERS ONLY. SORRY, NO C.O.D.

SubTotal \_\_\_\_\_

Tax \_\_\_\_\_

Shipping \_\_\_\_\_

TOTAL \_\_\_\_\_

192pp B&W.

# Peavey DPM3

## Digital Phase Modulation Synthesizer



**Peavey created quite a stir at the Winter NAMM show with their first synthesizer. What follows is a quick look through the machine's initial specs. Preview by Dan Rue.**

UPON FIRST GLANCING at the brochure, you'd be tempted to believe that the DPM3 was dropped from Mars into the backlands of Mississippi, where the folks at Peavey discovered it on a weekend fishing trip. Consider the evidence: this machine produces sounds using such as-yet-unheard-of synthesis technologies as *digital phase modulation* and *digital convolution* filters . . . Thankfully, further investigation brings the subject closer to earth. After wad-ing through Peavey's proprietary (and unintentionally humorous) terminology, what emerges is a product that looks to be a legitimate and potentially successful first-entry by the company better-known for its guitar amps.

By Peavey's own admission, the DPM3 will be in more or less direct competition with Korg's popular M1, both in sound structure and price (no specific target price has yet been announced), so comparison is rather unavoidable. The architecture is similar – a combination of 16-bit PCM sampled wavetables and digital filters to produce sounds, an on-board sequencer, and two on-board multi-effects processors. Both synths feature a RAM card port by which new patches, PCM data and sequences can be saved and loaded. However, the DPM3 also features a built-in 3½" disk drive as an alternative to the RAM card port. This is perhaps the single-most significant difference between the two.

Peavey touts the DPM3 as being

"only a software update away from next year's model" – which apparently means that the architecture of the sound generation can be altered by simply replacing ROM chips. We shall see. In addition, the disk drive allows PCM wave samples, patch data and sequencer data to be loaded into the machine via 720K IBM-format disks. To my mind, the most interesting option is the ability to load additional PCM samples. Peavey has definite plans to release disks with new samples of their own, but they're still tossing around the possibility of providing the DPM3 with the ability to read MIDI Sample Dump Standard files, so that you could load in your own samples. Needless to say, that would be *most* excellent . . .

Translating the specs into English, the DPM3 comes with 4Meg of ROM waveform memory and 32K of RAM (expandable to 64K). It is 16-voice polyphonic/multitimbral, uses dynamic voice allocation and actually offers two oscillators ("Digital Phase Modulation Oscillators, or DPMOs, in Peaveyspeak) per voice without reducing polyphony, unlike many other instruments with 16-note polyphony. Each DPMO is processed through a digital filter (a.k.a. "Digital Convolution Filter", or DCF), a "Digital Convolution Amplifier" (DCA), "Digital Convolution Envelopes" (DCE) and "Digital Convolution Modulators" (DCM). The sound is produced by two

24-bit chips, and then the audio is passed along to a third 24-bit DSP chip that handles signal processing.

The DPM3 features two fully-programmable multi-effects processors that are assignable to the left output, right output or both. Effects include reverb, delay, EQ, chorus, flange, early reflections, phase shift, exciter and distortion. Peavey is quick to point out, however, that the DPM3 is not limited to these effects (this is, after all, a totally software driven machine). The patches are then stored in any of 100 programmable preset locations (expandable to 200 with their "Cache Card" RAM data card).

In addition to the patch presets, the DPM3 houses 110 individual PCM drum samples, arranged in five complete kits. Once again, the disk drive offers the ability to load in new sounds (though, as mentioned above, only a meager 32K of RAM is available). Naturally, all of this amounts to an ideal environment in which to place a sequencer . . .

Here's where that disk drive *really* comes in handy. By storing only one song in memory at once (others are accessed from disk or RAM card), Peavey has been able to equip the DPM3 with a fairly large sequencer – 20,000 notes of MIDI data, to be exact. The sequencer includes eight dynamically allocated instrument tracks, plus a 9th track dedicated to percussion. The DPM3 sequencer is a real-time and step-time MIDI recorder, and offers multitimbral operation with the ability to assign individual voices and MIDI channels to each track.

The DPM3 includes a 61-key keyboard that responds to velocity and aftertouch. The front panel features a 40x2 character back-lit LCD display and a button configuration that should be very familiar to Ensoniq ESQ1 owners. The back panel offers some disappointment in the audio output department – left and right stereo output jacks. Period. The rest of the connectors include your standard headphone jack, pedal inputs (2), and MIDI In, Out and Thru.

So, once you cut through the Martian Peaveyspeak, what remains promises to be a fairly well-designed wavetable synth – certainly not a bad initial offering by any stretch of the imagination. ■

**PRICE:** \$750

**MORE FROM:** Peavey Electronics Corp., 711 A St., Meridian, MS 39301. Tel: (601) 483-5365.

# 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

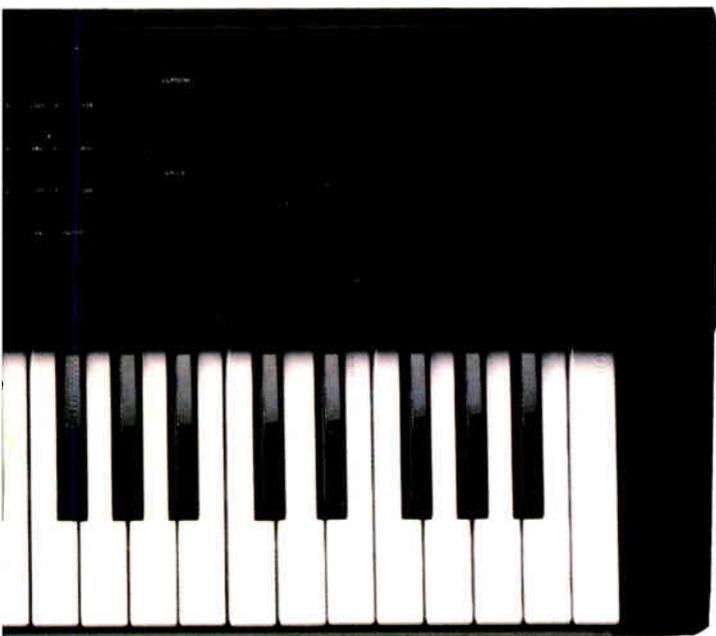
can be processed through either eight polyphonic outputs or a mix output.

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.*

# n the market, the 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 240 x 60 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 question.

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 re-

markable new W-30. Because they'd still be missing the most persuasive and motivating feature of all.

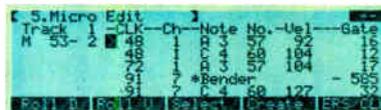
The Roland logo.

# Roland®

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



*Our state-of-the-art 240x60 dot LCD display lets you view all the parameters while editing.*



*While sequencing you can change the length or dynamic value of any note simply by using microscope editing.*

# Rehumanize YOUR SEQUENCES

## Part 5: Drums (For the Complete Idiot)



Illustration Toby Goodyer

**We conclude our series on adding life to your sequences by explaining how you too can ditch the dreaded Mechanical Man with a little help from your friendly computer.**

*Text by Travis Charbeneau.*

I hit a DRUM once, when I was five. I talked a neighborhood kid into letting me drop a bar bell through the skin of a big parade bass his family had stored in the basement. Sounded great! Once. That's all I know about drums. I think this qualifies me as a complete idiot. (The kid's mom sure thought so.)

You may be somewhat more qualified. If you're like most of us,

however, and came into computers and sequencing from the melody or harmony side of things rather than the percussion family of musical instruments, drums are simply alien creatures. You soar to heights of ecstasy on every track, as long as you're just playing to click. Then the fateful moment arrives for that full percussion track. At this point you face the last temptation of the complete

idiot: dumping factory patterns right off the old drum machine.

Sure, you can make good music playing the factory presets off the synth. This is merely a small sin. But the Mechanical-Man drummer hiding in those factory patterns will send you straight to MIDI hell!

Go ahead and do it anyway. Just follow the rest of this piece, and I may at least get you a backstage pass into purgatory.

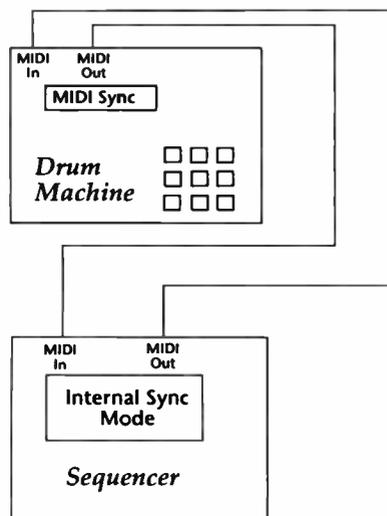
There are a lot of tricks the computer can assist you with to help turn plain vanilla drum patterns into at least that vanilla/chocolate/strawberry crap we used to eat as kids. In fact, we needn't bother with loop-programming or specific drum machine programming at all. Just stay parked in front of the old CRT.

### Dumping Your Drums

Your first challenge, of course, involves accurately dumping the factory patterns from the drum machine to the computer. You want to be able to use the drum machine, or the increasingly popular drum sections of un-programmed modules such as Roland's D110, simply as a sound module. As sequencers become more and more popular, and, as more and more of them feature loop-in-record, drum-machine style programming, more and more non-programmable drum modules will surely appear. As recently as two years ago, nobody would have known what to do with the D110's "R" section. And, like patchware and samples, third party percussion patterns are becoming increasingly avail-

able, the idea being, again, to drive the drums just like all of your other modules, from the computer.

Assuming you're without any patterns on disk though, you've got to make that initial dump. Here's how: hook your drum machine MIDI Out to a MIDI In port feeding the sequencer, and the MIDI Out of the sequencer to the drum machine's MIDI In. Place the sequencer in internal sync and the drum machine in MIDI sync mode (turn off the internal clock). Also, make sure that you turn MIDI Echo off on the sequencer to avoid a MIDI feedback loop. Press play on the drum machine and then press record on the sequencer. The drum machine should start playing as soon as you hit record on the sequencer. If the drum machine doesn't have a MIDI sync mode or the sequencer cannot be taken out of echo mode, put the sequencer in MIDI sync and press record, then press play on the drum machine. Assuming that the drum machine sends MIDI clock, the sequencer should start recording as soon as the drum machine is started. (See Figure 1.)



**Figure 1. The proper setup for transferring drum patterns from a drum machine into a sequencer.**

Real-time quantization on the sequencer can be turned off (if your sequencer offers it) because the patterns will record in perfect sync. You will find that the length of notes put out by drum machines is generally very short, so if you plan on triggering other sources, like a sampler, with your drum machine patterns, you may have to lengthen all the notes to get the other instruments to properly trigger. Unless you have some sort of global note length edit function this could be

a bit tedious but hey, nobody said this stuff was always easy. The only other thing you need to be aware of is the time signature of the pattern to be dumped. For convenience sake, you should make sure that the sequencer is set to the same one (though some sequencing programs will allow you to change this after the fact).

Get your MIDI channel assignments in order, a standard reverb wash in whatever digital signal processor you're using, and take care of other common housekeeping chores like echo on/off, pitch-bend and aftertouch recorded/ignored, and "metronome off." Then save the whole thing under the name "Setup." Being a 4/4, 8-beat rock kinda guy myself, I mute all the drum tracks and have a single, looped bar of the simplest 8-beat rock pattern from the drum machine. That's my metronome. Following this arrangement, whenever you sit down to compose something new, you load "Setup" and proceed from there. If you want something with a Latin feel, mute your looped rock "metronome" and substitute whatever Latin bar sounds good. If the beat is right, but there's too much cowbell and timbale or whatever happening, delete the fancier percussion and just keep a simple looped version to play your composition against. Sure, it will get monotonous. Bring the volume down on the mixer and be thankful that at least you've got a better metronome than you had before.

Once you've dumped all your drum patterns into your sequencer, you're home free. Well, OK, not exactly, because all you've done is simply move the Mechanical Man in the drum machine into the confines of your computer. But that alone gives you a world of flexibility and a big bag of tricks with which to humanize him, beginning with flexible song construction in an environment that is easier to work in and hopefully more familiar to you from your work with all your other instruments. (If nothing else, you're now working off the CRT instead of that accursed miniscule LCD.)

### Rudiments

Start with phrase construction. Let's say you've noodled yourself a nice rock pad against your new, looped drum metronome. You're getting a feel as to where the change-ups should come. Solo your full rock drum track

and audition the patterns you dumped. Let's say you pick the standard 8-beater, a 16-beat hi-hat variation and maybe two tom rolls with one stalled roll, and it all sounds promising. Store these in buffers one, two, three, four and five. If you don't have buffers, put them in order on separate tracks and mute them. Now start building: four bars of 8-beat, three bars of 16-beat, a tom roll. Now you've got an eight-bar loop, a more complex and more goal-directed metronome.

Noodle the pad some more. Flesh out the metronome. After 16 bars, you lead up to the stalled roll, preparing to go into the chorus which you have yet to invent but which you've guessed would probably sound neat played against the 8-beat only . . . with ride cymbal instead of the original hi-hat. (Brilliant choice!)

Go into edit on your original looped metronome bar and simply change the pitch assignment of all the hi-hat notes to ride. If you've got a global edit function (like map transform on Voyetra's SPIII), that will do the job too, but with only one bar to fix, a quick edit may be faster. Now make eight copies and insert them where your chorus goes. By simply re-mapping the original hi-hat notes this way, you've kept their relative velocity values, so you get the same accents on the ride cymbal. Velocity adjustments are probably the most important factor in humanizing a drum pattern and, of course, these are a cinch to fool around with once you've captured the beasts onto disk and have them up on the CRT.

After the chorus, you decide to 16-beat your way back into the verse and vamp out on rolls. You insert 16 bars of the 16-beat pattern, the last eight of which are riddled with rolls from your buffers. In fact, the last four are *all* rolls, one bleeding into the other as you vamp to a fade-out.

Now you have what may best be termed as the "skeleton" of your drum track. Despite the (hopefully) thoughtful construction, the drumming itself will still tend to sound mechanical. Leave it for now.

### Crosstalking

At this point, I would recommend getting on with the rest of your instrumental work. Your drum track will eventually need refining, fleshing out, and above all, humanizing, but there's no point in spending this

energy now before the full feeling of the composition is complete. The bass track in particular will give you ideas for accents, and you may discover rhythmic opportunities elsewhere that really beg to be supported by the drums. You may also find that a block copy is required to lengthen the chorus or the vamp, and there's no point in duplicating refinements which will then tend to sound like carbon copies, reverting you back to the Mechanical Man after a lot of hard work.

Ordinarily, while I feel this approach is essential for the drums, it's also a good rule to follow for all your tracks. One of the great beauties and a particular freedom you enjoy with this kind of ensemble sequencing is crosstalk between parts. Polishing each track to completion before going on to the next is an exercise in wasted opportunity. Enter your ideas and see what they suggest to other ideas already in the composition. Polishing, especially for the drums, should generally come last.

Once all the tracks are in rough form, once there's no danger of losing your creative train of thought, feel free to crosstalk like mad and hop from one track to another. You're fixing the bass, when it stutters perfectly on the beat, screaming "give me some snare!" Abandon that track and jump to the drums, placing snare hits on the bass beat. Just before your chorus, you notice that the pad is doing a great job standing all by itself, thank you. Jump to the drums and start deleting hits.

While all this may seem distracting, you're really fitting the rough pieces of a puzzle together, hopefully assembling a more coherent overall picture. Again, so long as your fundamental creative train of thought has more or less run its course, there's no danger and a lot of advantage in this seemingly scatterbrained approach to composition. Having said that, try to avoid getting too sidetracked into polishing here. Concentrate on the ideas, even if they're not fully realized.

### Fine Tweaking

Once you've got all of your tracks communicating reasonably well, go back into the drum track and start crossing the "t's" and dotting the "i's." The first thing you'll want to fix, apart from anything correlating to your other tracks, is the mechanical looping still evident from the skeletal construction. That first four bars of

utterly-repetitive 8-beat, for example.

Enter bar two, set a 16th note duration value, and insert one extra hi-hat strike at full velocity just after the last hi-hat in the bar. The extra tick sets up the next two bars, breaks the monotony and sounds "more human." The same works for an added snare hit in the same position. Experiment with two added hits, reducing the velocity on extra hit number one to 90. It's surprising how much subtlety you can get from a simple velocity adjustment.

A good rule to follow is: set up a change-up. When you shift from the 8-beat to the 16-beat pattern, for example, don't just let it happen. Insert the added hi-hat or snare hit. Or roll into it.

Tom, snare and even cymbal rolls can be difficult if not impossible for a non-drummer to comprehend. The patterns we ripped off the drum machine are usually one bar long and completely unsuited to making a brief, micro-bar transition from an 8-beat to a 16-beat phrase. Nightmarishly, you suddenly find yourself on your own.

I recommend sticking to the 16th note value. This automatically quantizes your step entries. Setting up our rolling tom shift, for example, we might start mid-bar through the last 8-beater, entering two high toms on beat two, two mid toms on three, and a cluster of three low toms rolling right into the next bar and climaxing with a crash cymbal hit on that bar's first beat. Assign the following velocities to the tom hits: 90, 127 - 90, 127 - 70, 90, 127 - and the crash: 127. Again, the velocity is definitely perceptible, and appropriate changes in velocity when you're shifting gears is expected by the ear. Fulfilling that expectation makes the ear say, "Ah. Human."

There will be times when working in the main kit (as opposed to the percussion section) that the 16th value itself becomes too mechanical-sounding. When this happens, shift to a 64th and try bunching your strikes closer together and further apart until the playing is just broken enough to satisfy, but not so broken as to throw off the time. Using a 64th note to shift the start of main beat hi-hat strikes slightly behind or ahead of the kick can also simulate the little inaccuracies we expect of that odd breed of human known as The Drummer. The hi-hat has a very special role, working outside the foundation of the kick and snare, up in a frequency range that is gener-

ally easy to hear. So change-ups, subtle velocity deviations, tiny shifts in time and added strikes are all very effective.

At the vamp of our hypothetical tune, as you may recall, we engaged in a section of rolls, one roll tacked onto another for the fade. It's a real challenge for a real drummer to sustain a roll like this which comes back to an accented beat at the beginning of each new bar. Unfortunately, it's all-too-easy for our cobbled-together patterns. In order to eliminate the "tacked on" feel, we need to bridge these sections, just as we did when changing up from 8-beat to 16-beat, only in a roll mode. The easiest way to accomplish this is to simply extend whatever tom you were on in one bar over into the next, deleting whatever gets in your way. If your toms are set to roll across the stereo field (and if they aren't, why not?!), you may wish to re-pitch the last series of tom strikes back across the field.

Make a duplicate of one pattern-dumped roll, and place it directly after its twin. Then, if you start high (left) and roll low (right), re-pitch the low strikes into high for Twin Number One, leaving Twin Number Two as it is. This maintains tension through a two-bar roll which doesn't resolve until the end of the second bar when the low tom finally makes its appearance over on the right. At least this provides a little variation, if not drama, in what would otherwise be a cloning exercise.

### Exotica Extraordinaire

In addition to our main kit, of course, most of us enjoy a percussion set: claves, timbales, quijadas, etc. While overkill in their use is definitely a temptation, I personally think that these are God's gift to sequencing. Used tastefully, a percussion set vitally expands the spectrum of expression, and adds a world of new accent opportunities for the crosstalk I described above. Furthermore, getting them in and out on time, a major headache in the real world, is a dead-center cinch with the computer (thus, I suppose, the temptation for overkill).

The real problems begin, though, in getting a tambourine to shake or a maraca to rattle. Enter edit, take that standard 16th note (127 velocity value), and manually shorten it to a 64th or the smallest value that still triggers. Set that as your new default note for step entry. At the assigned tambourine note position, simply enter

a string of 64th notes separated by 64th note rests (so as to simulate a series of 32nd notes, but at shorter values), starting on one beat and leading to another. Select a beat to emphasize something happening in another track, perhaps the sax break that's coming up.

What you have now is a pretty good simulation of a robot shaking a tambourine at maximum speed. To humanize this, either add a crescendo, or simply back up from the last strike and start reducing the velocities from the level of 127 that you started with. Judge how much to reduce each note depending on how long the shake runs. A short whiffle of six hits could run 80 to 127 in 10-point increments. A long run may require finer resolution. A really long run could achieve two or three velocity peaks, each exquisitely timed with a kick hit or some other musical happening. This technique should work pretty well for all shaken instruments, and, if you want to reach for a supernatural, rattlesnake effect, change to all 64th notes (without rests) on the tail of your shake. This works sometimes.

The 64th note setting is also good for multiple timbale strikes and other off-center work. If you set the low and hi timbale strikes apart by this value, or even a 32nd, you get a real nice, off-the-beat effect. A string of such hits, flying in all directions, can make for a very nice change-up.

I find velocity decrescendo especially effective on cowbells and other mid-frequency percussion. You can get a really nice echo effect, even if your main DSP is occupied, simply by repeating a cowbell strike in a chain with increasingly diminished velocities.

Velocity, important in every department, is especially critical in the higher-pitched instruments that tend to be heard over everything. Claves, finger cymbals and other super-high frequency percussion make ideal punctuation devices, since they'll cut through pea soup. There is a school of thought that says you should cover every frequency in the spectrum at some point or another during a composition, and these items definitely fit the bill at the high end. I like to use them when I've painted myself into a dynamic corner, running full-out with distortion, bass out of register, etc. and still need an accent or a change up. Sort of a fifth gear.

Don't forget to use velocity adjustments and crescendo/decrescendo on

# WISE MUSIC

"VISIT THE MIDWESTS"  
LARGEST MULTI-KEYBOARD SPECIALIST"

**KURZWEIL**  
E-mu Systems, Inc.  
SEQUENTIAL  
**AKAI**  
KAWAI  
**Oberheim**  
**KORG**  
CASIO  
TOA  
Inicon  
Sax  
AUDIO-TECHNICA  
Aric  
FOSTEX  
dbx  
Studio Master  
**ROSE**  
**ALESIS**  
**RANE**  
**DIAPHR**  
**SIMMONS**

**SOUTHWORTH**  
digidesign  
**PASSPORT**  
Hybrid Arts, Inc.  
**J.E. COPPER ELECTRONICS**  
Performer

**Dr. Ts**  
Opcode



**ATARI**  
ST-1040-520  
Sold and Serviced

**KEYBOARDS  
DRUM COMPUTERS  
SEQUENCERS  
PA  
RECORDING  
SOFTWARE  
COMPUTERS  
SERVICES  
SUPPORT**



## MIDI SMPTE SYSTEMS FOR THE PROFESSIONAL

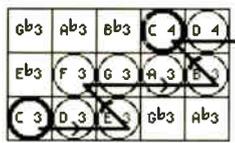
**800-635-WISE  
314-837-3030**

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

### Did you ever wish an intelligent instrument could help you learn music theory?

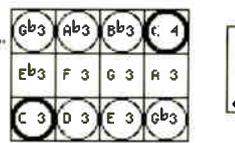
#### See How Modes Work.

semitones

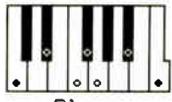


Ionian (major scale)

semitones



Whole Tone



Blues

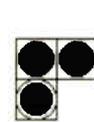
#### See How Chords Work.

semitones



Major

semitones



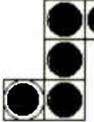
minor

semitones



diminished

semitones



\*11th

**Play by Pointing. Change Chord, Mode, or Key with a Touch.**

**HARMONY GRID for Macintosh. \$99**  
MAKE MUSIC WHILE LEARNING HOW

MIDI supported but not required.

To hear or order Harmony Grid call (617)661-2HIP. Mastercard & Visa accepted. Dealer Inquiries welcome.



**SOFTWARE CORPORATION**  
117 Harvard Street, Suite 3, Cambridge MA 02139

finally...

# THE KEYBOARD LIGHT™

You asked for it...an inexpensive portable light source for keyboards, drum machines and mixers. Powered by four AA batteries, this wireless wonder goes anywhere. Features include a soft white fluorescent tube, built-in reflector and easy transfer Velcro® back. Great for gigs and sessions!

Model No. KB-70.



## DUROWN

LIGHTING CORPORATION

14709 Oxnard Street, Van Nuys, CA 91411  
Tel: 1-818-780-6207 • Fax: 1-818-780-4125

the final pass. When everything else is finished, go back and see where the drummer needs to come down, build up a head of steam, fade out, etc. We've all played with drummers who have the dynamics of a pile driver. This may be great for speed metal, but if you're working in any other genre, you want feeling. You can get it, even from dumped patterns, if you use your sequencer's velocity edit functions.

Tempo adjustments can also add the spark of human life. If your sequencer supports a tempo track, use it – but use it last in the process. Typically, if you're working, say, at 120 BPM with a composition that doesn't introduce drums for eight bars, start off at 117 or something and kick into 120 with the first drum beat. It's a subtle change, but we perceive that something important has just happened. Likewise, a perfect ritard is only possible with the computer. Tag a drag on the end of tunes where it will work.

And finally, after all I've said about humanizing your drum programming, don't be afraid to be "mechanical," at least in a very limited sense. Every time you're tempted to cringe at your lack of elaboration, sensitivity, dynamism, etc., conjure up images of the Rolling Stones and the wonderful drumming of Charlie Watts. The Stones ate the world partly on the basis of Charlie's "relentless" (read "mechanical") back-beat. You don't have to be some hybrid Buddy Rich/Olatunji to make good, vibrant and yes, well-drummed music. Some of the simpler variations described above should get you out of the robot department anyway. From there, don't be afraid to let 'er ride. Even the complete idiot deserves to feel good about his drumming some of the time.

### The End

That wraps up our series of five articles on getting machines to sound more human with a single human attempting to "do it all" in the MIDI studio. Those of you who've followed the series will not have missed the irony of relying on one machine, the computer, to humanize a bunch of others, our various synths, samplers, drum machines, etc. But, combined with the right efforts in composition, arrangement and orchestration, this is exactly the function a competent sequencer can perform in the right hands. Human hands.

Just don't let your dog or canary get into the act, and it'll come out just fine ■

**(312) 756-7625**  
**PRICE PERFORMANCE**

**YOUR SOURCE FOR KEYBOARDS, COMPUTERS, SOFTWARE & RECORDING EQUIPMENT. WE SPECIALIZE IN SMPTE/ MIDI STUDIO APPLICATIONS**

<b>NORTH</b> 9 E. Golf Terrace. Arlington Hts, IL 60005 (312) 439-7625	<b>DOWNTOWN</b> 3154 N. Clark St. Chicago, IL 60657 (312) 327-5565
---	---

**SOUTH**  
3416 Chicago Rd.  
Steger, IL 60475  
(312) 756-7625

**HOURS**  
Mon-Fri 12-9  
Saturday 10-6  
Sunday Closed

**VISA • MASTERCARD • AMERICAN EXPRESS • SERVING THE CHICAGOLAND AREA**

**GS** Guitar Shack plus

# Roland W30

## Music Workstation



**The company's first official entry into the workstation market combines a sampling keyboard with a sequencer, but is it enough to justify the title? Preview by Bob O'Donnell.**

WHAT EXACTLY IS a workstation, anyway? That's not the easiest question to answer nowadays, but the general consensus seems to be that a workstation should include some sort of sound generating unit, a controller (generally a keyboard), a sequencer for recording purposes, drum machine-like functions, and built-in digital effects. All of these components must be included in and be accessible from a single box and, if the product is well designed, there ought to be a fair amount of integration between them.

Roland's new W30 Music Workstation will fill all the above requirements except for onboard effects – there simply won't be any available. It will offer all the features and functions of the company's 12-bit S330 digital sampler, most of the features found in their new Super-MRC software for the MC500 family of sequencers, and a velocity- and aftertouch-sensitive keyboard. On top of all that, it will incorporate a huge backlit LCD capable of displaying graphics (including waveform displays) and a great deal of parameter information at once. Unlike the S330 and other Roland samplers, no external monitor output is necessary, nor will it be available.

The W30 will function much like a software-based sampler. Its operating system will be stored on disk and all of its operations will be performed using

the large display, the two alpha dials, the numeric keypad and the software definable buttons underneath the display. At last count, the W30 had over 60 different screens of information, divided among its three modes of operation: Performance, Sequence and Sound. The Performance mode will include some keyboard controller functions, the Sequence Mode will offer a very full-functioned 16-track sequencer – complete with extensive editing options, and the Sound Mode will include all the sample editing and digital processing functions found on other Roland samplers (see the Super-MRC review in MT January '89, the S50 review in MT December '86, and the S550 review in MT June '88 for more specifics).

In terms of sound generating circuitry, Roland's approach to the workstation is that it should be based around a sampler because "it's easier to make a sampler sound like a synthesizer than the other way around." While this seems to be a reasonable way to look at it, I think that there could be a few problems with this philosophy – at least with its implementation on the W30. Like the S330, the W30 will include 512K of RAM, which at the maximum 30kHz sampling rate works out to about 14.4 seconds of 12-bit samples. The W30 will also come with 1Meg of unalterable samples stored in ROM. These ROM samples, which will include drum sounds, several different bass samples and other general purpose sounds, will be accessible at the same time as the samples stored in RAM. However, the potential problem I see with this scheme is the same one that any sampler with limited memory

faces – the ability to play numerous sounds at once.

The W30 will have a generous 16-note polyphony capable of being divided among eight multitimbral parts (and eight individual polyphonic outputs). However, if you have a sample disk that uses up most (or all) of the 16 available preset locations – the total limit for ROM and RAM sounds – then you may not be able to hear all musical parts at once. A limit of 16 presets is just too small and may compel you to commit certain musical parts to tape. Unfortunately, the W30's otherwise very impressive sequencer will not have a sync-to-tape function, so you'll have to resort to an external sync box like JL Cooper's PPS1. If you use mostly internal sounds and add only a few samples of your own, then of course, you won't have this problem; but it's a limitation of which you ought to be aware.

In terms of compatibility with existing instruments, Roland gets tremendously high marks. The W30 will read and play back S50, S550 and S330 sample disks, as well as sequence disks created with the SYS-503 and 553 sequencing programs for the S50 and S550, and sequences created with MRC or Super-MRC software for the MC500 family of hardware sequencers. As a result, there will already be a huge base of sounds for the W30 when it is released and owners of current Roland gear will be able to easily make a transition to the W30 without losing any work. The W30 will also have an optional SCSI port for connecting to the company's HD80 80Meg hard drive as well as the new CD5 CD-ROM player. With either of these options in tow, you'll have nearly instant access to hundreds of sound banks.

I recently got to spend a day with the W30, and while I can't yet offer definitive opinions on it as I would in a review, I can say that it was a lot of fun to work with. I'm not convinced that it has everything you'd want to see in a "Workstation," but it does appear to be a great combination keyboard sampler and sequencer.

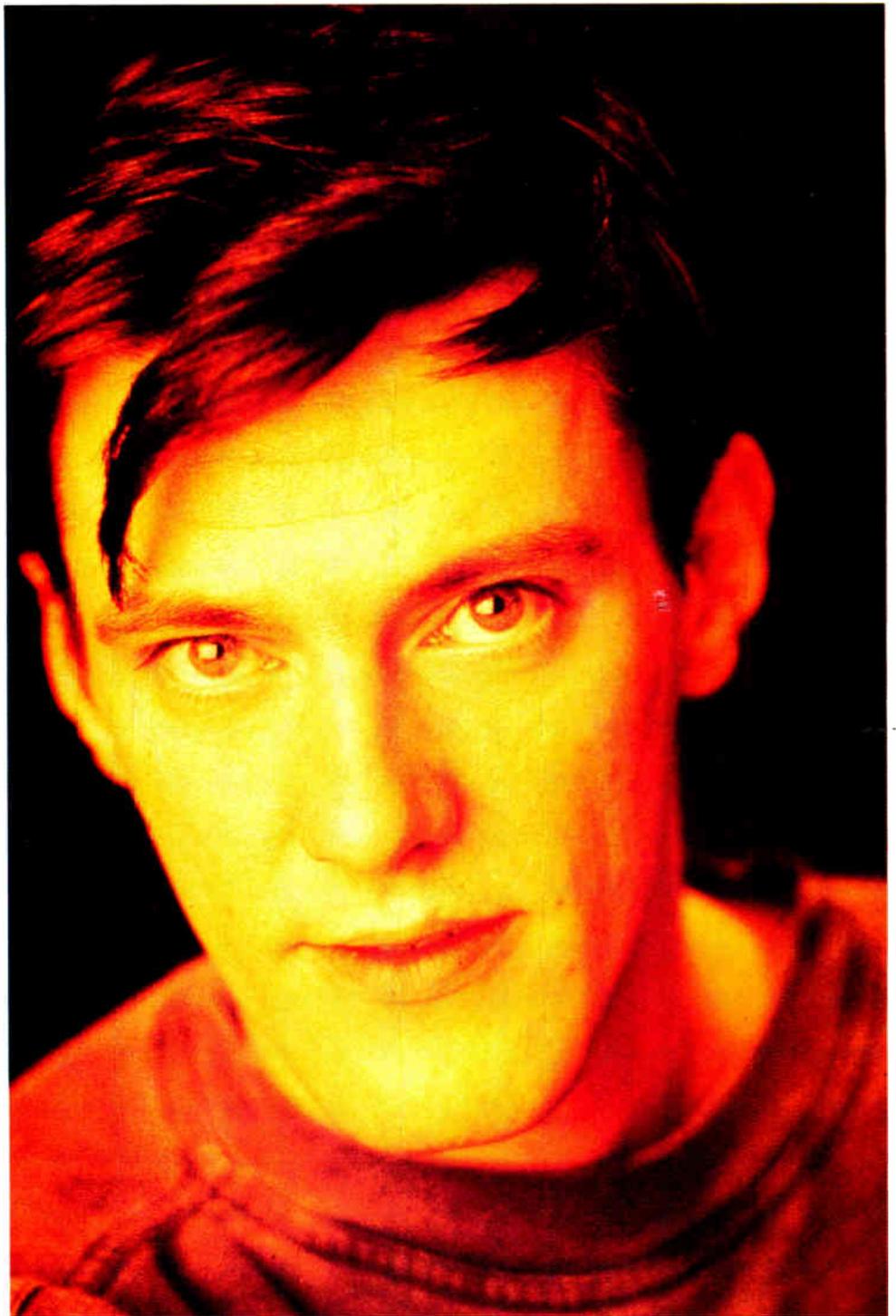
I think Roland might have put themselves in a bit of a bind by naming the W30 as they did, but just because it may not be a tremendous workstation doesn't mean it won't be a great instrument. ■

**PRICES:** \$2795; \$300 for SCSI option

**MORE FROM:** RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

MUSIC TECHNOLOGY

47



**Eight years and five albums into their career, New Order is enjoying new-found commercial success. Drummer Stephen Morris talks about old songs and changing technology. Interview by David Bradwell and Chris Williams. Text by David Bradwell.**

**T**HERE IS A brief half hour left 'til our scheduled 11:45 rendezvous with New Order drummer Stephen Morris, and panic is just beginning to set in – we are approximately 80 miles south of the target. One small mishap was all it took; right road, wrong direction. It could have happened to anyone.

Despite our arrival an hour later

than scheduled, Morris is in high spirits. We follow him to the house he shares with keyboard player Gillian Gilbert. Once inside we are given a preview of a test pressing of *Technique*, the fifth studio album to be released by New Order. It was recorded last summer in Ibiza (a tiny island off the coast of Spain) much of it actually in the open air, before being mixed at

Peter Gabriel's Real World studios in Bath, England in the autumn. It is the band's most obviously commercial work to date, sounding more optimistic than previous albums.

New Order has moved on from the days of 'Blue Monday.' They've learned how to write coherent albums and their songs have been reduced from eight minutes to four. As a result,

they now get playlisted for daytime radio. At the same time, the band has managed to maintain their credibility, building up a huge international following.

The history of New Order is well documented. Formed from the ashes of Joy Division by Morris with Barney Albrecht and Peter Hook (handling vocals and bass respectively), they were joined on keyboards by Gillian Gilbert. Their sound has developed in line with advancements in technology, yet surprisingly, it is the drummer who seems the most technologically aware.

"Playing drums is basically a very repetitive operation," Morris explains, sipping his Earl Grey tea. "If you're a drummer you're just doing the same things over and over again, and a lot of it is best left to a machine. Then you can do some of the more interesting bits yourself. I also always wanted to have access to a wide range of sounds, because with conventional drum kits you're stuck with one. As soon as the first little programmable drum machine, the little Boss Dr. Rhythm, came out, I grabbed it. When I first got it I chucked the manual away, assumed you just had to tap your rhythm in and was disappointed to realize it didn't work like that."

Nowadays Morris has taken drum machine programming very much to heart. One of the most famous bass drum riffs of all time opened 'Blue Monday,' which was programmed on an Oberheim DMX. More recently Morris has acquired a Roland R8.

"Lovely machine, lovely machine . . ." he enthuses. "I used to have a Yamaha RX5, but that was stolen. When I went out to get a replacement, I walked into a music shop and saw the R8. It looked like it was covered in fuzzy felt which I thought was a good gimmick for a start. I've not yet completely got to grips with its Human Rhythm Composer title, but it's an interesting box with good sounds. I wish Roland would bring out 808 and 909 cards for it. The thing that I like about the R8 is that someone is putting out a drum machine with the specific idea that it shouldn't sound like a drum machine. Even putting very subtle variations in can make it harder to detect as a machine."

All the songs on *Technique* were played live on a drum kit, with samples replacing the kit sounds once the basic drum track had been recorded.

"We took the drums into loads of different rooms in the studio, whacked them and recorded them onto DAT," comes the explanation. "We sampled the best sounds into Mike Johnson's Greengate (an older sampling device for the Apple II computer) and then we recorded the drums that were on tape into the Master Tracks sequencing program on a Mac using a Syco PSP (Percussion Signal Processor – an early British-made pad-to-MIDI converter). It was the first time I've managed to get one of those to work. I've tried triggering it off tape before but never with any success. I always got a delay, but once it's recorded onto a sequencer track and you know what that delay is, you can move everything back so it all lines up. We kept the feel and replaced it with our wazzo drum sounds."

Occasional drum patterns are also worked out on an Apple Macintosh

*"If you stick in your own little world of writing songs and producing yourself, you reach a point from where you never get any further."*

with the aid of Intelligent Music's Upbeat software. Although primarily designed for drum programming, Morris also uses it for writing sequences – especially basslines.

"I love the fact that it's so interactive," he enthuses. "It's like a massive TR808 really, because everything you put into it gets automatically quantized, and there's no way to turn it off. I generally save sequences from it as MIDI Files and load them into Master Tracks for humanization. The Mac has become increasingly important to us as a songwriting tool. Not quite 50% of this album was written by jamming for ages and picking up on bits we wanted to work on. The rest started out as ideas that someone had that we then all worked on with the Mac. The great thing about a program like Upbeat is that it's dead easy for anybody to knock out an ace drum riff. It's equally easy to come up with a wazzing bassline, whereas I couldn't sit down in a practice room and come out with an ace keyboard riff because I'm not really a very good keyboard player. I'm not even that good a drummer, I suppose, now you come to mention it."

As recently as four years ago, New Order would speak openly of their love for a pair of Voyetra eight-voice

rack-mounted synthesizers. While the company that made them, New York-based Octave-Plateau, has mutated into Voyetra Software, the former mainstays of the New Order synthesizer lineup have remained intact . . . but only just.

"They're still alive and kicking . . . but very bruised," comments Morris. "They've each developed their own particular little quirks. Modulation's been spontaneously induced in one of them which is a bit embarrassing when you actually go on stage. You get a lot of dirty looks.

"The main problem is Voyetra themselves. They're very helpful but they've given up repairing them, and basically you're stuck with a somewhat outmoded piece of equipment that is very hard to replace.

"We're thinking about sampling the basic sounds into Emulator III's, and then using the EIII's to get the creative

variations that we use. It's a big job really. Every time you get a new piece of equipment you've got to bear in mind that you've got a back-catalog of sounds to recreate. The obvious solution would be to sample them, but it's not as easy as it sounds."

The current New Order armory is based around four Akai S900's and two Emulator II's. But not for long.

"The EII's are going, I'm afraid. They've got this annoying habit of working fine until you want them to and then they don't. It crashed twice in the set at the G-Mex concert last month which was slightly embarrassing. But it worked fine here until the day before it was supposed to go with us to France, and then it got really noisy, the buttons stopped working, and the bottom disk drive stopped working. It knows – these things know!

"We've just replaced the QX1's that we've been using ever since they came out. They were very reliable until just recently when they all went at the same time – the disk drives stopped working, and the displays went on both of them. We decided to rent one and that one broke as well. I'd never seen a broken QX1 before, but the other day I went into a shop and people were bringing them in in droves. I reckon that Yamaha is ►  
MUSIC TECHNOLOGY

▶ putting a little bit of software into them that makes it commit Hara Kiri after five years," Morris quipped, "so you've got to go out and buy a new one.

"The same thing seems to be true of the EII's. They lasted very well until the EIII came out. How do they know? The S900's are still there. They've seen an S950 but they still carry on working. They've not seen an S1000 yet. I'd like to see what effect that has on them."

The band bought an Emulator III while they were in the studio, but look likely to replace their Emulator II's with Akai S1000's.

"The idea behind getting the EIII was that we could sample everything 16-bit, store it in the Mac, and then, if necessary, degrade it slightly to whatever samplers we bought. The weird thing we found with the Akais was that if you sampled into the Emulator, which is 8-bit, and then transferred it into a 12-bit Akai it sounded better than if it was sampled directly into the Akai. Another suspicious thing."

**N**EW ORDER GIGS have a reputation for being joyously disorganized. The band has recently returned from a visit to Brazil where, much to their amusement, they are regarded as megastars. Playing live does seem important to Morris, but the size and nature of New Order's following creates serious practical problems.

"We prefer playing small club-type places, but a lot of kids can't get in because of the licensing laws and people have problems if they can't get buses home. Plus, I don't like touring that much. Eight or ten dates is about the most I can do without feeling myself turning into a bit of a robot. We do different sets every night but there are only so many different permutations, and the whole process of touring is very repetitive. Live, I would usually play to a click track. Unfortunately, I must be really deaf because I have to have it so incredibly loud that everybody else can hear it and they all start playing as though they are wooden. We tried out a Kahler Human Clock the other day but it expired very rapidly. That's the sort of thing I'd like to get into – something to play live to without having to worry very much about this woodpecker taking off the top of my head on every beat."

Surprisingly, New Order rarely



Photography David Bradford

plays 'Blue Monday' now – to many fans' disappointment.

"Sometimes we play it because we fancy playing it, but most of the time we're just too sick to death of it. It's down to who decides – do you let the audience dictate to you or the other way round? We've got loads of songs as good as, if not better than 'Blue Monday,' it's just like a catchphrase really and I think that's awful. I would be disappointed if I went to see a band and they didn't do my favorite song, but I'd like to think I could understand why they didn't do it."

Away from the more conventional aspects of the pop world, New Order has recently been earning some cash on the side working on the soundtrack for the BBC comedy/drama *Making Out*. As well as the opening and closing themes, they have also been responsible for all of the incidental music.

"The producer turned up about 18 months ago and we agreed to do it because it seemed an interesting project. We didn't hear any more until we got to Ibiza. Then scripts started turning up, followed by videos and then deadlines. We did it in parallel with work on the album, and that's why a version of 'Vanishing Point,' one of the album tracks, is the theme tune for the show.

"I quite like working to picture. In a band you tend to write music on fours and eights, but when you're doing stuff to picture it's threes, two-and-a-halves, sixes, sevens. If you listen to it on its own it doesn't make much sense,

but if you're watching it on screen it does."

While Morris generally seems to have enjoyed the project, one brief request from the producer caused more problems than most.

"They wanted us to play the organ for a wedding march and the bridal chorus, so we went out and got the sheet music," he recalls. "I can only read music a little bit, and the rest of it is baffling to me. I cheated really, because I laboriously entered every note into a sequencer. It was quite an interesting experiment to work on a piece of music when you know how it sounds but you don't know how to play it.

"It's amazing how difficult it was to get a really rotten organ sound that sounded convincing. D50's are only eight-note polyphonic in Dual mode, whereas on an actual organ you've got one note for every key, and you've got bass pedals as well. When we put the full music into the sequencer, notes were being dropped and half of it disappeared. In the end we had to edit the music to fit the limitations of the synthesizers. It took ages, but you'd scarcely notice it on the program."

By the time you read this interview New Order hopes to be working with Michael Powell, "a famous but aging film director" who the band had approached with the intention of doing a video.

"He came back to us with a specific idea that I can't tell you about because it'll spoil the surprise," says Morris,

mysteriously. "We're going to base it all on a poem, so we're going to get someone to read it at various tempos, and then write the music and make the video at the same time. It's not a video to promote anything, and it's not a commercial venture in any sense of the term. There's no way it's ever going to make any money, we just wanted to work with him.

"I was saying the other day, 'Try and imagine the world without music video. If there were no video and radio, how on earth would people sell records?' Most videos are just an advert for the song whereas this Michael Powell project is an anti-video; it's not an advert for the record, it's a film.

"We were very pleased when we won the BPI (British Phonographic Industry) award for the 'True Faith' video, but awards don't mean bloody anything really. They're something nice to stick on your mantelpiece, but that one was bugged when we got it anyway. It had one prong broken off, New Order was spelled wrong and they'd got the title of the record down as 'True Face.' It was a complete farce – they didn't even know we were there. Everybody else was in little boxes and we were put with the punters, and we didn't know what to do."

Although New Order is generally independent in its work, the award-winning 'True Faith' video demonstrated their ability to profit from a liaison with another artist. On the musical side, the band has tried working with several different producers and remixers – 'Round And Round,' their new single, has been remixed by both Inner City's Kevin Saunderson and Mark Moore of S'Express.

"It would have been pointless for us to do the remix because we've already done the best we could do with it," Morris explains. "Shep Pettibone originally got involved at the record company's suggestion, but we liked what he did to 'Bizarre Love Triangle' so we got him to do the remix of 'True Faith.' We worked with Arthur Baker because we'd heard 'Planet Rock' and other stuff he had done which we thought was interesting.

"If you stick in your own little world of writing songs and producing yourself, you reach a point from where you never get any further. If you work with someone else, however traumatic the process may be, they've got a way of working that is going to be a bit

different to yours. It may result in a clash or it may result in perfect harmony, but either way you come away with a lot of new experiences that you can employ yourself in the future.

"The 'Blue Monday' 1988 remix was just an attempt to try to get Quincy Jones off his arse and do something. We're signed to his label in America, and he kept saying he wanted a remix, so we told him he could have one if he did it."

When Stephen Hague was called in for 'True Faith' and '1963,' the songs ended up being co-written by the producer.

"Most of the time we spend working with producers, it's a case of co-writing. With Stephen Hague we just had two very rough ideas. He wanted to do some pre-production, which we'd never done before, and which we didn't have time to do. So we just went

*"Every time you get a new piece of equipment you've got to bear in mind that you've got a back-catalog of sounds to recreate."*

into the studio for ten days with two ideas and wrote the whole songs from that. He had an interesting approach to the vocals – he wanted the vocals done early on so he could change the music around them. The music was just a backing to the vocals, whereas a lot of our songs are written so that the music stands up on its own before you put the vocals on, and occasionally you just get this wall of sound thing. Sometimes it must be really difficult for Barney to find any space, but Stephen Hague helped a lot. This was at the time when we were first getting into Macs. He'd gotten a Mac, so we got the sounds we wanted to use on our Mac and let him have them."

**T**HINGS REALLY COULDN'T be going better for New Order at the moment. They're more successful now than ever before, and with their new-found maturity in songwriting they've earned respect right across the music industry. The weekly music press has hailed the arrival of *Technique* as the high point in their career. Morris has his own ideas about why the band is successful . . .

"We draw our influences from things that we like or are interested in. The area known as 'dance music' is the only area where anything interesting

has been happening. Rock 'n' roll seems to have gone as far as anyone can take it. There isn't really anyone doing what Lou Reed and the Velvet Underground were doing. There are loads of Velvet Underground imitations knocking about, but there's nobody working in the same way that they were. One thing that always annoyed me about Joy Division is that we did it, and instead of other people trying to do it but differently, they all copied us. The problem with the music business is that everyone wants a record to sound like the last No. 1 record.

"I don't think we influence people musically as much as Joy Division, because Joy Division started the Joy Division Syndrome. I think 'Blue Monday' was an influential record in that it was copied, for example by Divine with 'Love Reaction.' I think there's more to New Order than just

dance music. There's also acoustic stuff that's more of a soundtrack type of thing. I think that if New Order was just one thing, like an electro-dance group, we could be very influential, but it's the whole attitude, and even, in a way, the image that's important."

That image used to be one of great mystery, of a band from Manchester who released doom-laden records and never did interviews. Nowadays it's all so different . . .

"I don't mind doing interviews, I'll talk to anyone," Morris reveals. "Usually I get picked on by Irish tramps in the street, I'm that sort of person. Out of a group of 20 they'll pick on me and start telling me their whole life story and I, like a fool, listen to them. I can't help it – 'Oh, yeah, you're alright mate, you and me against the world, eh?'"

Very often when success takes a band away from its roots, its values become distorted, and that very success sows the seeds of destruction. New Order is staying true to its beliefs and its origins. They have refused to play conventional music business games and seem to have carved their own enviable niche in the world of popular music. It's a technique that's served them well for the last ten years, but only now is the real New Order coming to light. ■

# LISTENING LAB

Our reviewers did some hard listening this month and came up with some highly recommended tracks to help you think about how you put together your own sounds.

---

JOE SAMPLE

*Spellbound*

Warner Bros. Records



### Pick of the Month

Here's the most musical use of technology I've heard in a while, and it's no wonder. Long-time Crusaders' keyboardist Joe Sample fronts one of those mega-bands (Marcus Miller, bass; Omar Hakim, drums; Michael Landau, guitar; Lenny Castro, percussion), throws in some remarkable vocalists on a few tunes (Michael Franks, Al Jarreau and Take 6), and gets some of the most technically hip arrangers and programmers around (Larry Williams, Jerry Hey and Robbie Buchanan) to round it all out. The quality of musicianship is impeccable, and Tommy LiPuma's production is, expectedly, excellent. It's one of those albums you slip on after dinner and wear late into the evening.

Great care has been taken on the synth arrangements – and it is regrettably so successful that you begin to

wonder why anyone would hire a string section any more. Sample uses an "Acoustic Grand Piano w/MIDI" (no credit to manufacturer or retro-fitter) to excellent advantage, blending percussive and electronic textures with mesmerizing grace. With such a seamless production, it's impossible to tell where Joe stops and Larry Williams begins to contribute to the synth performance, but you really don't care. It's a sonic striation impossible to resist.

Every album is entitled to one flop, and for me *Spellbound's* belly-up comes with the vocals on 'Luna En New York.' If I was going to tape this, I'd skip that tune altogether.

Nonetheless, if you like music with a great jazz feel that has an ear cocked towards the romantic, this album's a must. Guaranteed to leave you warm and glowing. ■ *Deborah Parisi*

---

HAROLD BUDD

*The White Arcades*

OPAL Records

Who is Harold Budd? Ever heard of Brian Eno, Daniel Lanois, or the Cocteau Twins? His collaborations have established him as a master of sonic textures: *The Pearl* (Eno, Lanois), *The Moon and the Melodies* (Cocteau Twins), and *Plateaux of Mirrors* (Eno). His latest work is being released on Eno's newly-formed OPAL label. As always, the power of this music lies in the tone quality of the complete aural tapestry instead of a melodic or harmonic emphasis. *The White Arcades* is space music of a majestic simplicity, warm and infinite.

Without careful listening one can easily miss the point; this is not sonic wallpaper. An ever-shifting balance of textures is carefully manipulated to create space. Although there is seldom any silence, a feeling of contemplation and silence pervades the most interesting pieces: the title cut, with its shimmering textures of acoustic piano, synthesis, and processing; 'The Algebra of Darkness,' translucent and elusive; and 'Totems of the Red-Sleeved Warrior,' co-written with Eno (who also engineered the track), intense and reminiscent of the end of *2001: A Space Odyssey*. Forget about drum machines and sequenced obscurity, this music feels alive despite its electronic nature. Like all great music, it takes repeated listening to get "inside" the subtle pulses and to appreciate the traces left with the listener. ■ *Mihai Manoliu*

---

MIDGE URE

*Answers To Nothing*

Chrysalis Records

In the classic example of an unreliable narrator, Midge Ure blatantly lies in his hit song 'Dear God': "I'm a simple man with simple words to say." Wrong, Midge. With a consistent theme of world-consciousness running through the lyrics, these words are simply *not* true.

*Answers To Nothing* can be considered a model of orchestration technique. Ure expertly blends bubbling, restless rhythm programming with live drums and synth arpeggios to produce a lively, yet uncluttered, backdrop to the vocals and clean, chorused guitar. His synth pads, when called for, pro-

vide interesting timbres without impairing the listener's focus on the melody; and the effects processing on both vocals and instruments, while definitely felt, *never* bottles the sound in washes of reverb or cages of gate – the wide-open-air feel is present throughout the album.

Fans of Ultravox are sure to be pleased with Ure's solo effort. Much of that band's grandeur is retained in such songs as 'Just For You,' with vocal lines that soar across Ure's expansive range. Midge-melodies have always had a quality of reminiscence coupled with scintillating energy, and this album is no exception. Tunes like 'Homeland,' with a chorus that echoes phrases of 'Gethsemane' from Rice and Webber's *Jesus Christ Superstar*, and 'The Leaving (So Long),' similar in feel to Peter Gabriel's 'Don't Give Up,' present the familiar in Ure's own unmistakable context.

The real gem on this album is 'Sister and Brother,' a fiery duet with Kate Bush, and an obvious candidate for single release. Both singers flaunt their stuff in this hard-driving song about loyalty, complete with Midge's octave-hopping and a trademark Kate Bush dozen-layer-vocal vamp-out; a treat for Bush and Ure fans alike.

*Answers To Nothing* does, in fact, provide one big answer – it's a good place to find good music. ■ *Dan Rue*

---

## PAULA BRION

### *Excuses (12" remixes)*

*Tommy Boy*

'Excuses' (four mixes, including Club Vocal, Excuses for the Birds Dub, Liars Choice Dub, and the Radio Edit – the first and fourth are my favorite) features a riveting beat with a fresh kick drum that reminds me of an iceberg (big, solid, and with more down low than visible/audible up top). It also features analog bass, tasty sparse synth and sampler work, and a vocal performance that grabs you and throws you against the wall (the *a cappella* intro to the club vocal mix is particularly soulful, reminding me of Patrice Holloway's rendering of 'Walkin' on Beaver and Krause's *Gandharva*). The Club Vocal remix is a must for your next party dance tape (and that kick drum is worth studying). ■ *Yung Dragen*

---

## Inner City

### *Good Life (12" remixes)*

*10 Records/Virgin*

'Good Life' comes from that Techno unit 'Inner City' which produced the chart-topping 'Big Time.' This release contains *five* mixes of 'Good Life' by Derrick May, Steve "Silk" Hurly, Kevin Saunderson (original producer and one of the co-writers), Juan Atkins, and Mike "Hitman" Wilson, plus a new remix of 'Big Time' by Les Adams. The components include pop/soul female vocals, a cute sampled voice used for keyboard turnarounds, drum machine Latin percussion, TR808 kick and claps, and a chewy synthesized piano comping the four-chord melody throughout. May's remix is my second favorite, with emphasis on the Latin percussion, bars spliced and turned around, and breakdowns that include a good muted-bomb doubling of the claps and really thin filtering of the synpiano. Hurly adds a bunch of gunshots and squeaky sounds to the percussion line, with the bouncy, understated analog bass brought a little more to the fore (featuring great stereo tricks on the intro) and the voice samples are all but buried.

Saunderson believes in a strong bass too, tom fills, and extra keyboard lines, along with letting the vocal have more space. Atkins presents the simplest remix, with a few long reverse claps thrown in. Wilson's remix is the one that shines brightest of all – he moves the beat around quite a bit (making it swing), lays in staccato sampled snippets of the lead vocal, adds some resonate acid synth, reverses a few beats, and even throws in a dead stop – and that's the intro. My only problem with 'Good Life' in general is that in the end, it winds up sounding like a 'Big Fun' B-side. ■ *Chris Meyer*

---

## DINO

### *24/7*

*4th & Broadway/Island Records*

First you have to stop snickering at the name. Just because it's shared by the Flintstones' dog and an infamous, if questionably talented, film director doesn't mean Dino Esposito can't kick out a groove. He can, and *does*, aided by some of the most interesting tech-

nical orchestrations I've heard for awhile.

It was bound to happen, I suppose; someone just had to come along with enough musical savvy and street smarts to mesh new age synth arpeggiation ('The Opening') with hip hop drum programming ('No More Heartbreak,' 'Summergirls'), mixing in a heavy R&B overtone ('Never 2 Much of U,' 'Sunshine') and a strong funk sensibility ('Boyfriend-Girlfriend'), to create an album that bridges all of the styles. The result? An album guaranteed to crossover, bringing new appreciation of disparate styles to listeners usually grid-locked by labels.

The sonic strength of *24/7* (translate 24 hours a day, 7 days a week) also resides in the diversity of the sounds, samples and processing, which scream professionalism but maintain their rough and tumble edge. Orchestra hits, pitch-shifted vocals, acoustic piano (contributions by Jeff Lorber) juxtaposed against sampled strings, space effects, funk-up bass (courtesy of Keith Nelson on 5-string) and great drum and horn programming accentuate the fun, imaginative songs.

I'll put myself on the line here. If the first single, '24/7,' doesn't reach #1, I'll quit my job. Honest. ■ *Deborah Parisi*

---

## De La Soul

### *3 Feet High and Rising*

*Tommy Boy*

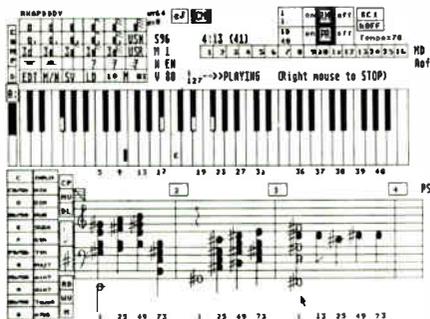
As in "from the soul," as opposed to "in your face." Flower power rap – no joke. Listen to the singles: 'Plug Tunin',' 'Jenifa Taught Me (Derwin's Revenge),' and 'Potholes in my Lawn' – this is a whole album of that stuff. If you haven't heard it, this is the best source for layers upon layers of rare grooves and other spun-in snippets I've ever heard (with bits of TR808 on top, of course), produced (by Prince Paul of Stetasonic) and rapped in the most harmless manner possible. De La even put out a \$500 bounty for anyone who could identify the slowed-down stolen chorus on 'Plug' – nobody got it. (On this album, a trivia game show runs throughout, with a prize offered care of Tommy Boy Records at the end for anyone who can get all four questions right). Smiles are promised. And remember, it's the D.A.I.S.Y. Age – Da Inner Sound, Y'all! ■ *Yung Dragen*

# Dr. T's Keys!

**A step-time sequencing and notation program for the Atari ST. Review by Mihai Manoliu.**

Keys! is yet another addition to Dr. T's already sizable library of ST software. Written as a simple, user-friendly environment for step-time creation of sequence and notation files compatible with the much more powerful sequencing and notational software products available from Dr. T's, Keys! provides users with a score of features usually found in more expensive packages. The most attractive feature seems to be its price; at under \$80, this little gem is priced to sell.

The program's primary functions include a very useful and intuitive step-time entry interface, an interesting algorithmic module called Auto-Composer, and a couple of helpful features like chord-mask and rhythm-mask. The main screen is packed with the necessary icons in a dense yet surprisingly accessible manner. The main screen areas are separated into a 61-note keyboard used to input notes via the mouse or keyboard, a grand staff that typically shows three to four measures of musical notation, a box for choosing the note and rest values, and a chord mask box used to choose any of the 12 tonics and an associated chord type (12 are available). There are nearly 30 other small boxes used for such details as accidentals, copy/move/delete functions, MIDI channels,

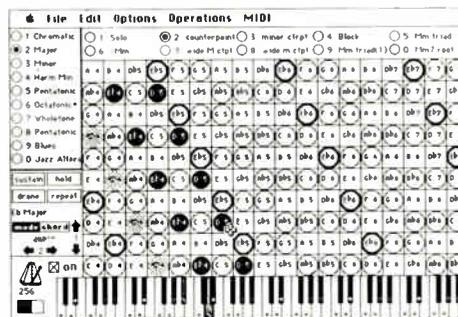


Dr. T's Keys!

velocity, dialog area, rhythm mask, tempo, etc . . . Truly a study in ergonomic design.

The player piano feature lets the user see the actual keys being played as the music unfolds - a nice touch. Music input on screen can be played with the Atari's cheesy internal sound chip or via MIDI. The chord mask puts a series of tiny icons on top of the keyboard so that one can instantly see all the notes applicable to a certain chord. As the player piano plays, it becomes a lot easier for a beginner to visualize and understand the relationships between key signature, chords, and melody. The rhythm mask defines the time values for notes as they are input by using a pattern from previous data, thus simplifying the task of inputting motifs. This feature also comes in handy in conjunction with the Auto-Composer, which is quite powerful. A series of variable settings give a wide range of control: key change frequency, scale type, melodic tension, chord scale degree start, chord change frequency, harmonic tension, rhythmic values, velocities, and octaves. The rhythm mask can be used to determine velocities and rhythms while the Auto-Composer generates random variations based on the parameters.

Keys! is definitely geared toward the beginner and as a consequence it lacks some professional features. For example, there is no support for MIDI Files (and therefore other non-Dr. T's sequencers), no grandstaff scrolling to follow the music, and playback can be quite erratic (depending on how dense the file is). Similarly, the music print-out of the program is extremely simple. Nevertheless, this program can be a great introduction to many facets of music: theory, notation, step-time entry,



Harmony Grid

single note editing, and especially algorithmic composition. Keys! is a real bargain.

**PRICE:** \$79

**MORE FROM:** Dr. T's Music Software, Inc., 220 Boylston St., #206, Chestnut Hill, MA 02167. Tel: (617) 244-6954.

## Hip Software Harmony Grid

**A Macintosh program that combines algorithmic composition with educational music theory. Review by Robert Rich.**

Harmony Grid lies somewhere in the realm between Laurie Spiegel's "Music Mouse" and a fun lesson in harmonic theory. The program centers around an innovative technique for displaying musical harmony consisting of a grid that fills the screen of the Macintosh. The tonal "distance" (in semitones) between adjacent grid boxes affects the visual patterns of chords and scales as they appear on the screen. As you move the mouse across the screen, Harmony Grid plays only those notes that fall within a selected mode and automatically harmonizes these notes with a selected class of chords.

The grid provides a unique way to view harmonic structures, stressing the similarities between various chord types and de-emphasizing their variations from key to key. In other words, a major triad will make the same visual pattern in Harmony Grid regardless of the key or mode you play it in. Inverted or transposed versions of a chord are quickly recognizable. From an educational point of view, the grid is a great way to show harmonic theory in action. The grid confused me a bit at first. However, the elegance of the grid metaphor impressed me once I got over my head-scratching.

Harmony Grid's flexibility sets it apart from many other performance-oriented algorithmic programs. Not only does it give you many parameters to play with, it also lets you customize your chords and scales. You can personalize your Harmony Grid performances, making them feel jazzy, bluesy, baroque, minimal or any shade of

strange, and you can save setups once you change them. While just fooling around, I discovered settings that sounded amazingly like Bartok. Harmony Grid parameters include a palette of 10 chords and 10 modes, grid dimensions, tempo, staccato/legato, MIDI and more. You can change many of these parameters while playing the grid by pushing corresponding keys on the Mac keyboard. You can modulate keys just by mouse-clicking on a note in the grid. The screen quickly rearranges itself around any new tonic or mode, and the musical output reflects these changes with nary a hiccup.

Harmony Grid can play music on the Mac's own sound chip, or externally on a MIDI synth. It can monitor notes from MIDI and harmonize them with any selected chord (although it will not limit these MIDI harmonies to selected modes as it does when harmonizing to mouse movements). By combining custom-made chords and modes with dexterous mouse, Mac and MIDI keyboard control, you can play some pretty wild music. This sort of variety gives Harmony Grid a life outside of "mere" education.

Alas, Harmony Grid cannot remember the actual notes of a performance, but you could always record them into an external sequencer. MIDI Files would come in handy here. While I'm griping, I must say that I don't like Harmony Grid's copy protection, Softguard, which leaves joker files in your system folder that confuse virus killers like Vaccine and make hard disk backups a real pain. Some people will say it's a necessary evil, but I'm not one of them.

Harmony Grid has an excellent manual. Not only does it tell you how to get the most out of Harmony Grid, it gives a great introduction to harmony in general and describes how to notice harmonic principles while playing the grid.

David Levitt of Hip Software thinks Harmony Grid is best for "hobbyists and amateurs who never learned much harmony theory, who would learn if it were more fun than practicing scales." I agree. Harmony Grid is fun, and its programmability allows plenty of creative possibilities. ■

**PRICE:** \$99

**MORE FROM:** Hip Software Corp., 117 Harvard St. 3, Cambridge, MA 02139. Tel: (617) 661-2447.

# Musicode TX81Z/DX11 Voice Development System

**A voice editor/librarian for the Yamaha TX81Z/DX11 and the Atari ST. Review by Scott Wilkinson.**

IF YOU HAPPEN to own an Atari ST computer of any flavor and a TX81Z (or the functionally equivalent DX11), you'll want to know about a new voice editor/librarian from Musicode. The TX81Z/DX11 Voice Development System (VDS) provides a number of interesting features that make it well worth consideration.

VDS offers seven separate editors for Voices, Performances, Chord Effects, Delay/Pan Effects, Microtuning, Utility Parameters and the Program Change Table. The editors are available for selection in the bootup screen and the Control menu.

Speaking of bootup, VDS does some things when you first run it that bothered me somewhat. For one thing, it sends a message to the TX that turns its memory protect off. When I asked the company about this, they said that, after serious consideration, they decided that control of the TX should reside in the computer and not in the instrument itself. I personally would rather have manual control over this function, in the event of an accidental erasure of patches, but it may not bother you. Another minor annoyance is the fact that the program sends a performance called "Dual" at bootup. The company informed me that this is intended to "initialize" the TX and can be replaced with any other performance on disk or defeated if you want. For something like the MT32 that doesn't have a battery backed-up memory this could be a great feature, but I'm not convinced of its value for the TX81Z.

Each editor is very logically laid out and easy to use. The Voice and Performance Editors include eight edit buffers that allow you to generate and



compare up to eight different versions of the voice or performance that you're working on.

As I mentioned before, VDS includes several very nice features. Among these are Power Keys (that allow you to quickly change one or all parameters to the maximum, minimum or default values) as well as a Voice Randomizer and Mixer. These functions let you specify which parts of the current voice are to be mixed and/or randomized to create new versions of existing voices. Another very cool feature is called Autoload. This allows you to automatically load specified voice banks, effects and microtunings whenever you load a performance into the Performance Editor. All of this data is also sent to the instrument at the same time.

VDS also includes its own built-in sequencer. This allows you to audition voices, performances and other setups in a musical context without leaving the program. The sequencer runs asynchronously with the rest of VDS, making it possible to change parameters while the sequence is running and hear the result immediately. It even provides an overdub facility for multitrack recording. The sequences are saved in MIDI file format and can be imported to other sequencers that recognize this format if you happen upon your next hit while programming sounds.

Aside from a few minor quirks, I feel that VDS is definitely worth looking into. The sequencer and real-time editing features are particularly cool. If you need a TX81Z/DX11 editor/librarian for your Atari ST, this program could easily fit the bill. ■

**PRICE:** \$99

**MORE FROM:** Musicode, 5575 Baltimore Dr., Suite 105-127, La Mesa, CA 92042. Tel: (619) 469-7194.

# Yamaha V50

*Digital Synthesizer*



Photography Melodie Gimple

**As we enter the technological Age of Refinement, Yamaha submits their new FM synth-based workstation to the increasingly competitive market. *Review by Dan Rue.***

**A** new synth from Yamaha is usually pretty big news, and the V50 provides no exception. Up to this point, the only entries into the workstation market to emerge from Yamaha have been low-end, home-consumer products, with the possible exception of their YS200 (see review in MT January '89). But now Yamaha has finally released the V50, their first full-fledged professional musical instrument workstation.

"Refinement" is the key word here – it's what the V50's all about. No, Yamaha is not offering us new technology, but rather a well-implemented *refinement* of their existing technologies. Basically, the V50 embodies two TX81Z 4-op synths, an RX-style drum machine, a QX-style sequencer, a single effects processor, and a disk drive for storage. Let's take a closer look at the finer points of the V50.

The V50 includes a whopping six demonstration Songs (three permanently stored in ROM, three on a demo disk, all fairly negligible), and a Single-voice editing demo. The voice-editing demo races through the steps involved in creating a voice from scratch – a great idea, except that the demo really flies by, hardly pausing for a moment, rendering it far less useful. You're much better off learning to program new voices with the Operating Manual, which, by the way, is extremely well written. In fact, I'm tempted to rave about it, but I'll hold off for now . . .

### The Voices

Because the V50's basic voice architecture is built around two 4-operator, multi-waveform FM tone generators, the editing parameters are pretty much the same as Yamaha's other 4-op synths (see this month's chapter of "Programming Compleat" for more details). However, the polyphony is expanded to 16 notes, with up to 8-voice multi-timbral capabilities. The V50 includes 100 Preset (ROM) Single voices and enough RAM for 100 user-programmable or "Internal" Single voices. Also included are 100 Preset and 100 Internal "Performances," in which up to 8 multitimbral voices can be layered or split across the 61-note keyboard. To augment the V50's RAM memory, an additional 100 Single voices and 100 Performances can be stored in an external RAM card. And, in addition to that, countless voices, Performances, and setup data can be saved to floppy disk. Needless

to say, there's plenty of room to store your patch creations.

The V50's four operators can be arranged in any one of eight algorithms, with any one of 8 waveforms assignable to each operator. Further manipulations on each operator include: pitch and amplitude modulation, EG Bias, and Key Velocity sensitivity settings; individual detune; a 5-parameter Envelope Generator; rate and level Keyboard Scaling; and Output levels. On top of that, the overall sound can be modified by an LFO with saw, square, triangle and random wave options; a 6-parameter Pitch Envelope Generator; Transpose; Portamento; controller and aftertouch settings; and digital effects processing. All of these functions are quite clearly laid out across the front panel and accessed via 11 buttons that are large enough and positioned far enough apart to let you develop a quick technique for hopping through parameter pages. Very intuitive. If you're unfamiliar with all this tech-terminology, don't worry – the manual explains every single function *very* clearly.

Simply put, the voice editing capabilities on the V50 are virtually identical to the TX81Z and DX11. There is, however, one very nice exception: the 12th button. The 12th button is labeled "Quick Edit" – a name that speaks for itself. With this function, you can perform adjustments on the Attack, Release, Volume (output level for carrier operators), and Brilliance (output level for modulator

**Manual** "Yamaha should get an award for the Operating Manual. We're talking a table of contents, full index, dozens-upon-dozens of cross-references, detailed instructions on how to edit with FM synthesis and more."

operators) of all four operators *simultaneously*. To illustrate, let's say you've found a string voice that you like a lot, but the attack is too slow to accommodate the quick riff you're trying to play. You press the Quick Edit button once to call up the Attack page (repeated pressing reveals the other three functions). The display shows the current levels of Attack Rate. By moving the data slider or using the plus and minus keys, the levels of the Attack Rate (actually, Attack Rate and Decay 1 Rate) for all four operators shift in proportion to each other, rendering an immediate and significant

alteration of the original voice. Needless to say, this is a great little brain-child and it works very well – almost as good as ol' analog programming.

Another function designed to simplify editing is found by pressing the Store/Copy button in the Utility section of the synth. This lets you copy specific parameter values from one operator to another – another very nice feature.

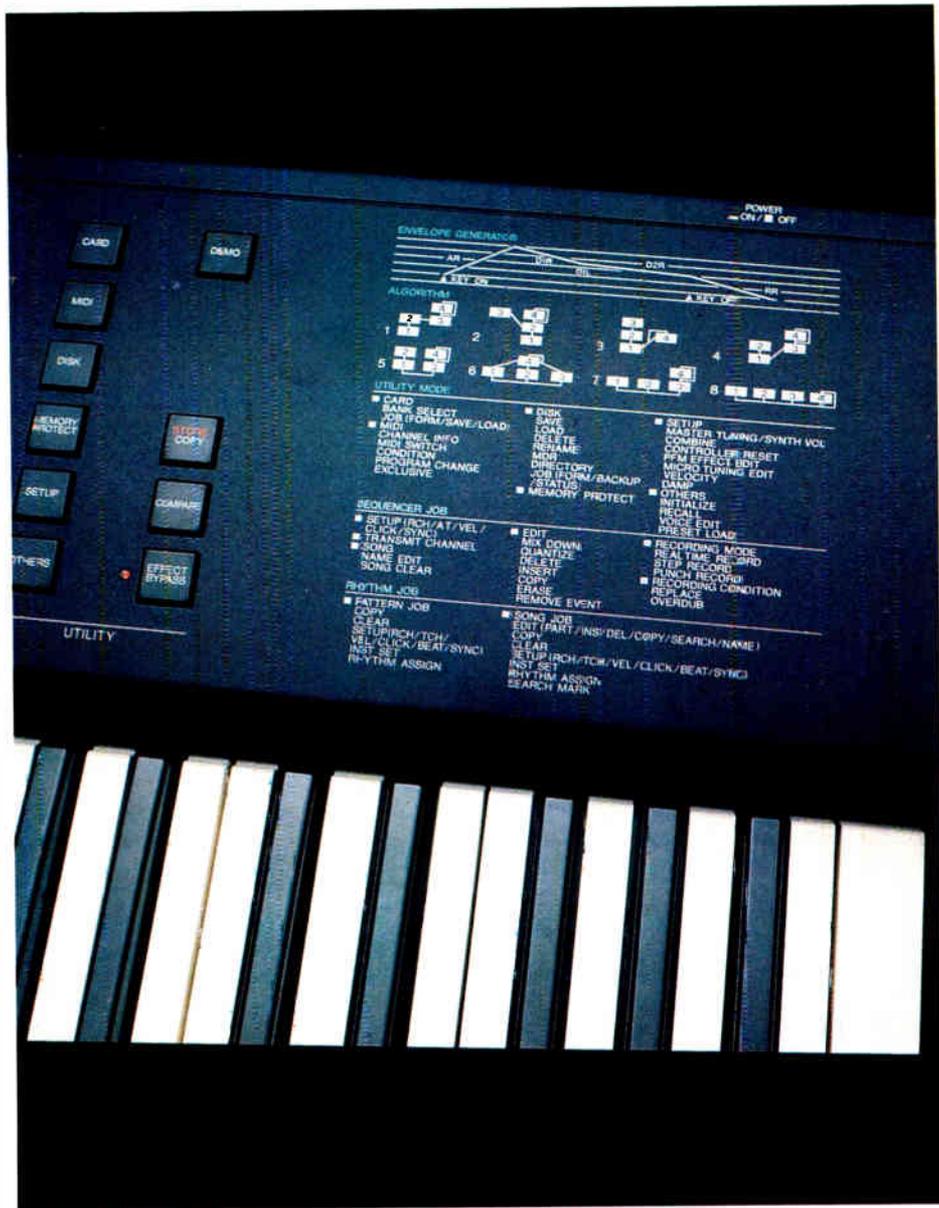
Finally, last in the chain of stuff to tweak is the digital effects processor. Thirty-two different effects are available, including hall and plate reverbs, delays and echoes, several gated reverbs, distortions, early reflections, EQ, and others. You can save a different effects setting with every Single Voice and similarly, one effect for each Performance setup. After selecting the effect you're going to use, you can set the Output Level for the effect, and the effect-to-signal balance. By pressing the Effect button a second time, three additional parameters are revealed for tinkering. These three parameters vary, depending on which effect you're using. For example, the first effect, 'Reverb Hall' (along with several of the other reverb effects), allows you to adjust the reverb time (0.3sec to 10.0sec), the low-pass filter setting (1.25kHz to 12.0kHz or bypass), and the first reflection delay time (0.1msec to 50msec). Once again, the manual offers detailed explanations of each parameter for each effect.

Because the V50 has only one effects processor, the effect you choose will affect not only the Single voice you're

working on, but all of the voices used in Performance mode, as well as the drum kit sounds in the rhythm machine. This setup is similar to Roland's D20, and certainly suffices for the most part. However, it does present some problems when dealing with the rhythm machine. More on that later.

### Performance Mode

In the Performance mode, you can combine up to 8 Single voices at once by layering them all together or assigning various splits across the keyboard. This allows you to store your basic multitimbral setups, and ▶



located in the Utility functions and additional personalized temperaments can be stored on external RAM cards or on disk. Most of the alternate preset tunings are rather subtle, but can be very effective and are definitely worth exploring. This is an excellent feature of the V50, and one that sets it apart from other workstations currently on the market.

As in Single mode, you can set and tweak the digital signal processing while in Performance mode. Once again, this has a global "effect."

Yamaha defines a Performance as a combination of voices and a "Setup" of the other various parameters. As a result, you have the option to save entire Performances or just "Performance Setups" to disk or RAM card. Similarly, the Performance Effect data can be saved separately onto RAM card. As with Single voice editing, you can "copy" and paste entire Performance setups or specific parameters within a Performance to other Performances with the Store/Copy button in the Utility section.

### The Rhythm Machine

Anyone familiar with Yamaha's RX line of drum machines (particularly the RX21), will have no trouble finding their way around the V50's Rhythm mode. As with the voice editing parameters, the setup of buttons and displays is very intuitive and a number of editing options are available.

On the right-hand side of the front panel, all of the rhythm machine's editing functions are listed by page. This makes for a quick and very useful reference (I was checking it out constantly) - nice touch. Writing Rhythm Songs basically entails writing Patterns of 1 to 4 measures in length and then assembling them on the Song edit page. The V50 has room for 100 Patterns and 8 Songs. However, none of this data is permanently stored in RAM, so you must save it to disk or card. This is a bit of pain, but not uncommon (the Roland D20 works this way as well). Just pray that you don't encounter a power surge after hours of programming...

When you enter the Rhythm mode, the drum kit is automatically called up on the keyboard. The kit consists of 61 PCM sampled sounds (one on each of the 61 keys) including 6 kick drums, 7 snares, rimshots, toms, hi-hats, a crash cymbal, and a whole assortment of accessory percussion. The arrange-

► several parameters are available.

Since the V50 is 16-note polyphonic, the first thing you must specify is the note allocation. You can reserve a maximum number of notes for each voice ("normal" mode), assign notes to alternate between two voices assigned to the same MIDI receive channel ("alternate" mode), or (Praise the Lord and pass the RAM card!), set the V50 to Dynamic Voice Allocation (DVA). From there you can set the MIDI receive channels for each voice, high and low note limits (to define the splits and layers), individual Detune, transpose (or "Note Shift"), Volume, left, right or stereo Output Assign, LFO on or off, Performance Effect data, and Microtune on or off.

The Performance Effect data is worth a closer look. These effects are not a part of the digital signal processing and

only apply to the Performance mode. This feature allows you to pan the Performance patch from left to right at various speeds, produce an echo or delayed repeat of the sound at various speeds and pitches, or produce a three-note chord from a single note. A fun example of the chord-generation is found in the preset Performance patch called Big Band (pfP42), rendering an instant Glenn Miller effect. The parameters of all three effects can be tweaked to your liking in the Utility section under the Setup button.

The overall Performance can be assigned to any one of 11 preset microtunings, or one of two user-programmable microtunings that allow you to define the tuning within one octave or for every note on the keyboard. The actual editing pages for the user-programmable settings are

ment of the sounds across the keyboard can be set to one of three preset Rhythm Assignments, or you can position the kit yourself in two user-programmable settings, thankfully stored in RAM.

You have the option of recording Patterns in real time or step time, with time signatures ranging from 1/4 to 32/16 (so, you could conceivably arrange to have 8-bar patterns in 32/16 time). Quantization can be set from 1/4 to 1/32 notes, or turned off. I should mention that "real time" recording provides 1/192 note resolution. This allows you to capture the subtleties of human error.

In Step recording, a single-line 32-segment bar graph representing one measure appears in the display. Moving the data slider reveals the pattern played by each of the 61 instruments one by one. A little diamond appears on the beats where data has been recorded. As the cursor is scrolled forward, the notes you've entered sound when you reach their respective steps. However, the notes do not sound when you scroll backwards (I'm not complaining too loudly - earlier RX models didn't even allow for backwards scrolling). From this page you can mark accents on specific notes by striking the keys hard, or by adjusting a parameter on this page (from 0 to 7).

Editing functions within Pattern mode include copying one pattern to another, linking two patterns together to create a third, Pattern clear, MIDI receive and transmit channel settings, MIDI note number assignment for each instrument, and effects setting (on, off, or stereo mix) for the rhythm machine as a whole.

In Rhythm Song mode, you assemble Patterns into Parts. In addition to placing Patterns into Parts, you can also place repeats, song markers, and volume and tempo changes. Once you have put a Song together, various editing jobs can be performed: jumping from one Part to another, inserting Parts, deleting Parts, copying Parts, and searching for the markers mentioned above.

### The Sequencer

The V50's sequencer records about 16,000 notes in up to eight Song positions with time signatures from 1/4 to 16/16. You have up to eight tracks, in addition to the Rhythm track, on which to record, each with assignable MIDI transmit channels, program

change maps, and playback muting. Like the rhythm machine, sequencer data is not stored permanently in RAM, so you must save it to disk or card.

Real-time and step-time recording is available, logically controlled by a tape recorder-like arrangement of buttons in conjunction with eight Track buttons (also used for voice and Performance editing). These buttons have LEDs beside them to indicate which Tracks are playing. Unfortunately, "punching in" is a bit more of a hassle - while punch-in capabilities exist, you cannot do it in real time. Your start and end punch-in points must be pre-set before you begin recording. Like some of my other gripes, I'm not overly-miffed about this; it's just a bit of an inconvenience.

A little more disconcerting is the fact that the aftertouch and velocity enable/disable cannot be set for individual tracks; these settings affect the entire song. True, you can exit the sequencer and call up the appropriate Performance edit page to accomplish this for each voice - that's only a small hassle. The real problem arises when you are driving external sound sources, like other synths and samplers (which the V50 is quite capable of doing). In these situations, you would have to address each machine separately - not very conducive to creative spontaneity.

On the positive side, however, the sequencer does offer several editing functions once a Song is recorded. As with the rhythm machine, all of the sequencer's editing functions are printed on the right-hand side of the front panel. Tracks can be "bounced," measures can be inserted or deleted in all Tracks as well as in individual Tracks, quantization for individual Tracks can be set from 1/4 to 1/48, and measures can be copied within individual Tracks.

Like the rhythm machine, what you have here is all the necessities. You can write your songs with the V50, but because it lacks some of the more subtle editing functions found on other sequencers, you probably won't be able to perfect them.

### The Bottom Line

So how does the V50 sound? Well, as far as the Single voices go, it sounds like a DX11/TX81Z with effects slapped on it (no surprises there). Obviously, what you really want to know is: "How do the Performances, effects, and drum kit sound?" My answer is: ▶

**F**or a full line of professional equipment, at a price you can afford - call ACE.



**(305) 892-6100**

**ACE MUSIC CENTER**

13630 WEST DIXIE HWY.  
N. MIAMI, FLA. 33161

### Introducing MIDI-CON™



**your link between MIDI  
and non-MIDI devices**

With MEICO's MIDI-CON, you can now have the convenience of controlling your non-MIDI devices with any MIDI unit that can send patch changes, such as a MIDI foot controller. When attached to such a unit, MIDI-CON receives patch changes and converts them to contact closure outputs, for control of devices such as analog delays, multi-effect units and lighting controllers. Call MEICO for complete information on this compact, easy-to-use unit.

**MEICO**  
ELECTRONICS

35 South Dishmill Rd., P.O. Box 251  
Higganum, CT 06441 • (203) 345-3253

► "Quite nice, thank you."

The Performance mode produces some very rich, very thick sounds, often much more so than the previous DX11 because of the V50's 16-note polyphony. While you *could* layer eight sounds on the older synths, the added polyphony makes this layering practical. On top of that, the employment of Dynamic Voice Allocation takes this even further (you'd almost be nuts *not* to use DVA in a heavily layered Performance patch). Excellent examples within the preset Performances include: "V" Brass (PFP57), a huge, anthem fanfare blast; W-limba (PFP51), a cross between a marimba and a nylon string, very pristine; and "V" Bass 4 (PFP67), a thick, super-techno driving synth bass. In general, the V50's strongest points are often brass and bass-type sounds, since those are the ones that tend to capitalize on the sharp, biting characteristics of FM synthesis.

The digital effects on the V50 sound are very well-implemented and sound very good and well-rounded. The reverbs are clean, the distortions are dirty . . . you won't be dissatisfied. The impact of the effects on the voices is

notable, often making a world of difference, especially on the string, brass and "atmospheric" timbres. This, of course, has its strong points and weak points - and the weak points become evident when you're using the sequencer and the rhythm machine's drum kit.

**Quick Edit** "Within this function you can perform adjustments on the Attack, Release, Volume, and Brilliance of all four operators simultaneously."

About those drum sounds . . . What we're dealing with here is compromise. Yes, the drum kit consists of PCM samples; yes, the samples are positively superior to a synthesized kit. But geez, the samples are just *too* short! The timbres are fine, the samples are clean, but they're so short that when used unprocessed, they simply don't pull their weight. So that's what the effects processor is for, right? Well, yes and no. Because the samples are short, they tend to get swallowed up when using a heavy effect. This is where the compromise comes in. Some of the Performance sounds really *need* heavy processing to sound great. Take "V"

Brass 1 (PFP01) for example. This is a huge, grainy, biting brass patch. The preset effect attached to it is Rev. Hall (the longest reverb effect setting). Without this reverb, the patch is really pie-in-your-face, almost cheesy, and much too up-front to be usable. This illustrates the constant compromising

you must endure when choosing sounds to use with the sequencer and rhythm machine - you can kiss those atmospheric timbres goodbye . . .

### The Verdict

Aside from the problems with the balance between the synth and drums, and their relationship to the effects processor, the V50 still offers some improvement sound-wise over Yamaha's previous 4-op synths. The expanded polyphony and the implementation of Dynamic Voice Allocation really makes a difference in the Performance patches. As I said at the beginning of this review, the V50's strongest point lies in its refinement.

Brace yourself, I'm going to rave now - Yamaha should get an award for the Operating Manual accompanying the V50. Or perhaps they should assume Toyota's motto: "Who could ask for anything more?" We're talking a table of contents, full index, dozens-upon-dozens of cross-references, easy-to-read detailed - no, make that *very* detailed - instructions on how to edit with FM synthesis (why did we ever think it was so complicated?) . . . the works. Couple all of this with the too-cool Quick Edit functions, and programming FM voices from scratch has *never* been simpler.

The sequencer and rhythm machine functions are very intuitive, and the arrangement of the front panel approaches the innate - you know where to go without checking first. The massive storage capacity of RAM voice presets, along with the disk drive and RAM card port, add all the more power. As a complete product, a true workstation, the V50 scores high marks. ■

**PRICE:** \$1895

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

## KEYBOARD SPECIALISTS

FOR MUSICIANS/BANDS/STUDIOS  
CHURCH/HOME/SCHOOLS

ALL MAJOR BRANDS

- SYNTHESIZERS
- DIGITAL PIANOS
- SAMPLERS
- DRUM MACHINES
- SOFTWARE
- MIXERS/AMPLIFIERS
- RECORDING EQUIPMENT

VOLUME DEALER

NEW & USED

ALL BRANDS

ALL MAJOR  
CREDIT CARDS

PROFESSIONAL  
ADVICE

Call for a catalog and pricing information

## RHYTHM CITY

287 East Paces Ferry Road N.E., Atlanta, Georgia 30305

1 (404) 237-9552 • 1 (404) 433-2777

## upgrades & updates

It's a jungle out there! How are you supposed to keep track of the latest (and endless) hardware and software revisions? By reading MT's Updates and Upgrades, of course.



■ **MPC60 and ASQ10:** Akai Professional has released new system software, version 2.0, for their two Akai-Linn products. The update consists of four chips, installed for free by authorized Akai service centers. New features in version 2.0 include: support for 64 MIDI output channels (with each of the four MIDI Outs supporting an independent set of 16 channels), simultaneous recording on all 16 MIDI channels, a "multi-pitch mode" (for the MPC60 only) that allows the user to assign one drum sound to all 16 pads in order to play the sound in 16 chromatic pitches, individual track volume output control, real-time control of the mix while recording into the sequencer (MPC60 only), global editing of velocity and duration values in individual tracks, and adjustments to SMPTE within 1/100 of a frame. The SysEx buffer has been tripled, and several other features have been added as well.

– Akai Professional, 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114. Version 2.0 update is free to owners by contacting their local authorized Akai Service Center for installation. The new price for the ASQ10 is \$1199 and the new MPC60 price is \$3299.

■ **MX8:** Digital Music Corp.'s MIDI patcher/processor can now be updated to version 1.31 with their new ROM

chip. The new chip, installed by the user, allows the MX8 to perform companding functions that compress or expand the velocities of incoming MIDI notes.

– Digital Music Corp., 5312-J Derry Ave., Agoura Hills, CA 91301. Tel: (818) 991-3881. Version 1.31 ROM chip update: \$10. MX8 retails for \$395.

■ **Performer:** Mark of the Unicorn has released version 2.4 of their popular sequencer for the Macintosh. New features include audible playback directly from the event list, MIDI File compatibility, recording and editing System Exclusive messages, a conductor track for editing tempos and meters, a MIDI channel activity monitoring window, and a "change key" command for viewing note events.

– Mark of the Unicorn, Inc., 222 Third Street, Cambridge, MA 02142. Tel: (617) 576-2760. Update is free to all registered owners. Performer retails for \$395.

■ **Roland product modifications:** **D50:** internal memory expansion to a total of five internal banks of patches and tones, along with full use of the external memory card slot, \$350. **D550:** memory expansion, 8X's the internal memory, \$500; 16X's the internal memory, \$750. **GR700:** MIDI In mod, receive channel is selectable, and performance parameters can be set to

receive or not, \$200. **GM70:** All B-string mod, allows for the use of all B-strings on the controlling guitar, for faster tracking in the lower registers, Auto Tune feature allows for accurate tuning placements for the new B-strings, \$150. **JC120:** turbo Chorus mod, adds Killer Distortion sound to chorused sounds, features channel switching via footswitch, enhanced EQ and range of distortion and overdrive tonality, \$300. **MT32:** memory backup mod, allows the MT32 to retain edited parameters after powering down, \$95. **S50:** +8 Output mod, adds eight polyphonic outputs to the existing outputs, with dynamic allocation, version 2.0 software for the S50 allows for visual editing of tone assignments to the eight outputs on a new edit page, \$350. Also for the S50: SCSI hard disk interface mod, \$500.

– Top Gear, Inc., 6742 Balboa Blvd., Van Nuys, CA 91406. Tel: (818) 786-1177.

■ **Synthworks MT32:** Steinberg/Jones has completely revamped and renamed the program to Synthworks D10/D20/D110/MT32. The program, now in keeping with other programs in the Synthworks series, features a graphics-oriented user interface, various pages to address specific parameters, a main page that displays all envelopes, filters and parameters, and a "mixing console" page with faders, pan pots and muting switches for editing the nine multitimbral synth parts. An on-screen keyboard lets you audition sounds as you make changes, and a built-in sequencer (compatible with Steinberg's Pro24, sequences can be saved on disk) lets you audition sounds in a musical context. Also, Synthworks features random patch creation functions, allowing up to four sounds to be combined into one, with various user-defined masking; and a "Drum Kit Editor" that graphically displays all of the percussion sounds and their parameters. Finally, the program will convert D50 sounds to D10, D110, D20 or MT32.

– Steinberg/Jones, 17700 Raymer St., Suite 1001, Northridge, CA 91325. Tel: (818) 993-4091. Update costs \$35 to owners of the original program. Retail price: \$199.

**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; GENIE, Musicmkr.LA; or FAX (818) 407-0882.

# PATCH WORK

**Freeze:** Put down whatever you're doing and start programming your synths. You heard it right, get moving! We want your patches, and we want them NOW! That's right, fill in a patch chart from your user's manual with all the necessary data. That's it, now stick the completed chart, along with a blank one and a tape demonstrating the patch, in an envelope and send it to this address: Patchwork, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.

Calm down, you're getting something out of this too - if we publish your patch you get a free year's subscription to MT (add it up, Buddy, that's a \$25 value). Now move it!

## ROLAND D50 Tinker-Bowl Bruce Mara, Reseda, CA

■ This is essentially a bell sound, but with a distinct timbre - sort of like a metal mallet striking a metal bowl, hence the name. The upper register has a high ring without peaking too much, and the middle register has a pleasant hollowness about it, good for arpeggiations.

Patch No. I-97  
Patch Name TINKER BOWL

Key Mode	DUAL
Split Point	C2
Tone Balance	S1
L-Key Shift	-12
U-Key Shift	-24
L-Fine Tune	00
U-Fine Tune	+15
Bender Range	00
After(Pitch Bender)	-12
Portamento Time	00
Portamento Mode	U
Hold Mode	U
Output Mode	01
Reverb Type	03
Reverb Balance	00
Total Volume	15
Chase Mode	UL
Chase Level	00
Chase Time	00
MIDI TrCH	B
MIDI SepCH	OFF
Used Tone	
Upper	SYN-HARP
Lower	INIT-SQU

Tone Name INIT-SQU Used Patch No. I-97

[Common Parameters]

Structure No.	3
Pitch ENV	Velocity 00 KF(Time) 00
Partial Mute	
L1	00
L2	00
SusL	00
EnDL	00
LFD Depth	00
Lever Mod	20
After Mod	00

Wave	TR1 TR1 TR1
Rate	75 50 30
Delay	50 00 00
Sync	OFF OFF OFF
L1	150
Lg	00
Hf	1-0
HO	0-3
Hg	00
Type	04
Rate	99
Depth	+1
Balance	58

[Partial Parameters 1/2]

WG Pitch	Coarse CG C4 Fine 00 00 KF(Pitch) 1 1
WG Modulation	LFD Mode + + P-ENV Mode + + Bender Mode KF KF
WG Wave Form	Wave Form SQU SQU PCM No 31 01
WG Pulse Width	PW 00 60 Velocity 00 00 After Touch 00 06 LFD Select +2 +2 LFD Depth 06 00
TVF	Frequency 60 60 Resonance 00 00 KF(Freq) 1/2 1/2 Bias Point Bias Direction <<4 <<4 Bias Level 00 00
TVF ENV	Depth 00 00 Velocity 00 00 KF(Depth) 00 00 KF(Time) 00 00
T1	00 00
T2	50 50
T3	50 50
T4	50 60
T5	50 50
L1	100 100
L2	100 100
L3	100 100
SusL	100 100
EnDL	00 00
LFD Select	+2 +2
LFD Depth	00 00
After Touch	00 00
TVA	Level 100 100 Velocity +10 +10 Bias Point Bias Direction <<4 <<4 Bias Level 00 00
TVA ENV	Velocity(T1) 00 00 KF(Time) 00 00
T1	00 00
T2	50 50
T3	50 50
T4	50 50
T5	00 00
L1	100 100
L2	100 100
L3	100 100
SusL	100 100
EnDL	00 00
LFD Select	+3 +3
LFD Depth	00 00
After Touch	00 00

Tone Name SYN-HARP Used Patch No. I-97

[Common Parameters]

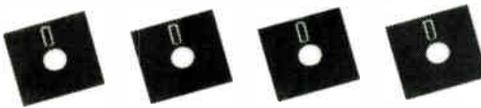
Structure No.	01
Pitch ENV	Velocity 00 KF(Time) 00
Partial Mute	
L1	00
L2	00
SusL	00
EnDL	00
LFD Depth	05
Lever Mod	22
After Mod	02

Wave	TR1 TR1 TR1
Rate	75 50 30
Delay	50 00 00
Sync	OFF OFF OFF
L1	63
Lg	+6
Hf	250
HO	0-3
Hg	+1
Type	1
Rate	52
Depth	54
Balance	00

[Partial Parameters 1/2]

WG Pitch	Coarse CS C7 Fine 00 00 KF(Pitch) 1 1
WG Modulation	LFD Mode A+L A+L P-ENV Mode OFF OFF Bender Mode KF KF
WG Wave Form	Wave Form SQU SQU PCM No 01 01
WG Pulse Width	PW 00 00 Velocity 00 00 After Touch 00 00 LFD Select +2 +2 LFD Depth 00 00
TVF	Frequency 39 38 Resonance 20 00 KF(Freq) 1 7/8 Bias Point Bias Direction <<4 <<4 Bias Level 00 00
TVF ENV	Depth 90 98 Velocity 55 55 KF(Depth) 00 00 KF(Time) 01 01
T1	00 00
T2	26 23
T3	62 30
T4	60 80
T5	92 100
L1	100 100
L2	53 53
L3	01 10
SusL	06 00
EnDL	00 00
LFD Select	+2 +2
LFD Depth	00 00
After Touch	00 00
TVA	Level 100 100 Velocity +15 +15 Bias Point Bias Direction >>4 >>4 Bias Level -2 -1
TVA ENV	Velocity(T1) 00 00 KF(Time) 02 02
T1	00 00
T2	62 58
T3	62 99
T4	52 42
T5	58 58
L1	100 100
L2	64 94
L3	24 12
SusL	00 00
EnDL	00 00
LFD Select	+3 +3
LFD Depth	00 00
After Touch	00 00

# PATCH WARE



**NEWS:** New from the company cleverly called **Patch/Works** comes a new slew of sounds for the **Roland D50** entitled **D-Spectrum Volume Two**. This new compilation features 64 studio-quality sounds accommodating Top 40, pop, dance music, and New Age genres of music. Some of the sounds included are: 'DX7IIrhodes,' 'Funkee Komper,' 'EFEM,' 'FarfisaOrg2,' 'Air Pad,' 'SessionStrings,' 'FenderBass,' 'SharpSampleAndHold,' 'Sojourner-Truth,' 'Jump Horns' (and "many more," of course). D-Spectrum is available on a RAM card (\$89.95), ROM card (\$59.95), or disk (Atari or Mac, \$39.95); you can have a RAM card of your own loaded up for \$34.95. For even more information, contact: *Patch/Works Music Software, P.O. Box 450, New York, NY 10024. Tel: (212) 873-2390.*

For the **Ensoniq ESQ1/ESQM/SQ80** comes a series of sound collections from **Sound Logic**. The complete set of 120 stereo voices is called the **ESQ1/ESQM/SQ80 Modular Voice System** (\$39.95), which includes the **Fundamental 80** (\$29.95 separately) 80-voice collection of "imitative" sounds, covering a "complete spectrum of musical instruments and basic sounds," and the **Unicorn Series I** (\$18.95 separately), a collection of 40 orchestral and synthesizer voices. The Modular Voice System makes extensive use of performance controls and Ensoniq's CVP1 Control Voltage Pedal. Included is a 64-page manual containing program sheets and performance notes explaining the design of each voice and how it should be played. The Modular Voice System is available on "all popular disk formats" or cassette. For more info, contact: *Sound Logic, 1125 Eleventh Street, Ramona, CA 92065. Tel: (619) 789-6558.*

**REVIEW:** Let me start off by saying this isn't just a normal Patchware review. What **Electron Artistics** is selling is the

**M1 Sky Album**, a cross between a program and sequence package inergonomically-placed on four RAM cards. The purpose of the package is to demonstrate the capabilities of the Korg M1, or to put it in their words, to be used as an "audio reference." Now to my understanding, demonstrations ordinarily find their place in 1) the manufacturers' trade show displays, and 2) your local music store. This package is a "home demo," or perhaps viewed more abstractly, an "LP" made to play only on the M1. Personally, if I'm going to dish out my hard-earned money, I want my cards to be packed to the gills with killer sounds. True, E.A. does include a fairly comprehensive sort of "track sheet" for the onboard sequencer, making it a little easier to keep track of what sound designer/artist Ron Crosby has done here. But let's take a look at exactly what the *M1 Sky Album* consists of.

Out of four cards included in the package, *one* had sounds on it. Alas, that *one* only had 50 new sounds and 49 combinations. The rest of the cards were filled with sequences. I must say I was disappointed, as I expected at least *one* full card. As it turns out, I'm glad that it didn't have more than fifty sounds. To be brutally honest, there really weren't any spectacular sounds on it. I personally feel that the M1's factory sounds are "awesome," unfortunately the *M1 Sky Album's* sounds rated somewhere in the "mediocre" category.

There were exceptions: 'Crackles' was a striking sound effect, with a quick attack and a thunderbolt-like timbre; and 'Stormchime' was a mid-range bell chime with an interesting synthetic quality to it. Overall, however, the sounds lacked life, and often times the timbres were very obscure; they were designed for the sequences and simply not very useful outside the context of the *Sky Album*. The Com-

binations were all right, generally making good use of layers and splits, but once again, it comes to the single sounds. So on to the next subject - the sequences.

Sequence 1, entitled 'Velvet Sky,' was a bouncy rock-pop, 4/4 backbeat tune. Not all bad, it entailed some interesting chord progressions and sounds, but nothing like the M1's stock demo, 'Oh Yes.' As I listened to the next six songs, my attention slowly drifted and I finally ended up playing solitaire on my Mac. Well, I guess the songs weren't really *that* bad, but if this product is resting on their merit, it's not resting too well. I can appreciate the time and effort Mr. Crosby put into this project, but I feel that if he's trying to market this in a similar fashion to an "LP," it still needs work.

Brace yourself, I'm going to start talking about prices now. Retail price for the four RAM card collection is \$300 (\$75 each card). If you send E.A. your own cards, they'll load all four of them for \$26 plus \$3 p/h. If you just want a cassette of the music, it's \$9.50. Other formats *M1 Sky Album* is available on include: Yamaha MDF1 (\$35), Synergy Resources Synthview M1 and Key Clique's Sys Ex for Atari ST users (\$30 each), and Opcode's Korg M1 patch librarian for the Mac (\$30). Also, be sure to add \$3 to the price of any of the packages for postage and handling (\$6.50 outside U.S.).

Overall, the concept behind the M1 Sky Album is good. To fully show off your sounds, I think you should do like the factory does and write one or two good sequences; but I feel that the focus should remain on the *sounds*. Regretfully, this package falls a little short of the M1's own factory presets, and marketability of an M1 "album" is dubious. Contact address: *Electron Artistics, 1039 Marty Lee Lane, Carlisle, OH 45005. Tel: (513) 746-4283. ■ P.C. Menotti*

# Fun in the WAVES



Illustration Sophie Lawrence-Jones

**We have the sound sources; we have the technology – now it's time to mix them all together.** *Surfing by Tom McLaughlin.*

In last month's "Fun in the Waves" I discussed designing wavetables from scratch using variations of additive synthesis. You'll recall that a wavetable is a waveform represented as a series of numbers that correspond to the instantaneous amplitude levels at many points along the sound wave. If this sounds suspiciously like the definition of a sample, that's only because it is in fact quite similar. The only difference between a wavetable and a sample is that a wavetable need not have been sampled in real time. Wavetables can be constructed in non-real time with the help of the appropriate software.

The static waveforms described last

month can often give us unique tone colors unavailable anywhere else. But unless you're satisfied with the variations you can achieve using filters and amplifiers, they can get somewhat boring to listen to – at least when compared with sampled sounds. Just as a motion picture is really built out of individual stills, the next step to making more interesting sounds is to string waveforms together. So, it's time to drag out the razor blade and get splicing.

## Sonic Attack

A simple example of better sounds through splicing is a two-segment percussive sound. For the first

segment, find or make a "body" sound that gives you a musical loop – a metallic bell-like or mellow electric piano wave, for instance. Now, find a very bright sound for the attack portion of the wavetable. You can go to town on this, depending on the type of percussive sound you want: a dull, clikky synthesized sound will complement an electric organ wave loop, while the attack segment from a sampled cymbal will give a cutting edge to a struck string sound. Both segments can be as short as one cycle, but since the attack portion (which only needs to be a few milliseconds long) is little more than a click, it need not be in tune with the "body" of the sound. If you paste the mellow segment after the bright one and loop the second segment, it will give you percussive wavetable material that can be filtered and modulated to taste.

My favorite trick when building percussive sounds is to use a clipped waveform for the first segment or so. The first waveform(s) of the wavetable can be purposely clipped to emulate (or, in the case of mixing wavetable material with samples, enhance) the concentrated high-frequency/energy transients characteristic of this family of sounds.

More complex sounds can be created by plotting and then programming the desired harmonic progression wave by wave using computer synthesis. If you've paid attention to starting each segment on a positive-going zero crossing and ending on a negative-going zero crossing, you shouldn't have any problems with clicks between segments. Alternatively, waves can be designed for key transition points in a sound with progressions created by crossfading from one to another. The same goes for sampled sound material; you can take single segments of samples and treat them as if they were additive (or similarly computer generated) sound waves.

As an example, get three distinct tone color segments together. The first should be very loud, the second rather bright and of medium loudness, and the third a very simple, low volume tone color - a sine wave if you like. We'll refer to these as segments A, B and C. For purposes of this example we'll be constructing another percussive sound, so only the second two segments actually need be in tune with each another.

Segments A and B can either be "butt" joined or crossfaded over a short period of time. On the other hand, segments B and C will give you the best results if crossfaded over a second or more. Looping the last segment will enable you to sustain the sound even longer than the raw material lasts, and it can be faded away to nothing with your filter and amplifier just as a real percussive sound would.

Constructing a wavetable of woodwind, string, vocal and other sounds that don't have the pronounced attack of percussive sounds is a simple matter of starting your wavetable with a soft

segment and crossfading to a louder, steady-state segment. The amount of time over which you crossfade will, to a large extent, determine the character of your constructed sound.

You can get as involved as you wish with the number of segments in your wavetable, "butt" joining segments for an abrupt change in quality or crossfading for smoother transitions. The principle remains the same. Remember that "sampled" waveforms can be combined with sample-mixing software to make composite tone colors. Different versions of the same waveform can be designed to take advantage of the "loud and soft" sample switching facility on many samplers. Rapidly sweeping past high concentrations of upper harmonics with a lowpass filter will give a cutting edge to percussive waveforms, and is useful in creating synthesized mallet percussion and plucked/struck string sounds.

### Designer Loops

Seamless loops can actually be designed into a progression of

wavetable segments. Yeah, you can loop around a cycle or two of many sounds and get away with it, but it will lack animation. Something as simple as slightly altering the amplitude of the fundamental or second harmonic in different waveform segments within a loop makes a significant difference. Even the smallest amount of harmonic movement adds life to loops.

Be tasteful with the degree of harmonic change within a loop unless you like more severe effects - harmonics that change gradually sound more natural to the ears. If you're working with sampled source material, try isolating segments that flow smoothly from one to another. With additive synthesis you'll want to change the levels of harmonics only a little from one segment to the next for a natural movement. Crossfading between members of a wavetable will give you smoother transitions, but if care is taken in the first place you may not need to resort to crossfading at all.

Having said that, there should be nothing to stop you from constructing loops with wide variations in tone

## MASTER THE ART OF SAMPLING

GET THE MOST OUT OF YOUR SAMPLING INSTRUMENT  
WITH TIPS FOUND IN THESE HAL LEONARD PUBLICATIONS:

### THE SAMPLING BOOK



by Steve DeFuria and Joe Scacciaferro  
This book provides a complete step-by-step presentation of all the skills needed to master sampling. Topics include: looping, splicing, multi-sampling, velocity cross-fading, resynthesis, choosing the best sampling rate, key mapping and much more. Over 25 actual hands-on experiments walk you through practical and useful musical applications of sampling. Another book in the Ferro Technology Series.

00605666 ..... \$17.95



### SAMPLER SET-UPS

By Terry Fryer  
Set-ups are quick guides that provide step-by-step instructions for every major operation of each individual instrument. Ideal for road musicians, recording engineers, users of multi-keyboard set-ups, as well as the novice. These handy reference guides are printed on durable stock and are 3-hole punched so they can be kept together in a binder.

00239002 Casio FZ-1 ..... \$9.95

Available soon—

00239001 Ensoniq Mirage ..... \$9.95

See your local music dealer or order through Music Maker Publications

#### PLEASE RUSH ME THE FOLLOWING:

\_\_\_ 00605666 The Sampling Book ..... \$17.95  
\_\_\_ 00239001 Ensoniq Mirage Set-Ups ..... \$9.95  
\_\_\_ 00239002 Casio FZ-1 Set-Ups ..... \$9.95

\$.00 Shipping/Handling

\_\_\_ Tax (CA residents add 6% sales tax.  
Los Angeles residents add 6.5% sales tax.)  
\_\_\_ Total

\_\_\_ Check/Money Order enclosed  
(Make payable to Music Maker Publications)

#### PLEASE CHARGE MY:

\_\_\_ VISA  
\_\_\_ MASTER CARD

Account Number Exp. Date

Cardholder's Signature

#### SHIP TO:

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

Mail this coupon to:

**Music Maker Publications**  
**22024 Lassen Street, Suite 118**  
**Chatsworth, CA 91311 MTM14**

color between segments – it's just that you're not used to hearing sounds like this. You may stumble upon some very useful sounds (especially when played back so fast that you can't hear the changes).

Making loops can be approached in two different ways. Segments that flow from one to another then back to the beginning of the loop again give a natural sound, but it can be time consuming to refine these ideal segments. A more practical method is to derive several segments that flow from one to another then reverse their order – A-B-A; A-B-C-B-A; A-B-C-D-C-B-A.

Loops within loops often help conceal the tell-tale loop points. Certain samplers provide the ability to create sub-loops within the primary loop. For example, a loop that is 32 segments long might have sub-loops occurring every 16, 8, 4 and 2 segments; a loop 24 segments long might have sub-loops every 12, 8, 6, 4, 3 and 2 segments. If you have a Casio FZ1 (or other sampler with multiple loops), you can try nesting them on the sampler itself; otherwise, get out a piece of paper and plan some progressions that will duplicate the effect. With additive synthesis, try a slight alteration in the amplitude of different harmonics having differing "sub loop" cycles.

### Stereo Acoustic Events

I like stereo effects – stereo echoes, chorus effects and different reverbs on each side of a stereo mix. Before the introduction of that second audio channel we could either make things sound close up or far away; crisp 'n' clear or smothered in reverb. That was about it. With wavetable synthesis we can design stereo effects into wavetable progressions – amplitude panning, timbre panning, tuning and phase panning. A stereo effect that's easy to program into two wavetables is a simple panning loop (see Figure 1).

A stereo Leslie effect can be created by making the "front," "left" and "right" waveforms brighter than when the sound is at the "rear" (see Figure 2). The effect you're trying to create (best assessed when wearing a pair of headphones) is for the sound to move around your head in a circle. To do this you'll need to adjust the amplitude of the individual waveforms for each channel as you did for the panning loop so that the right channel gets louder as the left channel gets softer

and vice versa. In addition, you'll need to make the louder waveforms get brighter (more high harmonic content) and the softer waveforms get duller (less high harmonic content). The loop is twice as long as the panning example because the sound has to do a complete 360° movement as opposed to the 180° movement for the panning trick. If you're using crossfading between segments and have the facility, experiment with different fade curves (linear, exponential and so on) for different movement effects.

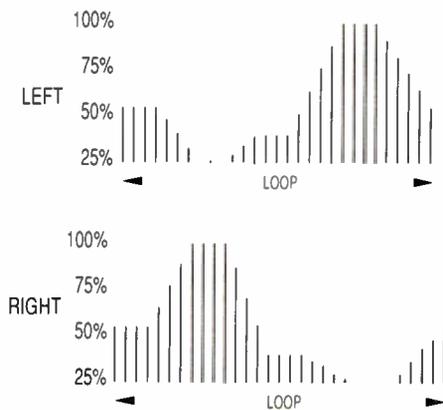


Figure 1.

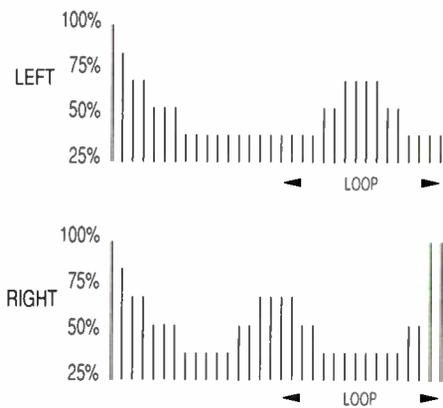


Figure 2.

### Flanging

Many things we take for granted on synthesizers and samplers turn out to be laborious or frighteningly complex programming jobs with additive synthesis. But flanging effects are no more difficult than layering the same sound on top of itself. Play them back at exactly the same time and pitch and you probably won't hear anything, but playing one back slightly delayed or out of tune (static or modulated) with the other will produce phasing and flanging effects.

A new palette of flanging effects lie waiting to be discovered with a tech-

nique available on any sampler capable of playing two samples at once. Loops give a constantly changing phase "swirl" when one sample is slightly detuned from the other. The severity of phase cancellations increases as the samples become more "in tune." Bright samples with a fair amount of harmonic movement will give the most dramatic effects.

### Song Within a Sound

I'll leave you with an esoteric approach to creating sounds from additive synthesis wavetables. For those of you into the nitty gritty side of things, one approach to stringing wavetables together is to think in terms of chords or chord progressions. There are many chords to be found hidden within the harmonic series. Also, intervals foreign to our Western music system are present that may be used to create tension within a progression.

Chord progressions can be constructed by emphasizing different harmonics in different segments of the wavetable. For something much more bizarre than even the most outrageous analog filter sweep effects, try programming a "circle of fourths or fifths" wavetable, ending up on the fundamental chord. Also, if you happen to have samples of a stack of instruments playing chords, you can crossfade between these as well (major to minor is particularly fun).

Progressions may be thought of in terms of block chords or counterpoint. You can experiment with the chord progression of a song's hook line or chorus to reinforce it in the mind of the listener in a subliminal fashion. There's no reason why melodies couldn't be programmed into a wavetable, even entire arrangements in four-part harmony are possible for those with enough patience.

### Surf's Up . . .

While this series hasn't touched upon every aspect of additive and spliced-wavetable synthesis and all of the various permutations available in software or hardware, it has hopefully whetted your appetite enough to experiment. Yes, it's a time-consuming process, but so was painting the Sistine Chapel. At the end of the day, you'll have custom-built waveforms unavailable anywhere else. ■

(For more tips on stereo sampling, read *Sampling in Stereo* in the May '87 issue of *MT*.)

# Why God gave keyboard players only 10 fingers.

Ever wish you had four hands instead of two? Imagine the incredible arpeggios. And all the new ways to split and layer your keyboards. Not to mention dazzling new riffs that are humanly musical, never mechanical.

Great in theory. But in practice, God knows 10 fingers are hard enough to train, control, and keep in shape. That's why Oberheim created a whole series of revolutionary **PerF/X MIDI Performance Effects™**—to take care of things that extra human hands could do. Plus a lot of things they can't do.



## Introducing the Cyclone.™

Give all your MIDI synthesizers a central "live" arpeggiator that's fully flexible and programmable. The Cyclone arpeggiates in any rhythm, any combination of inversions, assignable to any part of each keyboard. "Live" because the Cyclone will store tempo and feel from real-time human "tap," footswitch, or external trigger.

Which means you can even use the Cyclone as a "human trigger" for all your MIDI gear.

The Cyclone is also an amazing source of happy accidents—processing ideas you didn't even know you had into fresh-sounding riffs and parts that store for live performance. Invisible hands, with a head start from 32 factory programs.

## Introducing the Systemizer.™

Forget limitations on keyboard splits, layers, and even the number of voices. The Systemizer transforms your individual synthesizers into one big instrument. So you can use sounds from anything in your MIDI set-up to create new textures while splitting each keyboard 3 ways. You can even combine, for example, a 12-voice and 16-voice synth to create a 28-voice keyboard.

"Floating Splits" actually follow your hand movements. And "Auto Patch" randomly creates and

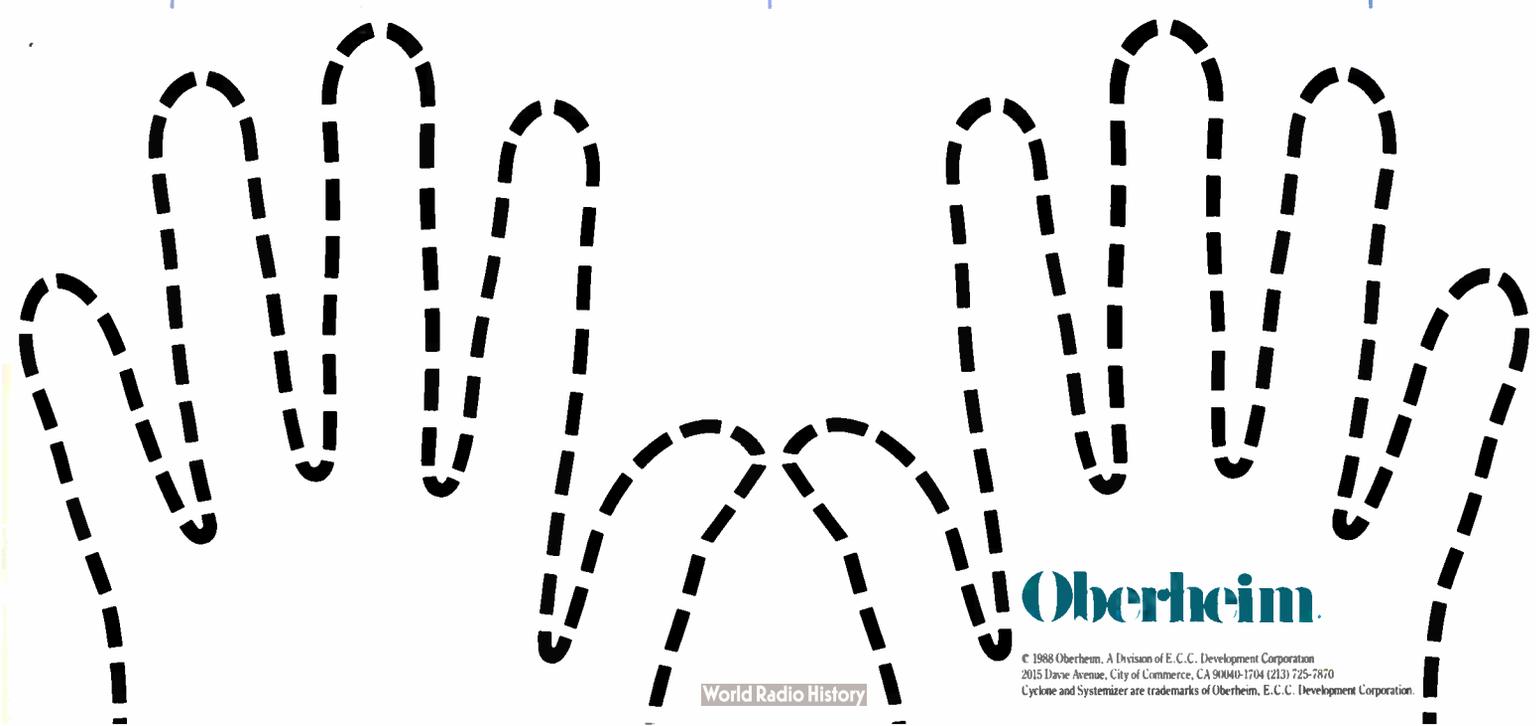


auditions new composite patches from different synths.

Once you find the magic, the Systemizer stores 32 different multi-synth set-ups for instant recall—including patch combinations, volume, controller settings, and splits.

PerF/X MIDI Performance Effects are an incredibly affordable way to turn your MIDI set-up into a whole new experience. So if you've only got 10 fingers, get down to an Oberheim dealer and shake hands with the Cyclone and the Systemizer.

**PerF/X MIDI Performance Effects.**  
**\$249. From Oberheim.**



**Oberheim.**

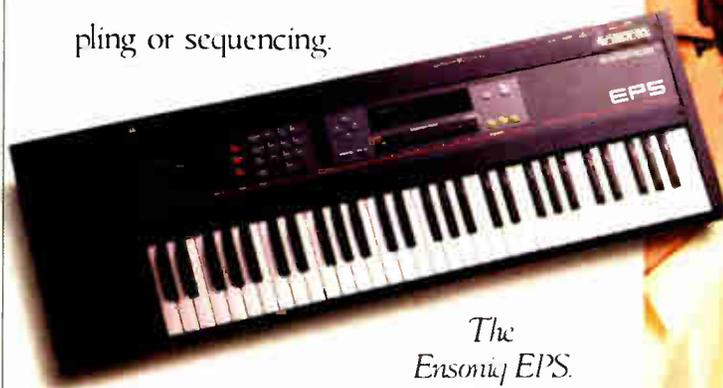
© 1988 Oberheim, A Division of E.C.C. Development Corporation  
2015 Daise Avenue, City of Commerce, CA 90040-1704 (213) 725-7870  
Cyclone and Systemizer are trademarks of Oberheim, E.C.C. Development Corporation.

# TOO OFTEN, OVERP

A funny thing happens when technology advances. It forces musicians to think more and more like technicians. And less and less like artists.

We kept this top of mind when creating the Ensoniq EPS and new EPS-M, two sampler-based workstations that combine sophisticated technology with a fast, intuitive method for sampling, sequencing, recording, mixing and performing.

Ensoniq's workstations let you quickly audition changes in sampling or sequencing.



*The Ensoniq EPS.*

So you have plenty of freedom to experiment while composing and arranging.

The EPS and EPS-M also let you choose from a large library of available sounds, including the new EPS Signature Series of super-pro sounds.



*The Ensoniq EPS-M.*

Key™ pressure and Patch Selects.

The rack-mounted EPS-M features

You can add expression to these sounds with our exclusive Poly-

# POWERFUL TECHNOLOGY OWERS THE ARTIST.



a built-in SCSI port for fast access to storage in an external hard drive. And you can play and load sounds simultaneously.

Putting all this great technology into our workstations took a lot of technical expertise. But turning this technology into great

music takes very little at all. For more information and the name of your nearest Ensoniq dealer, call toll free 1-800-553-5151.

**ensoniq**<sup>®</sup>

THE TECHNOLOGY THAT PERFORMS.

# Sansui WSX1

## Six Track Cassette Recorder/Eight Channel Mixer



Photography: Melodie Gimple

The evolution of the personal multitrack continues with this unique desktop entry from the consumer electronics giant, Sansui. *Review by Bill Lewis.*

The "W" word has crossed the boundaries of the digital domain. This holistic concept born of the health care industry and embraced by computer and synthesizer manufacturers has also found a home in the multitrack tape market. Although some may argue that, in terms of tape, this is not a new genre, evolution has proven once again to go beyond the confines of carbon-based life. Crossing the shoreline and standing a bit more erect than its ancestors, the Sansui WSX1 multitrack cassette deck has landed.

I love the concept. The WSX1 is the natural evolution of the Portastudio design popularized by Tascam, and may be the personal multitrack analog workstation. Why? Because for under \$2000, this 24"×14" desktop unit contains enough features to establish a nearly complete tape recording studio. That's not to say the WSX1 is flawless,

but it certainly has plenty of wiz-bang.

Due to Sansui's incorporation of an eight-channel stereo mixer, a myriad of internal routing possibilities and external patch points, an internal digital reverb, a six-track cassette recorder and a two-track "mixdown" cassette deck, the only name for this unit is "system."

### The Mixer

Each module of the eight-channel mixer consists of a trim control (-50dB to -10dB), high (10kHz) and low EQ (100Hz) each  $\pm 12$ dB, digital reverb send (for the on-board effects processor), effects send for external processors, pan pot, solo button and input level slider. The first six channels have a tape/mic select button for monitoring input or playback of the six-track deck. A similar switch on channels 7 and 8 selects mic/line or the

Aux input buss, which I'll cover a little further on. All eight have 1/4" connections on the front of the unit and channels seven and eight include Low Z cannon connectors on the back, so you can plug in a low impedance source without using a transformer.

The mixer also contains a number of possible monitoring options: Stereo Out, Reverb Send (for the on-board reverb), Effects Send, Deck A and Deck B. Although there are plenty of options, they're *only* routed to the two headphone jacks. The Solo function is routed there too, so when you hit the solo button on any module, it only appears in the headphones and not at the stereo outputs. This is fine when using a set of cans, but it would be nice to have a choice when mixing down.

The headphone outputs also receive the Cue mix. Each of the six tape tracks has a Cue control that determines its level in the headphones. This is an

extremely important section of the system to understand. Here's why.

In order to route a mixer module's input to one of the six tracks of Deck A, you must select whether the input is direct (each of the first six modules can go directly to tape tracks one through six), or through the buss scheme. When bussing, each of the six tape tracks receives its signal from either the right or left stereo buss, and the Pan control on each module determines where output is placed. Because there are only six tracks, modules seven and eight can *only* be bussed right or left.

The Cue system must be used to monitor playback when bussing, otherwise its output becomes part of your new track. That's how tracks are bounced: select Tape as input, bring up the input slider, and Pan right or left to re-record (bounce) to a new track. I found this out by accident. The good news is that my accidental "mix" was a nearly perfect combination of both the new and old source material, but then I had to figure out why they came together. As I discovered, monitoring channel playback through the Cue system while leaving all but the new tracks' input sliders at zero (or shutting off a module's input selection), records only the new material. There is still some crosstalk, but it's minimal and was not something I couldn't live with. And yes, all six tracks can be recorded simultaneously.

### Connections to the World

The outboard effects loop in the mixer has 1/4" connections for mono Effects Send with Stereo Returns. There is also a built-in Digital Reverb which is a misnomer. It's closer to a very short digital delay, although there are three settings and a continuously variable time control. To be honest, this is the weakest part of the entire system; the sound quality is very poor. Apparently Sansui may rework this feature in future editions of the WSX1. The only other 1/4" connection is the Tape Cue output. The remaining connections (and they are multitudinous) are all RCA. These include direct outputs from the six tape tracks as well as left and right outputs from the mixer's Master Level controls (for connection with an external mixdown recorder) and the Stereo Master fader.

Naturally, the WSX1 would seem a perfect adjunct for anyone with a MIDI studio. With six tracks, you can record

a sync tone, lock up to a sequencer, even leave a guard track and still have four tracks left for acoustic parts if you use virtual tracking. Of course, the scenario is to "print" the sequencer tracks in the final mixdown to the two track.

A Sync switch defeats Dolby C (when it's on) for multitrack channel six, and routes sync signal I/O to a pair of back panel RCA connectors. The sync tone *output* is attenuated by a small rotary dial, also on the back panel. The input level for the sync tone recording must be set at the source. Interestingly, I could hear the sync tone bleed through my headphone monitor if I set the meter bridge to monitor Sync level, but it virtually disappeared when I switched the meters to monitor the tape tracks. The headphone outputs are noisy, but this doesn't necessarily transfer to tape. Ambient headphone sonics were not apparent when playing back tapes made with the WSX1 on other recorders. Recording sync signals and locking my drum machine and/or computer sequencer to both FSK and SMPTE was not a problem.

The system also has a multi-pin DIN connector labeled "To Master." By the time you read this, Sansui will have probably shipped the MR6, a rack-mount version of the six track only (list price \$1299), as well as the SY1 Sync unit (\$299) to lock any combination of two decks (rack or table top) together.

The final set of I/O plugs are three pairs of Aux inputs (for outboard stereo sound sources) and two Processor loops. The Aux inputs can be routed through mixer modules seven and eight or go directly to the Master Level controls, bypassing the mixer entirely. The two Processor loops are stereo in and out for connecting items like a graphic equalizer, digital effects or in my case, a BBE Sonic Maximizer. Devices connected here can be switched in or out on the front panel and affect the output at the Master Out, Stereo Out and the signal being recorded to either tape deck.

### Getting it on Tape

Tape tracks are like disk space and RAM: no matter how much you have, you *need* more. While six isn't eight, it's not four either. In Deck A, on the multitrack side of the system, Sansui has employed a single head that divides the deck into six parallel tracks with a tape speed of 3 3/4 ips (with pitch

**SIGN UP THESE  
WELL-RESPECTED  
ARTISTS FOR YOUR  
NEXT SESSION.**

*Craig Anderton*

Craig Anderton, producer/author

*Claude Gaudette*

Claude Gaudette, producer/keyboardist

*David Hentschel*

David Hentschel, producer/keyboardist

*Paul Jackson Jr.*

Paul Jackson, Jr., producer/guitarist

*John Robinson*

John Robinson, producer/drummer

*Nile Rodgers*

Nile Rodgers, producer/guitarist



### THE EPS SIGNATURE SERIES.

You're looking at the names behind stars like Madonna, Michael Jackson, Anita Baker, David Sanborn, Elton John, Steve Winwood and Genesis.

Now Ensoniq has brought these talented producers together to create a wide range of distinctive new sampled sounds. We call it the Ensoniq EPS Signature Series.

Choose from six sound libraries, each containing three high-quality discs. Pick up any set for just \$39.95 at your local Ensoniq dealer. And start playing with some of the best names in the business.

For a dealer near you call 1-800-553-5151.

**ensoniq**®

THE TECHNOLOGY THAT PERFORMS.

**OMNIRAX™**  
by *Sausalito Craftworks*

**M1 OAK**  
\$30.00

**D18 OAK**  
\$159.95  
including  
wheels

**W18**  
\$139.95  
including  
wheels  
(shown with  
optional  
top shelf  
\$30.)

88 (\$94.95 in oak  
or birch)  
**\$79.95**

(Wheel Sets  
option \$20  
- installed)

**Introducing the Best Value  
in 19" Rack Mount Furniture!**

- Available in Oak or Birch ply, or Gloss Black finish
- 2 sizes holding up to 8 or 18 rack spaces of gear
- Heavy duty locking wheels included with D18 & W18
- Optional 15"x22" removable top shelf for drum machine, computer, tape deck, etc.
- Convenient hand holds for easy mobility
- Black equipment mounting screws & washers provided

**MONEY BACK GUARANTEE!**

- SHIPPED FULLY ASSEMBLED
- SHIPPED UPS FREE OF CHARGE
- M/C & VISA ACCEPTED
- ALLOW 2 WEEKS FOR DELIVERY

**SAUSALITO CRAFTWORKS** 415-332-3392  
P.O. Box 1792 1-800-332-3393  
Sausalito, CA 94966 (Outside CA)

— DEALER INQUIRIES INVITED —

## THE MUSICIAN'S LOOP

Here's your chance to beat the high cost of high-tech by becoming a charter member of a unique cooperative. Put together by musicians, for musicians, and pooling our buying power, we can pass on prices from the quantity discount columns on the price sheets. And we're authorized to sell all the big names in MIDI keyboards, drum machines, software and recording equipment. We're set up for immediate delivery, quality service and plenty of helpful advice.

Members receive a free catalogue and regular newsletters with the latest product info, tech tips and "members only" specials.

**Call today for membership  
details and best prices.**

**919-968-1616**

© 1987, The Music Loft

control) and Dolby C that can be turned on and off from the back panel. For those who need to know, here are the specs: wow and flutter -0.06% (NAB weighted), frequency response 40 to 15,000Hz, channel separation 50db (1kHz, 0VU, NR on), erasure 70db (1kHz). In the *real* world, the audio quality of this machine compares favorably to all of the other machines in its class, that being multitrack recorders intended for demo and semi-pro use. Frankly, I like dbx better than Dolby and I'd rather use a Synclavier Direct-to-Disk system. I'd also like to have a universal floppy disk format, ban all hand guns and rifles, abolish nuclear weapons and control time. Those of us with budgetary constraints will be hard pressed to get more fidelity and function within similar monetary parameters.

Deck B, the two track, is a normal speed cassette recorder with a choice of Dolby B, C or neither. Both machines are solenoid controlled. To mix down from Deck A to B, simply set your levels and use the Mixdown button. When play is pressed in either transport control section, both decks go to work. Naturally, Deck B can play back any normal cassette tape and conversely, its product is universally accepted. You can also mix down to Deck B and then bounce back to two tracks of Deck A, which maintains a stereo field while adding four additional first generation tracks.

There's a digital tape counter that employs separate buffers for each of the decks, and Deck A includes a rehearsal function. You find the beginning of the passage to be rehearsed and hit the Start button. When the tape reaches the end of the desired section, tapping the Rehearsal button immediately rewinds the tape to the start point, and it begins to play again, over and over until you press stop. The problem with this is that the original Zero setting is lost because Zero is now the Rehearsal Start point. Once the Stop button is pressed, the Rehearsal end point is also lost. This all means that automated punches are not possible, although there is a punch in/out footswitch jack. Another anomaly of the Auto Function is its inability to return to Zero on Deck B. No matter what deck is in operation and regardless of what the counter is reading, pressing Zero Return moves Deck A to Zero. This is all a function of ROM and a bit of recoding in the firmware could dramatically improve functionality in

this area.

One final note on recording, I found it necessary to keep the meters above 0db almost constantly in order to get the proper S/N ratio on the tape, especially when mixing down to the two track. The gain structure could have been better applied, with more amplitude at the Trim control and less at the Headphone level control. I routinely had each input module's slider at a position that was much higher than it seems I should have, even after adjusting my Trim pots to a position just below the point at which the Overload indicators started flashing.

By the way, the Meter Bridge is a very cool item. Its six independent orange level meters are switch selectable between inputs to the Six Track and Buss L/R, D. Reverb, Effect, Cue and Sync level indicators. It could just use a little more color contrast between low level (an orange/yellow hue) and overload indicator (an orange/red color). Ergonomically speaking, the WSX1 is very well laid out, making it a pleasure to look at and very easy to use.

### The End Result

Three days after the WSX1 arrived, I made a call to the DEA and suggested that it be put on the controlled substance list: I hadn't come out of my studio in 72 hours due to an immediate addiction. It is not the direct to hard disk digital recording system I want, but I haven't won the lottery yet either. This is a neat package. It's all here: the mixer, the multitrack, the mixdown deck, plenty of patch points (oh, if only the internal "reverb" wasn't so bad, then it would *really* have everything), all in a desktop unit I could put under my arm and carry upstairs when I need four different walls to look at. It also makes a pretty good traveling companion for live sound reinforcement or recording dates with buddies who don't happen to have multitrack capability. Individually, there are better components available for each of the sub-systems, but the WSX1 is the embodiment of the whole being exponentially greater than the sum of its parts. ■

**PRICES:** WSX1, \$1949; MR6 rackmount version of the Six Track only, \$1299; SY1 sync unit, \$299.

**MORE FROM:** Sansui (Kaman Distribution Sales), P.O. Box 507, Bloomfield, CT 06002-0507. Tel: (203) 286-0498.

*more from*

**See something in the pages of MT you hadn't heard of? Check this list for the product and contact address.**

**Alchemy:** Blank Software, 1477 Folsom St., San Francisco, CA 94103. Tel: (415) 863-9224.

**AudioFrame:** WaveFrame Corporation, 4725 Walnut Street, Boulder, CO 80301. Tel: (303) 447-1572.

**Auricle:** Auricle Control Systems, 3628 Woodhill Rd., Sherman Oaks, CA 91403.

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

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

**CD5:** RolandCorp, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

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

**D10/D110/D20/D50/D550:** Roland, see *CD5*.

**D1500:** Yamaha, see *C1*.

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

**DPX1:** Oberheim, see *DMX*.

**Dr. Rhythm:** Roland, see *CD5*.

**DRV2000:** Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

**DS8:** Korg, see *DRV2000*.

**DW8000:** Korg, see *DRV2000*.

**DX1/DX5/DX7/DX7HFD/DX9/DX11/DX21/DX27/DX100:** Yamaha, see *C1*.

**Emax SE:** E-mu Systems, 1600 Green Hills Rd., Scotts Valley, CA 95066. Tel: (408) 438-1921.

**Emulator II/+ /III:** E-mu, see *Emax*.

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

**FB01:** Yamaha, see *C1*.

**FZ1/FZ10M:** Casio, see *CZ101*.

**GenPatch ST:** Hybrid Arts, Inc., 11920 West Olympic Blvd., Los Angeles, CA 90064. Tel: (213) 826-3777.

**HD80:** Roland, see *CD5*.

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

**Juno 106:** Roland, see *CD5*.

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

**KCS Level II:** Dr. T's Music Software, Inc., 220 Boylston St. #306, Chestnut Hill, MA 02161. Tel: (617) 244-6954.

**KX88:** Yamaha, see *C1*.

**LXP1:** Lexicon Inc., 100 Beaver St., Waltham, MA 02154. Tel: (617) 891-6790.

**M1/R:** Korg, see *DRV2000*.

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

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

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

**Master Tracks Pro/PC:** Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94019. Tel: (415) 726-0280.

**Matrix 6/R/12:** Oberheim, see *DMX*.

**Mentor:** Forte Music, P.O. Box 6322, San Jose, CA 95150. Tel: (415) 965-8880.

**MEP4:** Yamaha, see *C1*.

**MIDI Mitigator RFC1:** Lake Butler Sound Co., Inc., 5331 West Lake Butler Rd., Windermere, FL 32786. Tel: (407) 656-5515.

**MRC:** Lexicon, see *LXP1*.

**MT32:** Roland, see *CD5*.

**Music Mouse:** Aesthetic Engineering, 175 Duane St., New York, NY 10013. Tel: (212) 925-7049.

**Navigator:** Oberheim, see *DMX*.

**OB8/OBX:** Oberheim, see *DMX*.

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

**PostPro and Direct-to-Disk:** New England Digital, 49 North Main St., White River Junction, VT 05001. Tel: (802) 295-5800.

**PPS1:** JL Cooper Electronics, 13478 Beach Ave., Marina del Rey, CA 90292. Tel: (213) 306-4131.

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

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

**QX1:** Yamaha, see *C1*.

**RX5:** Yamaha, see *C1*.

**S330/S50/S550:** Roland, see *CD5*.

**S612/S700/S900/S950/S1000:** Akai Professional, 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114.

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

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

**Sound Designer II:** Digidesign, see *SoftSynth*.

**Sound Filer:** Interval Music Systems, Inc., 12077 Wilshire Blvd. #515, Los Angeles, CA 90025. Tel: (213) 478-3956.

**SPM8:2:** Simmons Electronics USA Inc., 2630 Townsgate Road, Suite H, Westlake Village, CA 91361. Tel: (805) 494-5007.

**SPX90/II/1000:** Yamaha, see *C1*.

**SQ80:** Ensoniq, see *ESQ1*.

**SRV2000:** Roland, see *CD5*.

**Super JX:** Roland, see *CD5*.

**Synclavier 3200/9600:** New England Digital, see *PostPro*.

**Systemizer:** Oberheim, see *DMX*.

**TF1:** Yamaha, see *C1*.

**TR707/TR727/TR808/TR909:** Roland, see *CD5*.

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

**V50/V80:** Yamaha, see *C1*.

**VZ1:** Casio, see *CZ101*.

**X7000:** Akai, see *S612*.

**XOr:** Dr. T's, see *KCS Level II*. ■

# S T A R

# G A Z E R

**Jerry Goldsmith's remarkable talent has graced films as disparate in their musical moods as *Patton* and *Star Trek*. Now he's off on another voyage, to boldly go . . . Interview by Deborah Parisi.**

**S**TAR TREK V is now in the final boarding stages. The actors are retiring to their seats, the editors are snapping closed the cargo holds, and the producers are making sure they've still got their wallets for the trip to the theaters. All that remains to be completed in the multi-million dollar production is the creation and installation of that atmospheric force that will provide the travellers with the ambience appropriate to the vision: the music.

The man at the musical helm is an experienced crew member. His score for the original *Star Trek - The Motion Picture* was nominated for an Academy Award in 1979. Jerry Goldsmith sits in his cabin alone, day after day, aiming his sights towards the day of his own departure: a recording session with an 85-piece orchestra.

In the midst of it all, a very gracious Jerry Goldsmith consented to a discussion on the important part that technology plays in his work and the methods behind his success.

*MT: Tell me a bit about your musical background.*

**Jerry Goldsmith (JG):** "I studied privately as a kid [with Jacob Gimpel and Mario Castelnuovo-Tedesco]. My parents were very good about getting me the best, as far as teachers go. I started studying theory and harmony when I was 12, and by the time I got to the university and had to go back to beginning harmony, it was really a bore."

*MT: That's a bit unusual. Why did you study theory so early?*

**JG:** "I don't know - I guess my parents thought that I should go on to be a musician and felt that I should have a

proper background. They were right - so, along with the piano, I started studying theory and harmony, and later, counterpoint."

*MT: Was your original goal to be a composer?*

**JG:** "No, my original goal as a kid was to be a concert pianist, but by the time I was 12 or 13, I knew I wasn't going to do that, and I wanted to be a composer. But I also liked films very much, and drama, and I decided when I was about 14 that I wanted to write music for films. I'm one who's doing what he almost wanted to do."

*MT: How did your parents get you so focused at such a young age?*

**JG:** "Well, they didn't do it - I did it. My mother was a school teacher, and my father was a structural engineer. This was my own. I liked the glamor of showbiz - who knows? I'm still looking for that glamor. I just did a couple of concerts in Texas, and said to my agent on the way back, 'Tell me about all this glamor end of the business. I'm always in these crummy towns, in these crummy hotels, or scoring a picture in these crummy situations. Where's all the glamor?'"

*MT: Maybe on opening night?*

**JG:** "Oh, I suppose. The couple of hours you're involved in doing a concert is glamorous, I suppose."

*MT: And certainly at the Academy Awards festivities.*

**JG:** "Yeah, that's glamorous."

*MT: But that's only once a year . . .*

**JG:** "Once in a lifetime, so far, in my case." [Goldsmith won the Academy Award in 1976 for his score to *The Omen*.]

*MT: Let's talk about your work environment. Tell me about your studio.*

**JG:** "Well, years ago, I used to have a piano and a pencil and a piece of

paper, and a stopwatch and a calculator, and I'd write music. Now I'm surrounded by computers and synthesizers and outboard equipment."

*MT: Are you a gear head? Can you tell me why every piece of equipment is in there?*

**JG:** "Yeah, I can tell you pretty well. But you should call us wire heads - gear head sounds more like the automobile fans. I guess I've always had a minor fascination with gadgets and all that. I've been interested in electronics in music since the early '60s, the early days of electronic music, when it was realized by taking an oscillator and running it through some primitive filters and processing one tone at a time, recording it onto tape, and then cutting the tape for the time values and all. There was no such thing as voltage control, so everything was manipulated by hand. I was doing various things - recording music backwards and upside down and slowing it down, and processing it.

"And then, I guess in 1964 or something, I discovered a guy who was modifying the old Novachord, an old Solovox, and then using an early type of delay unit called the Echoplex. All very primitive stuff. And I sort of fooled around that way through the '60s. Then, when the first Moog modular synthesizer came out - although I never owned one, I used someone else's - it got very complicated, with filtering and all that. I did get a Minimoog and some of the early ARPs. But I was always very frustrated, because there was no memory in those machines.

"So in the middle '70s I got fed up with it all and went back to pure music for awhile. But I became intrigued again when I did the first *Star Trek*,



Photography: Melodie Gimple

which was 10 years ago, and I had to use some electronics in that. I'd been away from it for a few years, and I suddenly realized that they'd put microprocessors in these things. They had memory! You could store a whole bunch of different sounds in them, and I thought that was wonderful. And then along came MIDI . . ."

**MT:** *And how did you ever get along without that?*

**JG:** "Well, everybody's always saying 'MIDI is the end-all. With MIDI you can rule the world!' But all MIDI means is that you can talk to a computer. It has opened up great possibilities, however. Now I'm surrounded with 1, 2, 3, 4, 5, 6, 7 big keyboards, plus another 8, 9, 10, 11, 12 rack-mounted modules, tone generators or samplers, a ton of

outboard equipment, a mixer and a couple of computers."

**MT:** *What do you have specifically?*

**JG:** "Well, there's a Prophet VS, a DX7IIFD, Roland D50, a Yamaha KX88 keyboard controller, Emulator II+, Roland Super JX, a Yamaha TX16W sampler, an Oberheim DPX1 sample player, a Roland S550 sampler, the Roland digital piano, a Yamaha TX816, a TX81Z, a Yamaha RX5 drum machine, and an old-fashioned Yamaha DX7."

**MT:** *You have quite a few samplers in there . . .*

**JG:** "Yeah, more than . . . I . . . I don't know why I have so many samplers."

**MT:** *That was going to be my next question.*

**JG:** "I don't know. I don't even make sounds. I have enough trouble writing

music, without trying to make sounds."

**MT:** *Do you use all presets, or do you have someone come in and create sounds for you?*

**JG:** "Yeah, I use factory patches and presets. They're great - I know there's a lot of snobbery, with people saying, 'Oh, I wouldn't dream of using presets. I have to make my own.' But I think that's a lot of nonsense. I mean, that's those people's job, to make sounds. Let them do it, they're experts at it. Let me just write music.

"The thing with sampling is, it's kind of a fun thing, but it just takes too much time. Each instrument to me has a different character, a different personality."

**MT:** *Can you give me an example of what you mean? ►*

MUSIC TECHNOLOGY



► **JG:** "Well, it's very difficult to put into words. A lot of it boils down to analog versus digital, and I really prefer the analog sounds, to be honest with you. But then I prefer the real orchestra over everything, to be perfectly honest. However, as an addition to my palette with the orchestra, they are just wonderful."

**MT:** *That's something I'm particularly interested in. How do you integrate electronics with the orchestra, and what kinds of things do you use synths for to enhance orchestral work?*

**JG:** "Well, I use them for anything. The idea that you shouldn't use electronics just because you've got a film of such and such a nature is nonsense. I've done a medieval picture with electronics and orchestra. The idea is to use what will give me a broader palette of sound. I have an orchestra of 85 musicians in front of me; I don't need a sampling instrument to sound like violins. But there are a lot of samples of treated effects that I've got that don't sound like *any* instruments. They are wonderful sounds, and I mix

those with the orchestra. There are different musical effects that work wonderfully. It's just an extension of sounds I can hear in my head that I cannot realize with acoustic instruments. But you don't want to go off into sound effects, either."

**MT:** *Yeah, I'm curious if you ever cross that line.*

**JG:** "No. Sometimes people say I do, but it's not intentional. I think that as long as it's within musical parameters, you're not creating sound effects. Anything in music today is viable."

**MT:** *How did you select the instruments in your studio? Did you have someone come in and design it for you?*

**JG:** "No, not really. I talk to my son about it – my oldest son is a real whiz at this. He's also a composer, and he does everything electronically. But we're all – you said gear heads – but we're all intrigued with the new technology that's constantly coming upon us. I don't think that any one of us fully realizes the potential of any one of these instruments any more than we do of any of the computers

that we have. All we're tapping is really a very small part of each computer or instrument's potential. There's just not enough time in the day. Take the KX88 – I think I'm using one one-hundredth of its potential. We just get into little categories of what's good for us, and that's what we do. If you surround yourself with this huge bank of various instruments, there's just no way to use it to its fullest potential. All you want to do is make some noise."

**MT:** *I understand that you're using the new version of Auricle with the Yamaha C1 computer.*

**JG:** "Yes. That's an amazing program. When you're writing music for film, you're writing to fit certain time parameters. For instance, if you have a piece of music that runs three minutes, you may have 25 different moments within that three minutes that you have to accent or change the mood or synchronize to events on the screen. And there is a certain amount of math that's involved in getting your music to arrive at those various points. You can do that by changing the tempo of the music, or the meter – if you have to synchronize to a scene that's 35 and  $\frac{2}{3}$  seconds long, those  $\frac{2}{3}$  seconds are important. You'd think that this is a blink of an eye, but you can tell when the music's up against the film that you're significantly off.

"We used to make those adjustments by long hand, but now the Auricle does it for you. You just tell it what tempo you want, and what meter you're writing in, and then you say I'm going to catch something at 15 and  $\frac{7}{8}$ th seconds, and it'll tell you what bar you're going to be at, and what beat you're going to be at, and how far off you are. Now if you want to come on a downbeat, you can change the meter, but it still may be off by 25%. Well, the computer can then adjust the tempo automatically and make it happen dead on it.

"It also generates clicks, clicks being a metronome. A lot of times when you're conducting an orchestra, you'll use the click track to guide you. Although you can do it free-timing too, using just cue marks on the film, which gives you a little more latitude than being tied down by the click track. When I'm free-timing, there is a series of marks on the screen to tell me where I am. Those used to be punched in by a music editor, but this program generates them now, saving the music editor an awful lot of time."

# An Education for Life

**MT:** *After the composing and pre-production work in your home studio, are there things you take with you to the recording session?*

**JG:** "Oh, yeah. When I record in this country, other than the computer and the baton I don't take much because the guys have all got it here. But I record it all over the world as well. I just did a picture in Italy and took 21 pieces of equipment – I felt like a rock 'n' roll show. A lot of it didn't have to go, but you're never sure what's going to be there and what's not going to be there. As it turned out, I didn't take an Emulator because they said they had one, but it was the wrong software so my disk wouldn't play. Fortunately, we found a DPX1 that could play it. The computer goes with me most of the time, because I usually end up finishing writing wherever I am, too. And now with the new C1 laptop, it's a little easier to transport."

**MT:** *Do you feel comfortable with the MS/DOS approach of the C1? Have you ever used a Macintosh?*

**JG:** "Yes, I use a Mac as well, with Mark of the Unicorn's Performer, for all my sequencing. I've been using the Mac solely for years, and got very comfortable with it. I used to use the Auricle on the Commodore 64. Now I don't even look at the Commodore. But MS/DOS – that required some rethinking, I was so used to the pull-down menus. But once you boot this program, everything is up there anyway. It's not really MS/DOS any more except for the directory."

**MT:** *Is there anything missing from your studio? What would you like that isn't there?*

**JG:** "Oh, I'd like to have a bigger board, and a little more flexibility, but really the stuff here is just for monitoring. I've got four tape machines, but I don't know how to operate any of them. I have a 16-track Fostex, a 2-track Fostex, a little 8-track Tascam, and a 4-track Otari."

**MT:** *What do you need all those tape machines for?*

**JG:** "Don't ask me. No, actually I've done a couple of pictures here, and I've done a couple of commercials here, and I use the 16-track for that. But when I do that I have an engineer up here to take care of operating the equipment."

**MT:** *So you never commit music to tape and then sync that with an orchestra?*

**JG:** "No – there's various ways of approaching it. Some people like to go in and put all of the electronics down ▶

The entertainment industry is a multi-billion dollar enterprise, and music plays a leading role in it. In fact, the frequency and variety of musical entertainment available every day through radio, television, recordings, and concerts can overwhelm even the most accustomed listener. That's one reason why a comprehensive program of music study is such an important part of a good education: It teaches us to listen attentively, to think about what we hear, to recognize complex musical content, and to participate fully in the musical experience. After all, great music is always entertaining – but if we don't even hear it, we'll never know everything else that it has to offer as well.

Music study – think about it.  
It's an education *for life*.

One in a series from the  
*Foundation for  
the Advancement  
of Education  
in Music*

1902 Association Drive  
Reston, Virginia 22091

► first and then put the orchestra over it. But the best way is to record the orchestra and then put the electronics over that. However, when you're recording for a director or producer, they want to hear what they're getting right away, so you've got to do it all at once to give them a rough idea. Then when I mix down, a lot of times I'll go back and re-do a lot of the electronics, and add new things to the music – that's the fun of it."

**MT:** *What is your approach to writing – do you still sit down with pencil and paper or are you using computers?*

**JG:** "I still sit down – in that old-fashioned way, as they say so much in these hi-tech magazines – and use that archaic system of pencil and paper. Somebody even said something that really infuriated me – Wendy Carlos, I think: 'Oh you're still using the same crutch that Stravinsky used, pencil and paper.' And I say, 'Hey, give me a few of his crutches, I'll take them any day.' The crutch . . . the crutch! I can't believe the arrogance."

"But aside from all that, I find that I need to have the music organized in my head. Even though I'm using a sequencer, I need it down on paper so that I can see what I'm doing. But sequencers are great, because you can hear your ideas back right away. And I must say that they have affected my way of writing. If I write something on paper, but if I'm not quite certain of it, I'll put it into the sequencer and I'll play it back. It's like stepping back and looking at your work, like the painter does when he paints, and then he can step back to the easel and study it objectively without the insecurity of trying to write it. I'll hear things and go 'Ah- ha! I don't like this, I don't like that.' And then I'll change it. So that's helped me a great deal. It's a real handy device to have."

"Generally, I have the synthesizers around me because I don't know how somebody can write for synthesizer not knowing what they're going to sound like. I know that many composers will go to a session, and if they have to write a synthesizer part, they'll tell the player, 'Well, give me something that sounds like this.' That just doesn't make sense to me. When I go to a session, I've got cartridges and cards and the sounds, and I write the notes of the music and include a patch number and an instrument name so that they'll punch up that patch number on the right instrument. And I know what it's going to sound like."

78

JUNE 1989

"The other advantage of having the equipment at home is that I can fool around with the outboard stuff – particularly the EQ and the reverb, because that makes such a difference – and jot that down so that when we mix, I know that I treated these sounds in such and such a way."

**MT:** *Can you give me a very specific example of something you're using in the new Star Trek that really works?*

**JG:** "Well . . . there's one effect that I have to use, where a man casts a spell on people. You want something to musically underscore this to indicate to the audience that this is happening. Using a combination of sounds, a couple of synthesizers mixed in with the orchestra, I was able to create a very startling effect, and I think that the audience will be able to identify it. I could have done it without electronics in a different way, but I think this is more effective."

"I really try to combine the two so that nothing really sticks out as being electronic – I just want it to be a piece of music, I don't want to take it apart. A lot of people will say, 'I don't hear any electronics.' That's when I think that I've been successful in creating the music."

**MT:** *One last question, and I'll let you get back to your work. Could you give me the run-down on when you're hired for a project, and how the work progresses? Are you hired before the films are even shot?*

**JG:** "Sometimes. I've been hired for two films recently, one that I won't complete until next year, and another that I'll start at the end of this year, and neither one of them is even beginning to shoot yet. But sometimes I'm hired after the picture's completed, or sometimes during the shoot. It's always different."

"Once the film is locked, then I can come in – they can't be changing the film around much while I'm writing, although they sometimes do. Then I sit down with the director and we discuss the concepts – his ideas, my ideas – and hopefully we can come up with a mutually accepted idea for the approach. That's when the music editor comes in. The director, the music editor and I decide where the music's going to go. The music editor has to break those scenes down in detail for me, both dramatically and time-wise."

"When I start working on a picture and I'm getting the musical ideas, I will also get a library of sounds together and decide to dedicate these 10 or 20

sounds to this particular film. I will try to stay with those sounds rather than just using a hundred different sounds. Just as there is a musical theme, there should be a sound theme, so you have the sounds as unified as the music is thematically."

"My choice of sounds is really determined by the themes that I'm going to use for the picture. With *Star Trek*, I'm using the main theme from the original picture, which is also the theme for the television show. There's also a theme that I wrote for the Klingons. So those are already there – that's the nice part about doing sequels. There are also two new themes that I've written."

"Then it's just a matter of sitting down each day and doing the drudgery. Getting the themes is the most difficult part. Once you've got those, the rest goes a lot easier."

**MT:** *And the last stage is taking everything you've done to a sound stage and doing the recording?*

**JG:** "Yeah, and that's fun. You sit here for weeks, working by yourself, and all of a sudden you get to walk in front of an orchestra and hear it. That's what makes it all worthwhile." ■

## *Some of Goldsmith's Film Credits*

**Leviathan**  
**The 'Burbs**  
**Warlock**  
**Criminal Law**  
**Rambo I, II and III**  
**Innerspace**  
**Extreme Prejudice**  
**Hoosiers (Academy Award nomination)**  
**Supergirl**  
**Gremlins**  
**Psycho II**  
**Poltergeist (Nomination for Academy Award) & Poltergeist II**  
**Star Trek – The Motion Picture (Nominations for Academy Award and Golden Globe)**  
**Alien (Nominations for Golden Globe and Grammy Awards)**  
**The Boys from Brazil (Nomination for Academy Award)**  
**Capricorn One**  
**The Omen (Academy Award for Best Score and Best Song, and Grammy nomination)**  
**Logan's Run**  
**Chinatown (Nominations for Academy Award and Golden Globe)**  
**Papillon (Nomination for Academy Award)**  
**Patton (Nomination for Academy Award)**  
**Tora, Tora, Tora**  
**Planet of the Apes (Nomination for Academy Award)**

# ADVERTISERS' INDEX

Ace Music Center.....	59
Akai .....	6
Alesis .....	23, OBC
ApheX .....	26
Bill's Music .....	21
Electro-Voice.....	IFC
Ensoniq .....	68/69, 71
Foundation for the Advancement of Music .....	77
Four Designs Company .....	29
Guitar Shack.....	46
Hal Leonard .....	65
Hip Software .....	45
Hybrid Arts.....	3, 17
Kawai .....	12/13
Keyfax 3 .....	38
Meico .....	59
Musicode .....	21
Music Contacts.....	36
Music Loft .....	72
Music Solutions.....	31
Oberheim.....	67
Our Own Lighting .....	46
Perfect Pitch .....	8/9
Resonate.....	1
Roland .....	40/41
Rolls Music Center.....	11
Rhythm City.....	60
Sam Ash.....	36
Sausalito Craftworks .....	72
Wise Music .....	45
Yamaha .....	24/25
Yamaha Pro.....	80/IBC

# CLASSIFIED

✧ **BEST PRICE** ✧  
✧ **BEST REFERRALS** ✧  
We can find you the best price for any equipment/instruments. Largest database available for referrals and gigs/anything.  
**MUSICAL MINE INC (804) 467-8806**

**BE A RECORDING ENGINEER**  
Train at home for High Paying - Exciting Careers. FREE Information.  
**AUDIO INSTITUTE OF AMERICA**  
2174 Union St., Suite 22X,  
San Francisco, CA 94123.

**KAWAI K5 EDITOR/LIBRARIAN**  
*for IBM/PC*  
OVERTONE is the software for the K5 and PC. Mouse-driven graphic interface. Draw the spectrum you want, use standard spectra or extract spectra from sample files. Multi patches automatically adjusted when rearranging card layouts. Complete Kawai patch library (over 750 patches) included. \$99.95 from:  
**SYNTONYX**  
7 Loudoun St., SE, Leesburg, VA 22075.  
☎ (703) 777-1933.

**ROCK STREET MUSIC**  
Music & Pro Sound  
Drums, Guitars, Amps,  
Sound & Recording Gear  
Call or write for more information:  
148 South Main St., Dept M,  
Pittston, PA 18640  
(717) 655-6076

**D110 USERS GROUP**  
Check out studio quality sounds for free, and demo the best Editor/Librarians. Membership includes simplified D110 manual and monthly newsletter. Share info with professional and amateur musicians from NYC, Boston, LA and Stonehenge. (Tap into America.) Our BBS is live BBS # 212 496-8650. Contact (800) 888-8937. Write us: D110-Users Group, 217 E85 St., NY, NY 10028, SUITE #130.

**UNIQUE KAWAI K1 SOUNDS** ●  
Vol. 1: pads, synths, claviers, etc. ●  
Vol. 2: horns, vocals, percussion, etc. ●  
**\$15 each / \$25 for both (ppd)** ●  
Available in Atari ST (w/DA) or Mac (on HyperCard stock) format; will also fill your RAM cart. Send check or MO to: Chris Meyer, 9920 Jordan Ave, #11, Chatsworth, CA 91311.

**SINAP Software**  
*Musical Instrument Digital Interface*  
Genuine "Companion" Products by Snap Software. Patch Editor/Librarians for your Favorite boxes  
**For DOS Machines and Yamaha C1**  
GM70 Companion ..... \$100  
GP8 Companion ..... \$125  
MEP4 Companion ..... \$125  
PCM70 Companion ..... \$125  
M1 Data Organizer ..... **NEW!** \$150  
**For the Apple Macintosh™**  
GM70 Companion ..... \$125  
Snap Software, 1116 Janey Way,  
Sacramento, CA 95819  
(916) 451-9914



**POP FILTERS**  
*An absolute necessity for every studio*  
Available with Optional Clamp & Gooseneck  
Call or Write for Free Brochure  
Outside CA ☎ (800) 446-7677  
Inside CA ☎ (818) 788-3635  
**POPPER STOPPERS**  
P.O. Box 6010-658, Sherman Oaks, CA 91413  
ASK YOUR DEALER FOR DEMONSTRATION  
SATISFACTION GUARANTEED  
See review in Home & Studio Recording  
February 1988 issue, Fast Forward, p7

**Korg M1/MIR related products: The M1 Sky Album:** 50 Programs/49 Combinations. 6 full-length songs with documentation and sequencer info/tip sheets: \$28.00 plus data disk. **Audio cassette** of songs only: \$9.50. **M1 Sound Set #2:** 100 Programs/100 Combinations: \$29.00 plus disk. 100 Drum/Percussion Patterns in various styles and time signatures, drum Programs included: \$16.00 plus disk. **Trac'M Sequencer Track Sheets** designed for the M1/MIR: \$8.50/40 or \$14.00/100. \$3.00 S/H; International: \$6.50. Please call about librarian formats. Electron Artistries, P.O. Box 40, Franklin, Ohio 45005. (515) 746-4283.

Reach today's modern musicians through Music Technology's Classifieds.  
Only \$55.00 per column inch (typesetting included).  
To book your ad, call  
**Melissa**  
**(818) 407-0744**

# The cure for the one-track mind.



World Radio History



Earlier tonight in the restaurant, someone at the next table laughed. No one heard it quite the way you did.

By the time dinner was over, you almost had the entire tune done in your head. You apologized to your date for not being much of a conversationalist.

And once you got home, *MT100 Multitrack Recorder* the creation took real form.

Flip on the amp. Set the EQ. Grab your guitar. Hit record/play.

That primal urge is precisely why Yamaha created the Personal Studio Series.<sup>™</sup> A line of products designed especially for the home recordist.

Like the MT100 multitrack recorder. Which records on four tracks simultaneously, separately or in any combination. It has dual speed tape drive. With dbx<sup>™</sup> noise reduction. Pitch control. Cue mix section. Aux send and return for effects devices. Plus plenty of inputs, outputs and busses.

The Yamaha Personal Studio Series. Get cured at the Yamaha Professional Audio dealer near you. Yamaha Corporation of America, Professional Audio Division, P.O. Box 6600, Buena Park, CA. In Canada, Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1.



*Personal Studio Series*<sup>™</sup>

**YAMAHA**<sup>®</sup>  
Engineering Imagination<sup>™</sup>

Personal Studio Series is a trademark of Yamaha Corporation of America.

HR-16 HIGH SAMPLE RATE/16 BIT DRUM MACHINE

ALESIS

QUANT LENGTH PATT  
COPY OFFSET SWING  
DELETE INSERT SOLO  
ERASE TAPE FILL

PLAY STOP/CONTINUE RECORD

ALESIS HR-16  
1 2 3 4 5  
6 7 8 9 0  
- < > +

MIDI/UTIL  
TEMPO  
BIX  
TUNE  
VOICE

TOM 1 TOM 2 TOM 3 TOM 4 RIDE CRASH PERC 1 PERC 2  
KICK SNARE CLOSED HAT MID HAT OPEN HAT CLAPS PERC 3 PERC 4

# 100% Real.

It's true. Nothing sounds like the Alesis HR-16 Digital Drum Machine. Except real drums.

16 Bit technology. Incomparable 20kHz frequency response. No wonder the music press calls the HR-16 "staggeringly realistic." There's plenty of kicks, snares, toms, hi-hats, cymbals... and a bunch of percussion and rhythm toys. 49 sounds altogether. All tuneable and touch sensitive. Each one unique and dripping with personality. Record-quality sounds. 100% real. And, you can combine them endlessly.

Own a drum machine already? Put it in the drum machine museum. Permanently. The HR-16 is the one you wish you had anyway. And it's so affordable you can buy two. You know you want real drums. So go ahead, get the Alesis HR-16. The industry standard. The 100% real choice.

\*David Cigger in Home and Studio Recording

World Radio History

ALESIS  
SPEECH ELECTRONICS

LOS ANGELES:  
Alesis Corporation • 3630 Holdrege  
Avenue • Los Angeles, Ca. 90016

LONDON:  
Alesis Corporation • 6, Letchworth  
Business Center • Avenue One,  
Letchworth, Hertfordshire SG62HR