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MUSIC TECHNOLOGY

BILL BRUFORD

From Rock to Jazz via MIDI

SYNTH OR SAMPLER?

We Review Roland's D50 and Casio's FZ1

DIGITAL DILEMMAS

The Truth About MIDI Delays

ON TEST

Korg DDD5 Drum Box; Hybrid Arts MIDItrack;
360 MIDIMerge+; Dr. T Copyist; Steinberg Cosmo; and more..



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485 Alberto Way
Los Gatos, CA 95030
408/395-4332

EDITOR
Rick Davies

ASSOCIATE EDITOR (US)
Bob O'Donnell

**ASSOCIATE EDITOR
(INTERNATIONAL)**
Dan Goldstein

SUB EDITOR
Trish McGrath

PRODUCTION CO-ORDINATOR
Janice Pirath

PRODUCTION MANAGER
Shaun Barrett

EDITORIAL CONSULTANTS
Paul White (Recording)
Nigel Lord (Percussion)
Neville Marten (Guitar Synths)

SPECIALIST CORRESPONDENTS
Marcus Aigner, Dave Bristow, Bill Bruford, Jim Burgess, Warren Cann, Jay Chapman, Julian Colbeck, David Ellis, Keith Emerson, Franco Fabbri, Trevor Gilchrist, Tim Goodyer, Mark Jenkins, Chris Many, Chris Meyer, Ken McAlpine, Trish McGrath, Patrick Moraz, Nick Rowland, Paul Tingen, Simon Trask, Peter Vinella, Matthew Vosburgh, Ian Waugh.

ART STUDIO
Stuart Catterson (Director), Eddie Allen (Deputy), Sam Masters, Lynn Cooper, John Waterson, Elaine Tye.

PHOTOGRAPHY
Samuel Barksdale, Trevor Gilchrist, Tim Goodyer, Matthew Vosburgh.

ADVERTISING DIRECTOR
Ce Ce Hernandez

DISTRIBUTION MANAGER
Sue Rawlings

ADMINISTRATIVE SECRETARY
Kathy Sorren

PUBLISHER
Terry Day

PUBLISHING DIRECTOR
Dennis Hill

MUSIC MAKER PUBLICATIONS, LTD.,
Alexander House, 1 Milton Rd,
Cambridge, CB4 1UY, England.
Tel: (0044) 223 313722

EUROPEAN AD MANAGER
Graham Butterworth

MUSIC TECHNOLOGY
MUSIC TECHNOLOGY is published monthly, 12 times per year, by Music Maker Publications.
Offices at:
7361 Topanga Canyon Blvd.
Canoga Park, CA91303
Tel: (818) 704 8777
Applications to mail at second-class postage rates is pending at Canoga park, CA Postmaster: Send address changes to above address.

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THE OUTSIDE STORY

IT'S ONLY BEEN a couple of dozen hours since the Audio Engineering Society's 5th International Conference ended. It has also been a handful of hours since most of MT's US editorial staff (both of us) took in a D50 demo at a local music store. In a couple of weeks you'll be reading this issue.

The AES conference itself was encouraging. Headlining at the LA Biltmore as "Music and Digital Technology", a conference that proved a good opportunity to catch the drift of designers, musicians, and writers working in the deep end of music technology. Overall, the conference managed to cover a variety of new and interesting musical applications for digital technology - from PAN's Perry Leopold discussing how musicians can use telecommunications, to several discussions on digital audio workstations (dedicated and personal computer-based) and instrument design considerations.

One of the topics which I found most interesting was discussed by Bill Buxton of the University of Toronto, and concerned the use of Local Area Networks (LANs) in music production environments. It was Mr Buxton's concern for the established MIDI-based musical community that caught this editor's ears, for there are apparently a lot of "MIDI bashers" who are quick to condemn MIDI, but seem to forget that MIDI is a reality that musicians live with. The main concern of musicians is their music, not just keeping up with the computer industry - though that's not to say that doing so can't be beneficial. To my knowledge, there are currently not any commercially-available multi-user music programs which use AppleTalk or any other LAN, but you can bet this isn't the last you've heard on the subject.

Deadlines being what they are, we were unable to get a full report on the AES conference in this issue, but rest assured that we'll have features on many of the topics discussed there into these pages in coming months. Hopefully there will be a few more tangible examples worth presenting, also.

Speaking of tangibility, our contributor from the Great White North, Jim Burgess,

recently got his hands on some 16-bit reality in the form of a Casio FZI sampler. His review, which appears in this issue, indicates that the times are changing faster than many of us had thought, though there are certainly those who would have you believe otherwise. We don't specialize in misinformation, but there are times a mistake falls through the cracks (which open mysteriously wide sometimes) despite our best efforts to prevent this from happening.

For example, a mention of 12-bit A/D conversion on the FZ in our NAMM report slipped through in the last-minute shuffle, though it was our intention to remove this remark when we were unable to confirm what amounted to no more than a rumor. In any event, all doubts regarding the FZI's specs or performance are laid to rest this month.

Joining the FZI in the 16-bit arena is Roland's D50 (admittedly not a sampler) which landed in our UK offices recently, and which is overviewed in this issue. With so few 16-bit instruments in the marketplace right now, the competition is likely to be like a friendly arm-wrestling match when compared to the full-scale 16-bit Rollerball game that is sure to follow. With NAMM coming up next month, we hope to find out exactly how other manufacturers have been preparing for the event.

Coming back to the matter of timing, about how long it takes for MT's writers to see or learn something and get the news to you, it's worth mentioning that everything in MT's pages could be found out by anyone with a healthy supply of determination. There are no "secrets" to synthesizers, really, and there aren't any "secrets" on display at NAMM, either. The demystifying of synthesizers has helped musicians to get past the ominous blinking lights of early electronic music, and to appreciate what these instruments can do to expand their musical vocabulary.

Similarly, by following the industry - seeing what it sees, hearing what it hears - musicians can plan for the future, rather than try to live in it before it gets here. ■ Rick Davies

Truly Professional

In the short time they have been available, Kawai's K3 and K3M synthesizers have been recognized by musicians and computer enthusiasts alike as truly professional musical instruments with

sophisticated capabilities and warm, rich sounds.

The K3 keyboard and its companion K3M synthesizer module have been accepted by leading professional musicians such as Jan Hammer and Tom Coster. They find the K3's unique sound a perfect compliment to their existing electronic music systems.

Computer software companies such as Opcode, Dr. T's Hybrid Arts, and Compumates also support the K3 with sound editing software for the Atari ST and 130 XE, Apple II and Macintosh, IBM PC, and Commodore 64 computers. These software packages allow graphic editing of the K3's unique programmable

user-wave. They also have advanced voice editing and librarian functions that allow patches and user-waves to be easily accessed from disk and via modem.

So take a listen to the surprising Kawai K3 on the "Miami Vice" television show, on tour with Tom Coster and "Vital Information," or at your local authorized Kawai electronic musical instrument dealer.

Kawai America Corp.
Dept. EM
2055 E. University Dr.
Compton, CA
90224-9045

Kawai Canada Music Ltd.
Unit #1
6400 Shawson Dr.
Mississauga, Ontario
Canada L5T1L8

KAWAI
SYNTHESIZER MODULE
K3M

Jan Hammer

"When you think you've exhausted all possibilities of creating new sounds, Kawai brings out the K3M which enables me to use a whole range of sounds that compliment both my FM and analog instruments."

KAWAI
The Master Builder

Tom Coster

"The Kawai K3 and K3M Rackmount is a powerful combination: analog punch and digital sounds of the 80's... a welcome addition to my keyboard setup. Thanks, Kawai!"

Tom Coster can be heard on two new CBS releases: "Glacial Bear" Vital Information live featuring Steve Smith and "Songs of Freedom" live.

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After a month's vacation, our series on MIDI's newest standard data format returns with a look at actually transferring sounds from one sampler to another - and the differences in quality that ensue.



**The biggest improvement
to the new Mirage-DSK
is the smaller price...
\$1295**

When the Mirage was introduced two years ago, digital sampling was a high-priced technology, available only to the rich and famous. Now, over 20,000 Mirages are living proof that any musician can enjoy the creative advantages of sampling.

The new Mirage-DSK takes the best of the Mirage and brings it to you at an even more affordable price.

The vast library of Mirage sounds is 100% compatible with the DSK. And with few

exceptions,* all existing Mirage editing software and accessories can be used with the new Mirage-DSK. New stereo outputs give your sound increased width and depth.

Visit your authorized Ensoniq dealer and see just how easy it is to own the world's most popular sampling keyboard.

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

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NEWS

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FOSTEX SYNCs TO VIDEO

Fostex is looking to set the world of post-production alight with the release of the Model 460 multitrack cassette/mixer. In conjunction with the Fostex 4030 synchronizer (fitted with the 3.0 software update), the 460 is capable of synchronizing to both video recorders and other audio recorders. The recorder section features a true two-speed transport (separate record EQ circuits for the 1 $\frac{1}{2}$ and 3 $\frac{3}{4}$ ips options), both Dolby B and C noise reduction, two-position autolocate, search to zero, auto repeat and SMPTE/EBU sync capability. Although the 460 is a four-track recorder, Fostex has seen fit to provide the mixing section with eight channels (each with XLR-type mic connector, phantom powering, stereo send, parametric EQ and solo), four buss outputs, and a dedicated stereo mixer for the four-channel buss. The Model 460 carries a list price of \$2495.

MORE FROM Fostex, 15431 Blackburn Ave., Norwalk, CA 90650. ☎ (213) 921-1112

FEET FIRST WITH ECHO PLUS

Digitech's new PDS8000, code-named Echo Plus, may be encased in a foot-pedal chassis, but the compact digital delay/sampler

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in fact, has three delay ranges (0-500msec, 500msec-2sec, and 2-8sec), and the sample can be triggered by either the footpedal itself or via a 5V positive pulse. Digital delay effects such as slapback, echo, delay and layering are featured, and Echo Plus is also capable of sound-on-sound in either the delay (with infinite repeat mode) or the sample recording mode. Suggested retail price is \$299.99.

MORE FROM Digitech, 5639 South Riley Lane, Salt Lake City, Utah 84107. ☎ (801) 268-8400

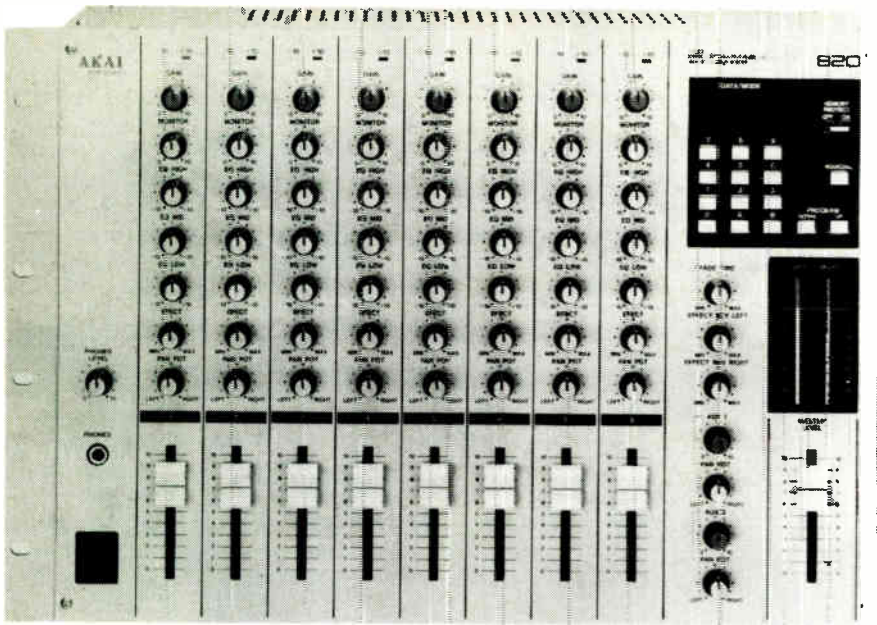
BEAT CODE BEATS TIME

If you'd like the power of SMPTE at a fraction of the cost, and want to make the most of your sequencer's MIDI capabilities, then the Synhance MTSI synchronizer from Harmony Systems could be just what you're looking for.

The MTSI is a tape synchronization system that provides your computer or dedicated sequencer with the ability to sync to tape, provided your sequencer supports external MIDI clock sync. And a unique error-correction method allows the MTSI to operate properly even when it encounters the kind of tape dropouts that normally ruin an FSK sync-track.

But the beauty of the MTSI lies in its ability to bring full chase-lock capabilities to a ▶





memorized and stored in any of the 99 memories available (accessible via a 10-key pad).

The event fade time feature allows the MPX820 to smoothly fade from one memory location to another, which allows the mixer to simulate a moving fader automation system. And since the MPX820 is MIDI compatible, it can receive program changes from a synthesizer or sequencer.

Frequency response is 20Hz-20kHz, and if a larger mixing system is required, up to eight MPX820s can be chained together for 64 programmable channels. Suggested retail price is \$2500.

Also new from Akai is the MG614, the first multitrack cassette recorder to provide four tracks of audio recording, and still have synchronizing capability. The MG614 achieves this feat by having Track 1 record the audio signal and a sync tone; the sync tone is modulated out of the audio range, thus allowing Track 1 to contain musical data while also controlling external sequencers and drum machines.

The MG614's mixing console section has six input channels, with channels 5 and 6 having balanced XLR inputs for connecting low-impedance mics. Each channel has two-band sweepable EQ and two effects sends with stereo returns.

The new mixer shares many of the features of the acclaimed MG1214: for instance, a built-in computerized channel/track selector allows for noise-free switching. The versatile autolocator allows for three memory locations (for easy access to pre-selected sections of recorded music), plus a user-selectable "capture" location can be programmed into memory. To this end, the control section has two tape counters: the first reads the tape as it's moving, while the second reads and stores memory locations. Meanwhile, the dbx Type I noise reduction is claimed to reduce tape hiss by 30dB, while greatly increasing dynamic range. The MG614 is priced at \$1799.95 retail.

MORE FROM Akai Professional, PO Box 2344, Fort Worth, TX 76113. ☎ (817) 336-5114

GET GRAPHICAL WITH SMART CURVE

ART announces the introduction of their "Smart Curve" intelligent equalizer system. The IEQ is a microprocessor-controlled, 15-band 1/3-octave graphic EQ which uses digital control of analog circuitry. The LCD on the front panel displays the current parameter setting, and all parameters can be increased ▶

▶ sequencer that supports MIDI Song Pointers, thus providing SMPTE-like performance but without the complexity and the cost. The MTSI uses a proprietary "beat code" recording method that completely captures the tempo and beat information of a performance during the generation of the synchronization track, so tempo variations in a song are well catered for, too.

And the MTSI doesn't stop there, either: it includes a built-in MIDI merge function that enables you to record into your sequencer while it's receiving sync information from tape; a "keyboard echo" capability for live overdubbing of sequenced material; and two MIDI outs which may eliminate the need for a MIDI Thru box.

The MTSI is packaged in a half-rack wide case and is available now at a suggested retail price of \$229.

MORE FROM Harmony Systems, Inc., PO Box 2744, Norcross, Georgia, GA 30091. ☎ (404) 662-8788

THE AUTOGATE TAPES?

Valley People has announced the Autogate—a two-channel, frequency selective noise gate/expander and their most sophisticated such unit ever. As its name implies, many of Autogate's processing parameters are automatically varied in response to the demands of the program material, thanks to proprietary Auto Slope circuitry. Thus, if a transition from expansion to noise gating (or vice versa) is demanded, the change in processing modes occurs naturally, and is said to be imperceptible.

Each of the Autogate's two channels consists of an automatic gate and expander featuring a continuously variable high-pass and low-pass filter set, a dynamic low-pass filter (to remove quantization noise from sampled and synthesized sounds, for instance), and continuously variable Threshold, Range and Release controls. Program Variable Release Shape circuitry continually analyzes the input

signal level and the settings of the threshold, range and release controls, and dynamically varies the release time so that the gate exhibits the desirable characteristics offered by a "hold" circuit. Also, the employment of the above circuitry allows Autogate to be used effectively on acoustic pianos, guitars, strings and drum kits to remove "leakage."

Valley has thoughtfully included a trigger pulse generator on each channel, which produces a trigger pulse each time the input signal exceeds the level of the Threshold control setting. This feature allows electronic drums or synths to be played simultaneously with acoustic drum kits and so on, and also allows unsatisfactory recorded drum tracks to be replaced with sampled or synthesized drums.

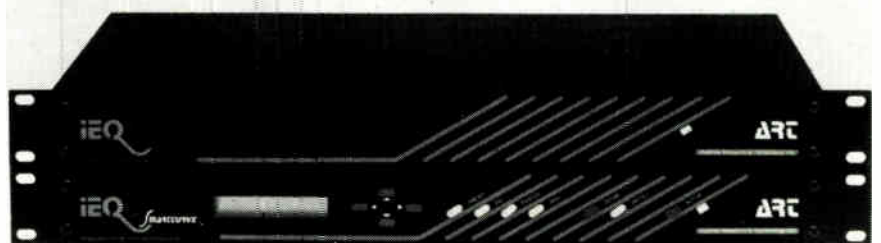
MORE FROM Valley People, PO Box 40306, 2817 Erica Place, Nashville, TN 37204.

☎ (615) 383-4737

AKAI KEEPS 'EM COMING

Visitors to the recent NAB show in Dallas were witness to demonstrations of two new Akai units: the MPX820 programmable mixer and the MG614 multitrack cassette recorder.

The MPX820 is a MIDI-compatible eight-channel mixer with programmable functions that include faders, panpots, effects sends and returns, EQ, monitor sends, auxiliary input levels and pans, master fader, and event fade time. Each setting of each knob can be



LET AKG GIVE YOU A HAND ... OR TWO.



Who needs a headset mic? Everybody. Who likes them? Nobody. . . the way they used to be. But all that's changed since the AKG C 410 hit town. Feather-light, snug, comfortable on any head, almost invisible in use, virtually indestructible — tie it in a knot and it'll spring right back into shape — the C 410 is the perfect mic for guitarists, keyboardists, drummers, engineers, vocalists . . .

And no tradeoffs either. The C 410 doesn't buy comfort at the cost of quality. It offers the full-frequency response of a prepolarized cardioid condenser, is plug-ready for anything with 9 to 52 volt phantom power, and there's even a model for wireless applications.

So who needs an AKG C 410? You do. Because you've got better things to do with your hands.



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▶ and decreased using simple front panel controls.

The Smart Curve system ensures that the displayed fader settings are an accurate representation of the actual response. And as the unit is digitally controlled, it's possible to store up to 128 curve memories, each having its own user-defined name.

As a composite video output is provided, you can display the frequency response as well as "slider" positions and system status on a video monitor. And if you don't have a monitor on hand, ART can supply a 3U-high 19" rack-mount monitor for this purpose.

The IEQ itself comes in a 1U-high 19" rackmount unit and is available as a master or a remote version. The cheaper remote may be programmed either from the master or a computer for the curve settings, and once programmed, curve memories may be recalled via MIDI. (The remote also has the hidden advantage of being tamper-proof in a studio environment.)

With the 128 curve memories selectable over MIDI, this allows you to choose a different EQ setting for each synth voice, and in a studio environment, the unit can be triggered from a MIDI sequencer that's sync'd to tape.

MORE FROM Applied Research & Technology, 215 Tremont Street, Rochester, New York. ☎ (716) 436-2720

MESCAL KITS OUT THE SKI

Mescal Music has released a trigger interface modification kit for the Casio SKI sampling keyboard that allows any drum machine or synth with a trigger output to trigger user samples - particularly useful if you're using the SKI as a drum expander.

The Mescal SKX kit is designed to be installed with a minimum of fuss, and the



material, such as snare drums, will be left intact, and a fade control offers smooth, linear fade times of up to 30 seconds. Threshold range is greater than 60dB, making the SG35 useful for both studio and home recording levels.

Other features include detector symmetry to within 1/4dB, a hysteresis circuit to prevent chattering near threshold, high slew-rate circuitry throughout, active balanced inputs, and a 16-gauge steel chassis.

The Ashly VCA used in the SG35 is said to exhibit extremely low distortion, low noise, low control voltage feedthrough and excellent thermal stability. Ashly claims that use of the

demonstrating the modular nature of the USS stands.

The former acts as the "recording station" of the studio and is designed with multitracks and computers in mind (nice features include a surface provided for writing or mouse applications and a six-way electrical outlet for quick and easy power access). The table height is adjustable, and the second tier is ideal for monitors. Also included in the package is a half tier for stacking drum machines and smaller devices. The suggested retail price of the HR-36BP package is \$280.

The Home Keyboard Extension, which attaches directly to the Home Keyboard stands, is available separately and comes equipped with one 48" tier for keyboards, and one half tier for sequencers and other small units. Suggested retail price is \$105.

Also new from Ultimate Support is the two-tier Dakota keyboard stand that stands (!) only 48 inches tall, giving the player high visibility on stage. The stand is available in either silver or satin black anodized steel, and the A-frame design allows for an optional third tier to be added. The Dakota is priced at \$144 upwards.

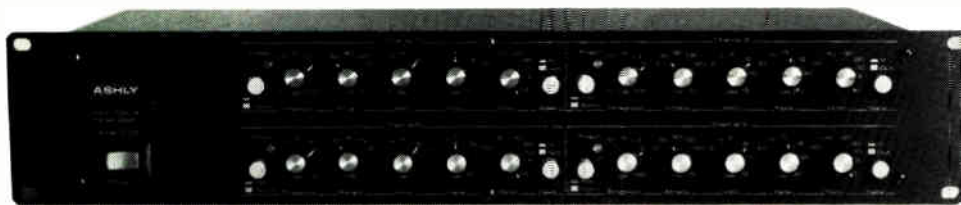
MORE FROM Ultimate Support Systems, PO Box 470, Ft. Collins, CO 80522-4700. ☎ (303) 493-4488

ARTISYN MIDI SAX

Apologies are in order here: those of you interested in the SX01 saxophone MIDI controller from Artisyn which we told you all about in our April issue will no doubt have already discovered our faux pas. That's right - wrong telephone number!

The correct number to use if you wish to contact Artisyn is in fact ☎ (0503) 295-1915, and we sincerely apologise for any inconvenience caused.

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complete kit (components and instructions) sells for \$15, while an assembled and tested interface board ready for installation is \$23.50. Both prices exclude a \$1.25 postage and handling charge.

MORE FROM Mescal Music, PO Box 5372, Hercules, CA 94547. ☎ (415) 724-0804

ASHLY AUDIO ATTACKS NOISE

The new SG35 four-channel noise gate from Ashly Audio is currently doing its bit to control leakage and background noise in recording and live sound reinforcement applications. The fast (10msec) attack time ensures that the leading edge of fast transient 10

VCA offers superior audio fidelity, accurate tracking of two or more units tied together, and attack/release times that are faster than those of competitive models.

MORE FROM Ashly Audio, Inc., 100 Fernwood Ave, Rochester, New York 14621. ☎ (716) 544-5191

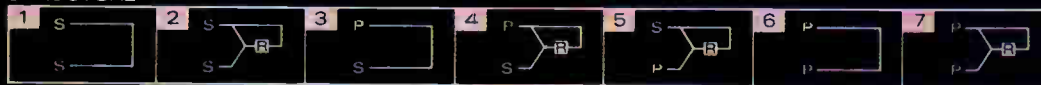
ULTIMATE AT HOME AND IN DAKOTA

New from Ultimate Support Systems is the USS Home Studio range of stands, which comprise two sections: namely the Home Recording Package (HR-36BP) and the Home Keyboard Extension (HE-48B), which are complemented by accessories aimed at

A NEW TECHNOLOGY IS CREATING A POWERFUL STORM IN THE WORLD OF SOUND SYNTHESIS

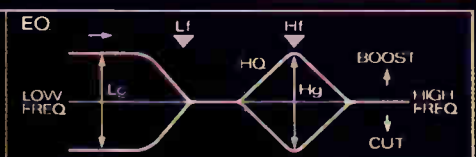
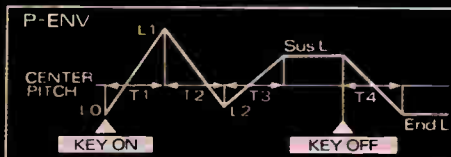


STRUCTURE



S: SYNTHESIZER SOUND GENERATOR
P: PCM SOUND GENERATOR
◻: RING MODULATOR

OUTPUT MODE

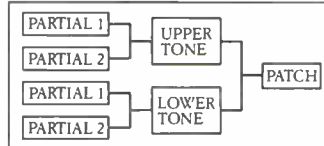


INTRODUCING THE D-50

THE BOLD NEW FORCE IN DIGITAL

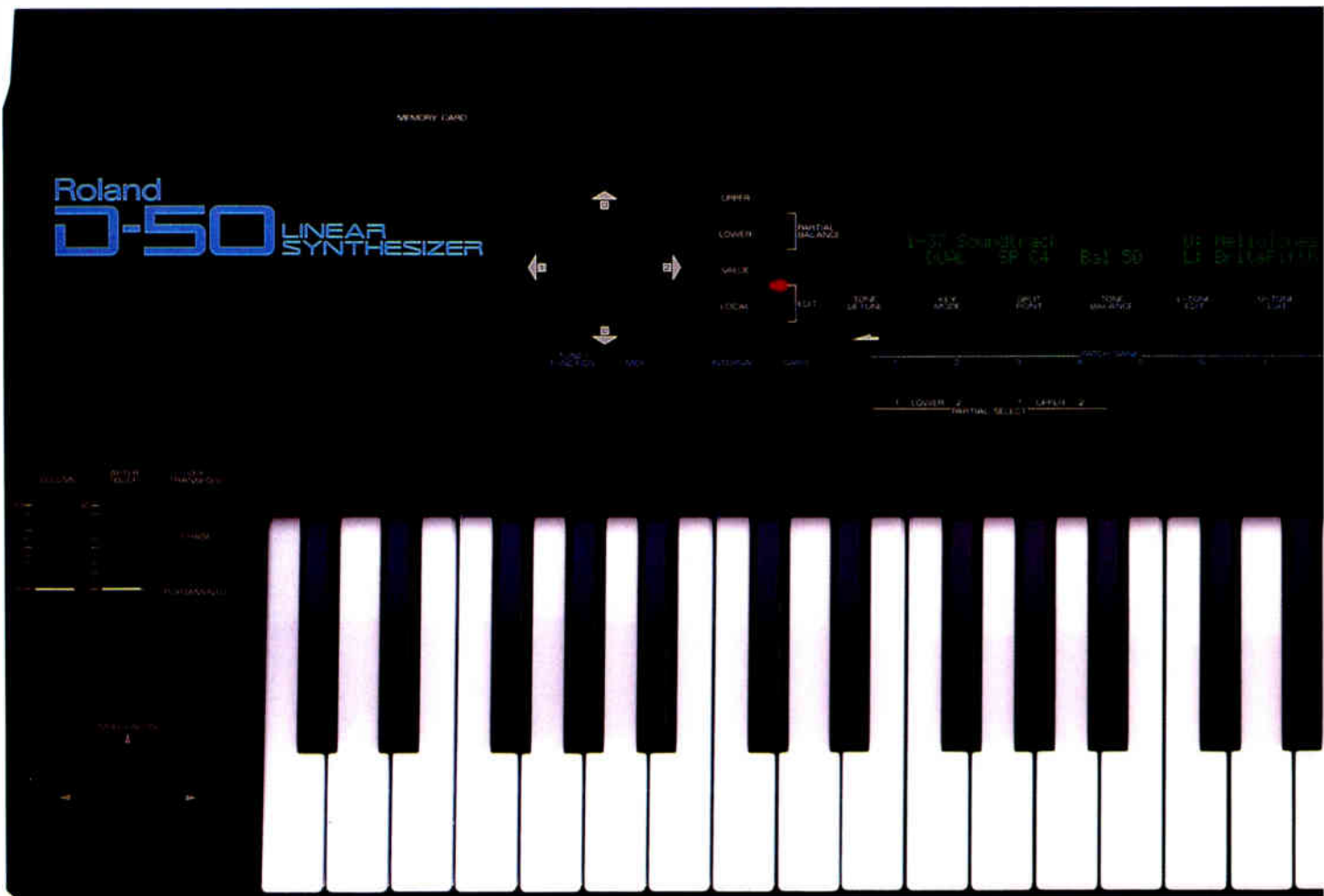
To the Player It's a Dream, To the Programmer It's a Miracle/Imagine a new technology that is so sophisticated that it offers totally new and unparalleled sound creation possibilities, combined with a programming method so logical that it actually builds upon the knowledge you currently have of sound synthesis. That is the essence of the D-50 Linear Synthesizer, a completely new, fully-digital synthesizer realized by Roland's Proprietary LA Synthesis Technology. The sounds created by the D-50 are simply breathtaking, resonating with character, depth and complexity, but with a warmth and completeness digital synthesis has never had before. The reason is that no sound has ever before been created in a manner so complex and rich with possibilities, and yet ultimately so very logical. Linear Arithmetic (LA) is normally used for computing complex mathematical problems in the field of science. In the area of sound synthesis it is an ideal creative method, offering superb

FIGURE 1 PATCH CREATION



predictions, analysis and control capabilities. Roland engineers have spent years developing a new highly sophisticated LSI chip, code-named the "LA Chip," that utilizes a linear arithmetic technique to digitally synthesize sounds. The "LA Chip" is the heart of the D-50.

LA Synthesis Explained/LA Synthesis is component synthesis on the highest order. To create complex sounds, the D-50 starts with a very simple premise—build sounds from the ground up by combining different types of sounds together, and then experience the interaction of these sounds on each other. We start with individual elements of sound called Partials. Two Partials are combined to create a Tone, and two Tones are combined to create the Patch. (Figure 1) The D-50 can hold 64 Patches and 128 Tones. Each of the two Tones can be processed individually by on-board signal processing that is sophisticated enough to rival a rack-full of equipment, and includes digital reverb, digital parametric eq,



LINEAR SYNTHESIZER

SOUND SYNTHESIS TECHNOLOGY

digital chorus, digital delay and more. But before we go too far, let's get down to the basics, the building blocks of LA Synthesis — Partials.

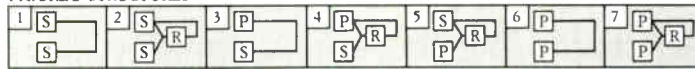
Synthesizer Partials/What is a Partial? A Partial can be either a digitally synthesized waveform, or a PCM sample. Each of the thirty-two Synth Partials contains all the components usually

found in the hardware of an analog synthesizer, presented here as digital

software. This includes the Wave Generator (to create a sawtooth or square waveform), the Time Variant Filter, the Time Variant Amplifier, three five-stage Envelope Generators and three digital LFOs.

In this way, even though the D-50 is a digital signal, programming the Synth Partial is very similar to programming on an analog synthesizer, (as these components react in the same way as VCO's, VCF's and VCA's on analog synthesizers) while offering sound synthesis capability beyond the most advanced digital synthesizer.

FIGURE 2 STRUCTURES



PCM Sampled Partials/A Partial can also be more than a digitally synthesized signal, it can also be a PCM sample. Resident in the memory (ROM) of the D-50 are over 100 carefully selected 16 bit PCM Sampled Wave Tables which can be used by themselves, combined with Synth Partials or combined with each other. The PCM Partials

are carefully selected, and digitally processed so that they combine well with other Partials. Some of the

sounds include a wide variety of the attack portions of percussive sounds: marimba, vibes, xylophone, ethnic instruments, grand piano hammer attack (with the fundamental removed), a variety of flute and horn breaths, a range of different string plucks and bows, nail files, guitars, and many more. The Wave Table library also includes Loop sounds and long samples, such as: Male and female voices, organs, pianos, wind and brass instruments, and also Harmonic Spectrum sounds, which are created by removing all of the fundamentals of a sound, isolating its harmonic components.



The sounds created by the D-50's PCM Waveform Generator are far superior to wave table samples found in other synthesizers, which are usually only one looped cycle in duration, and are usually no more than 5 milliseconds. In contrast, many of the PCM Partials on the D-50 are up to 256 milliseconds.

Structures/The combination of the Partials' operation modes can be set by selecting one of the seven Structures. (Figure 2) By choosing one of these Structures it is possible to combine two Synth Partials, or two PCM Partials, or a combination of the two in several different relationships. In addition, the Partials can be cross-modulated by the digitally-controlled Ring Modulator, which helps to create the complex harmonic environment for the resulting Tone.

Unlike ring modulators of the past (which tended to be interesting yet unpredictable), the Ring Modulator in the D-50 is designed to track with the keyboard, ensuring the proper harmonic relationships as you go up and down the keyboard.

Built-In Digital Effects/The final routing of the signal before it reaches the output is through the digital effects circuitry. (Figure 3) But, far from being merely an add-on, the D-50's effects are as carefully thought-out as the rest of the instrument, and likewise just as integral to the creation of new and unique sounds. The first effect is the digital Parametric Equalizer, used to contour the equalization curve for the tone before it passes into the digital Chorus, or we should say Choruses,

as the D-50 fields an arsenal of eight chorus circuits — all available simultaneously, configured in any of 16 modifiable presets such as panning chorus, tremolo, flanging and much more. Within each chorus there are parameters set up as to how these chorus

interact for maximum effectiveness. Lastly, the signal passes through the digital Reverb, which can also function as a digital Delay, offering various room and

hall sizes, gated (non-linear) reverb, reverse, stereo panning effects that can be routed to either or both of the stereo outputs. The awesome power of these built-in effects means that the D-50 requires literally no outboard effects processing. And just as important, because all the D-50's effects are processed in the digital realm, they are completely noise free.

A Mother of a MIDI Keyboard/The D-50 is also an excellent mother keyboard for your MIDI system, as it is totally dynamic, offering 61 keys in four different key modes (Whole, Split, Dual and Separate). In the Whole mode the D-50 is 16 voice polyphonic, while in the other modes it functions as two 8 voice synths, one for each Tone. All mother keyboard functions

are programmable per patch including a separate transmit channel and a separate program change transmit. As the D-50 is

truly bi-timbral it can function as two MIDI sound modules as each tone can receive on its own MIDI channel. All D-50 parameters and programs can be saved on Roland's new M-256D memory card which

M-256D MEMORY CARD

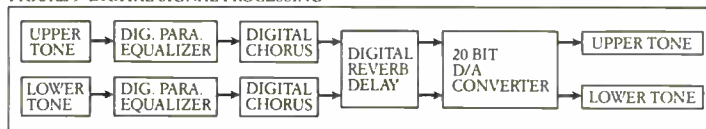


offers 32K bytes of storage in the size of a credit card. All of the D-50 functions can be programmed internally, or externally with the use of the optional PG-1000 programmer, which combines visual clarity and speed for

the programming professional.

Put It All Together/Taken as a whole, the D-50 represents more sound creation potential than most of the leading synthesizers combined. And just as important, it comes at a price that you can afford — \$1895.00. Of course, the only real way to find out for yourself is to play the instrument, but we'd like to suggest you do a little more. Go to your dealer, but before you try the D-50, try three or four other synthesizers first — really give them a good going-over. Then spend some time on the D-50. We think you'll find that the world of sounds you knew before, now seems to be black and white — while the D-50 has just exploded you into a universe of color. The new force has taken you by storm. Roland Corp US, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685 5141.

FIGURE 3 DIGITAL SIGNAL PROCESSING



PG-1000 PROGRAMMER



THE SOFTWARE PAGE

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BACCHUS EDITS FM

Yamaha TX8IZ users may be pleased to hear that Bacchus has announced the TX8IZ Graphic Editing System, a sophisticated mouse-based program for the IBM PC that features icons, control panels, multiple overlapping windows and pop-up menu "stacks" in a high-resolution graphic environment. All windows are active and instantly accessible, which ensures that you can explore with ease the TX8IZ's front panel functions (which has got to be good news).

With the program's Performance Editor, the TX8IZ can be used as eight independent instruments; Microtuning, NoteShift, Pan and Delay are just some of the features available in performance mode. Pan, Delay and Chord can be adjusted using the Effects Editor and Micro tuning and Program Change tables are also fully programmable.

Each of the TX8IZ's Operators is given its own window with the oscillator wave graphically displayed; the Algorithm Window shows all eight configurations simultaneously. Any voice, including the TX's internal RAM/ROM voices, can be instantly auditioned or retrieved for editing, and the Graphic Editor provides complete librarian functions, according to Bacchus. Suggested retail price is \$199.95.

MORE FROM Bacchus Software Systems, 2210 Wilshire Blvd., #330, Santa Monica, CA 90403. Tel: (213) 820-9145

JAZZ IMPROVISING WITH MIDI

Electronic Courseware Systems are making available a new teaching tool for jazz improvisation, which provides instrumental and vocal students with play-along material to learn jazz improvisation using original tunes based on traditional chord progressions.

'MIDI Jazz Improvisation I', written by Tom Rudolph and Roger Morgan, allows for flexibility of changing keys, presentation speed and practice with selected tracks. Each exercise is organized to eight separate tracks, comprising bassline, simple chords, complex chords, melody line, counter melody, scale study, sample improvised line, and rhythmic pulse.

The program is designed for beginning and advanced improvisers, and is available for the AppleII, II+, and IIE computers and requires a

Passport Design MIDI interface, MIDI/8 and a MIDI-compatible synth. The program retails for \$79, with educational discounts available to schools placing quantity orders.

MORE FROM Electronic Courseware Systems, Inc., 1210 Lancaster Drive, Champaign, IL 61821. Tel: (217) 359-7099

KILL A HAPPY FACE?

At last, a manufacturer has announced a software package aimed at the average musician – or at least the mental age of the average musician . . . 'MIDIMaze, The Game', from Hybrid Arts is a maze game that allows up to 15 Atari STs to be networked together using MIDI (the speed of which provides fast graphics and response). Players are each assigned an individual color Happy Face and can play against the computer or in conjunction with as many as 14 other people.

The object of the game is to find the other Happy Faces and exterminate them, while keeping your own alive. Players can use a mouse or a joystick and can even design their own mazes to run through. MIDIMaze is designed for players aged five to "adult" (a bit optimistic, perhaps), and retails for \$39.95. So who said MIDI wasn't fun?!

MORE FROM Hybrid Arts, 11920 Olympic Blvd., Los Angeles, CA 90064.

COMING SOON FROM COMPU-MATES

The company that's currently bringing you graphic editors for the Kawai K3, Casio CZ, and Korg DW synths, as well as the Kawai R100 drum machine, has announced details of their forthcoming releases.

The Korg DSSI Synthdroid features a real-time additive synthesis editor that can paint in a wave, accent 5th harmonic content, octaves, or odd and even harmonics. It also features a Fourier Transform display with real-time cut and paste, and an artificial intelligence android. The DSSI Synthdroid retails for \$129.95.

Compu-Mates has also added the Oberheim Matrix 6 and 6R to their list of synthdroid editors; the new program will incorporate all existing Matrix 6 parameters, as well as added features that do not exist on the synth itself. The program is due to retail for \$79.95.

And following in the footsteps of the K3PO editor for the Kawai K3, Compu-Mates plan to

unleash the K5 editor on unsuspecting Kawai devotees at the June NAMM show, at a retail price of \$129.95. Compu-Mates is creating a synthdroid editor with a wave-generating feature, which will allow you to load a sample from any sampling synthesizer and convert it to an additive wave that can be manipulated on screen or in the K5 with a harmonic resolution of 128.

Other new products planned by Compu-Mates include the Final TRAK ST, a complete multitrack MIDI sequencer that will support SMPTE of all types and will also support programmable MIDI to acoustic mixing. The sequencer will allow you to select any track and print a score with musical and text notations. There will also be a feature that does real-time scoring to a dot-matrix or laserprinter (Atari is announcing a laserprinter at an incredibly low price with the new MEGA STs). The package will also have free update insertions periodically to keep up with the rapid pace of change – hence the name Final TRAK ST.

Compu-Mates have some new hardware products up their sleeve too – namely a MIDI Programmable Patcher which will allow you to program sequences of events and sequences of MIDI switching through 16 inputs and outputs. Future software packages will incorporate features to manipulate volume, pitch, parameters and so on, directly inside this intelligence-based MIDI switcher. The unit will also allow you to sync to tape or sync to the Compu-Mate SMPTE Brain. The Patcher is due to retail for \$189.95.

The SMPTE Brain just mentioned is a package which will lock to any SMPTE standard, sync, FSK, and so on, for the purpose of synchronizing your Compu-Mates sequencer with new digital tape machines and video machines, as well as the old stand-by systems.

Finally, watch out also for the Gen-Pedals for the Atari ST. These are a set of eight MIDI assignable controllers; you can use eight standard volume pedals, modulation wheels, faders, and so on, and the package comes with an editor to allow you to assign the eight controllers to any MIDI parameter on any MIDI device with a system exclusive parameter change. You'll also be able to set up 50 sequences of eight pedal setups that can be accessed in sequence by an additional footswitch.

MORE FROM Compu-Mates, 8621 Wilshire Blvd, #177 Beverly Hills, CA 90211. Tel: (213) 271-7410 or (818) 904-0661.



Dear Music Technology,

In their article "We Can't Go On Beating Like This", MT April '87, Chris Meyer and Matt Isaacson raise some important issues about the use, abuse and limitations of drum machines. It should be noted, however, that like many other articles which appear in the hi-tech music publications, the emphasis is on the synthesizer as a piece of technology rather than as an instrument with which music is made.

While the limitations of drum machines are quite as they spell out, the authors neglect to mention that most users are making dull nonsense with their programming. They are working within a style which allows little in the way of imaginative rhythm tracks. The drum machine becomes a vibrant instrument, on the other hand, when used by groups like Kraftwerk or Cabaret Voltaire, who allow them to express their own language instead of using them as excuses for live drummers, or as shortcuts to quick dance-fodder. Listen to the use of drum machines by these groups. Every quirk is the result of the unmistakable presence of a unique compositional style, something lost on most electronic musicians today.

As for cheaper machines, there is one shockingly easy way to take the chintz out of the sound: speed up the pattern, record it fast and then slow the tape down. Even the Roland Drumatrix sounds relatively convincing then. Happy programming.

Carl Howard
New York, NY

Thanks for the tip and the commentary. We're always willing to air our readers' views on technology and music (after all, that is what the magazine is all about), so if you've got something you want to say to us or to fellow readers, drop a line. We love getting mail.

Dear Music Technology,

In your review of the Barcus Berry Electronics Sonic Processors, MT March '87, you described their function as changing the time alignment of low frequencies relative to the highs. Couldn't much of the same effect be achieved by speaker placement?

In a home listening situation, if a stereo pair of two-way or three-way loudspeakers are oriented

sideways with tweeters closer to the center, woofers to the outside, then the sound path from the tweeters to the listener is shorter than from woofers to the listener.

Assuming that the speakers are about seven feet apart, that the listener is on the centerline between the speakers and about six feet away and that the woofer and tweeter are 18 inches apart, this would delay the lows by about 1.5msec relative to the highs. Arranging the speakers this way also puts the tweeters closer together to minimize the "hole in the middle" effect and the woofers nearer the corners of the room to improve bass response.

In a performance situation, where low, mid, and high-frequency drivers are in separate cabinets, placing the high frequency drivers about a foot and a half forward of the mids and the mid frequency drivers half a foot forward of the low frequency ones should create the same time alignment as the Barcus Berry unit generates.

Barry Cook
South Salem, NY

Perhaps, if that's what you want to do. I think that the point of the review is that the BBE units essentially allow the "aligned" audio to be recorded. Once you've done that, the effect should be reproduceable on virtually any speaker system.

Dear Music Technology,

Your review of Kahler's Human Clock, MT May '87, claimed the unit to be "unique", "the first of a breed", for its ability to "make machines follow humans in a live situation". This is incorrect. Actually, synchronization to live musicians in real time is a Garfield Electronics first and has been available as one of many features on our Master Beat SMPTE Synchronizer (which was first shipped in March '86, over a year ago).

The essentials of our system (Gain, Mask, Window, Damping and Lead/Lag) are all duplicated on the Kahler product with different names.

Dan Garfield
Garfield Electronics
Burbank, CA

Quite right, Dan. Sorry for the oversight. Readers interested in this subject should note that Garfield is introducing a new product this month, the Time Commander Real Time Clock, which also includes the tracking system.

Dear Music Technology,

Although any one person's thoughts are probably most accurately termed "opinions", thereby "biasing" one's reaction or outlook as verbally expressed, there comes a time (in my "opinion") when a fair level of objectivity may be achieved. However, since people with common opinions tend to group together, let us (in the interest of objectivity) call it "biased objectivity".

Anyway, if you folks continue biasing your admirable objectivity as I've seen in your April '87 edition, then you'll have won an eager subscriber! Being an acoustic and electric bassist, sound/recording engineer, electronics tech./

experimenter and lover/manipulator of music, sound and technology, I've been waiting for a magazine like this! Being indifferent to most trendy, shallow or commercial publications, I've found just the well-rounded (not to mention "hip") supplement of information I've been looking for in your magazine. Please don't change too much.

Jai Salvatori
West Milford, NJ

What can we say but "thanks"? We work hard to maintain the "biased objectivity" in our articles that you refer to and we're glad to see it's appreciated. If you don't agree, however, don't be afraid to write and complain. Every now and then we can use a good swift kick.

Dear Music Technology,

This is in response to the suggested use of a digital delay for stereo simulation in "We Can't Go on Beating Like This", MT April '87.

While the effect described works (I often use it to fake a double or to thicken individual tracks), I would hardly advise processing an entire track with it. The reason? Psychoacoustics. Even if the delay return on, say, the right is equally loud when compared to the program on the left, the slight uniform delay of all the program material will make the sound seem to originate on the left. There will be stereo ambience, to be sure, but the imaging will be screwy.

However, a DDL can be used very effectively to process the return of an old mono reverb unit. Put the program material in its proper perspective, put the straight reverb return on one side and the delayed reverb return on the other and voilà; stereo ambience plus proper stereo imaging!

Jon Gordon
New York, NY

Dear Music Technology,

I enjoyed reading your April issue which included an article on the new Ravi Shankar album - Tana Mana. There is, however, one point which I would like to clarify. The article states that Ravi and Ali Akbar Khan are "adopted brothers" which was not really the case. Ravi was not adopted in the traditional sense, but instead was accepted as a devotee of the greatest known musician in India - Ustad Allaiddin Khan of Maihar. This saintly and learned man became Ravi's revered Guru.

Part of the confusion surrounding the use of the word "adoption" stems from the difference between eastern and western cultures. In India the Guru is like a father (Guru Bhai), and fellow devotees - like brothers, as was the case with Ali Akbar Khan and Ravi Shankar. As a child Ravi performed throughout Europe as an Indian classical dancer. At the age of 15 he began studying music intensely for 7½ years with Ustad Allaiddin Khan. After years of world travel, Ravi returned to India every year to study with his Guru for 10 years thereafter.

Frank Serafine
Santa Monica, CA

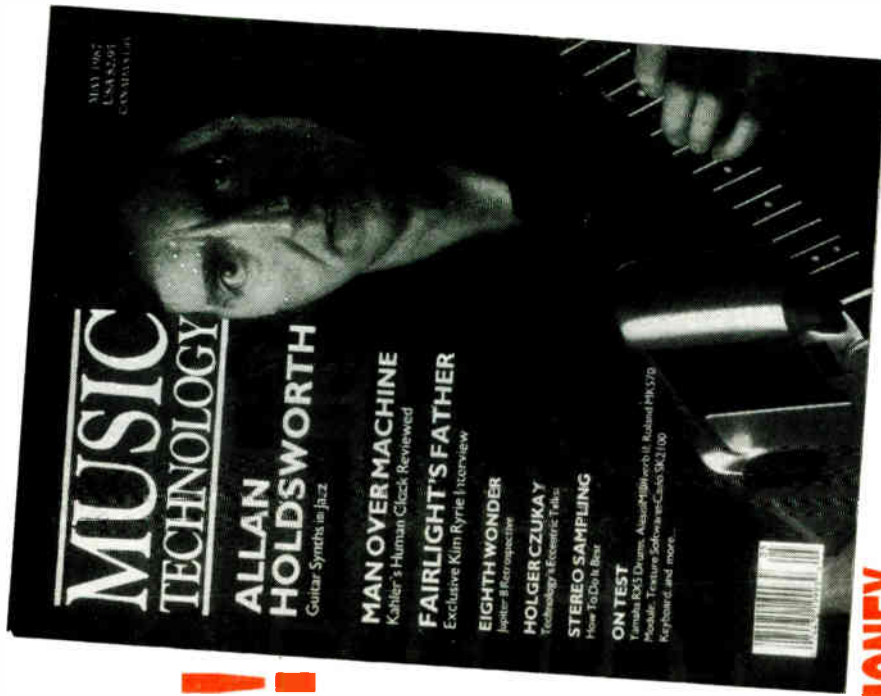
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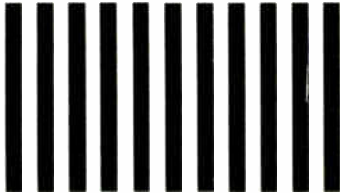
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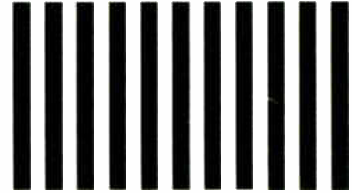
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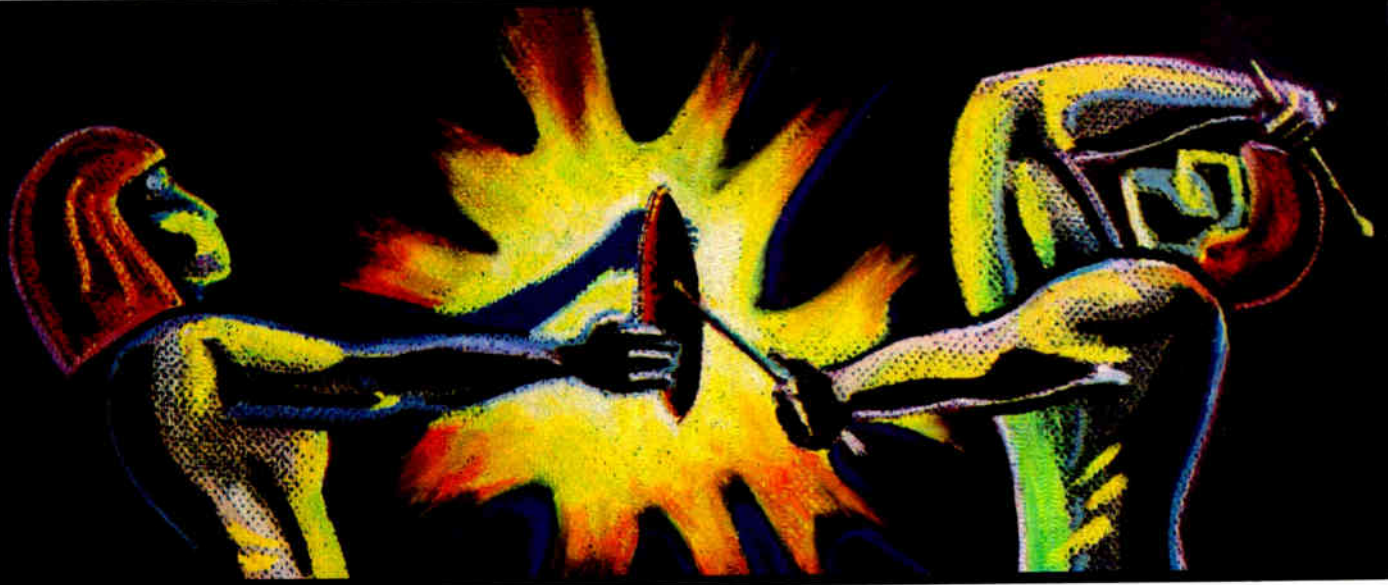


Illustration: Stuart Caterston.

we can't go on

BEATING LIKE THIS

part 3

The third installment in our series on creative percussion programming looks at trigger-to-MIDI convertors and explores their usefulness for triggering drum samples and/or sounds. Text by Matt Isaacson and Chris Meyer.

WE STARTED AT the ear and are now working backwards. In the first installment, we explained why drum machines sound like machines, and offered a few quick tips on how to get around it if you happen to own one. In the second, we suggested using samplers as replacement sound generators for drum machines, and gave tips on how to program those more effectively. We also hinted that playing plastic piano keys may not be the ideal method of triggering these sounds.

So, in this installment we'll be looking at the next step upstream – trigger-to-MIDI convertors, the things that turn a physical, or in this case electrical, “thunk!” into something which can play our wonderfully programmed sounds. In the next two installments we'll be looking at those things you actually go “thunk!” on – the pads (and other weird strikeable devices) themselves.

We got our hands on seven different trigger-to-MIDI convertors from six different manufacturers, representing a variety of

features and costs – the Translator 2 from Phi Tech, the DZI from Casio, the Octapad from Roland, the TMI and MTM from Simmons, the SC40 from Pearl, and the PMCI from Yamaha. It is worth mentioning up front that while we originally approached this set of reviews from the angle of a keyboardist (or other non-rhythmic musician) looking for good ways to trigger percussion sounds, we ended up being fascinated with the keyboard-oriented possibilities these devices opened up for drummers – fledgling young Bill Brufords, sit up and read on!

What follows is a capsule review of each conversion system, in price order, from the bottom to the top (or vice versa, depending on your current financial status).

Phi Tech's Translator 2 (\$249.50) was the least expensive and the most basic of the interfaces we tested. Front panel “controls” consist of a power LED, a single “trigger happening” LED (alas, not one per input), and a “panic button” to kill droning notes. The back panel consists of six ¼” input jacks, six ¼” output jacks, MIDI In, MIDI Out, and a

jack for the wall-mount power supply. Notice anything missing? Well, there's the “internally adjustable ‘set and forget’ parameter controls over individual pad sensitivity, separate MIDI In/MIDI Out channel assignment, velocity tracking, and selection from a choice of eight pre-programmed MIDI note assignment options!”

In other words, you have to open the small, sturdy metal case to get at a set of miniature trimmers and DIP switches to set up the device. There are sensitivity trimmers per input plus a master velocity curve trimmer (ie. how subsequently stronger thunks translate to various MIDI velocity levels), MIDI channel switches, and the aforementioned note assignment options. These options are pre-programmed for certain note values to match up with a handful of drum machines, along with forming a C Major or C# Pentatonic scale.

Hint: have small tools available when setting up this box – those controls are *small*. Also, even though hitting the panic button was supposed to reset the box after changing an

MT JUNE 1987

internal DIP switch, we found out we had to unplug and replug the box more than half the time to “unfreeze” it after making a change. Once the lid’s back on, things are cool.

If it’s not obvious already, this box is more suited to fixed setups where not much variation is expected (the controls are fiddly, and who wants to keep opening their box?) such as a live gigging situation. However, if you are indeed using a sampler for your playback device, you can map and transpose your various drum and percussion samples to match up with the preset note configurations. An additional bonus is the ability to translate MIDI In to trigger outs – nice for driving an existing electronic drum kit (the designers’ intention) or perhaps a cheap monophonic analog synthesizer (our idea); we’ve heard some great electronic toms out of a Pro One and the likes . . .

The Translator 2’s most important feature is its price. It doesn’t present the same over-the-top creative options as some of the other boxes we’ll be getting around to, but it does its job with little hassle, and the manual has a good, sardonic sense of humor – what more can one ask of a drummer?

Casio seems dedicated to making technology affordable. True, occasional corners are cut from the “pro” point of view (ie. when are they going to make something – anything – in rackmount form?), but, on the other hand, they also manage to throw in a surprising number of well thought-out features. The Casio DZI (affectionately referred to in this neck of the woods as “The Dizzy One,” just as the FZI is “The Fuzzy One” – no reflection on either’s quality), which retails for \$399, is another such example.

On first blush, a “pro” sees things to gripe about – the rather nice metallic gray and aquamarine case is not rack-mountable, but is about the size of a hard cover book and about the weight of a football (not very confidence-inspiring). It comes with no power supply – six AAs are included (the manual also gives instructions on how to run it with a car battery). As a matter of fact, a lot of Casio equipment is battery-powered – hmmm . . . When is their battery-powered amplifier/speaker coming, so we can actually take these things to the beach?

Okay, let’s remind ourselves of the price, and keep going. The back panel is generous, with room for eight trigger ins, four preset selector footswitches, and a hi-hat switch (all ¼”). Two wired-together MIDI Outs are provided (that’s one less MIDI Thru box to purchase), along with a nine-volt power input, power switch, and overall sensitivity control. The top panel includes eight sensitivity sliders, a selector button per “translator” (Casioan for “trigger input”), four preset selectors, four mode selectors, a three-digit LED display, and a pair of scroll keys (used for parameter editing only – thankfully, they are not needed to access the parameters as on so many synthesizers today). Each trigger input and edit mode switch have an associated LED, telling the user precisely what’s going on – a basic human need overlooked on other more expensive devices.

The front panel is virtually the manual – there are four presets, and each “translator” may have a MIDI channel, note number, and program change number selected for each one. When a new preset is selected, the program changes are sent, and various modulations are zeroed and the pitch wheel recentered. However, reading the non-offensive manual reveals a couple of other thoughtful features.

The first is that hi-hat switch. While the footswitch is left alone, one translator’s note number is sent per thunk at input 8. While the footswitch is held down, a different note is sent. At the time it is actually depressed, it also sends a note, at a selectable velocity. In other words, it can work just like a hi-hat (or at least as close as any drum machine has gotten so far). Just line up one note number with a closed and another with an open hi-hat sample. Of course, other samples (slap bass, for example) may be selected just as easily – or this switch could just be used to extend your kit out to nine sounds (the footswitch can be programmed to be silent when struck).

Another thoughtful feature is a mode where the velocity of a selected translator is displayed when struck, including an overload indicator, which is nice for the initial setup of a trigger-to-MIDI interface (and for when you’re unsure just what velocity range should be producing what results).

Finally, while you’re editing a particular trigger’s parameters, all others are blocked from being transmitted. This is a quick and easy way to figure out which pad is which (even though it would have been nicer if the trigger number followed the last pad hit, instead. Sigh, almost nobody does this).

Disadvantages? Not many. The biggest is being restricted to only four patches. Once you start using any of these interfaces beyond the drum machine or drum kit level, it quickly becomes clear that four presets are not enough. Also, the DZI is the only convertor not protected by a metal case – doesn’t Casio realize that drummers are . . . are . . . animals? (Of course, more sedate keyboardists would be safer owners.) And coming with batteries instead of a righteous power supply borders on jive. But, it is the second cheapest device of its kind, competent, and by far the easiest to use.

Next up is our second “conventional” trigger-to-MIDI convertor. The Simmons TMI, which retails for \$455, is a one-rack height module with eight sensitivity controls, a twin seven-segment LED, and an otherwise minimal front panel. The back panel consists of eight trigger in and eight trigger out jacks, along with MIDI In, footswitch, cassette (an unusual multi-pin DIN connector), and “suitcase kit” jacks. The trilingual manual is generally a tad cryptic and wordy in places. For example, “channel” is used to refer to trigger/pad inputs, not MIDI channels, resulting in sentences like “Each channel in each patch can also be sent down a midi (sic) channel, to see which midi channel has been programmed for each of the TMI channels, press the DISPLAY button (A), you will see that the channel led lights up in the display (B) and the display has changed to show one of the 16 midi channels

that the particular TMI channel is being sent down (C).” Reading manuals like this no doubt contributes to the supposed illiteracy of musicians.

Additional negatives include the fact that numbers greater than 99 cause a decimal point to come on in the display to indicate 100 onwards, and the autoscroll (for value adjustment) seemed a bit overeager – we often overshoot values. Aside from that, the manual’s illustrations are helpful and, in general, the TMI is easy to learn.

Having trigger sensitivity knobs on the front panel is a big plus, and there is an LED under each one showing current trigger activity. Despite that, we still had a couple of problems with crosstalk rejection, where hitting one pad on a stand causes another one to trigger.

Each trigger input (not “channel”, damnit) can be sent as a particular MIDI note on a particular MIDI channel or be silenced altogether in a patch. (Because the trigger ins are echoed back out, presumably, in their case, to an electronic drum kit – you may not want MIDI doubling up your thunks on some patches). There are 50 of these patches (each of which may send out a MIDI program change) that can be chained in various “sequences” (not to be confused with sequences of notes – language problems again) and stepped through, back and forth.

A real meat-and-potatoes sort of machine – nothing fancy, but all of the basics are there times 50 patches, and you don’t have to open the chassis.

One quite often thinks of the venerable Roland Octapad (\$675 list) as eight rectangular pads in one case with a MIDI Out, and indeed, we’ll be looking at it in that context next issue. But what one may not realize is that it also has six trigger inputs that it converts to MIDI – in essence making it a 14-“channel” thunk-to-MIDI convertor. The additional trigger inputs behave identically to the built-in pads with respect to programming options, and allow you to use other outboard pads (or electronic kick pedals, or whatever) at the same time.

One immediate and obvious advantage of the built-in pads is that you save the roughly 8×\$100 that normal pads would run you (not to mention stands to support them). These would be a necessary expense because the other trigger brains pretty much demand them to get started. The Roland pads, although small, feel darn near as good as most of the free-standing ones, and (thanks to some clever crosstalk-cancelling electronics inside the box) are entirely isolated from one another – not all pad/brain combinations can make this claim.

While banging out hard rock rhythms in a space the size of a large TV dinner may not be your idea of an ideal performance situation, there is something to be said for the technique-related aspects of having all your pads so close together – whether you’re a drummer or not. And by the way, just try carrying anyone else’s trigger converter and eight of their pads in one hand (juggling counts).

The Octapad stands alone among this group in its very simple and elegantly-implemented

▶ programming interface. All you have to do is choose a parameter for editing, then hit a pad (internal or external), and that pad's values are displayed and may be changed. Once you've worked with it, it seems incomprehensible that no other thonk-to-MIDI convertor we tested is set up this way.

The edit mode is either global (edit all pads at once) or per individual pad, indicated by slow or fast flashing of the two-digit LED display. There are but six editable features – unfortunately, there are only four parameter buttons to hit. It is somewhat annoying that two of them are accessed as hidden controls (hit the “A” and “B” preset buttons while in edit mode), although there are few MIDI percussion interfaces which are *not* guilty of some equally heinous trespass against reasonable programming methods. At least these two, pad sustain (time between note-on and note-off from a pad hit) and minimum MIDI output velocity, are less subject to frequent adjustment than the other parameters, which include MIDI channel, MIDI note number, trigger velocity curve (a generous five choices), and pad sensitivity.

Being able to set up different sensitivities per pad is useful, even though there are built-in pads. This is particularly true, for example, when pads are mapped to multiple sound sources with different velocity characteristics.

Other spiffy features include a built-in merger that passes incoming MIDI information to the MIDI output (for chaining multiple Octapads, in case 14 thonks is not enough, for instance) and the ability to send program changes to your sound boxes in response to pad strikes (while also depressing the appropriate footswitch).

There are, of course, some areas in which the Octapad is lacking. The most oft-cited one is that like the Casio DZI, there are but four presets. There is no way whatsoever to back up this preset information – perhaps its function as a controller does not justify this need in some people's minds, but it *could* have allowed offline storage and retrieval of more than four presets.

What the Octapad ultimately does is fairly bare-bones – one pad strike translates to one MIDI note with variable velocity (that does not go down as far as it could, by the way) – so some of the tricks from the more expensive boxes would really sweeten the pie. And in place of “mode” LEDs, the display blinks at different rates to state the mode, which can be annoying to some of us higher-strung types (doesn't a blinking light mean that something's about to blow up?).

But overall, a very useful and cost-effective unit.

Speaking of blinking displays, the first thing we noticed about the Yamaha PMCI, which retails for \$720, was that it had five large, red, seven-segment LED displays, as opposed to the common (and expected) Yamaha LCD. The second thing we noticed, right after we powered it on, was that the information in these displays blinked, alternating semi-leisurely between different sets of values. There – we have 80% of our complaints about the Yamaha out of the way.

Let's get another 5% or so out of the way

next – the trigger in connectors on the back are all XLR. Fine for Yamaha's own pads (which even come with their own XLR cables) and early Simmons, but it means adaptors or expensive cabling for most other pads.

On to more positive things. The rest of the back panel connectors include one MIDI In and two MIDI Out jacks, footpedal and footswitch inputs, and a memory select footswitch input. The front panel of the two-rack height case includes eight trigger sensitivity controls (easier to grab and more conveniently spaced than any other interface we tested – ergonomic points) with eight large “select” buttons that have imbedded activity LEDs underneath. The five LED digits are split into two groups, each with its own inc/dec switches. The remaining controls include 16 function select switches (with their functions labeled on them) and a DX7 RAM cartridge slot (!) for downloading programs to an offline FM brain. Indeed, the PMCI came with a QXI disk and a double-ROM cart of FM percussion voices which, while perhaps lacking a little in variation, literally blew us away with their bite and frequent realism. The voices in particular took advantage of the fixed-versus-pitched operators in the DX7, resulting in different keys transposing the “shell” sound while keeping the skin, snare, and other noise components of the sound constant across the keyboard – in other words, they transposed gracefully.

If you buy a piece of Yamaha gear, they expect you to own nothing but Yamaha gear in the rest of your system. The manual is written from this point of view, and something like the PMCI is optimized to take advantage of such a setup. Given that, Yamaha takes very good care of you and presents you with a well-integrated system that has a ton of power. Your mission is to fill in your own brand names (and MIDI implementations) in place of Yamaha's to take full advantage of the system – which ain't that hard.

For example, Yamaha assumes that you are driving one of their drum machines and a DX/TX7. You are supposed to plug your (Yamaha) drum machine into MIDI Out B and your (Yamaha FM) synth into MIDI Out B. The MIDI In, which presumably connects to your (Yamaha) sequencer or master keyboard, is echoed to both Outs. Since your (Yamaha) drum machine maps each of its drum sounds to a selectable MIDI key, all MIDI Out B transmits is singular note messages (programmable per pad) on a selectable MIDI channel.

We hooked a sampler loaded with drum sounds to MIDI Out B and it worked just fine – and so would practically any MIDI'd drum machine. But since your (Yamaha FM) keyboard on MIDI Out A has considerably more flexibility in terms of transposition, chords, gate times and so on, this is where the fun really begins – and where we started to cross the line into using drums to create new “keyboard” lines.

Each trigger input may cause transmission of up to five selected MIDI notes. The gate times for these notes range from nothing up to about three seconds (fixed). The footswitch can be used to “hold” these notes on, and this

feature may be programmed per pad (we found this very useful for drones or, say, phrasing a bassline from the kick pad).

Velocity may be used to decide how many notes of the programmed chord get sent – this proved to be a very useful “punctuation” feature, either for thickening up drum sounds (Yamaha's FM drum sounds respond very well to just whacking a fistful of keys at once) or bringing in notes and suboctaves of a musical chord. The display shows these by alternating between the basic note and these “simul-notes.” There can be a different MIDI channel assigned per trigger in.

Now we start having *real* fun. Yamaha has a feature called “dynamic shift” which allows you to have the velocity information determine the transposition of a single note (the other four are dropped) instead of determining how many notes of a chord get played. The transposition can be up or down, and selectable up to an octave. If you're driving percussion sounds, this means that different pitches or versions of a sound can exist under one pad. If you are driving a keyboard sound, you have just crossed into the realm of free music.

This mode provided an unexpected amount of enjoyment. As mentioned above, we had MIDI Out B driving “normal” percussion sounds on a sampler, and MIDI Out A driving a Prophet VS in split mode with the kick drum playing a monophonic bass patch and three tom pads (one in chord mode) playing a bell-like sound. We have taped documentation of what this sounds like – *pretty intense*. At times it even sounded like an ultra-tight jazz keyboardist with a drummer (circa early Frank Zappa).

As time went on, we realized that the PMCI was really oriented towards keyboardists in a good way. (For further reference on the “keyboard potential” of drum playing, pick up a copy of David Torn's *Cloud About Mercury* or Earthworks' debut album discussed elsewhere this issue, both of which feature Bill Bruford doing similar things with his Simmons kit.)

Other features include a footpedal input for sending modulation to your saved keyboard (it only goes out over MIDI Out A), program selects per trigger input (since each may be on a different MIDI channel) plus a “system” program number (for reverbs and the like), a reasonably generous memory of 32 programs, and a patch edit/recall memory that saved our ass at least once when we made changes we didn't intend to.

The remaining few percentage points of complaints include the wish that notes in dynamic shift mode were selectable, like the simul-notes were, so that scales and such could be programmed (it's hard to play against anyone who could pick any of the 12 semitones in an octave on the next beat). Also, the hold footswitch could have sent a MIDI hold pedal command – that would have meant we could program two different release times on keyboards that implement a “second release” function instead of just having everybody drone.

The lack of an LCD, played against the wealth of features, meant constant references to the manual to learn the Yamaha, but

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fortunately the manual was well-written and, in general, we had a lot of fun with the PMCI.

Our modus operandi tends to be checking out equipment and making a lot of noise in general on Saturday nights, traveling into the local beach town (Santa Cruz) on Sunday mornings in search of the perfect brunch, and then tackling one more piece of equipment Sunday afternoon. The relaxed state of mind this produces proved to be the best way to check out the **Simmons MTM** (\$1150 list), because it had the most features – and hid them in the most devilish ways.

We don't want to give the impression right off the bat that the MTM was a bummer – like we said, it had the most features, and it proved to be a total gas once we figured it out. If you follow the manual very carefully, you *can* figure it out. As with the TMI, however, the manual left us wishing that the British would learn to speak plain English. The front panel features an LCD – great – but it is sunken into the panel and not backlit, meaning you have to have a bright light behind you and the display has to be dead on eye level to read. The LCD also seems to be an excuse for not including any status LEDs on the front panel, which made it hard to figure out which pad you were thonking (even Simmons' lower-priced TMI has LEDs per trigger input), for example. The editing procedures also give the impression of climbing down a hole to reach a certain function, and needing to climb back out again before climbing down some other parameter's hole. In other words, it shouldn't be *this* hard to use, guys.

On a more positive note for the user interface, the trigger flowchart is printed on the front panel, with each major section being printed over a membrane switch which helped select that function. The back panel includes eight sets of trigger in and trigger out jacks (both XLR and 1/4"), along with MIDI In and MIDI Out jacks. In fact, as mentioned earlier, the MTM shares the rare quality with the Phi Tech Translator 2 of being bidirectional, in that MIDI In can be turned into triggers along with triggers being turned into MIDI. Trigger ins can also be routed to trigger outs, and some cross-patching is allowed.

Like most interfaces, the MTM also includes trigger sensitivity knobs on the front panel. In addition, the MTM has the most comprehensive trigger processing of any converter we tested, allowing selection between 12 different velocity curves and control over threshold levels and trigger expansion and compression.

Now on to the fun stuff with this box. It, too, has the ability to play chords from pads. As opposed to individually picking the notes, the user selects from a variety of "canned" chords and sets the root note for them – less open-ended than the Yamaha system, but quicker and also easier for those with little or no music theory (ie. many drummers) to use. Velocity can be linked to how many notes in the chord(s) are played, or which single note of the chord is played – much more tonal and less random than the Yamaha's "dynamic shift" effect. (We disagreed on whose implementation we liked better.)

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► for "echoes" to be generated per thnk. As with the thickness of the chords, the number of echoes can be velocity-derived. The delay between echoes can be set from 8 to 800msec, steppable in 4msec increments. The echoes can repeat up to 51 times and successive echoes can even be transposed. Echo decay is set in a percentage – down to 1. These decays are stated as rates – on short decays, you cannot hear the repeats (we would have preferred that it took into account how many notes are in the echo, and calculated such that the last one ended up at the set decay).
Another interesting feature is the ability to

set up a sequence of notes for the MTM to transmit either on successive hits or as "repeats" of an echo. Simmons originally sold this as a "one-pad roll" feature, but (as stated in the manual) it can be used for basslines and arpeggios. You can even program the phrasing (spacings) of these notes. There can be up to 16 notes in a sequence, and if more than 16 echo repeats are selected, the sequence repeats over. We personally didn't find this feature as useful or fun as the chord features, but it does add another dimension.
The MTM's not done yet either, as it allows still more fun to be had with velocity. For

example, velocity may be routed to gate time and delay. In the former, harder hits hold notes on longer – the only convertor we ran across that does this, and very useful for varying how much of a sample gets played back. The latter adds a smearing or delay effect to hits, which also proved to be a useful effect.
Of course, the MTM also has such expected features as the ability to select different MIDI channels per trigger input and the ability to transmit MIDI program changes for each of its 20 patches.
Next up is the Pearl SC40, which retails for \$2330. Why is it so expensive? Because along

MIDI Delays & Samplers

Text by Chris Meyer

IN OUR WORK with triggering sounds from percussive instruments, delays become an unavoidable topic. Keyboardists are used to delays – there is always some delay between first touching a piano or organ key and when the hammer actually strikes the strings, the switch is tripped, or air pressure builds up in the pipes. With a guitar the delay is a bit more critical – there is always the noise of the pick first hitting and/or releasing the string as a cue that something's happening, even if the amp is 30 feet away.

Percussionists, however, are the ones most used to instant feedback – their noisemaker is at most an arm and a stick away, and starts making sound the instant they hit it. Any perceptible delay between a strike and the resulting sound is going to be most alien to them. Therefore, when selecting a sound module for electronic drums or percussion, less delay means a more natural, more responsive instrument.

Also mixed in with that equation is the variance in delay – if one strike has X amount of delay and the second has Y, the groove can suffer from this unpredictability – particularly if the player is a deadly accurate drum machine or sequencer. The general rule-of-thumb is that a delay of 10-15msec between an action and a sound is perceptible to a musician, and that a variance as little as 2-5msec against another event or rhythm is enough to change the feel of a drum pattern.

As audio playback devices, samplers are much more complex than the average drum machine and are expected to produce higher sound quality. As a consequence, in the process of outputting a sound, a sampler has a larger number of steps to go through, and may spend somewhat more time setting things up. Under most conditions, the resulting delays are not highly noticeable, but when an intricate, rapid drum pattern or a drummer playing MIDI pads is brought into the picture, these delays can present a real problem. Unfortunately, until now there has been little hard information to go by (and no specifications are published by manufacturers), but impressions abound with respect to the relative time delays exhibited by different samplers upon playback. Sloppy sample editing (ie. leaving a bit of silence or

noise on the front of the sound) can add further to the inherent delays. Of course, to avoid getting bitten by this, it is best to test a sampler in the exact configuration in which you intend to use it before plunking down the bucks.

We set out to actually test the delays inherent in various sample playback units – the things we advocate in our "Beating" series for percussion playback. The delays involved in converting a trigger to MIDI, or in transmitting the MIDI note itself, are both in the order of a millisecond apiece – miniscule by themselves (and by now you're sophisticated enough to realize that such things as length of cables contribute mere microseconds which are certainly not audible – also, they tend to be fixed). Therefore, we built the adjoining table of times (Table 1) based upon how long it took 10 samplers to convert MIDI into a sound. To do this, we set up a repeating sequence of identical MIDI notes driving a sample that had been truncated down to a very short burst. We used an oscilloscope to display the MIDI stream on one line and the audio output on another. Then, we measured the time between the last bit of the MIDI note-on message and the start of the sound. What we found is ranked by average response time (fastest ones first).

A couple of the numbers in the table need additional explanation. The E11 is commonly maligned as having a built-in 15msec delay. Thus, we were surprised by the numbers we were actually measuring. However, careful

study of the amplitude shape of the sound coming out of the E11 proved interesting – namely, even though the sound had started, it was obvious that the amplifier's envelope had not opened up all the way yet, and actually needed another 5msec or so to reach full amplitude. This resulted in a rounding of the attack of the sound, and explains why many people (including E-mu themselves) append a little bit of silence on the front of the sound to let the VCA open up all the way. Other ways around this are to either leave the VCA release envelope out at its longest time (which means for rapid-fire notes, the VCA doesn't get a chance to close down, and therefore opens back up to full right away), or to try out the hardware modification E-mu recently announced to get around this problem (see our News section last month).

On the other hand, the VCA on the Prophet seemed to open up about a millisecond before the sound actually started, meaning that nothing got rounded off, but an additional bit of delay got added. The two fastest machines – the S900 and SPI2 – do not have a full compliment of envelopes (the Akai lacking a filter envelope and the SPI2 any at all), a fact which may help their performance. These times also validate their current popularity as percussion sound brains. We were frankly shocked at how fast and steady the DSSI and Studio 440 were (true, the DPXI was faster, but varied), and disappointed at the wild variance of the Rolands.

In short, these are some stats to keep in mind before purchasing your drum brain – important ones that you probably won't find in any glossy brochure.

Table 1.
(all figures in milliseconds)

Sampler	Fastest Response	Slowest Response	Average
Akai S900	1.5	1.5	1.5
E-Mu SPI2	2	3	2.5
Oberheim DPXI	2	6	4
Korg DSSI	4	5	4.5
Sequential Studio 440	5	5	5
Ensoniq Mirage	4	8	6
Roland S50	2	11	6.5
E-Mu Emax	5	9	7
Roland S10	4	10	7
E-mu Emulator II	7	10	8.5
Sequential Prophet 2000	9	11	10

with being a trigger-to-MIDI translator, it is a sound playback brain. We're not here to make an extensive review of its sound capabilities, but it's worth mentioning that the sounds are an interesting combination of sampled sounds and analog processing that range from snares to tightly looped cymbals to tubular bells to electronic toms. We started out really liking the sounds, many of them being unique, but about half of them grew tiring quickly. To each his or her own though, so listen for yourself if you're also looking for an electronic percussion sound module as opposed to a sampler.

The Pearl has several very nice features – such as an LED bargraph showing the level of the trigger along with an LED bar trigger input, and a mode where the eight front panel buttons played the currently selected sound at eight levels – very nice for working from the front panel. It also had sensitivity trimmers on the front panel – little round knobs with slots in the middle – a tad fiddly and harder to read than Yamaha or Simmons. Continuing downhill (unfortunately), the Pearl won both the Most Cryptic Front Panel and Most Indecipherable Manual awards of the group. There was also one fatal editing flaw – for an edited MIDI key number to take effect, one must leave that mode – annoying, to say the least.

The SC40's MIDI implementation is fairly simple and straightforward. There are ultimately 32 kits, arranged in two banks of 16. It has three velocity scales that can be applied to both input and output (numbered 0, 1, 2 – how very computerese). It allows selecting if a pad triggers internal sounds, MIDI, or both. The Pearl can be played from MIDI, of course, and the MIDI key per trigger is selectable.

The one sleeper feature is the ability to expand from eight to 16 inputs. The drum kit we used for these tests included seven pads and a couple of kick pedals, and it becomes very tempting to have an octave of pads for playing scales and the such. In a live performance setup, one could quickly outgrow eight trigger inputs.

In general, though, unless you are an electronic drummer needing a sound brain along with a trigger to MIDI convertor and really dig the Pearl's sounds, this was the least desirable of the convertors we tested.

Several blown eardrums later... In this part of our quest for The Better Beat, choice is not lacking. There are indeed a few different approaches and a wide range of prices out there in the trigger-to-MIDI world.

A tight budget cries for the Phi Tech Translator. A couple hundred more buys the solid TMI, or the rather competent Casio DZI. A Roland Octapad is perhaps the best buy, because it gives you eight pads and six additional trigger inputs along with some basic, useful functions at a reasonable price. And the Pearl is just plain expensive.

But the real jewels, to us, were the Yamaha PMCI and Simmons MTM – they do the basic thonk-to-MIDI conversions of the less expensive units, and if you have the extra cash, they open up quite a wealth of alternative approaches to percussive and melodic playing techniques. ■

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Photography: Tim Goodyer.

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Review by Simon Trask.

"THE ROLAND D50 is very different from any other synthesizer, past or present, and as such heralds the dawn of a new era in synthesis."

Yes, it's 1987 and the synthesizer is alive and well (as, so it seems, is the enthusiastic manual writer). The D50 is Roland's first all-digital polyphonic synth (and their first 16-note polyphonic synth), and the company has come up with a new name – and a new synthesis system – to delight us all with: Linear Arithmetic Synthesis, which is implemented on a new custom-designed chip known, not surprisingly, as the LA Chip.

In fact, so new is the D50 that we've decided to spread our review of it over two issues. We could say that this will give you more time to get to grips with the D50, but in

fact, it's your UK-based Reviews Editor who needs more time, owing to the fact that MT's review model arrived on the doorstep just as the magazine was going to press. We couldn't pass up the opportunity to tell you about the D50 as soon as possible – but not at the expense of thoroughness. So this first part will concentrate on providing an overview of the instrument, while part two will look in more depth at just what the D50 can and can't do.

Before we start considering the delights of Linear Arithmetic Synthesis, consider the scene on a Wednesday afternoon in MT's English offices. One of only five D50s in the country has just arrived courtesy of a major security firm in the UK, and the staff are stirred into something resembling activity. In a matter of seconds, the D50 is up on the stand

and plugged into a passing keyboard amp. Fingers are laid to rest on keys, and suddenly the office is filled with vibrant sounds which instantly mark the D50 out as something a bit special.

Now, MT staff are as capable of child-like excitement and fascination as the next idiot musician, and the D50 is certainly doing its best to bring out the best in us. Could Roland's enthusiastic manual writer be right after all?

Well, put simply, the D50 retains all the richness of tone that you typically associate with Roland's upmarket analog synths, and couples it with a "bite" and "sparkle" that is more generally associated with digital sound-generating systems. And the whole is definitely greater than the sum of its parts.

Background

BUT WHAT IS this Linear Arithmetic Synthesis, and do you need a degree in Mathematics to understand it? Well, if you were designing the D50 you probably would, but fortunately, all you have to do is play it and program it.

The programming system which Roland have devised isn't the easiest to understand initially, but if you stay cool, most of it clicks into place without too much brain-ache. And in true Roland fashion, there's an add-on programmer which allows you to adjust all the D50's sound parameters using analog sliders. The PGI000 (for so it is called) is the most sophisticated programmer that Roland has yet come up with, which seems reasonable enough for what is really the most sophisticated instrument they've yet come up with, too.

Essentially, the D50 achieves its results by providing PCM samples of the attack stage from a wide range of acoustic instruments, which can be combined with sounds created in the instrument's synth section. The idea behind this is that you get the realism and bite that comes from the attack of a real sound (always an important element in the definition of a sound) combined with the sonic flexibility of a synthesizer section for the rest of the envelope.

The D50 has 100 PCM samples onboard. Forty-seven of these are one-shot and 29 are looped. The remaining 24 are combined and looped versions of the other samples, for some more unusual effects. Roland's attack samples include all manner of percussion instruments, together with piano, harpsichord, organ, electric and acoustic guitar, electric and upright bass, flute, clarinet, trumpet, trombone, violin and cello (often with several versions of each instrument type).

These PCM samples provide one type of sound source (the other being the synth section) for what is known as a Partial. Don't get these confused with harmonic partials; a D50 partial is really a complete sound in its own right.

Two partials together with various parameters that are collectively known as a Common block (because they apply to both partials - it's easy, really) make up what is known as a Tone, which constitutes a single voice on the D50. As each partial can be either a PCM sound or a synth sound, you can of course decide to combine two of the former or two of the latter. You can get some very effective sounds very quickly by combining different PCM samples (a violin scrape combined with a flute chiff gives a very convincing impression of the shower scene music from *Psycho*, for example). And further flexibility is provided by the D50's ability to balance the volume of your chosen two partials.

Structure

ROLAND HAS PROVIDED seven Structures which determine whether each partial is a PCM sound source or a synthesizer sound source (this setting is one of the Common parameters). These structures are printed in MT JUNE 1987

graphic form on the D50's front panel - providing an invaluable amount of feedback when you're trying to figure out what the hell's going on. Essentially you can have sample+sample, sample+synth and synth+synth. But you can also choose structures which bring in ring modulation (digitally implemented, of course).

The synthesizer section allows you to choose between sawtooth and square waveforms (the latter with adjustable pulse width), while the synthesizer sound generator has three sections - WG (Waveform Generator), TVF (Time Variant Filter) and TVA (Time Variant Amplifier) - with the PCM sound generator missing out the filter section. There are also three LFOs and a five-stage pitch envelope which can be applied to various parameters of each generator.

The "Time Variant" label is cleverspeak for envelope - filter and amplitude respectively for TVF and TVA. As with the pitch envelope, these are five-stage affairs, with level and time settings. The filter envelope allows you to select the filter cutoff point for a synthesizer sound dynamically - not that common a feature. And remember that these envelopes (which are adjustable in real-time) are digitally defined - which makes the D50's filtering a great improvement on the digital filtering found on, say, Roland's S10 sampler.

Carrying on up the hierarchy, two tones can be combined into a single Patch, of which there are 64 onboard the D50 (organized in Bank/Number format). A further 64 patches can be stored on one of Roland's new wafer-thin memory cards (like credit cards, but cheaper in the long run), giving instant access to 128 patches at any one time. The D50 comes with a ROM card which duplicates the factory set of internal patches (so you can overwrite the latter without fear of losing them), but you'll also be able to get RAM cards, and it seems likely Roland will be supporting the D50 with a sound library.

The way the two tones (specified as Upper and Lower) are placed on the keyboard is taken care of by the keyboard mode - essentially whole, split and dual. While whole mode obviously gives you 16-note polyphony and dual gives you eight-note, split can be either 8+8, 8+1 or 1+8. You can also set the instrument to whole solo and dual solo, while separate solo modes take you into the weird and wonderful world of MIDI.

Dual mode actually allows you to layer up to four sounds (2x2 partials), while you can adjust the volume balance of the two tones in a patch - which means, in effect, that you can balance all four partials. Volume balancing is accomplished using an onboard joystick (which can also be used for coarse adjustment of all parameter values -inc/dec buttons take care of fine adjustments). This shouldn't be confused with the Prophet VS' joystick-based mixing of timbres.

What can be annoying is that there seems to be no quick way of selecting either the upper or the lower tone for whole mode (you always get the upper), while for split and dual modes, there's no quick way of altering the combination of tones other than by copying a tone from one patch to another.

Processing

INTEGRAL TO THE D50 are onboard programmable digital reverb, chorus and EQ. As Roland is keen to point out, *all* processing on the D50 takes place in the digital domain. The reverb is patch-programmable, while chorus and EQ may be programmed for each partial within a patch. The D50 has four output modes (again represented graphically on the synth's front panel) which determine whether the programmed reverb effect is applied to a mix of upper and lower tones, upper and lower tones individually, the upper tone only or the lower tone only. Output mode is programmable for each patch, as are the balance of "dry" and reverb signal, and the choice of reverb type - and that's about the extent of the control you have over reverb on the D50.

There are 32 reverb types, providing rooms, halls, chapels, boxes, single delays and cross delays, gates, caves, gated reverb, reverse gate, slapback and twisted space(!).

Chorus is provided for by eight chorus types, which include flanging and tremolo effects. You can also set rate and depth together with a balance of "dry" and chorused signal. EQ (which is applied before the chorus) is a two-band parametric, and essentially allows you to set LF frequency and gain, HF frequency and gain and the width of the high-frequency band.

Another patch-specific feature implemented in software on the D50 is Chase Play. This replays notes that you have just played to give a DDL-type effect according to level and time settings. If you're familiar with the Roland JX10 synth, you'll no doubt be familiar with Chase Play. It's a very effective feature, and a dedicated front-panel button allows it to be switched in and out with ease.

Coming Soon . . .

IF YOUR LOCAL music store salesman starts talking about the LA sound, you'll know now that he's not referring to the latest West Coast craze. But the D50 does have a *sound* - and ultimately it will sit next to other synths with other sounds. We racked it up with the DX7II, and a wonderful combination they made, too. As we said at the start, the D50 excels at lending sparkle (thanks to the PCM samples) to warm synth sounds that have plenty of movement.

From the factory programs, those with the greatest impact are "breathy" sounds, strings sounds, and special-effects voices with complex envelope settings. But the existing piano and brass sounds are not the D50's forte, and there's nothing to compare with the best acoustic guitar sound on the DX7II, for example.

But the D50 is an *exceptionally* impressive and intriguing machine which looks capable, perhaps more than any instrument since the original DX7, of bringing a new *quality* to sound synthesis. Next month, we'll go in the deep end. ■

PRICES D50 \$1895, PGI000 \$395

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



getting more MILES PER MAC

Illustration: Stewart Carterson

Apple's Macintosh computer has become an established standard for many music applications, but it can be slow to work with. We offer some helpful tips to increase its speed and efficiency. Text by Jim Burgess.

SPEED. THE FASTER the better. If you make music for fun or profit, the speed and efficiency with which your system operates can make the difference – more songs, commercials, soundtracks or original sounds for the time you spend using it. If you use a Mac for music, you already know the beauty of its user interface for musical applications. Now see if you can speed things up by using some of these tips to get your Mac moving fast.

Most new Mac users have to endure the bitter experience of swapping the same two disks back and forth for what seems like forever. If you use a single-drive Mac system, it's not unusual to find yourself dutifully obeying the Mac's requests to first insert this disk then the other then back to the first then again the other . . .

Sound familiar? You can avoid this situation entirely just by taking into account a few simple rules. In normal use, the Mac usually wants to have access to at least three different files:

- 1) The System File – because it contains most of the Mac's operating instructions and as such is required regularly.
- 2) The Application – that's the program you're running. It might be a sequencer, sound editor or librarian or any number of dozens of existing Mac music applications.
- 3) The Data File – your all-important data, whether it's a sequence file, a freshly-edited sample or your latest synth patch.

To get the best possible performance from the Mac, you have to let it have access to all three of these types of file at all times. Taking this harsh reality in mind, here are some simple tips designed to ensure that your Mac is cruising at full speed.

Customizing

FIRST, CUSTOMIZE THE Mac's System File. Use Apple's Font/DA Mover utility to create a compact version of the Mac System specifically for using with your music software applications. Remove all fonts except the ones the Mac needs for its own use (no need to worry about what they are; Font/DA Mover won't let you remove them when you try). Now remove every desk accessory except the ones that you might need to use from within a music application. You might consider keeping the Notebook, Calculator and Control Panel DAs, for example. If so, go ahead and remove all others. Be ruthless. Now you've got extra memory for a few third-party desk accessories that are of special interest to musicians.

"Tempo" is an easy-to-use macro recorder. You can use it to speed up any function you use frequently that requires one or more repeated operations. Tempo can reduce a series of operations to a single keystroke command. You teach it what to do by recording the movement and actions of the mouse. Tempo will play it all back whenever you ask it to do so. Mind-numbing routines for transferring data (ie. open this, copy it, paste it to here, close it) are ideal candidates for Tempo automation.

"Teleport" lets you get from one program to another by bypassing the Mac's regular Desktop. Use Teleport to load a new program directly from within the one you're using now. Teleport quits the program you're in and boots the one you want in one smooth operation.

"Zapper" lets you get at your files from within an application program. If you need to delete, copy and rename files from within an

application program, you'll grow to appreciate Zapper fast.

"Voilà" is a handy text outline that you can use to make point-form notes in hierarchical format. Users of Thinktank and More will appreciate having many of the features of those programs in the form of a desk accessory. Use Voilà as an organizational tool: keep track of the sounds you're using, effects settings, the production plan, lyrical ideas – in fact, just about anything you might like to jot down quickly.

Using Ramdisks

ONE OF THE easiest ways of getting things moving fast is to make full use of ramdisks. You should think of a ramdisk as a kind of extra drive – except that it only exists within a section of the Mac's memory. A ramdisk partitions off a specified amount of the Mac's RAM to be used exclusively for whatever you put inside that space.

Because of the temporary nature of RAM, it's important to never put important data inside your ramdisk. After all, a single power surge and the new song you just wrote could be vaporized. Instead, put your newly-customized System file in there. If your Mac has 1Mbyte of RAM or more, you might even try putting your most commonly-used program(s) into the ramdisk, but this can create problems in some instances. Use the System to start – it's a safe bet.

Ramdisks are easy to set up. Use the Get Info command on the desktop to find out the precise size of the System and Finder files, plus any frequently-used desk accessory data files (your notes, macros, and so on). Add it up and add an extra 5K for safety. Now you know how large your ramdisk should be. The actual method of installing the ramdisk may vary depending on which one you use (there's many available). I've had great success with RamStart.

Once you define the ramdisk, you can use it
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to boot the Mac every time you use it for music. The better ones will proceed immediately to partition the RAM, copy the files you want into it, quit, return to the desktop and eject the boot disk. Now you can enjoy the benefits of a new, compact and powerful System that lives right in its own RAM nest and makes everything faster.

Combining Applications

IF YOU HAVEN'T already done so, copy all of the software applications you use on a regular basis together onto several disks, each featuring a different but useful collection of programs. If you've got an old Mac and you haven't updated the single-sided drive yet, you might only be able to fit one or two programs onto each disk. Mac users with 800K drives should be able to fit two, three or even four applications on the same disk. Don't fill the disk completely, however. Be sure to leave at least 60K as a temporary workspace to store datafiles you're working on.

By assembling a number of work disks, each containing useful combinations of your most frequently-used software programs, you'll be able to move from one program to another without having to eject disks.

Hard Drives

IF YOU'RE ONE of the growing legions of hard drive owners, you've probably already installed all of your music software onto it. If you haven't, check the manual for each of your programs. Most Mac music software developers provide users with the means to install a copy of their program on a hard disk.

Of course, convenience isn't the only feature a hard drive offers. Disk access time is improved tremendously (more so with SCSI hard drives) so the programs themselves work faster. Hard disks also provide large workspaces that can be backed up easily to floppies with any number of hard disk backup utilities now available.

Plus, now that the first SCSI-equipped samplers are appearing on the market, hard drives are even more appealing as a more efficient memory storage means than floppies alone. With the price of Mac hard drives dropping consistently, it's only a matter of time before every music software user has one.

Using Switcher

APPLE'S SWITCHER UTILITY lets you get the most out of your Mac's RAM. Switcher takes RAM partitioning to the max by allowing you to configure multiple portions of RAM for use by different programs. You can make a Switcher configuration for every one of your combination disks. That way, you can boot a number of different programs at the same time and instantly toggle back and forth from one to the other - without quitting, closing or opening. To make this even more fun, Switcher's designers gave the program some simple animation tricks that make the screens slide across when you toggle between programs.

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Switcher is great - when it works. Unfortunately, not all music programs like the Switcher. You may have to fine-tune the individual memory allocations, the Switcher options and even the order that you install the applications in to get your own custom combinations to work consistently. Of course, once you've got it, you can store it and it really is worth the effort. By the way, Switcher is one of the cheapest and most widely available programs for the Mac, and the excellent documentation that Apple provides is well worth the price of the program.

Some music software manufacturers and many of the new breed of computer music retailers can supply you with their own Switcher configurations for many useful program combos. Bulletin boards such as PAN are another great source.

Conclusions

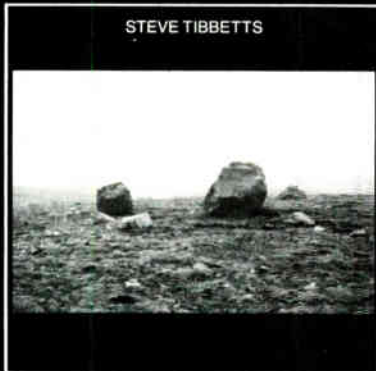
BY NOW IT should be pretty obvious that most methods of improving the Mac's speed are ultimately limited by the amount of RAM and the size of the storage device you're using. The good news is that both RAM chips and hard drives are now available at reasonable prices, and things will get even better in the next few years.

But what if you've got a meg or more, you use a ramdisk and Switcher, you've got a 40Mbyte hard drive and it's still not fast enough?

Start planning to get a Mac II. Its faster processor, greater RAM capacities, larger screen and color will make it the natural for all demanding computer music production applications in the next few years. ■

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Guitar Music and Beyond



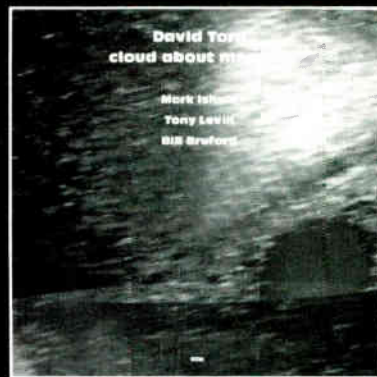
Steve Tibbetts
EXPLODED VIEW

Rock, folk, ethnic musics & sounds from everyday life come together in guitarist/composer Steve Tibbetts' music. Blending acoustic & electric guitars with kalimba, voice & Marc Anderson's pan-cultural percussion work, *Exploded View* is Tibbetts' most raucous & assertive album to date.
831 109



David Torn
CLOUD ABOUT MERCURY

Cloud About Mercury demonstrates that David Torn is more than an impressive young guitarist on the rise. In collaboration with Mark Isham (trumpet), Tony Levin (Chapman Stick, bass synth) & Bill Bruford (Drums, percussion), Torn reveals his maturity as a writer, group leader & conceptualist with a desire to delve into previously unexplored musical territory.
831 108

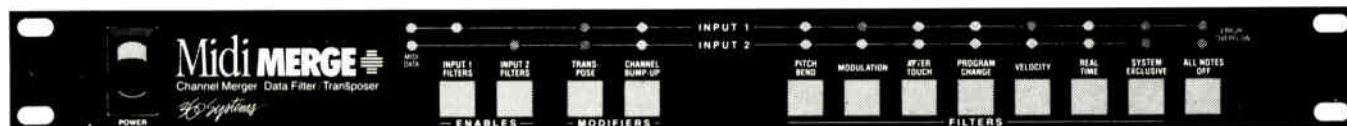


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ECM

360 Systems MIDIMerge+

The newest box from the makers of the MIDI Bass and Patcher is a data processor which gives users the ability to combine, filter and alter MIDI data. *Preview by Rick Davies.*



IT'S OFTEN HELPFUL to have a good analogy to work with when you're learning a new subject. Take MIDI, for example; there is a first time for (almost) everybody, and unless you're already versed in the ways of other serial communications interfaces, there are bound to be times when you ask "Why doesn't this happen when it's supposed to?"

Truth of the matter is that MIDI is still in its infancy – not necessarily because manufacturers don't know how to implement it, but because there are so many different applications and instrument configurations that it isn't safe (or fair, for that matter) for manufacturers to dictate to musicians the only way to hook up their equipment.

The analogy that often gets used for first-time MIDI users is that of audio systems. This is mainly due to the number of sequencers which use terms common to audio: tracks, filters, transposition, and other favorites.

Synth modules tend to have one MIDI input, but are often driven by more than one MIDI controller at various times. Perhaps you need to play a synth module from a keyboard one minute, from a sequencer the next minute, and at some point, from both. A MIDI switcher will only help matters for the first two instances, but come to the third, and it's time to scratch our collective heads. For unlike audio signals, which can be hard-wired together, MIDI signals cannot – unless you really want to confuse your synth module. So here the audio analogy breaks down, right where the MIDIMerge+ comes along.

360 Systems' latest MIDI processor follows their MIDI Patcher (reviewed in MT September '86); a logical move, and a sensible implementation at that. The function of a MIDI merger is to monitor two MIDI signals, and funnel them down into a single MIDI signal. Since MIDI mergers are required to prevent two MIDI messages from conflicting with one another, they must actually keep track of the data that flows through their circuits, so a microprocessor is usually required to handle this task at the required speed. The bad news is that microprocessors cost money. The good news is that microprocessors are capable of doing a lot

more than just sitting around all day keeping tabs on what sort of MIDI data is assaulting their input ports, and this makes most mergers much more than their name implies. Hence the "+" tacked on to 360's model. We'll see what this signifies in the following paragraphs.

Housed in a trim single-rack space chassis, the MIDIMerge+'s back panel requires little explanation. There are two input sections, each comprising a MIDI In and a MIDI Thru. Then there are two "Merged" MIDI outputs which provide identical MIDI signals, should you need to drive more than one MIDI device. A 1/4" input socket accommodates a momentary footswitch which, when closed, causes the unit to send out All Notes Off messages over all MIDI Channels – ideal for those times when your synth module is leaving a note hanging on here and there. The All Notes Off messages can also be initiated from a similarly named front panel switch.

If the MIDIMerge+ was a mere merger, you wouldn't really expect much of the front panel, but the "+" sports a host of switches and LEDs, so it must be up to something more. Like six preset filtering options, eight user-definable filters, and a transposition function. The filters help clear up the MIDI output signals by removing unwanted or unnecessary MIDI data. I won't go into why you might want to filter out data – there are too many reasons, and it doesn't take much experience with MIDI to discover what several of these reasons are. Suffice it to say that this unit lets you filter out pitch-bend, modulation, aftertouch, program-change, real time (clocks, and related messages), and system exclusive (patch dumps, sample dumps, and so on) data, and any eight continuous controllers of your choice (or disliking).

Each of these filters has a dedicated front panel switch with two LEDs (one red, one green, for inputs one and two respectively) above it to indicate whether or not the filter affects either or both MIDI inputs. This ability to selectively filter one input and not the other comes in handy when, for example, you want to send a sequencer's MIDI note messages to a

drum machine, but don't want its MIDI timing messages to affect that drum machine's internal sequencer. Simple – just switch on the Real Time filter.

If filtering isn't the only thing you need, look to the Channel Bump-Up switch (alongside the filter switches) which allows all incoming messages to be shifted up by one MIDI channel. Too bad you can't shift them up by a variable number of channels, though . . .

The MIDIMerge+ allows incoming MIDI notes to be transposed up by a variable interval, and individually per input also. For this function, and for the user-definable filters too, the unit provides a "Set" switch which tells the processor when to look at either MIDI input for relevant note intervals (for the transposition), or for continuous controller data (for the user-definable filters). This is great, but it makes me wonder why they couldn't have done the same for the Channel Bump-Up feature.

There's not a whole lot you can say about this unit that isn't indicated by its clearly labeled front panel, except perhaps "How many patches does it have?" And there's the rub. For although it does remember all the various parameter settings when it is switched off, it only remembers one set of settings.

So is the MIDIMerge+ worth \$295? Taking a look around the market, it appears worth considering. Other, more expensive, programmable merger/processors (like JL Cooper's MSB+) can cost hundreds of dollars more, and even if they do offer more bells and whistles than the 360 model, they are not what every MIDI user actually needs.

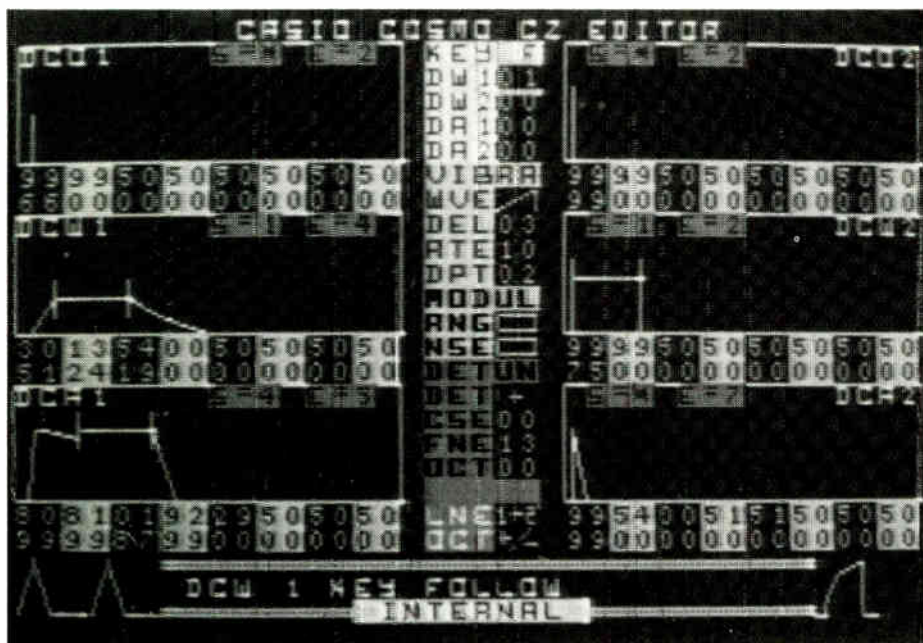
The MIDIMerge does what it sets out to do; it does so in the usual 360-style rack-mount chassis; and it does so with a full assortment of switches, avoiding the sort of "hidden function" lunacy that plagues so many other MIDI devices.

Sounds simple enough. And if you're being harrassed by multiple MIDI sources, simple may well be all you need. ■

MORE FROM 360 Systems, 18730 Oxnard Street, Tarzana, CA 91356. ☎ (818) 342-3127

Steinberg Cosmo

Of all the ranges of voice-editing computer software currently available, Steinberg's is one of the biggest. We put their Casio CZ package to the test. *Review by Ian Waugh.*



DIGITAL SYNTHS SHOULD carry a health warning. I mean, you know where you are with an analog synth: the VCO's connected to the VCF, the VCF's connected to the VCA, the VCA's connected to the amp. And you can plug your LFO into just about any VC you want. All good, clean, straightforward stuff.

Not so the digital synth. All those numbers and not a graph in sight. That's probably why many owners never get around to programming their instrument. That's also probably why a number of voice editors have appeared on the market: the software companies saw a gap and proceeded to plug it, Steinberg among them. In fact, Steinberg has voice editors for Yamaha's FM synths, Ensoniq's Mirage, Korg's DW8000 and Roland's Alpha Juno synths. But today it's the turn of their editor for Casio's CZ synths, cutely named Cosmo.

If you look at the manual – which all good software reviewers should do at least once during a review – the first thing which strikes you is the Germanic English and some “incompartible” spellings. The second thing which strikes you is just how few instructions there actually are. Whoopee! The program is a breeze to use and the textual incongruities don't seriously hamper the process, though I tend to think that when you're paying this sort of money for something, you're entitled to some comprehensive documentation.

But enough whining – what of the program? The main screen shows the two sets of Casio

DCOs, DCWs and DCAs both graphically and numerically. Down the center of the screen are the wholly numeric parameters such as key follow, vibrato, ring modulation, noise and detune settings, and so on. You move around the screen with the cursor keys, and a text window at the bottom of the screen spells out exactly which parameter has been selected. All very neat and tidy.

The two sets of waveforms for the DCOs are displayed graphically, and you can flip through them with the function keys. F1 selects the first waveform and F3 selects the second, but to switch off the second one you must press F2 (which is F1 plus Shift); I'd have thought F4 (F3 plus Shift) a more logical choice.

You alter the parameters with the + and – keys, a method similar to using the Casio's value buttons, so seasoned programmers should feel at home. The graphs are re-drawn as you alter the parameters, which helps enormously, but you can't latch onto a section of graph and pull it about.

The sustain point is shown by vertical lines cutting through the graph at the appropriate places, which is a great help when trying to visualize what the sound is actually doing. I do have a gripe about the way the end points are handled, though. If a node has a positive level value and you decide to stick an end point there, the level naturally enough reverts to 0. On the synth, if you then shift the end point you get your original value back, but in Cosmo

it is lost forever. There is a compare function, however, which flips from the current sound to the original one, which is very handy.

As soon as you boot the program, it grabs the contents of the synth's internal presets and stores them in its own internal edit bank. In order to keep these presets safe, you must transfer them to one of the program's other eight banks and preferably save them to disk. The program can only access the synth's internal presets, so cartridge voices must be placed in internal bank first.

All editing, loading and saving operations take place within the internal edit bank. When you load a bank from disk it automatically replaces the synth's internal voices – which is why you must be sure the originals are safe.

As you edit a voice, the changes are immediately transferred to the synth so you can hear what it sounds like. You can give the voices names, too, which is essential when you come to organize your creations.

One of Cosmo's best features is the way it lets you handle banks of voices. It uses a separate screen for this, and lists the internal edit bank down the left and one of the eight other banks down the right. A total of 128 voices are provided on disk to start you off, and some aren't at all bad – maybe I'll keep a few. A voice is highlighted on each side of the screen, and you can scroll through the sounds and change banks with the function keys. The aim is to line up a voice from one of the eight banks with one from the internal edit bank. Having done that, you press Return and the two sounds swap. It's simplicity itself to pull together the voices you require to make your own sound banks, and it's particularly useful being able to work with eight banks at once. You can get a printout of any screen, too.

Cosmo scores heavily in the ease-of-use department: you get 128 voices and I really like the way it handles banks of sounds. In fact, I was really very happy with the program and it is only in comparison to other CZ editors (from Dr. T's and Hybrid Arts) that it suffers.

If you are a committed Steinberg aficionado and voice organization is top of your list of priorities, then stick with the company you know. If you would like a few more editing facilities and perhaps have an eye on your bank account, it may be worthwhile checking out the others. ■

PRICE \$149

MORE FROM Russ Jones Marketing Group, 17700 Raymar St., Suite 1001, Northridge, CA 91325. ☎ (818) 993-4091

MT JUNE 1987

Kawai R50 Drum Machine

First there was the R100, now there's a younger, cheaper and in some ways more inventive brother, the R50. *Preview by Rick Davies.*



ONLY A FEW months ago, MT had a look at Kawai's first "serious" drum machine, the R100, and found a solid and flexible machine equipped with an assortment of very nice 12-bit, 32kHz-sampled digital percussion sounds, dynamic pads, eight individual and two stereo outputs, and a MIDI implementation to rank up there with the best of rhythm programmers. Barely a year after the R100's introduction, Kawai announced the R50, which at \$495 improves on the R100 in some aspects and represents a compromise in others.

Most of the guts of the R50 are essentially the same as the R100's, with the odd exception of course. For example, the pattern memory has a 1700-event limit and is approximately half the capacity of the R100. This smaller memory may be divided amongst 50 patterns and 10 songs, and to make life more interesting, Kawai has thrown in 50 preset patterns which really can come in handy from time to time, and which may be added to or torn down, but never replaced altogether; instead, the R50 automatically puts the new version of the preset pattern into an available programmable pattern location.

Apart from the memory capacity, the other main difference between the two drum machines is that the R50 only provides one individual output in addition to the standard stereo outputs. Although this may seem like a strange place to save costs, the compromise the single individual output represents is not really that severe, since the R50 lets you assign any instrument to that output, so you can still process, say, the snare or kick drum separately from any instruments panned across the stereo

image (something we'll get around to in a moment).

Apart from these differences, the R50 is basically the same instrument as the R100. The 24 factory-supplied 12-bit drum samples are the same, and in fact, Kawai's new alternate sound ROM for the R100 also works with the R50. Another pleasant surprise is that even though the R50 lacks eight individual outputs, it is still an eight-voice instrument, just like the R100, so you're not likely to run out of voices too quickly.

The R50's programming functions are basically the same as the R100's, and allow real-time or step-time recording, along with variable tuning, volume and panning per event — meaning you can twist each pattern event into various shapes, sizes, and positions, and do so as often as your patterns require.

Having spotted the most obvious similarities between the R50 and its predecessor, the newcomer's strengths can be more easily emphasized. For example, the R50 is tiny. (Not that the R100 is bulky, but the R50 really is compact.)

To keep the front panel uncluttered, its controls have been simplified. Instead of a ten-key pad, there are two sets of cursor controls: one set positions the cursor within the LCD, while the other changes control values. And instead of taking up front panel space with listings of the internal sounds, ten drum switches have access to any of 12 sets of drum sound assignments.

Four of these sets are preset; the other eight are user-programmable. Depending on the type of pattern you need to record, call up

the desired pad setup, then record. Each setup lets you define which sound appears on which pad(s), its tuning, volume, panning, and effects.

Effects? Yup. There are three simple digital effects (flange, short delay, and gate) which may be assigned to any pad, so you can have slightly different processing on each drum sound without having to rely on individual outputs to do so.

Although the R50's ten programmable pads are much more flexible than the R100's four-bank preset sound assignment, the R50 is limited by its non-dynamic pads. Considering that the R100's dynamic pads make that instrument a pleasure to program, the R50 suffers in comparison. Of course, the programmable pad assignment feature could be put to use to work around this drawback by merely assigning the same sound at different volume levels to different pads. But then again, you could just as easily use the programmable accent level to add dynamics to your patterns, and so save pads for more creative sounds.

The R50 also gives you several footswitch control options, including tap tempo (for manually counting in the initial playback tempo), hi-hat open/close control, and "vamp" (for temporarily holding on a pattern within a song during playback).

Kawai has also updated their idea of a drum machine's MIDI implementation to allow up to 70 user-definable drum events (including tuning, volume, pan, and so on) to be triggered by individual MIDI notes. This last feature in particular makes the R50 well suited for control by another drum machine, or better yet, a sequencer of higher memory capacity.

As one might expect, the R50 transmits and syncs to MIDI clocks, and also responds to MIDI Song Position Pointer messages, which makes it useful for operation with sequencers and SMPTE/MIDI converters in recording environments.

In summary, the R50 is really a lot more than merely half of an R100, at slightly more than half the price. Kawai has indicated that the R50 would make a suitable expander for owners of the R100, and since it is programmable over MIDI, it seems that the R100's dynamic pads would help compensate for the R50's non-dynamic pads.

But the R50 also offers a lot of novel and useful features for a drum machine under \$500, and would make a good drum "brain" for MIDI sequencing systems, or home recording setups with limited mixing facilities. ■

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the last word on
**MIDI
 DELAYS**

The infamous MIDI delay problem has sparked a great deal of controversy and confusion amongst both experts and end users. We present the real story. Text by Chris Meyer.



Illustration: Stuart Caterson

I EAT, DRINK and breathe MIDI. I think it has been the best thing that has happened to the music industry since the Minimoog – perhaps even the fuzzbox. And, yes, I admit it has problems and limitations – including delays.

However, hearing people attribute faults to MIDI that just don't exist (or are really something other than what they confidently espouse) makes my blood burn. The world is confusing enough without further misleading users with a burst of incorrect technogibberish. A few months back we focused on one such area in *Modes of Confusion*. This time around we're going to lay on the table exactly what "MIDI delays" are and explain where they really do and do not come from. Knowing this, we can then deal with minimizing or eliminating them – along with castrating those who would lie to us about them.

The Biggest Myth

"AVOID USING MIDI Thru jacks, since each one adds three milliseconds of delay." How many times have you heard that? I've seen it isolated and set in bold print in a couple of major music publications. Not quite as often, but often enough, I've also seen, "Avoid long runs of MIDI cable – this also contributes to MIDI delay."

But a real, honest-to-God MIDI Thru jack actually has just a couple of *microseconds* of delay. This is induced by the opto-isolator that the signal passes through. There is a very brief amount of time that the LED inside an opto-isolator needs to turn on and off, and an equally brief time for the photodiode to detect what the LED is doing and convert it into an electrical signal. By definition, this time has to be less than a MIDI bit – 32 microseconds. If it was any longer, the bits that make up a MIDI byte would start slurring into each other, and the integrity of the signal would be lost (resulting in notes being left on, etc.). For an opto-isolator to have a three-millisecond delay would mean that it had some place to store up 90 to 100 MIDI bits (the equivalent of three full MIDI note on messages) while it was busy delaying them – and that takes a RAM buffer and so forth. In other words, it's physically impossible.

The same holds true for MIDI cables. Electricity through a cable travels, at worst, at
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half the speed of light. There is not an audible delay in the amount of time it takes light to travel a hundred feet. Once again, the integrity of the MIDI signal can be lost through such things as cable capacitance, but in reality, you're not going to perceive it.

If you remain paranoid about these supposed delays, look for cables with low capacitance and replace all the opto-isolators in your MIDI equipment with ones that have fast "rise times" - you certainly won't be hurting anything, and you will be saving yourself potential problems if you do happen to run a MIDI signal over a couple hundred of feet through several MIDI Thrus.

Now, there always tends to be some germ of truth or reality behind any myth, rumor, story, or old wives' tale. The MIDI Thru delay is one such case. Some supposed MIDI Thrus are not really just opto-isolators - the signal passes through the microprocessor inside an instrument before going out the back panel. It is the time needed for the processor to recognize the existence of the message and send it back out that causes the delay. This situation is known as a "software thru", and is actually very useful on things such as MIDI sequencers. For example, you can have the data from a master keyboard that's recorded and passed along to the actual sound generating modules merged with whatever else the sequencer happens to be playing back. The infamous "three millisecond" number actually originated with the venerable Roland MSQ700 MIDI sequencer, which did precisely this - and happened to take that long to do it.

Unnamed Culprits

THE ABOVE DISCUSSION should have touched off something in your head like, "Hey, didn't he mention 'merging' as being the real 'Thru' delay?" Yep. And even though one rarely sees MIDI mergers, mappers, and processing boxes mentioned as sources of MIDI delay, they are indeed guaranteed sources of it.

Any time a MIDI byte passes through a microprocessor, it will incur at least 320 microseconds delay. Why? MIDI data is transmitted serially - this means one bit at a time. All ten bits of a MIDI byte (eight for the actual message; two to mark the beginning and end) must be received by a UART (Universal Asynchronous Receiver/Transmitter) before it can be assembled. Then, it is sent back out, one bit at a time, where it is received by another UART and acted upon there. In the very best case of a MIDI merger with no competing activity (ie. no two messages coming in at the same time), a byte must be read in by a UART, recognized by the processor, and sent back out the UART, giving a minimum delay of that one MIDI byte and some slight software overhead.

If there is any competing data, one message must wait until the other is fully transmitted before it can be sent. A typical MIDI message is two to three bytes, meaning a delay of up to two-thirds to a full millisecond waiting for the other message.

What if the creator of a MIDI merger is a poor software engineer, or is using a weak
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microprocessor? Then there is an additional perceivable delay involved in the processor actually recognizing the existence of a byte, and managing to get it back out again. In reality, I would not expect this delay to be over the three milliseconds of an MSQ700 (and quite often it's less), but I sometimes have to wonder when I see things like the manufacturer of one such device bother to write an editorial in another magazine claiming people cannot perceive a 20-30 millisecond delay - the real figure is more like half of that time.

Next - what if the box is actually processing the MIDI data? If part of the job of the box is deciding whether or not to actually pass the message or translate it into another one, it has to wait until it gets enough of that message before it can send it back out again. For example, if a MIDI mapper is splitting a keyboard by sending different key ranges out over different MIDI channels, it would have to wait at least until it received the second byte of a note-on message (the one which carries the key number) before retransmitting it - a 640-microsecond delay, not counting processing overhead. Some combination boxes care so much about this that if they detect that they are not going to be processing a signal that goes from one MIDI In to another MIDI Out, they don't even pass it through their processor and direct wire it to the opto-isolator (JL Cooper's MSB+, reviewed a few months back in these very pages, is one such box).

Time to put this all into perspective. Several psychoacoustic studies pick the 10-15 millisecond range to be the one where a musician can begin to perceive a delay. In the signal processing realm, this corresponds to chording. Shorter times - 2-10 milliseconds - enter the flange range, and some musicians and manufacturers claim (through actual listening tests) this is enough to shake the "feel" of one instrument against a tight groove or another instrument. The transmission of a single MIDI message does not take long enough to induce this much delay, so any fault rests on just how hot a MIDI processor is at passing MIDI data on. (Don't you wish minimum and maximum delay was a required part of the specification? Like frequency response and distortion are for audio devices? Me too.)

Unless, of course, there's . . .

MIDI Clogging

TAKE YOUR RIGHT hand, and start bashing a five-note staccato chord of 64th-note triplets at 250 beats per minute. Have you outrun MIDI yet? Nope - but you're pushing it.

Now reach over with your left hand and start moving the modulation and pitch wheels/levers/grope controllers back and forth while doing that. Now have you outrun MIDI? Choke, gasp, clog . . . maybe.

Now say you want five-note chords banging out 64th-note triplets on all 16 MIDI channels with a channel pitch-bending and modulating for good measure. Suddenly, you find your composition chugging along at somewhere around 15 beats per minute (no, that's not a typo).

What's going on here? MIDI can only deal

with information so fast - namely, 3125 bytes per second. Taking tricks like running status into account, you need on the average 2-2½ bytes to define a MIDI message. This translates to about 1200 to 1600 messages a second before MIDI cries "No more!" and simply won't transmit any more, just like after a certain point, a sponge can't hold any more water.

That still seems like a lot, until we throw it against the 10-15 milliseconds it takes us to perceive a delay. That means we can fit roughly one to two dozen messages (note-ons, note-offs, individual pitch-bend, modulation, and channel pressure commands) into an "instant of time" (ie. a downbeat) before we notice something's going wrong - like a smearing or something. This, along with our "too many hands at once" example above, is when and where we start to notice MIDI clogging. If too many messages try to fit down one MIDI cable and into an instant of time, somebody's got to wait.

Continuous controllers and the like tend to be the biggest culprits. A note is just one message, and one or two dozen notes are a lot to fall regularly on every beat. However, a pitch-bend or a pressure dig sends out dozens and dozens of messages to describe its actions. How fast it sends out these messages decides how bad the clogging gets. A synthesizer with a weak processor that's busy doing other things will tend to look at the wheels/benders/gropers only once every several milliseconds, not causing very many problems. Master controllers that have nothing else to do but sit around and send out MIDI have been known to clog MIDI just off of a pitch-bend alone.

How does one get around this? The "too many hands" issue can only be saved by multiple MIDI outputs on a sequencer. This splits up the load across several MIDI cables, thereby giving several times the bandwidth. Over-eager controllers can be curbed by preventing unwanted data from even being sent, and there are features on some sequencers (such as the one from Voyetra Technologies) that allows the user to "thin out" the MIDI controller stream. I would not be surprised to see ultra-fancy master controllers of the future that allow the user to pick the density of the controller data sent out, allowing a balance of smoothness of performance versus MIDI bandwidth to be struck.

A person testing a MIDI sequencer I wrote in a different life once complained of ragged timing of notes entered in step time. We finally determined that the keyboard was transmitting pressure every time he struck a note, and all of these pressure commands were piling up on the same "instant" of time - particularly if he held his finger on the key for a while after striking the note . . .

Also, I'm aware of one guitar-to-MIDI designer who is doing his master's degree thesis on "The Psychoacoustics of MIDI" - studying which pieces of information (pitch-bend, modulation, note attack, and so on) need to be heard in what order, so that the less critical information can be sent last and not interfere with the more sensitive stuff. ▶

The Biggest Culprits

BROADLY SPEAKING, THESE are the synths and samplers themselves. Uh huh, that's right. The actual receivers of MIDI data (which also quite often happen to be its source) are the ones that introduce the largest so-called "MIDI Delays".

Take this normal, and quite real, sequence of events involved in transmitting a MIDI note from one synth to another. You strike a key on a keyboard. Either the main microprocessor scans the keyboard every couple of milliseconds or so to see if you've done just that, or a slave processor figures that out and tells the main processor what happened. A flag gets set, or the note gets loaded into a buffer. Another subroutine comes around and asks, "Hey, do we have any new notes to process?" It unloads it, figures out what voice gets that new note, and loads it into a buffer to transmit over MIDI. Another subroutine actually starts the transmission.

So far we're talking about one to five milliseconds to get the note to the MIDI Out jack. It takes another millisecond to transmit it. On the other end, the receiver is loading this new message into a buffer. About as often as it checks its own keyboard, it checks to see if it has gotten any new MIDI messages to deal with. From here, it sets a flag or loads another buffer, until the routine mentioned above comes around and says, "Hey, do we have any new notes to process?" Then it unloads the data, figures out which voice gets it, and sets some flags for another routine to actually start playing that voice (start the envelopes and so on). This normally takes two to seven milliseconds, although I've heard one manufacturer say that the entire process can be as long as 15 milliseconds.

The case tends to be worse if you're a sampler - the voices are harder to get started than on a normal synthesizer. One has to shut down the filter and amplifier envelopes gracefully (one to eight milliseconds), stop playback of the one sample, redirect the playback electronics to the start of another sample, and start its playback and envelopes up again.

MIDI 2.0

IF YOU WANT to get a synthesizer or sampler manufacturer angry, go up to him or her and mention "MIDI 2.0". Aside from how hard-won compatibility within MIDI 1.0 has been, and the desire to avoid making obsolete several hundred thousand existing pieces of

equipment (not to mention panicking their owners), it just wouldn't solve anything with today's (or tomorrow's, or next year's) level of affordable synthesizer computing power.

The thing most often mentioned in connection with MIDI 2.0 is a higher baud rate - in other words, increased bandwidth. The bandwidth issue is the only valid source of actual MIDI-induced "delay" uncovered above. All of the other delays come from insufficient processing power. A MIDI processor delaying a signal by three milliseconds does it because of insufficient processor power. A DX7 which exclaims "there has been a MIDI error" when hit with a bandwidth-full of pitch-bend does so because of insufficient processor power.

A good portion of the problem stems from the fact that a MIDI'd synthesizer or sampler has a lot to do other than just send or receive MIDI data. It has to look out for the user pressing buttons. It has to keep the voices playing back and envelopes moving along - that procedure alone usually takes up fully half of the processor's available resources.

It is true that raw data, with the proper hardware, can be transferred at rates up to 16 times the normal MIDI rate (such as the Emulator II's RS422 computer port). However, it doesn't have time to do anything with that data while receiving it at that speed. An implementation like that could result in a rather unexciting musical instrument.

Let me give a very real-world example. I was one of the central players in the *faux pas* of giving Sequential's Prophet 2000 the ability to transmit and receive MIDI data at twice the normal MIDI hardware specification (62.5Kbaud). Aside from being bluffed that another major manufacturer was about to introduce two- and four-time rates on their machines, we wanted to see how fast we could transfer sample data over MIDI. The first barrier was the UARTs we were using - they made no promises above 100Kbaud. The second barrier was how long it took us to receive a byte from the UART, buffer it, unload it, and process it - this fell very roughly around 70-80 microseconds with the 2MHz 6809 processor we were using. Under normal conditions, a MIDI byte takes 320 microseconds, which gave us 240 microseconds to process it. However, the processor was taking half of its available time to keep up voice playback, giving 160 microseconds free to do other things, and 80 microseconds to do everything else other than MIDI.

Once you double the baud rate, you are caught in a double jeopardy - for a given period of time, you have twice as much data to process, and are spending twice as much time receiving it. At double baud, a byte comes in every 160 microseconds. The processor wants 80 of that to keep up the voices, and you need 70-80 of that just to receive the byte. If data is coming in at full bandwidth, you have less than 10 microseconds (20 clock ticks of a 2MHz processor, with the most primitive actions taking a least a couple apiece) for every byte to do something with it - along with keeping up everything else. Who has time for more data?

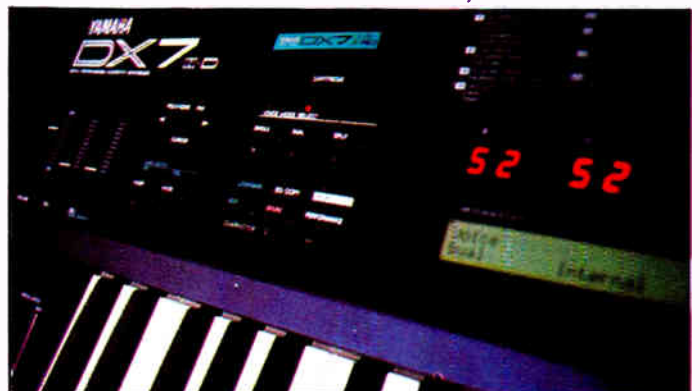
More powerful processors are becoming available - an 8MHz 68000 (main processor in the Macintosh, Amiga, and Atari ST), for example, is becoming popular. However, they still cost several times more than a lowly Z80 or 6809, and can only process up to two times more primitive instructions than their weaker counterparts in a given period of time.

Software slyness can buy a bit more performance, but there is a brick wall lurking nearby - and quite often this extra processing power gets thrown at new and more features as opposed to MIDI bandwidth. Throw in some people's demands that a "MIDI 2.0" include abilities such as telling the sender that it indeed got or is willing to receive a message (who has time for that noise?) along with all of our other reasons, and I can assure you that a MIDI 2.0 is not around the corner.

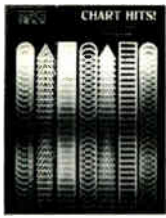
But why is any of this a problem in the first place? A very good question. Do you think three or four guitarists can land six-string power chords within 15 milliseconds of each other? I think not. So, why is it a problem that MIDI has trouble doing it?

Along with drum machines and MIDI'd sequencers came today's current fashion of multi-layered, tightly played, tightly sequenced material - they're what made it possible. This form of music would not exist in (over)abundance without MIDI, and it is this form of music that points up MIDI's timing weaknesses. Technology begets its own worse enemy - a twist on the old chicken-and-egg dilemma.

Use multiple MIDI outputs. Don't use continuous controllers excessively. Compliment manufacturers whose machines react faster than others. Don't wait on MIDI 2.0. Take mellowness lessons. And castrate the next person that tries to tell you not to use too many MIDI Thrus because each one has a three-millisecond delay. ■



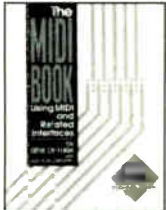
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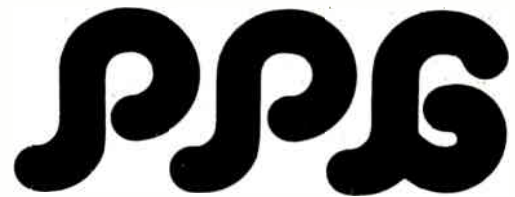
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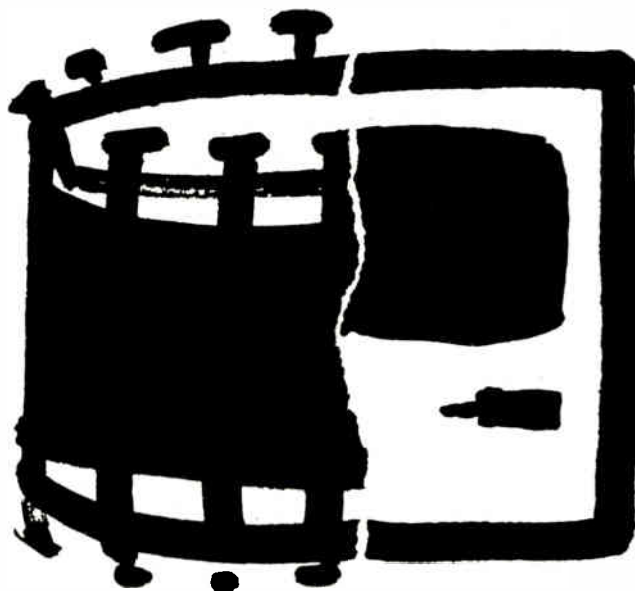
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Korg DDD5

Dynamic Digital Drum Machine

ONE OF THE WORST plagues to hit modern music is non-dynamic, robotic-sounding drum machine parts. Let's face it, the never-ending stream of static sounds from a drum machine is enough to drive anyone crazy. Non-dynamic hi-hat parts, in particular, can absolutely *destroy* any type of groove which you've worked hard to create.

Thankfully, a number of manufacturers seem to be aware of this problem and are starting to incorporate dynamic sounds into their machines. On lower-priced models, like Roland's TR505, this usually comes in the form of velocity-sensitivity over MIDI (which means that a MIDI drum pad or velocity-sensitive keyboard can control the machine dynamically). Touch-sensitive pads are the other possibility, but until quite recently, they were a luxury that could only be found on higher-priced machines like E-mu's SPI2.

With the introduction of Korg's DDD1 and Kawai's R100 last year, however, touch-sensitivity became an affordable option for many musicians. Now Korg has launched yet another, even more inexpensive drum machine with dynamically sensitive pads, which promises to make non-dynamic drum parts a horrible cliché of the past.

Overview

AT FIRST GLANCE, the DDD5 appears to be a scaled-down version of Korg's popular DDD1, but it is actually two very powerful machines in one. Thanks to an ingenious bit of design, the DDD5 can function both as a preset rhythm box and as a programmable drum machine. It achieves this remarkable feat by having two operational modes included in its software. To switch from one to the other you simply press a button, confirm the operation and then, most importantly, change the front panel.

Now, you might be re-reading that last sentence and thinking, "What? Change the panel? How?" It's actually very easy. Korg uses simple (but effective) clips to hold the panels in place, and to change one you simply pull back the clips and lift up the panel. The reason for this unusual arrangement is that the different software modes redefine the function of nearly every button on the front panel. So rather than trying to print multiple functions for the same button or spot in the matrix on one panel, Korg has decided to use separate panels. The beauty of the system is that because the two front panels are conveniently color-coded and labeled "Programmable Mode" and "Preset Mode", the idea of two independent machines is reinforced. Brilliant.

In addition to its unique characteristics, the



The new beat box from Korg maintains most of the important features found on its big brother, the DDD1, and adds the unique capability of being two machines in one. Review by Bob O'Donnell.

DDD5 also shares a number of features with the DDD1, but to different degrees. The DDD5, for example, includes 29 onboard sounds (as opposed to only 18 on the DDD1), seven touch-sensitive drum pads (14 on the DDD1), and two expansion slots for ROM and/or RAM cards (four on the DDD1). The memory capacity of the DDD5 resembles that of the DDD1 as well, but it's divided up differently. The DDD5 can store 100 patterns of up to 99 bars each, and 24 programmable and 24 preset songs, each of which can hold up to 99 parts. (A "part" can be either a pattern or another entire song according to Korg's definitions.) The DDD5 also has 100 preset patterns and 24 preset songs in onboard ROM which can be recalled at any time. (The patterns are used in the factory preset songs.)

One feature of the DDD1 which the DDD5 doesn't have is separate audio outs for each sound; only stereo outs are provided. This may seem an unfortunate omission, but it's actually a sensible compromise when you consider that the price of the DDD5 is about 40% less than that of the DDD1. Plus, the DDD5 includes a sync-to-tape facility and seven-position programmable panning, so if you want to process or record sounds individually, you can either pan sounds hard left or right, or multitrack each drum part.

The actual packaging of the DDD5 is sleek and small. Both of its front panels have a

function matrix similar to the one found on the DDD1, making it easy to see where you are and where you need to go in the programming process. The only complaint I have about the layout of the machine (and it's a minor one) is that the Play, Stop and Record buttons are rather small and difficult to find. Slightly larger, color-coded buttons would have been more helpful.

The 29 sounds that come with the DDD5 are all stored in the same eight-bit companded format used by the DDD1. The variety is excellent and includes: three snares and three kick drums (one of each sampled with gated reverb), a rimshot, open and closed hi-hat, ride and crash cymbals, stick (two drum sticks clicked together), three tuned toms, three types of congas, timbales, handclaps, two bongos, cowbell, claves, tambourine, cabasa, agogo bell and two bass guitars ("thumbed" and "pulled"). While these sounds may not compare favorably to those found on some 12-bit machines, all the sounds are very usable and many, in fact, are excellent. Their usefulness is greatly enhanced by the fact that they can all be tuned over a one-octave range, have their decay time altered over 15 different levels, have their volume level set to one of 15 different levels, and be panned to one of seven positions in the stereo field. It's a pity that the sounds can't be reversed, though.

Korg has wisely included the capability to ▶

▶ add up to 16 more sounds via ROM cards which plug into the two rear panel slots. The DDD5 uses the same cards as the DDD1, and about 50 of these are currently available, which makes it easy to mix and match cards to suit your needs. You can get anything from electronic drums to sound effects to extra cymbals on these credit card-sized ROMs, most of which retail for \$69.95. (Half-memory cards retail for \$39.95.)

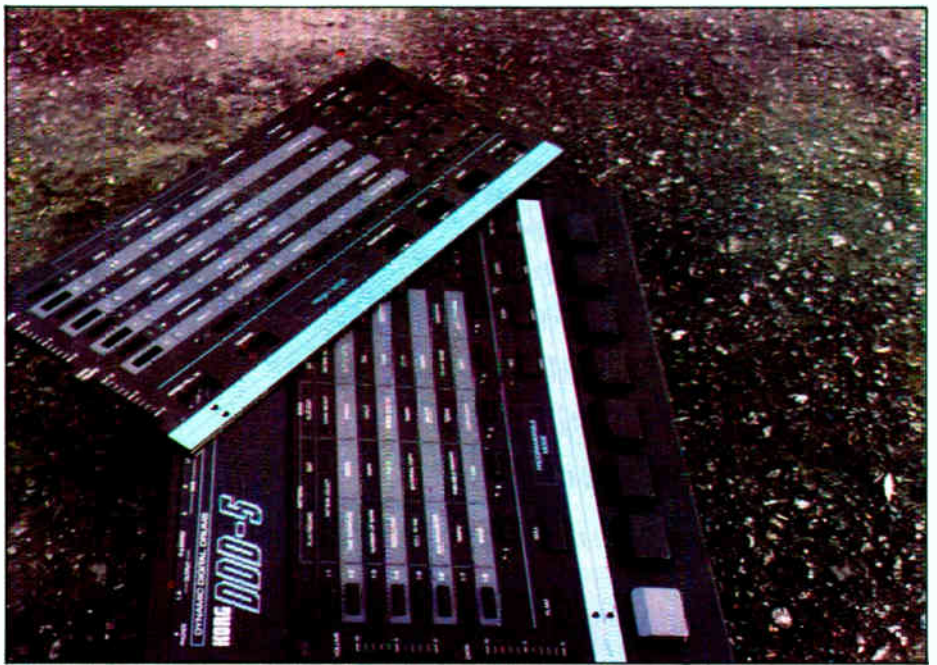
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Korg has also included a very nice feature on the DDD5 that was introduced on the DDD1. Each of the individual voices can be programmed to sound in one of three modes: poly, mono and exclusive. The poly(phonic) mode lets you layer the same sound over itself up to 12 times, so that the sound decays naturally and is not cut off if you repeatedly hit the same pad. As the manual points out, this is particularly effective for cymbals. In the mono mode, every time you hit a pad the previous sound from the same pad is cut off. Finally, the exclusive mode prevents selected sounds from occurring on the same beat. In other words, you can set up the machine to have the closed hi-hat sound cut off the open hi-hat, for example, or prevent the pulled bass from sounding at the same time as the thumbed bass does. You aren't limited to just two exclusive sounds, however: you can have up to 14 exclusive sounds (one per location - see below), each preventing the others from playing at the same time. The various modes often make only a subtle difference in sound, but they can be very effective in creating realistic drum parts.

As if all of these features weren't enough, each of the sounds can also be assigned to any of the 14 available locations (two per pad) and the dynamic sensitivity of each location can be set to one of nine levels. The same sound can be assigned to more than one location, as it can on the DDD1, and by using different parameters (such as tuning, panning, and so on) you can program melodic lines or multi-tom fills. (An even more effective method for creating such effects is with the Sequence Parameter function, which will be discussed later.)

To complete Korg's extremely flexible instrument assignment capabilities, the DDD5 has memory set aside for six overall configurations, which are called Instrument Settings. These settings, which can be recalled via MIDI program change commands (very nice!), memorize all the various instrument assignments and all the specific tuning, decay, volume, panning and sensitivity parameters that you choose to enter into the machine. In other words, it's like having six different drum sets at the tip of your fingers.

Operation

IF YOU WANT to record a pattern (which can only be done in the programmable mode), you must first choose the instrument setting you want to use. The DDD5 defaults to the programmable mode on power-up, so all you have to do is push the "4" and "f-1" matrix switches, and the Setting Select function will automatically be active. To select another function in the Instrument Setting group, 38



simply push the corresponding function button along the left-hand side of the matrix. If all you want to do is select a setting, then adjust the displayed Setting number with the "+1/Yes" or "-1/No" button or the numerical keypad. Simple, just as the rest of the machine's functions are.

To record a pattern, press the Rec and Start buttons and off you go. You can choose from nine different quantization levels, the highest being 1/96, and also program the speed of Roll and Flam functions. One nice feature that Korg has included is the ability to use more than one quantization level per pattern, so if you want triplets against 16ths and a few real-time fills thrown in on top for a more human feel, you can easily program it all in. Step time, of course, is also available and once again Korg has managed to spice up a basic feature by allowing you to hear everything that's already been programmed as you step through a pattern. Nice.

After you've recorded a pattern that you're happy with (a much easier and more satisfying process with touch-sensitive pads), the DDD5 offers editing functions that allow you to finetune your work into a monstrous groove or a subtle percussive accompaniment. In addition to the typical delete, copy, and insert functions, the DDD5 has a very powerful feature entitled sequence parameters which allows you to adjust the tuning, decay and volume level of every drum voice after the original pattern is recorded.

"But I thought you said you were supposed to set up those parameters before you recorded a pattern." You're right, I did. You set up the initial parameters (Korg refers to them as "total" parameters) for every drum voice before you record a pattern, but you can then make even more changes to the sounds afterwards. For example, let's say you want to record a pattern that includes a melodic bassline, two-part agogo bell harmony, a number of cymbal crashes and a snare roll that crescendos into the next pattern. (OK, so it's a strange combination, but it is possible.) First,

you would create an instrument setting with those sounds (remembering to put the agogo bell sound on two separate pads, perhaps with a different panning on each) and set up the initial parameters as you like them. There's no need to assign all the different bass or agogo notes to different pads because they will be put in after the pattern has been recorded. Then, as you record the pattern, you simply put a bass note or the two agogo bells on whatever beats you want them.

After you've done that, call up the Sequence Parameters tune function, put the DDD5 into record and use the data slider to make the appropriate changes in pitch. You can record these changes in real time or in step time and, if you want, you can even rehearse them before recording them. In a similar manner, the snare drum roll and cymbal crashes can be recorded and then manipulated afterwards with the volume and decay parameters. Needless to say, this is powerful flexibility, not to mention a great deal of fun. (The DDD5 demo sequence does an excellent job of showing creative use of these features, incidentally.)

Once you've created all the patterns you want (and named them, if you so desire), it's time to start assembling songs. Each song memorizes the initial tempo and instrument setting number, and patterns (or other songs) are easily inserted, copied or deleted. Tempo changes can also be programmed into songs as well as repeats, including nested repeats. Songs can be named, but for some reason, programmable songs and preset songs have to share the same name, which is unfortunate. They can have completely different patterns and tempos, of course, but preset song number one will automatically share the same name as programmable song number one, and so on. Strange.

For playback, you can either adjust the tempo with the Tempo function in the function matrix (an odd place to put a tempo control), or tap in the desired tempo on the Tap Tempo switch. The rear panel also

provides a footswitch input for controlling the tap tempo, which keeps your hands free for playing other instruments. (Note that although you can continue tapping new tempos into the DDD5 during playback, it doesn't seem to track reliably when you do so.)

Preset Patterns

AS I MENTIONED earlier, one of the most unique features of the DDD5 is that it can function as a preset rhythm box. Once you put the machine into Preset mode you can choose from 24 different rhythms, including your basic Waltz, Cha Cha and Samba and the mildly unconventional Heavy Metal 2, Rap and Reggae 1, to name a few. While you may not actually use them for recording or performance purposes, these presets are all quite well done and work very well for quick songwriting purposes. Intros, fill-ins and endings are available for all of them (they can be triggered either by front-panel buttons or footpedals) and, if desired, tempos can be set by means of the tap tempo button or optional footswitch. The DDD5 also has memory space for eight combinations, which consist of two basic patterns and two fill-ins.

If you're not happy with the factory preset rhythms, songs or combinations, you can replace them by changing to Programmable mode, and creating your own. (Korg is also planning to release ROM cards with pattern data.) Each of the four sections (intro, rhythm, fill-in and ending) in a preset song is programmed in the same manner as regular patterns. Preset songs are created (also in the programmable mode) by assigning each pattern to one of the four song sections. Combinations are done in the same way, but to hear the results of either of them you need to switch back to the preset mode.

The preset songs that you create can also be named and, like programmed songs, they can memorize the instrument setting and initial tempo. The preset mode also offers the option of changing the parameters of the instrument sounds (level, panning, tuning and decay) and

"The DDD5's ability to send velocity information over MIDI makes it worth the price as a MIDI controller alone."

choosing which of the three types of clock the DDD5 will respond to (internal, external MIDI and external tape).

One important point you need to be aware of, however, is that to get to the factory preset songs you need to perform a reset operation, and in so doing you erase its memory. While this may appear to be a major problem, it really isn't (although it could be if you're not careful), because Korg has included three different methods for storing the DDD5's memory. The quickest (which takes about two seconds) and easiest is with a credit card-sized RAM card (which lists for \$99.95), but you can also store data on cassette, or via MIDI with a system exclusive dump. (If you plan on using the presets as well as your own

patterns and songs, I strongly suggest you get a RAM card to store your work. That way you can keep the preset songs readily available and you won't have to worry about confusing song names.)

MIDI

THE MIDI IMPLEMENTATION on the DDD5 is excellent, and its documentation very thorough. Like the DDD1, the DDD5 can transmit and receive MIDI clock and associated commands (Start, Stop, and so forth) as well as song position pointer data. Song select numbers can also be sent and received over MIDI, and the machine will respond to Omni On/Off messages and program changes (only 0 through 5).

MIDI note information (with velocity) can be transmitted on up to 14 channels at once (one per location) or, if you want, you can disable the transmission of notes (this will not affect clock information). The DDD5 also responds to MIDI note and velocity information, but all the instruments receive on one, user-selectable MIDI channel. Each of the 14 locations can be assigned its own MIDI note, though (it's the same for transmission and reception), and you can even assign more than one instrument per note. You can record patterns with velocity from other MIDI controllers, and with a MIDI keyboard you can even control the tuning and decay of each voice. The way this is done is by designating MIDI notes 9-24 as decay levels, 72-96 as tuning and 25-71 as possible instrument assignments. Then if you play an instrument key while holding down a key in the decay or tuning ranges (or both), the instrument will sound according to the parameters you've chosen. Very useful for programming basslines or other melodic parts.

As mentioned above, the DDD5 can also initiate a memory dump over MIDI, and any device which is capable of recording MIDI system exclusive information will be able to store the whole of its pattern, song and instrument setting data.

Conclusions

AS YOU MIGHT be able to gather, I like the DDD5. It sounds good, it's inexpensive, well designed, expandable and extraordinarily flexible. Even more importantly, it's touch-sensitive. Believe me, that makes a big difference both in terms of its usability and in the final product which you are able to create with it (ie. very hip drum grooves). Even if you don't like the way it sounds, its ability to send velocity information over MIDI makes it worth the price as a MIDI controller alone. (In fact, it would be an ideal controller for triggering drum sounds from a sampler.)

So if you're in the market for a new drum machine or want to add dynamic capabilities to the machine you have (as long as it can respond to MIDI velocity), I highly recommend the DDD5. It's an unbeatable value for the price.

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the JERRY GOODMAN

story



This fusion pioneer and former Mahavishnu violinist has been creating instrumental music which he hopes will expand the boundaries of New Age. More than that, he's combined the characteristic timbre of his instrument with that of modern music technology to create an intriguing new blend of sounds. *Interview by Bob O'Donnell.*

IN AN AGE when the record industry appears to be satisfied to crank out music of the homogenized, commercial variety, the idea of being able to make a very personal artistic statement with a record is an attractive, if not altogether likely, proposition. Even musicians who are recognized as innovators tend to run into

difficulties when trying to release the music they most strongly identify as *their own*.

Violinist Jerry Goodman, however, is in the enviable position of being an exception to the rule. He and a handful of other musicians (including Patrick O'Hearn, Ravi Shankar and David Van Tieghem) record for the Private Music label, one of the more successful new record companies to have sprung up over the last few years. Started by former Tangerine Dream member Peter Baumann, Private Music (an ingeniously appropriate name) has developed a very distinctive sonic personality by concentrating on artists who produce sophisticated instrumental music with a healthy emphasis on electronics.

The material on Goodman's releases for Private Music, *On the Future of Aviation* and the more recent *Ariel* is being labelled New Age music, a category that, like most others, has its advantages and disadvantages. Goodman is quick to point out that although it immediately places boundaries around his music which he might find both inaccurate and limiting, the label also identifies his work with a rapidly expanding field of interest. He has enough business savvy to understand the importance of having some kind of method for selling the music, and he's willing to accept some of the category's negative connotations, as long as it helps expose the music to a wider audience.

"I think the most difficult thing to do is to get visibility for this kind of music", says Goodman. "People don't know what's out there, and how will they know if they like it or not if they never hear it?" He adds that at least the label gives people an excuse to investigate the music.

But all of this discussion begs a rather important question: how did a founding member of John McLaughlin's Mahavishnu Orchestra (one of the pioneering fusion bands of the early '70s) get involved with a type of music which appears to be almost the complete antithesis of what he had previously done?

Actually, a few words of description are in order. Neither *On the Future of Aviation* nor *Ariel* contain the freneticism which characterized some of the Mahavishnu recordings, but they also (thankfully) lack the dreariness and inactivity which mar so many New Age projects. In fact, both records strike an effective balance between contemplative sonic atmospheres and what Goodman himself terms "thoughtful grooves". The music is intelligent and expressive, shifting from sections of gentle lyricism to those with a more powerful rhythmic feel, particularly on *Ariel*.

The new music is also completely instrumental, of course, as was his work with Mahavishnu. But interestingly enough, that fact nearly stopped him from getting involved with Private Music. Having suffered a bit of "fusion overload",

Goodman was not particularly interested in

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performing or recording instrumental music of any sort again.

"Basically, when the Orchestra broke up there was an outbreak of fusion bands that all seemed to me to have just been totally misguided. They had gotten off on all the wrong things, the wrong elements of the best of the fusion bands, like the velocity and the volume, and there was really no musical point to what was going on other than a lot of self-indulgence. Consequently, I was trying to avoid being stuck and stigmatized by the fusion label. I wanted to break out of that, so I ended up working pretty pointedly on trying to put something together that was more vocal-oriented.

"I thought the whole fusion movement had been played out, and I didn't want people to think, 'Oh, here's a guy who was a fusion musician in the '70s about to go in to do an instrumental album again'. The thought of doing instrumental music, not knowing what was expected of me at first, was not a very attractive one. Plus, I didn't think that there was as much of an audience for instrumental music as I would have liked."

Goodman's opinion on the matter has obviously changed since then. While he may not be finding a large enough audience yet, he has found that he can make satisfying instrumental music without falling into the traps, clichés and stigma associated with fusion. Now, of course, he has to worry about some of these same problems under the New Age label. In this case, however, he doesn't seem terribly concerned.

"I think my change of opinion is primarily related to what I've been able to do to make the music happen for me. They're labelling what I'm doing as New Age, but most of what I consider to be New Age does not have too much excitement to it. So what I'm trying to do is push the parameters of the New Age category. I'm stretching it in as many places as I can."

JERRY GOODMAN, IN FACT, feels very confident that he has been able to create an interesting hybrid music which combines elements of New Age with rock and classical music. Asked to describe his work he called it "... contemporary instrumental music. It encompasses a variety of influences, including classical, rock 'n'roll and hi-tech. There are a lot of organic sounds blended in with some hi-tech equipment, which gives it a very different sound."

Goodman didn't exude that same confidence when he first played his music for Baumann, however. "To be honest, I wasn't sure at first if I would be able to do that and have it be accepted by the label. The kind of music that Peter had described to me was something more thoughtful and more flowing than what my own music came to be. But when I finally put

something on tape and played it for him, he realized that it had a lot of the elements that he was looking for, as well as something else."

That "something else" is what's commonly referred to as rock 'n' roll. Distorted electric guitar (and violin), screaming Hendrix-type harmonies and powerful drum sounds are all prevalent on Goodman's records. He's not about to hide his rock influences for the sake of maintaining complete tranquility in his music, and he enjoys flexing his impressive skills as a guitarist. And as he points out, his style as a violinist stems from his guitar playing and his influences as a guitarist.

"I think my actual improvisational style on violin was something that came after I had been playing guitar. I had never really improvised on violin as I had on guitar, so I adapted what I did on guitar to the violin. Also, as a soloist my influences were Hendrix, Clapton and all the other guitar heroes that everyone had in those days, and I think they are more responsible for my soloing style on violin than any violinist is."

On cuts like 'Broque' and 'Rockers', both of which are on *Ariel*, these kinds of influences are indeed apparent. But the most lasting impression that one takes from listening to these or any other tracks on the record is simply the sweet, soaring sound of that violin. Transcendent or biting, but always unmistakable, Goodman's violin ties together the various musics he blends into his own. As the producer of both records, he also manages to place his violin within a variety of beautiful synth textures.

Goodman currently uses two keyboard players to create those textures, but he has experimented with doing some of them

"My improvisational style on violin was something that came after I had been playing guitar. I had never really improvised on violin as I had on guitar, so I adapted what I did on guitar to the violin."

himself, via a MIDI violin. "I used the Zeta violin on a few tracks on the first album, but I found that I couldn't do a whole lot with it. I would like to try one of their new ones, though.

"I've also tried the Fairlight Voicetracker," he continues, "but I was never able to make it do what I wanted it to. I don't know if it was me or what it was, because I've heard other people say it's the greatest, but it's not very easy to understand and it's not user-friendly at all."

Goodman has managed to stay informed on technological developments, but he admits that "you could go crazy trying to keep up with everything that's out there. Another problem is that you have to be independently wealthy to do so, and that kind of wealth and being a musician don't always go together". The effort has been made on his part, though, because he understands its importance in his work to ▶

► create the right sounds and textures for his music.

Sound, it seems, is a subject about which Goodman has adamant feelings. (The title *Ariel*, in fact, which is the name of a joyous character in Shakespeare's *The Tempest*, was chosen as much for the sound of the word as for its meaning.) "I think it's really important to create an overall *sound* for the kind of music I'm doing. You have to understand that my main axe produces a very old sound that everyone recognizes, and I want to put that sound into a fresh, new environment. I'm not just another violinist, I'm somebody who's trying to do something special, and you have to create a special environment for it to be heard differently."

TURNING TO THE WONDERS of modern synthesis, Goodman and his keyboard players, Fred Simon and CJ Vanston, used a variety of tools to create the impressive (and appropriate) sonic environments. "We had a pretty incredible MIDI setup on the last record", says Goodman, "and we spent a lot of time getting the sounds we wanted. At one point, I remember the control room

"It's important to create an overall sound for the kind of music I'm doing. My main axe produces a very old sound that everyone recognizes, and I want to put that sound into a fresh, new environment."

was packed. We had the Synclavier set up in there, a ton of DX things and an Emulator II."

Goodman's also a big fan of analog synths. He used an Oberheim OBX on both records and feels that "there's nothing like some of the older analog sounds – they're wonderful. In fact, we even used the Oberheim 4-Voice on the new album. It's a killer."

Sampling is another tool which Goodman uses to create the textures on his records. This is particularly evident on the title track from *On the Future of Aviation*, which features a very full, string section-type sound playing a repeating eighth-note figure. Goodman explains that he used a variety of techniques to create that effect. "I overdubbed a number of violin tracks and then I also added some samples of myself from the Ell for depth. There's actually a

"We had the Synclavier set up, a ton of DX things and an Emulator II . . . but there's nothing like some of the older analog sounds. We even used the Oberheim 4-Voice on the new album; it's a killer."

blend of samples on it, but it leans heavily toward the real thing.

"We did some sampling on *Ariel* too, but not much in the way of string sampling. I didn't do as much big section stuff. The little bit of sampling that we did do for it was done on the Synclavier."

Of course, once the "environments" had

been created they needed to be recorded, and both albums were in fact meticulously recorded at Studio Media in Evanston, IL (a suburb of his Chicago home) on a Mitsubishi 32-track digital machine. "We record everything digitally for Private Music and I'm in heaven working with that machine. I think it's wonderful, especially for the kind of music that I'm doing, it's a great match-up. Recording digitally makes you so aware of what you can do with sounds; sounds that are going to be heard."

Goodman adds that the digital recorder even affects his compositional process. "I find that when I'm writing, the fact that I'm doing digital recording is always in the back of my mind. I'm able to write some things now that I know will work, whereas a few years back they might not have worked as well."

Another form of recording technology, in the form of sequencing, has also had an important effect on Goodman's composing. A self-professed amateur keyboard player, he uses sequencers to overcome his limited playing skills. "I'm using an Ensoniq ESQ1 for sequencing at home right now; it's a wonderful piece of equipment. It's very simple, but it does great things."

And on *Ariel*, Goodman was able to take advantage of the Synclavier's sequencer. "We used SMPTE to lock up the Synclavier's sequencer with the Mitsubishi recorder, and were able to do some incredible stuff."

Goodman's compositions can easily tax the limitations of the sequencing equipment he's using, though, because a number of his songs are written in odd meters. When asked why he chooses to do so, he provides an interesting response. "It's something I'm not totally thrilled with. You see, when I compose I try not to try. I just try to write whatever is happening, but I get stuck like everybody else and fall back on old habits. This is one that I've been struggling with and trying to drop, but when I get into a strange time signature it seems to open up melodic ideas for me.

"They can be effective at times," he continues, "but there are drawbacks. I try to put pretty simple, straight-ahead melodies on top of bizarre time signatures, so when I'm out playing the music live there is something for the audience to relate to. The band and I really enjoy playing in those time signatures and the audience usually seems to be getting off on what we're doing, but there's something missing in their response which would probably be there if we were grinding away in four." Goodman is quick to add that he does play in conventional time signatures as well – just not as often.

Regardless of the meter, though, his primary concern as a composer is to create what he calls "thoughtful grooves". "What I mean by that", Goodman explains, "is a repetitive figure which may or may not be in a strange time signature. I try to put

together something to play on top of, something to bounce with a little bit, something which will hold the listener's interest.

"The repetitive quality is what I think the New Age trend is really all about. The music usually has a figure of some sort that just gets burned into your memory. What I'm trying to do with that is expand on it and kick it harder."

Goodman's enthusiasm for writing music with an edge to it derives from a number of different factors. One of the most important of these is that, unlike many so-called New Age musicians, he enjoys going out and playing his music live.

"I really like to play out live, but for me, live playing requires something a little different than what I do in the studio. I need to have a lot of excitement out there on stage to get off. I can't just stand in front of people and snooze."

Prior to and during the actual recording of *On the Future of Aviation*, however, Goodman didn't think that live performances were going to happen.

"When I wrote and recorded the first record, I really didn't have any intention of playing that music live. It was kind of an afterthought, actually, because the album had already been released before I went out and played the music . . . The whole recording process was affected. The recording was more overdub-oriented and I did most of the overdubs myself.

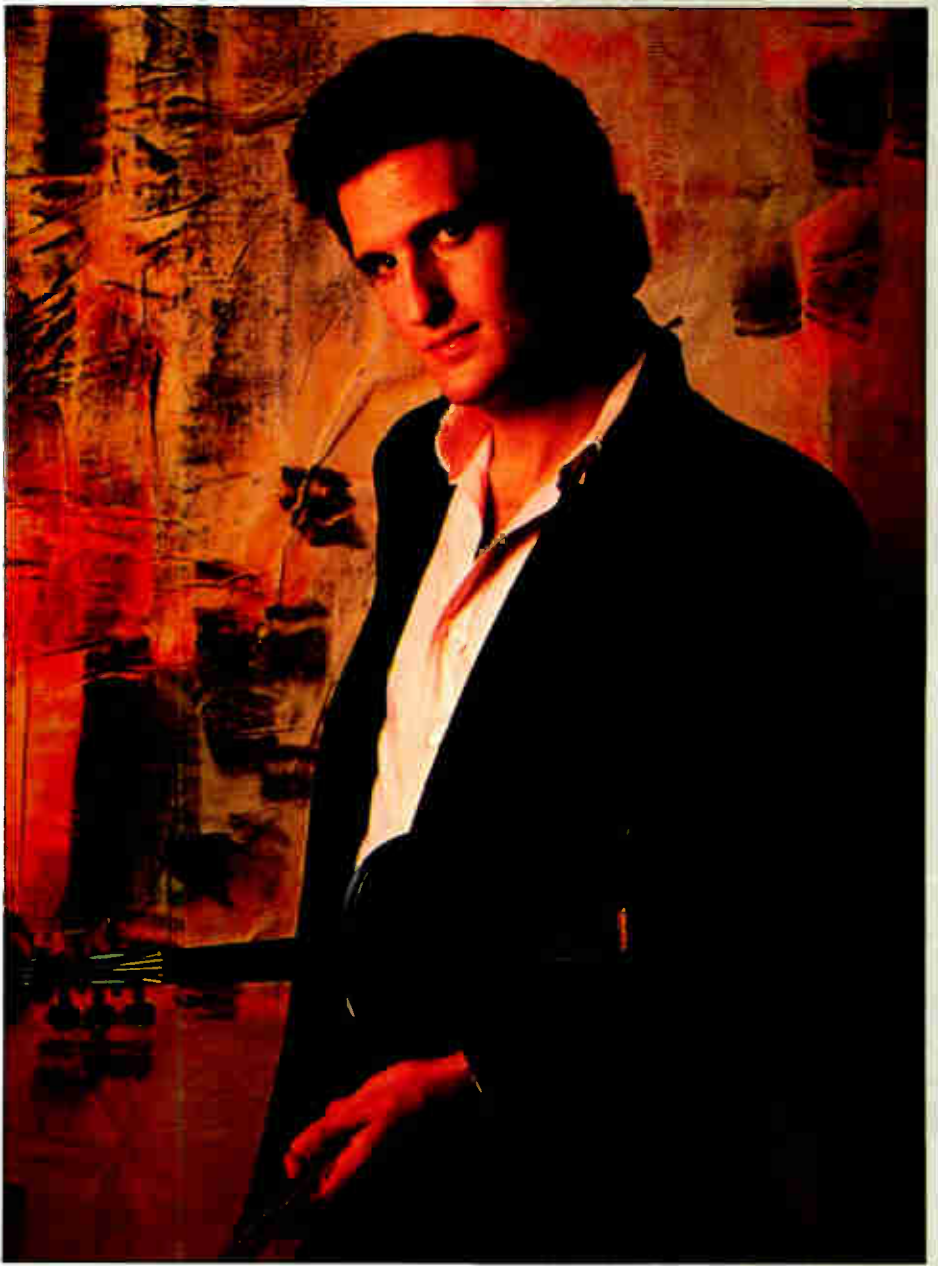
"The second album, though, was a different concept. I had already pushed the record company a bit into a certain direction, and they already knew what my band was capable of doing with my music, so I went into the studio with a definite idea that the second album would push even further and even harder and that it would feature the band." (In addition to the previously mentioned Vanston and Simon, Goodman's band includes Jim Hines on drums, Bob Lizik on bass and Craig McCreary on guitar.)

GOODMAN'S FUTURE PLANS include a possible live album with the band and a potential film project. He also hopes to play more live dates, even if it means sharing a billing as odd as one he recently had.

"We did a little tour opening for the Human League, which was very interesting. We got a polite response, actually better than I expected it to be, considering that most of the audience was apathetic teenage girls with weird haircuts."

Goodman explains that the pairing came about because both bands are represented by the same agency. "They were and still are looking for ways to get this music out to people."

Of course, getting wider exposure is a cause which Goodman has taken on with a passionate fervor. "As long as we can get people to start thinking of New Age as
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"We did a little tour opening for the Human League. We got a polite response, better than I expected it to be, considering most of the audience was apathetic teenage girls with weird haircuts."

something other than just hot tub music, then we're going to be okay. In order to do that, though, I've got to get out there and put my face in front of people. I'll do it with pairings as bizarre as they can get too, because 20 per cent of that audience goes away thinking, 'Gee, that was kind of neat,' and that's 20 per cent more than I had before.

Finally, Goodman reflects "I'm very happy with what I've done so far. I've been able to incorporate a number of different elements into my music, and I think it could change the definition of New Age a little bit. At least I hope it does, because you can't really wash a BMW to my music as well as you can to other New Age music."

DIFFERENT,

Sure we've been laughed at. "ATARI, isn't that a game machine?" They used to say. But the laughing has stopped. And the ATARI ST is now recognized as the most important computer for MIDI applications, PERIOD. Now the software companies who were laughing are scrambling to quickly port their software over to the ST. We don't have to, we spent the last 2 years writing custom programs optimized specifically for the ST. These products are designed to work together as a system. With an upgrade path that insures that registered owners can keep up with the current technology. All in a way that is just as affordable as the ATARI ST itself.

MIDITRACK ST™ Series:

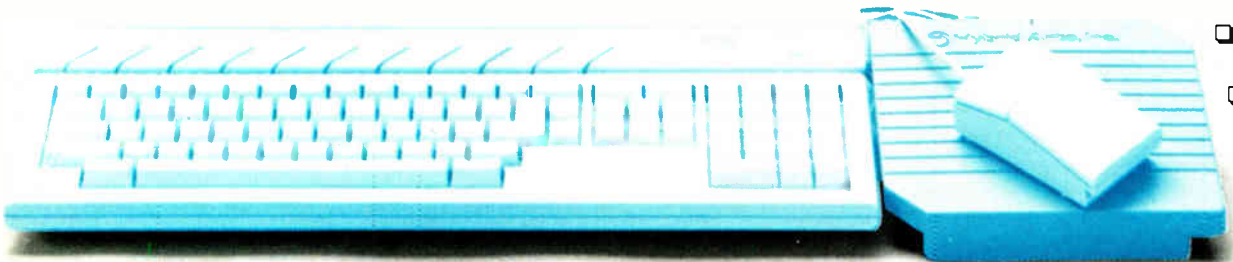
With SMPTE-Track™, bit accurate SMPTE isn't an option, its a standard. So the complete package with software and SMPTE interface is only \$575.95. Advanced differences include jam sync/SMPTE reshape and Read/Write in drop frame, non drop at 24, 25 and 30 FPS.

SYNC-Track™ has all the capabilities of SMPTE-Track with the exception of the SMPTE. But that still leaves TTL clock, two types of FSK sync, four types of drum sync and MIDI sync, all at a price of only \$375.95.

If you are searching for the right MIDI recorder system check out this list of differences:



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- GenPatch File Auto-Injector (loads patches automatically with song)
- Precise Retention of Tempo Even During Heavy MIDI Data Transfers
- Selectable Quantize (move note on only or note on and off)
- Super Fast Instant Locate (over 15,000 notes per second)
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- Real-time and Programmable Patch Changes
- Simultaneous Looping and Linear Tracks
- 191 levels of Programmable Quantization
- Cut and Paste Editing of Track Sections
- Song Position Pointer (read & write)
 - MIDI Note or Event Editing Screen
 - Advanced Song Chain Screens
- Mixing and Unmixing of Tracks
- Real-time Tempo Adjust
- Programmable Tempo
- Intelligent Punch In/Out
- 60,000 Note Capacity
- Real-time Transpose
- 60 Tracks



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and designed to stay DIFFERENT!

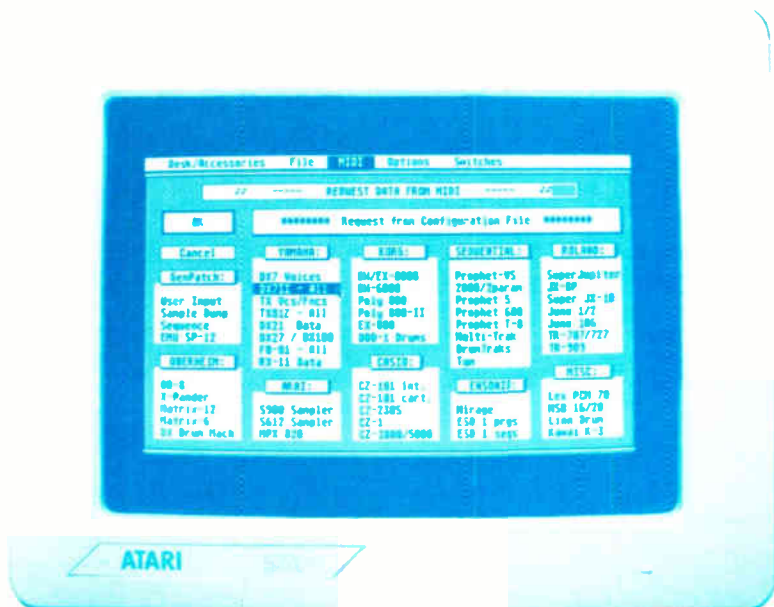
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DX-Android™ suggested retail \$199.95. For registered owners, \$15 upgrade fee. CZ-Android™ suggested retail \$99.95.

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PATCHWORK

This is the page where MT's Editorial team invite you, the readers to demonstrate your own synthesizer programs.

If you're still waiting to see your particular synth featured in these pages, then why not be the first to submit some sounds?

Send us your favorite sounds on a photocopy of an owner's manual chart (coupled with a blank one for artwork purposes) accompanied, if possible, by a short demo-tape. Please include a decent-length description of your sound and its musical purpose in life, and write your full name and address on each chart. And remember, edited presets are all very well, but an original masterpiece is always preferable. OK?

If we publish your patch, you'll be rewarded with a complimentary one year's subscription to MUSIC TECHNOLOGY (if you're already a subscriber, we'll simply extend your current subscription a further year). Interested? Then get twiddling and get scribbling!

The address to send sounds to: Patchwork, MUSIC TECHNOLOGY, 7361 Topanga Canyon Blvd., Canoga Park, CA 91303. ■

KORG DW8000

Rivendell

Paul Nagle, St. Petersburg, FL



11	8	21	8	31	30	41	7	51	4	61	0	71	5	81	1
12	10	22	11	32	2	42	31	52	31	62	19	72	6	82	2
13	31	23	21	33	3	43	0	53	0	63	17	73	11	83	9
14	3	24	1	34	1	44	0	54	0	64	4	74	0	84	1-16
15	1	25	3	35	28	45	7	55	20	65	0	75	31	85	2
16	4	26	0			46	31	56	26	66	2	76	15	86	0-1
17	9					47	6	57	7	67	0	77	0	87	

Key Assign: POLY 1

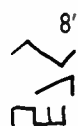

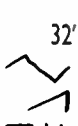

An extract from Paul's latest cassette album, *Wilderness*, due out later in the year, has made its way into the MT offices. One of the tracks, 'Rivendell', features a classy lead string sound which Paul describes as "a good sound for melodic playing. It's nice as a layered MIDI sound, say alongside a piano, and the touch-sensitivity only cuts through with real heavy fingering." One free prescription on its way... ■

ROLAND JUPITER 6

Ford's Fender

Ford Elliott, Oakland, CA

There's a definite accent on axes this month, and 'Ford's Fender' typifies the sound made famous by early '60s guitar heroes like the Shadows. Being one half of a duo comprising keyboards/bass, Ford finds it useful for impersonating a non-existent guitarist. And if rock 'n' roll's your cup of tea, you'll get the beat going with this one. ■

LFO 1		VCO 1		Resonance	0	ENV 2	
Rate	4	Range	8'	Envelope	-2	Attack	0
Delay	0	Wave		Env	4	Decay	4
Wave				LFO	0	Sustain	5
VCO MOD				Keyboard	4	Release	6½
LFO	0	VCO 2			4	Keyboard Follow	4½
Env 1	0	Range	32'	VCA		Glide	Off
VCO1 & 2	Off	Wave		Env 2 Level	10	Arpeggio	Off
PWM				LFO	0		
PW	5	SYNC	On	ENV 1			
PWM	1½			Attack	1	ASSIGN	
LFO		VCF		Decay	4	Unison Detune	2½
CROSS MOD	10	Mode	BPF	Sustain	5½	Mode	Unison
Manual	10	Frequency	2½	Release	0		
Env 1	0			Keyboard Follow	2	Key Mode	Whole

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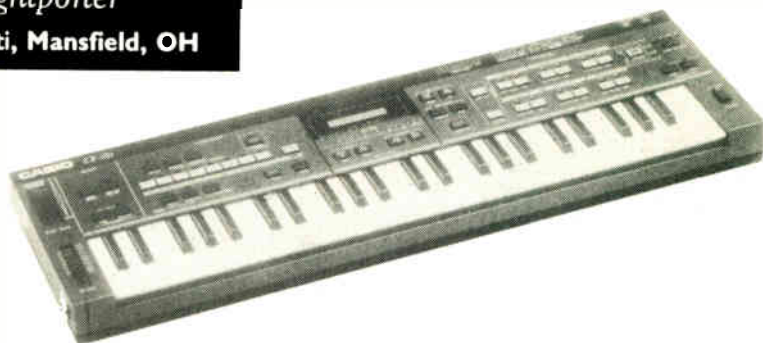
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CASIO CZ101 Nightporter

Steve Conti, Mansfield, OH



TONE NAME	CARTRIDGE NO.	TONE NO.
NIGHTPORTER		

PARAMETER

LINE SELECT	MODULATION		DETUNE				VIBRATO				OCTAVE	
	RING	NOISE	+/-	OCTAVE	NOTE	FINE	WAVE	DELAY	RATE	DEPTH	+/-	RANGE
1+2'	OFF	OFF	+	0	00	12	1	0	50	0	+	0
(1,2,1-2,1+1')	(ON/OFF)		(+/-)	(0-9)	(0-11)	(0-60)	(1-4)	(0-99)	(0-99)	(0-99)	(+/-)	(0-1)

1

DCO 1

WAVE FORM	
FIRST	SECOND
1	0
(1-8)	(0-8)

STEP	E N V (PITCH)								
	1	2	3	4	5	6	7	8	
RATE	50								(0-99)
LEVEL	00								(0-99)
SUS/END	END								

DCW 1

KEY FOLLOW
9
(0-9)

STEP	E N V (WAVE)								
	1	2	3	4	5	6	7	8	
RATE	60	12							(0-99)
LEVEL	60	00							(0-99)
SUS/END	END								

DCA 1

KEY FOLLOW
0
(0-9)

STEP	E N V (AMP)								
	1	2	3	4	5	6	7	8	
RATE	95	30							(0-99)
LEVEL	99	00							(0-99)
SUS/END	END								

2

DCO 2

WAVE FORM	
FIRST	SECOND
2	0
(1-8)	(0-8)

STEP	E N V (PITCH)								
	1	2	3	4	5	6	7	8	
RATE	50								(0-99)
LEVEL	00								(0-99)
SUS/END	END								

DCW 2

KEY FOLLOW
9
(0-9)

STEP	E N V (WAVE)								
	1	2	3	4	5	6	7	8	
RATE	77	12							(0-99)
LEVEL	50	00							(0-99)
SUS/END	END								

DCA 2

KEY FOLLOW
5
(0-9)

STEP	E N V (AMP)								
	1	2	3	4	5	6	7	8	
RATE	95	30							(0-99)
LEVEL	99	00							(0-99)
SUS/END	END								

'Nightporter' was programmed (surprise, surprise) in an attempt to recreate the mood of the Satie-influenced Japon song of the same name. If the sound comes across too sweet for your taste, reduce the Fine Detune to around 09 for a more piano-like sound. Some slow modulation delayed to the tail-end of the sound adds a different dimension, too. ■

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While you were playi

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

We also did some listening on our own and came up with improvements like random pitch shift, real-time parameter changes, digital pan, two-channel design. And two models, the DX7IIDF with built-in 3.5" floppy disk drive. And the DX7IID.

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

The dual FM tone generators in the II

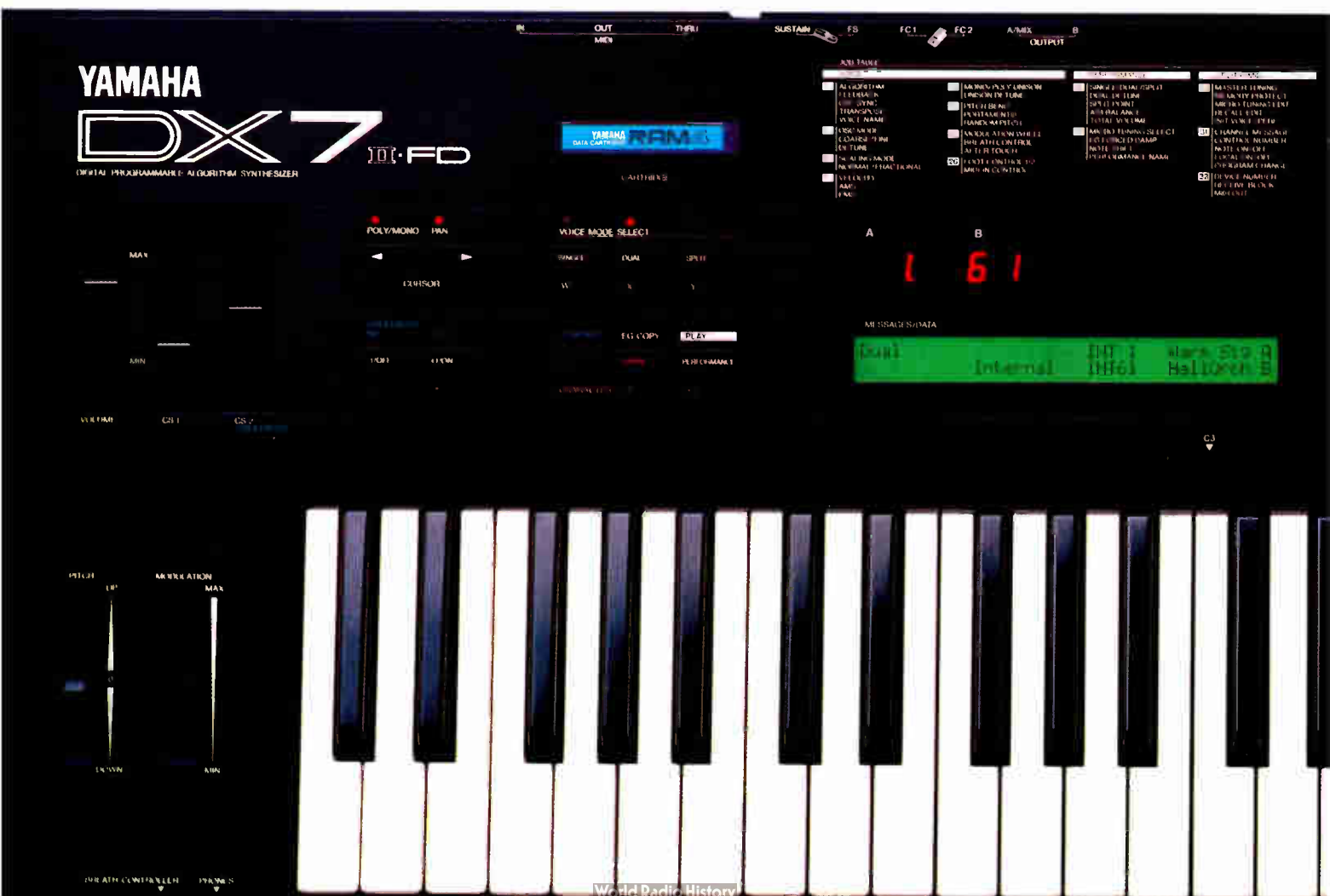
give true stereo output. They also open up some exciting new digital pan possibilities. And you can determine the position of the voices in the stereo field according to velocity, LFO and key number.

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

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

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

Second, with the DX7IIDF's built-in 3.5" disk drive. One 3.5" disk equals the storage capacity of 40 RAM4 cartridges. So you can



ng, we were listening.

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

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

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

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

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

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

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

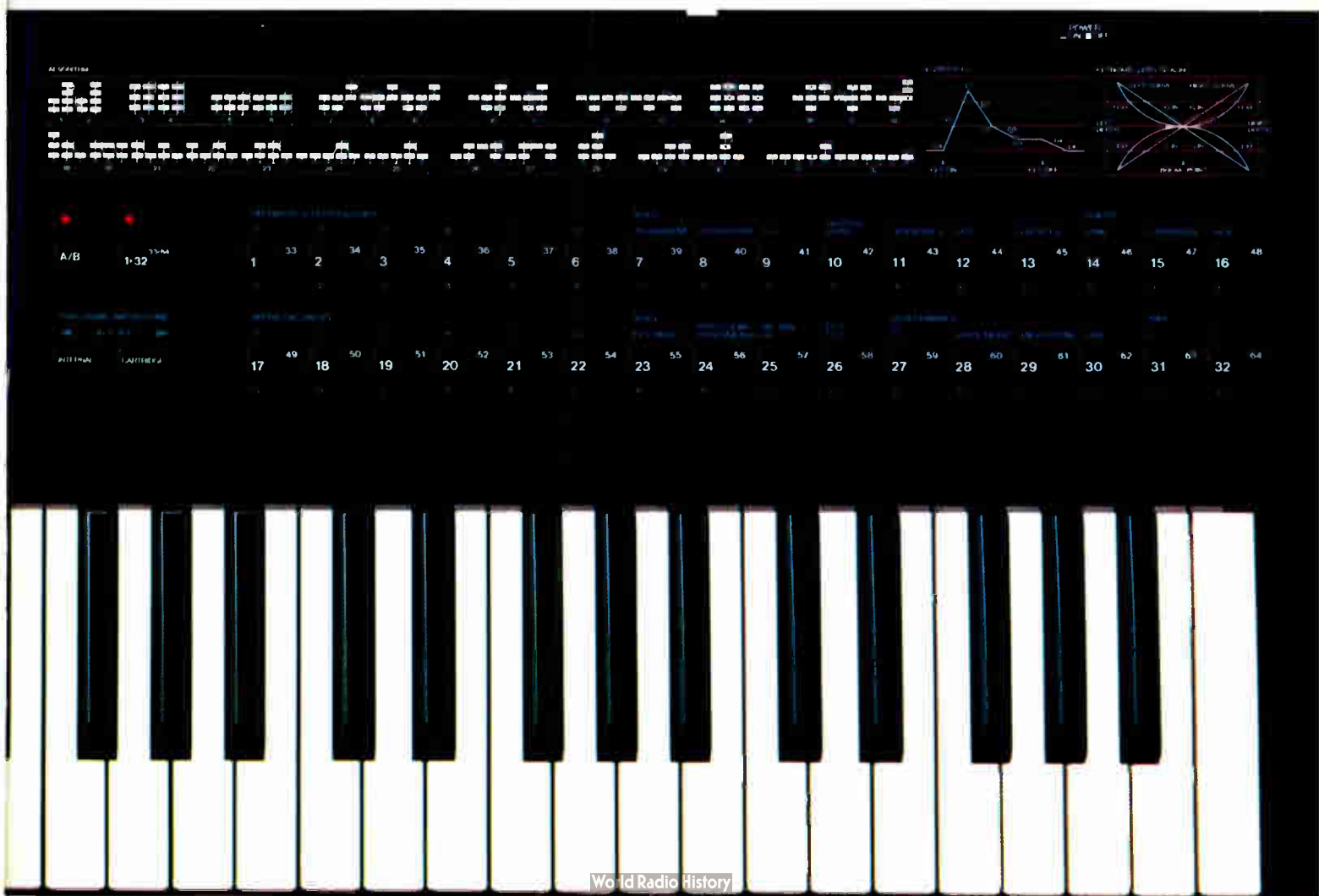
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FAIRLIGHT'S FATHER

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In the second and final part of our interview, Fairlight co-founder Kim Ryrie discusses linking his company's CMI to smaller computer systems, the future of storage media, and why DSP could be the next big set of initials for musicians. *Interview by Simon Trask.*



AS MY CONVERSATION with Kim Ryrie continued, we got around to one area that unites his company's ultra-sophisticated, ultra-expensive machines with those of less ambitious configurations – MIDI. The great five-pin standard has become an integral part of

Fairlight's latest CMI, in as much as the Series III has three MIDI input and four MIDI output ports, and MIDI control is a central feature of the new CAPS sequencing software.

"CAPS can record multiple MIDI channels simultaneously", says Ryrie, "the original reason for this being that I suspected one day

people might get interested in playing like they did in the good old days, in bands and so forth. I think that has to be the next step with MIDI-based recording.

"Another advantage of this approach is that if people are doing compositions using PC-based composer software, they can, if they ▶

► want to, subsequently download to the Series III without having to transfer tracks one at a time”.

So presumably, a MIDI sequence dump standard would find favor with the Fairlight team?

“Absolutely. Some of our users are already asking for that kind of facility. Some Fairlight owners are producers working with fairly small bands, and these bands are putting together their compositions on an Atari setup or whatever. They want to be able to load their stuff into the Fairlight and carry on working with that, which is perfectly valid.”

Generally speaking, Ryrie is far from dismissive of the low-priced music technology that is emerging from the R&D labs of Japan and America nowadays.

“It’s amazing what has come out. Of course we’re aware of the Akais and the new Casio 16-bit sampler. They certainly keep us on our toes.

“I know that if I was putting a studio together at home I would probably tend to run out and buy some of those things too. But – and obviously I’m biased – I would still want them to be built around a Fairlight system. There’s an inherent architecture and expandability about the Fairlight, and an

however, and the possibility it offers for digitally-based recording. But as it turns out, Fairlight aren’t about to rush into any one digital recording medium just yet.

“There are about six options that we’re looking at”, Ryrie reveals, “which include optical disks, R-DAT, high-density floppies with data compression, and hard disk – and also perhaps a combination of two of those. They all have different price levels, and what we’ve been doing is talking a lot with users to try and ascertain what they really want.

“What we’ve found is that not many of them want hard disk. Most of them have multitrack and they’re not particularly keen to outlay the amount of money that a hard disk system would cost. They’re also very concerned about the back-up situation – the time it would take and the cost of it. R-DAT or optical would solve that problem, and the technology is just around the corner. Synchronized R-DAT drives are an expensive business at the moment, but my overall feeling is that R-DAT or erasable optical are the most desirable.

“Erasable optical disks are working in the labs at the moment, but aren’t yet commercially available. There is another problem, in that the transfer rate to optical

of drive when we feel certain that the technology is not yet adequate. Otherwise you’ve got a situation where some people are spending maybe \$5000 on an optional drive only to discover six months later that something really useful has come out at a similar sort of price. We have to hold back until all of this settles down.”

ON A MORE general level, Fairlight is busy keeping up with new technological developments that may have significant implications for the music industry – though Ryrie is understandably cagey about giving away too many secrets about his company’s investigations.

“We’re in contact with a couple of different projects which we’re hoping to get involved in, or which we’re hoping will be suitable for us to get involved in. Both of these projects use completely new techniques for creating complex sound, and we’re hoping that these will lead to a new generation. They’ll be DSP-based, of course.

“We have a DSP team now who are working on determining what will be the most effective technology to use that will give the required flexibility and complexity of sounds, and control over those sounds in a meaningful way. Obviously control over sampled sounds is reasonably limited, but then it’s also pretty limited on FM sounds with the technology available today.

“There’s a new technology that allows just a couple of variable parameters to dramatically and predictably affect the whole nature of a sound.

“Both of these projects are happening at different universities in different parts of the world: one in Italy and one in England. The locations are a secret, though! We’re very impressed by what both projects can do, and what we’re trying to do is come up with a hardware solution which will be able to handle both of these technologies, because it’s a bit hard to know which will be the most popular until you’ve done it and got them out in the field.”

However, Ryrie feels that today’s commercially-available DSP chips aren’t up to handling the processing power required by these new technologies.

“I think DSP is the direction that everyone will be going in. But there are problems with DSP today. When you look closely at the current low-cost versions of DSP products, you’ll notice that it’s not the numbers which we have been used to associating with 16-bit digital. The reason for that is that when you start doing complex things (signal processing such as reverb and equalization, for instance) there’s an amount of noise generated by the mathematics that has to go on – through ►

“We assume someone who is going to buy a Fairlight will be using that as the basic machine in their production environment. But we’ll be adding software for people to use other machines with the CMI.”

inherent sound quality standard, that you really can’t achieve with those kind of products.

“Our basic policy is that we assume someone who is going to buy a Fairlight will be using that as the basic machine in their production environment. But we will be adding to the Series III whatever software might make it easier for people to use those machines with the CMI, if that’s what they want.

“For instance, if you don’t like multitracking you could instead buy an eight-channel Series III CMI together with other MIDI instruments, and have a fully-sequenced production which can be recorded direct to Sony F1 or whatever. You’ll use the Series III for the sounds that you’ll need it for, and you’ll use the other machines for the sounds that

disk is slow; you could only record two tracks at a time to disk, and even doing that would be hard because of error detection and correction requirements.

“There are high-bandwidth optical drives starting to appear, but at the moment optical disk transfer rates are running at about a quarter of the rate for hard disks. But the good news is that with optical disks, you’re talking about half a gigabyte to a gigabyte of storage.

“If you’re using WORM (Write Once Read Many) optical disks, then the costs are just astronomical when you consider that you’re only getting two tracks down. If you wanted to record eight tracks then you’d need four drives; each disk is costing you £100, and you can’t erase it. That’s obviously too expensive.

“On the other hand, if you were recording onto hard disk and using optical disks for

“People are concerned about the back-up situation with hard disk – the time it would take and the cost of it. R-DAT or optical would solve that problem, and the technology is just around the corner.”

they’re good at. That’ll allow you to get a compromise system which will be better than a \$2000 setup, but which won’t be the fully-blown Series III.”

One area in which the Series III inevitably scores is its massive amount of memory, **MT JUNE 1987**

backup, that’s more efficient. But because optical can only record two tracks at a time, if you had an hour of recorded material it’d take almost that time to back it up before you could use your hard disk again.

“We don’t like to leap onto a particular type

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rounding of values.

"What it really boils down to is that the more powerful the processor, the less of that problem you get. So in a few years I think DSP will be the way to go, but right now you can use DSP but it's very expensive to get what you really need. We've avoided jumping into the early DSP processors because we feel it's a first-generation thing. We'd rather stick with the technology that we know, and use DSP when it's really firing on all cylinders.

"We're using Transputers for the video side of what we do, but we don't think they're particularly suited for audio applications - certainly not for what we want to do. A Transputer roughly has the power of a 68020,

"Some people like to be surrounded by mountains of effects equipment with knobs and flashing lights; they might not be so happy to have one quiet-looking control that's capable of doing everything."

but the beauty of Transputers is that you can just pile them up on top of one another and do all your work in parallel.

"But digital audio doesn't work like that. Although the Transputer can do DSP processing, it's often more appropriate to use

a chip which has been more specifically designed for DSP applications."

And for anyone out there who's having difficulty keeping up with the jargon here, Ryrie has a more easily-assimilated explanation of current trends . . .

"What we're talking about here is replacing electronic components with just a processor that will do the functions that you would otherwise get using logic gates and medium-scale integration chips. If you look at most systems these days, the hardware functions are done by integrated circuits that are basically doing logical functions. DSP means that you just have this incredibly powerful processor. You have an A-to-D converter in

front of it and a D-to-A converter after it, and connected in there somewhere is a bit of high-speed memory. In theory that box can do anything - from synthesizing sounds to playing back sampled sounds to real-time synthesis to signal processing."

SO DOES KIM RYRIE see everything ending up in a single box?

"I think that probably everyone is assuming there may be more of a workstation approach to the whole thing, whereby all the functions can be done from a very user-friendly control panel, a series of panels, a keyboard combined with a control panel, or whatever.

"Obviously there's lots of scope within that. I don't think that anyone is going to come up with the system that's going to suit everyone. Some people on stage like to have 10 keyboards, even though today you only need one to control everything. It's the same sort of thing in a studio: some people like to be surrounded by mountains of effects equipment with knobs, flashing lights and buttons; they might not be so happy to have this one rather quiet-looking control which is capable of doing everything they can think of. It may obstruct the creative process of some people to have to work like that. But in any case, that's the direction we're heading in."

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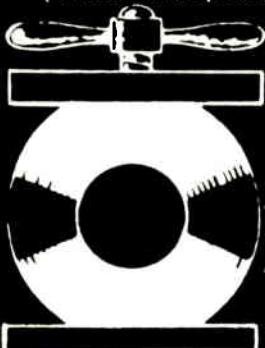
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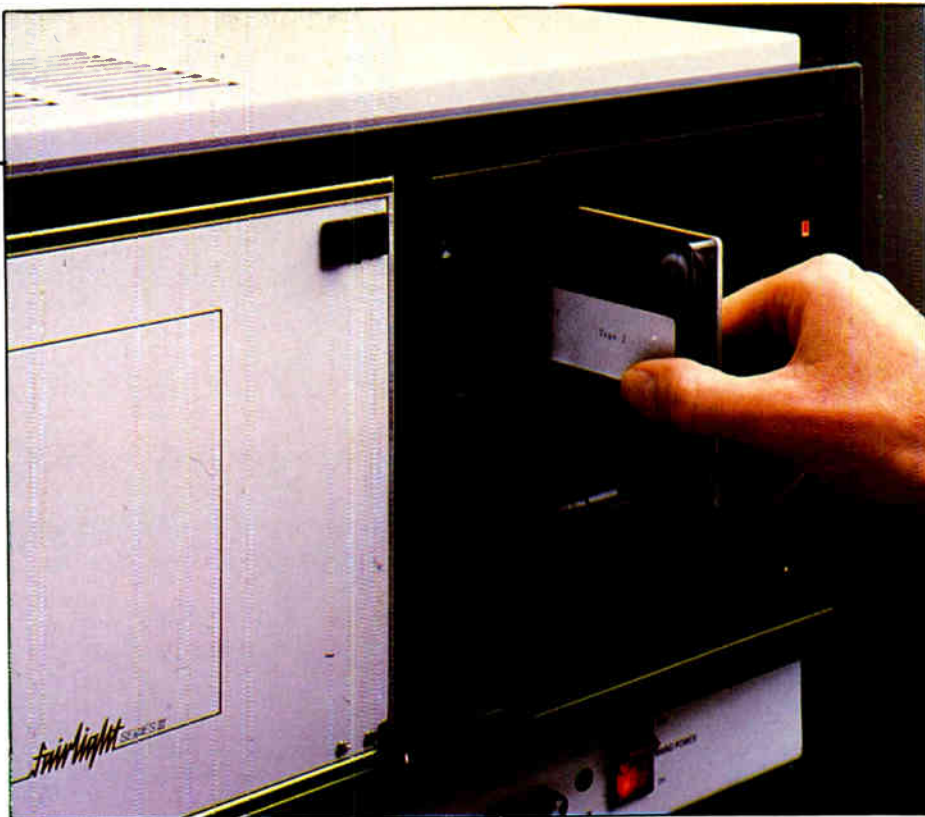
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▶ standard system. But in the longer term, the company is looking to fully integrate the audio and video sides of their operation.

"I guess our long-term goal is the production of a system which will be the next-generation audio system – and to some extent the present generation with video production. Powerful video effects generation, high-resolution graphics, computer art . . . all that sort of stuff, in a package which is integrated. And affordable, because I think that's the key.

"It'll be two separate boxes and two separate products, but they'll be designed to work together from the user interface point of view, which is closely tied in with the creative process. Integration means the user interface. We need to work out ways of doing things which are specific to working on music and video simultaneously, which we haven't thought too much about yet.

"At the moment a composer is given a video and he adds the music to the video, which is a fairly simple situation. If it's a music video then of course the music is already done, and the video producer has to add the vision. First of all we have to cover both of these processes, but beyond that I think there's a requirement for creating both the music and



the video simultaneously. There's no reason why a system can't be made friendlier in that direction."

Well, when you've got a tradition of

research and innovation that's as strong as Fairlight's, there seems no reason why anything can't be done. Given time, of course.



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Making the Most of the SAMPLE DUMP STANDARD

*Part 3: Several Samplers, a Couple
of Problems, and a Truckload of
Moral Dilemmas*



In the third segment of our series we cover the trials and tribulations of transferring samples between different samplers through MIDI, and discuss the implications and future of sample swapping. Text by

Chris Meyer.

AS MENTIONED in previous installments, the Sample Dump Standard (SDS for short) was developed in the hope that it would become a standard way of transferring samples via MIDI between various devices, regardless of internal data formats or other idiosyncracies. At the time of its creation, the intention was that, in addition to sample swapping, it would also spawn various "universal" sample editing packages.

Reality is always slower than ideals, however, and none of these have appeared yet (but at least I'm hearing encouraging rumors). Luckily, reality can also be more inventive than ideals. A recent announcement by Optical Media International concerning their possible intention to create a version of their CD-

ROM library unit that transmits samples via SDS is perhaps the best justification yet for the standard's existence. Thousands of samples could be available instantly for any sampler that implements it.

Enough about the past and future, though, and on with the present. The SDS, by its very name, is about dumping samples back and forth between instruments. In this installment, we look at trying to do this between the first crop of samplers to adopt it - the Prophet 2002+, the Akai S900 and X7000, and the E-mu Emax.

The Akai Dilemma

TIME FOR A bummer - the current version of firmware for the Akais will not speak to any other instrument properly implementing the

SDS. This is not fully Akai's fault, though. As mentioned in our first article on the standard (see MT March '87), the first versions of the Prophet 2000's firmware implemented an early, unapproved version of the SDS. Unfortunately, this is what Akai modeled their firmware after. It seems that when the specification was updated and approved by the MIDI Manufacturers' Association (MMA), there was some misunderstanding in the Japanese MIDI Standards Committee (JMSC) over which implementation was indeed "the real thing." This confusion was finally settled in meetings between the MMA and JMSC during the January NAMM show in Anaheim, California. But during this period of uncertainty, other Japanese musical instrument manufacturers shied away from implementing the SDS until they were sure that the standard had indeed stabilized. This is why, at this point in time, many more American and European instruments have featured SDS than Japanese. I hope we'll soon see this situation begin to change.

Returning to the topic at hand, do the Akais indeed work with older Prophet 2000s? Yes, if the Prophets have firmware revision 2.1 or earlier (as opposed to 3.0, or the "Plus" version, 4.0). I managed to procure a copy of 2.1 to test it and be sure. However, going back in revisions to 2.1 meant that I lost several features in the Prophet (expanded memory and so on), and also meant that all of my disks that were created with versions 3.0 or higher (99.9% of them) would not load. Oh well...

Is Akai going to update their firmware to the current level? I'm told there is an update available for the X7000 (though I have yet to get my hands on it), and with additional features for the S900 being promised, like trigger inputs, I imagine it too will be updated soon. Also, Akai is aware of the problem so, as people like to say, watch this space for further details.

One additional tidbit about the Akai samplers – there is no way to dump a sample over MIDI to another sampler from the front panel; one must send a MIDI sample request command to the Akai to get it out of there – either from a terminal support package (Sound Designer, etc.) or from instruments like the Oberheim Prommer or Dynacord ADD-One, which work that way. The Prophet 2000/2002 will only volunteer a sample from its front panel, as opposed to asking for one, making communication kind of one-sided in this case. It's a shame really; I would have liked to have stolen the X7000's factory slap bass. Or was this the point of not allowing it from the front panel? Hmmm . . .

Software Versions

HAVING COVERED THE Akais, our attention focuses on the 2002+ and the Emax. The Emax's version 3.0 software hates SDS. It aborts a dump after less than 6K of the sound has been transferred. Quick consultation with E-mu led to the discovery that versions 3.0SD or 3.1 do work, however.

Like the X7000 and the S900, the Emax does not allow sample dumps to be initiated from the front panel – they must be requested

over MIDI. Consequently, tests are restricted to transferring from the 2002+ to the Emax. Why doesn't the Emax allow access? Part of the reason is indeed to block the "giving away" of E-mu samples to other samplers. The other part has to do with the fact that the Emax has a different way of numbering samples than what the SDS expects. Samples inside the Emax are assigned to a particular root key and preset, and their occurrences in that preset (and others) are referred to as "voices". In place of the usual two-byte sample number in the SDS header (see "Implementing the Sample Dump Standard", MT December '87), they use the LSB (Least Significant Byte) of the sample number to tell the root key, and the MSB (Most Significant Byte) to tell if it is a "primary" or "secondary" sample. (The "secondary" sample has to do with sample layering.)

It's nice that some rudimentary form of mapping is being transmitted with the sample (an area not covered yet by existing SDS messages), but it does slightly complicate things. When a sample from the 2002+ is transmitted to the Emax, it appears in the current preset, and a new "voice" is created for it with the sample number equaling the root key. In the case of the 16 samples from the Prophet, they equate to the lowest 16 keys of an 88-key keyboard. They then have to be transposed ("reassigned" in Emax lingo) to where you want them on the keyboard.

Any other problems? Well, both instruments support two loops per sample, but the SDS, in its rawest form, only supports one. (An extension to the SDS, called the "Multiple Loops Message," was just approved by the MMA and JMSC.) What gets lost in the translation? The release loop – a fact which follows the strict definition that the one SDS loop is the "sustain" loop. Unfortunately, it's the *release* loop that often turns out to be the most useful on the Prophet. To make use of it you must find the lost loop points again. Thankfully, the Emax is quite friendly in this regard, offering the exact sample number



where the loop is placed, but unfortunately, the frugal 2 1/2-digit LED display on the Prophet only reveals what "K" (1024-sample segment) the loop is in. In other words, you end up having to reloop the sample half the time. It's not a big pain with the Emax, but it is extra labor – through nobody's fault, except perhaps the Prophet's display (or lack of it). Also, the Emax only supports forwards-only loops. This is somewhat odd because its



predecessor, the EII, supports forwards-only and bidirectional loops (as does the 2000 family). True, forwards-only loops get used about 80% of the time, but it's another minor bummer.

One more tip for sample transfers to the Emax – don't touch the pitch and mod wheels. They'll abort a transfer on a dime (which is okay if that's what you wanted, but freaky if you happened to get bored and played with them waiting for a transfer to finish). It appears that they're not fully disabled while a transfer is taking place. If you do manage to abort a dump in such fashion, delete the result before attempting to transfer again – I got hash when I tried sending the same sample across a second time without first doing so.

Transfer Sound Quality

ALL OF THE above are only side notes and tips to watch out for. What about the transfers themselves? In other articles I've hinted that the analog sections of samplers (input and output filters, etc.) may have more affect on their sound than the digital portions. Also, Sequential and E-mu use different digital schemes – the Emax uses E-mu's 8-bit proprietary version of delta code modulation, and the Prophets use straight 12-bit linear. I was very anxious to put to test the "street rumors" that the 2000 is the most transparent (ie. does not add or subtract as much from the original) sampler in its price class, and that the Emax munches the sound slightly – in a very rock 'n' roll kind of way.

I started with a Bosendorfer piano disk on the 2002+. Some of the samples on it are simply splendid, with lots of sweet hammer strike and a bright, detailed tone. Others are a bit lacking in excitement. There are nine samples in all, some sampled at 31.25kHz and others at 41.67kHz. Since I would have to remap the samples on the Emax after the transfer, I noted on paper how they were spread across the keyboard on the Prophet. This became doubly important because some of the transpose ranges on the Emax are different than those on the 2002+. For example, the Emax only transposes its highest sample rate up a semitone, whereas the Prophet goes up a fifth.

It took about 15 minutes to transfer the 482K-worth of 12-bit data across and map it on the Emax (not counting looping), and yes, there were sound differences. The Emax seems to add a bass "thump" to the attack of the sound and a slight midrange

hump to the sustained portion when compared to the same sample played back on the Prophet. This meant the good Bosendorfer samples got their hammer and sustain tones obscured on the E-mu, but that the duller samples actually sounded better – the E-mu adding "excitement".

This perception continued when I took a variety of electronic, Latin, and "mondo" drum samples from my 2002+ library and transferred them over to the Emax via SDS – a bass thump got added to the attack, and there was a slight midrange hump again. This was not appreciated on the attack of a conga or an electronic cymbal (in particular, I thought the midrange hump obscured some of the texture of my prize conga sample), but the type of munching that the Emax does would certainly help sound cut through live or in a mix.

Next came the acid tests – sampling CDs into both machines at their respective highest rates, transferring the 2002+'s sample into the Emax, and then comparing all three. The CDs in question were *Speaking in Tongues* by Talking Heads and *Flags* by Patrick Moraz and Bill Bruford. Sampling the opening of 'Burning Down the House' further confirmed my suspicions (nice when things work out consistently, isn't it?), with the 2002+ sounding more accurate and detailed and the Emax adding its own character. The rhythm guitar, in particular, benefitted from the Emax's EQ, sounding much "chunkier". Sampling various sections of *Flags* pointed out a couple of tidbits about the Emax's input section – it had a touch more noise than the 2002+'s (audible during quiet sections), but also sounded brighter (for example, hi-hats were a little more forward in the mix). I was able to isolate the source of this effect by transferring the Prophet's version of the sound into the Emax for playback. In other words, I had the exact same sample data, which had been sampled through two different input sections, playing back through the same output section.

Conclusions

YES, IT IS possible to transfer sounds from one sampler to another via SDS. Second, samplers do appear to have different "sounds" themselves, which can be a boon to an ambitious recording engineer (professional or bedroom), and possibly frustrating to someone trying to make exact, digital copies of another's sounds from a different sampler.



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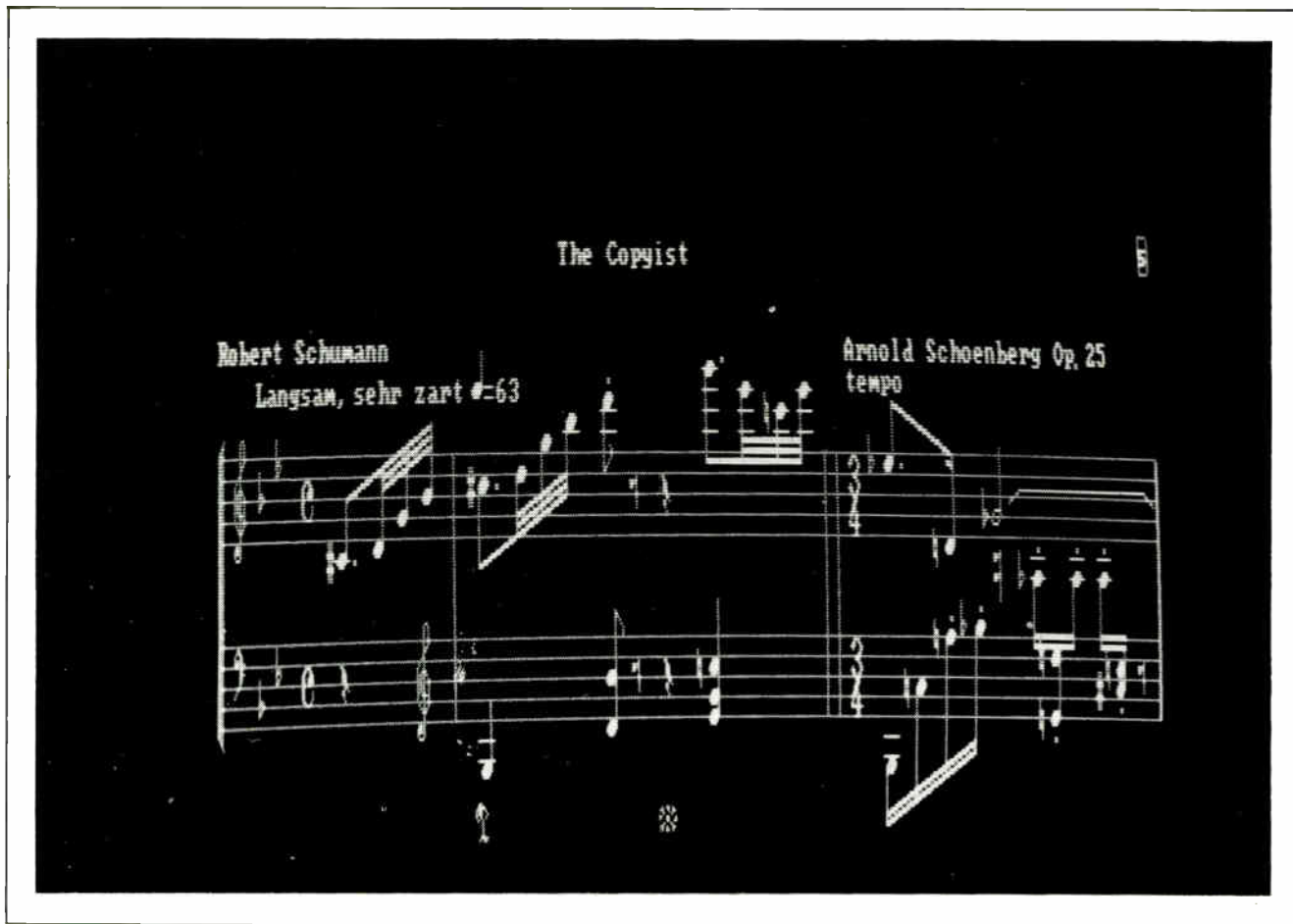
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Dr. T Copyist

Software for IBM PC and Atari ST

Is computer-assisted music transcription a viable option, given the state of today's personal computer systems? Dr. T's Copyist is one of the first programs to test the waters. *Review by Chris Many.*

MUSIC TRANSCRIPTION IS an ancient art, dating back thousands of years. Putting musical thoughts down on paper using agreed upon symbols of notation is, in fact, one of the oldest forms of written communication known and, through the ages, it has allowed musicians the opportunity to freely exchange their concepts of music performance.

It is fairly universal in nature; a quarter-note in the US is written the same way the world over, just as *forte* is read the same way in Italy as it is in Germany. Lines, staves, notes, flats

and sharps are shared symbols amongst all the world's musicians, allowing everyone to understand precisely what the composer wants to communicate, despite his or her nationality.

Being that transcription has been around as long as it has, it's surprising that very few advances have been made to ease the task. The printing press certainly revolutionized the process, making scores legible and available to many aspiring musicians, composers and conductors. But not much else has simplified the transcription process over the centuries.

Professional copyists earn their livelihoods by copying parts for band or orchestra, cranking out page after page after page. It's a laborious procedure, often requiring special onion skin paper, India ink, calligraphic pens and other tools of the trade.

Here, then, is a field seemingly tailor-made for computers; an area that, in this age of desktop publishing, could benefit enormously from some improved speed and quality.

Enter the Copyist, a software program from Dr. T. This is a program that promises publication-quality musical scores, allows full

screen editing using the computer's keyboard and/or mouse, and also converts popular sequencer datafile formats into standard musical notation for editing and printing purposes. Sounds great, but does it make the process of music transcription simpler, with greater speed and quality the overall result? In other words, does it make the musician's job any easier? Before answering that question, let's take a look at some of Copyist's features and how the program actually works.

Format

ONCE YOU'VE CONFIGURED the Copyist for your system (color or mono, Mouse installation, printer type, and work and program directory selections), you boot the program and are then presented with the main menu across the top of the screen. The editing tutorial provided in the documentation suggests you load in a sample file included on a sample data disk. Once it's loaded, the screen is redrawn displaying several staves of music, a title and a rectangular cursor with which you navigate the score. If you've installed a Microsoft Mouse (I've been told it works with other popular brands as well), you can use it to move the cursor.

Which brings me to my first complaint: that's all you can do with the mouse, move around. You can't access any menus with it; you can't drag notes, symbols, rests, accidentals or anything at all with it; you can't scroll to another page of music with it; you can barely put the mouse buttons to any use with it. In short, the mouse is used solely as a substitute for the cursor arrow keys on the keypad. Even broad-based, consumer-oriented products like The Music Studio or Music Construction Set (that sell for \$100-\$150 less) put the mouse to good use, letting you select note types, drag symbols all over the page and run the program from menus. And it's not that the Copyist doesn't use menus, it's just that the mouse is not enabled when the menu options are displayed. It sure seems like the mouse feature was just tacked on, without any real determination to realign

In Use "Erasing symbols can sometimes be troublesome", the manual tells us, and it's true. The cursor must be correctly centered upon the symbol to be deleted - especially tough when using a mouse."

the product to take advantage of a mouse. (Note: I reviewed the IBM version of the Copyist, not the ST version, but the implementation is the same.)

According to the folks at Dr. T, the reason behind this approach is that dragging notes to position them, and selecting note values or items from a menu is too slow a method for note entry, and in the hands of an accomplished Copyist user, notes can be entered much faster than with conventional mouse techniques.

While a professional mouse user might contest this statement (and I'm not arguing a mouse vs. keyboard input), the point remains that if software is going to support a mouse, then that device ought to be put to its full utilization, giving users the choice of which input method they prefer.

MT JUNE 1987

Mouse implementation deficiencies aside, the editing features are fairly complete. All symbols are entered from the keyboard, and the assignment of keys is pretty consistent with their function. For example, to enter a sharp, position the cursor where you want it on the staff and press 'S'. ('F' is used for flat, 'N' for natural, and so on.) Ledger lines are drawn automatically, but you can defeat this feature if you want. Some symbols require two key strokes; you type 'CT' for a Treble Clef, 'CB'

Transfer "When loading in a sequencer pattern or keyboard performance, the computer can be all too literal in gauging your performance - a problem all scoring programs have to solve."

for Bass Clef, and so on. It's fairly easy to move around a page, whether you use the mouse or cursor keys. I actually found it easier to use the keys, since all entry is done from the keyboard anyway.

Implementation

MANY OF THE standard musical notation symbols are implemented in the program, including trills, formata, coda, damper pedal, and arpeggiato. Beaming notes is another feature provided, either above or below the notes. It's a bit tricky to work out exactly how to do it, but when going through the tutorial examples, everything happens quite smoothly. Making the transition from hand-held tutorial to working operation takes some perseverance, but suffice it to say that you can beam your eighths, 16ths, 32nds, and so forth, slanting them up, down or horizontally.

"Erasing symbols can sometimes be troublesome", the manual tells us, and it's true. The cursor must be correctly centered upon the symbol to be deleted, and this becomes especially tough when using a mouse. The phrase the documentation uses to describe the correct placement of the cursor in most cases is "intuitive, but sometimes a little experimentation is necessary".

Copying bars or sections of a bar can speed up score entry, especially if your music is a repetitive motif. You can cut and paste, although you need to insert a space into your score; Copyist doesn't do this automatically. This too can be a somewhat bothersome routine, at least until you've grown used to it. Which brings me to complaint #2.

I found the editing features of Copyist, although admittedly pretty complete, cumbersome to use, and not readily learned. Let me give you some examples to help explain how I formed this opinion.

First of all, there are over a hundred different commands available for the user. Obviously some will be used more than others, but the fact remains there are lots of options, editing or otherwise. Usually, programs that are somewhat involved have a

Help key, or some other form of online directory of commands or assistance. None is included with the Copyist. I found myself leafing back and forth through the manual, trying to figure out how to do the simplest things, trying to see why this happened when I did that, and generally experiencing a frustrating learning curve on the program's operation.

Here's an example of how the editing tutorial is laid out: "Let's add some more

music by entering these strings of commands: <f2> <up> <up> J B <f2> <down> B <f2> <down> B <f2> <down> <down> <down> + + 1." It may not be fair to use the tutorial example in a review like this without defining what all of those keystrokes do, but I felt just as confused as you do now as I sat in front of my PC parroting this "tutorial" guide to editing. I could look up and find out that pressing 'B' placed a black note (quarter, eighth, and so on) wherever the cursor was positioned, or that <f2> moved the cursor one step to the right (I could see that when I pressed the key) or that the '+ + 1' beamed notes together. But for me, editing and transcribing music on a computer should be easier than demanding that I learn ten to twenty new commands in order to get a page of music written out.

I suppose, in fairness, that if I was an expert in the use of Copyist, my attitude might soften. That holds true for many subjects, though; once you know how to use a tool, it's easy. The hard part is in mastering the tool. That's the complaint I have with Copyist's presentation: it's slow learning compared to the time you have to invest. I'll reiterate, though, that once you've waded through the documentation and gained some experience using this program, the editing features you have at your command cover everything you'd want in terms of editing music from a computer keyboard.

Applications

COPYIST ALSO CONVERTS sequencer song files into music notation, which will probably find more use than entering transcriptions into the editor. It currently supports Texture, Sequencer+ and Master Tracks files, with conversion routines included to allow them to be loaded into Copyist. The problem with loading in a sequencer pattern or keyboard performance is that the computer can be all too literal in gauging your performance. This problem is one all scoring programs have to solve, not just the Copyist.

For instance, how accurate are you in playing and releasing eighth-notes? Perhaps the computer feels you released a few of them too soon to be considered eighths, and so transcribes them as 16ths. So you'll need to spend some additional time editing the sequence after you've loaded it in.

This is not really a fault of Copyist; it does do a good job of faithfully reproducing your

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performance, and allows you to adjust default settings (include or exclude) for parameters such as rests, dots, stems or beams, or whatever. But you can get a pretty odd-looking score after you first load it in, with 64th-note rests and 16ths instead of eighths.

You can change the note quantization amount to different variables which solves some of this problem. It's a smart idea and a handy way to cut down re-editing time, but you'll probably have to do some tweaking before you have a score you're happy with.

Testing

WHICH BRINGS US to the final evaluation, printing out the finished piece of music. Currently, Copyist supports several output formats: Epson (or an Epson-compatible printer), HP Inkjet or Laserjet+ printer, and HP-GL compatible plotter. I used a regular Epson printer, not having immediate access to an HP Ink/Laserprinter.

The Epson configuration prints out in either a high-resolution mode, in which the quality is much improved due to continuous passing of the print head, or a regular mode, which decreases the resolution, but speeds up the print process dramatically. This final point brings me to my third and most major complaint. No, it's not the quality of the printed page - the music is very crisply defined and more than adequate for publication or archive purposes. (In fact, I've seen the Laserprinter output of Copyist at the NAMM show, and could not tell the difference between it and a page of sheet music or any professional publication.) But the time it takes to print out a single page of music on a dot-matrix printer makes the program almost prohibitive in terms of usefulness.

How long, you ask? Well, in regular mode on an Epson printer, it took 8½ minutes to print out the first page of the demo song file included with the program. And in Hi Res mode it took over half-an-hour. For one page of music! Honestly, I thought there was something wrong with my printer when I accessed printing in Hi Res.

Now, you can multiply this out as quickly as I can, and when you do you'll discover it's going to take an hour to print out two pages of music, two hours for four pages, and so on.

Although it speeds things up threefold to use regular mode, waiting half-an-hour for the printer to produce three pages of music is beyond the borders of acceptability from my point of view. (Even with a Laserprinter, it takes 15 to 30 minutes to print one page, depending on the size of the printer buffer.)

In fairness, a Laserprinter can produce a very high-quality page of music in minutes, but how many musicians have access to one?

Conclusions

A PROFESSIONAL COPYIST would run rings around this program. Even an amateur copyist, or your average working musician, could easily write out a page of music faster than it would take to print out a page with a dot-matrix printer, much less edit that page as well. (By the way, I'm not comparing Copyist

to any other scoring program on the market; my evaluations are based solely on my experience with computers as a subject, music as an art, and transcription as a necessary administrative duty.)

So now the questions posed at the beginning of this review should be asked again. Does the program make the process of music transcription simpler, with greater speed and quality the overall result? In other words, does it make the musician's job any easier?

Unfortunately, the answer is no. Transcription is actually much easier doing it the old-fashioned way, by hand. It's much quicker, and the editing tools (pencil and eraser) are a lot more user-friendly than those provided with this software package. The one function that might have sped up a copyist's work, a transposition feature, is only included in a roundabout way (move notes vertically one staff at a time and then readjust the key

signatures).

So if you are a professional copyist looking for a way to ease your work load, keep on looking.

If you regularly hire copyists to write out parts for you, have the time and effort to invest in learning to use the program, already own an IBM (or ST), and use an IBM-based (or ST-based) sequencer, it's possible you can make the Copyist a cost-effective investment.

And if you just want to have fun with a program that will print out music that you can input, either by hand/mouse or from a sequencer file, check out some of the consumer-based programs.

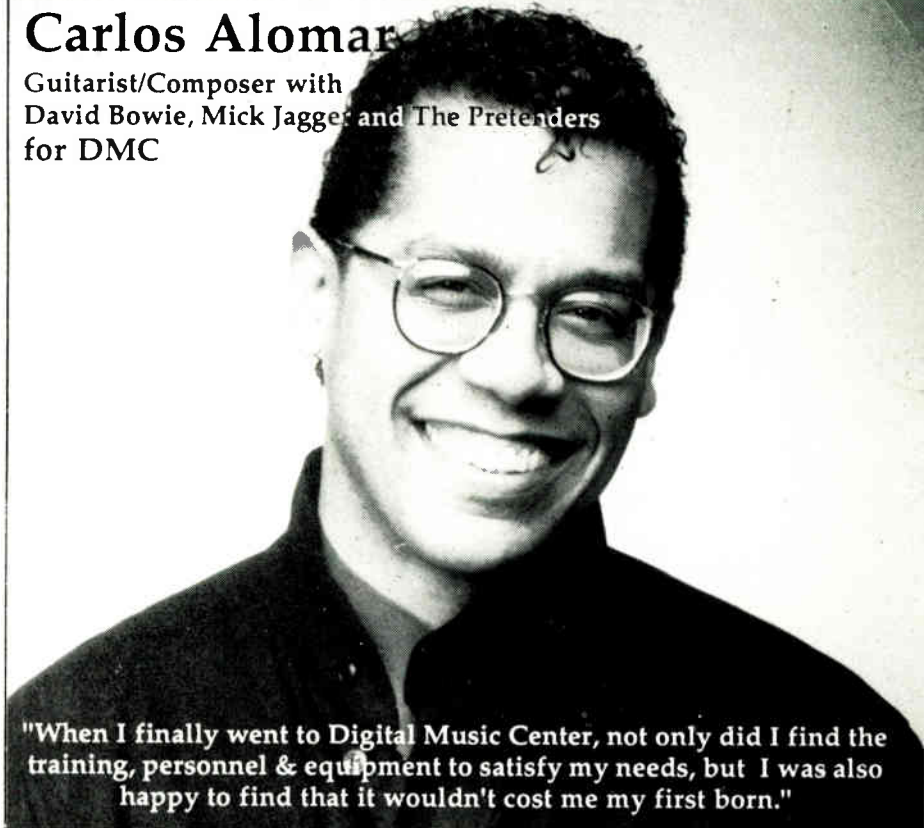
While Copyist is an admirable effort, it falls short of its mark. ■

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Bill Bruford, once one of progressive rock's greatest drummers, is now in the vanguard of a new wave of jazz with his ensemble, Earthworks. Characteristically, he's in the vanguard of using new percussion technology, too. We talk to him before his band gets to the States next month. *Interview by Tim Goodyer.*

LONG BEFORE THE record store became the well-organized affair we're familiar with today, it was often a dingy, rambling Aladdin's cave full of the sorts of people your mother warned you about. Looking through records, or "browsing", was an art in its own right and, like any art, it had its own customs and traditions. Confidently skipping over desirable albums indicated you already had them, pausing on anything

too iffy told the world you did not (yet) know what you were doing, and well-thumbed sleeves meant second-hand or unsaleable stock - not to be confused. The record sleeves told their own story: those bearing an unintelligible logo supposedly needed no introduction, long lists of equipment meant techno-rock, and endless notes explaining the intricacies of the music meant jazz.

Bill Bruford, previously drummer with ▶

► Yes, Genesis and King Crimson to name but a few, has a new band. Their name is Earthworks and the sleeve of their album – called simply *Earthworks* – is covered with intriguing sleeve notes documenting the music and its players.

“Yes, it’s jazz”, says Bruford with a smile. “I always thought sleeve notes were wonderful. I didn’t mind being told the tune was in 5/4 or that the bridge was modulated to another key, I was fascinated by it.”

Alongside Bruford, Earthworks consists of Django Bates on keyboards, trumpet and tenor horn, Iain Ballamy on assorted saxophones and Mick Hutton on double bass, a line-up Bruford describes as “a pretty fair English group”. The arrangement is Bruford’s introduction to the activities of a new breed of young British jazz musicians. Substitute Loose Tubes drummer Steve Arguelles for Bruford and you have the Iain Ballamy Quartet; alternatively, Bates and Arguelles are active as Human Chain. Bates and Ballamy are also regular Tubes members, and it was the musical empathy they share there that first brought them to Bruford’s attention.

“They have an arrangement that makes the pair of them greater than the sum of their parts”, he explains. “Mick, on the other hand, is the quiet guy of the group who, when all the talking’s stopped, is always right on the button.”

“I think they may have looked at me with some doubt to start with but, when you’re working with very good musicians, you don’t have to tell them too much. I just said: ‘I’m going to play this, you play what you like’.”

The Earthworks sleeve notes also denounce the elitist attitudes often associated with jazz, particularly since its recent resurgence in popularity on both sides of the Atlantic . . .

“Far be it from me to pronounce on the state of jazz, but I think things have changed a bit since the Tubes and their fraternity appeared. It used to be black, then it got whitish, as long as it was American, now it can be anything – white Norwegian, for example, like Jan Garbarek. We think it can be white and British. Earthworks has the spirit of jazz. At times it gets blurred of course, but you can sense that when the musicians don’t play the same thing twice, they’re playing jazz.”

“It does require dexterity though: you cannot just become a jazz player because it’s the flavor of the month. People say if musicians play well they’re showing off their technical dexterity. Well, it’s not just technical dexterity, but there is an element where you can use the dexterity of musicians creatively. You don’t get bogged down with all this ‘should the bass player play an F or an F# here?’ It’s performance music, and the performance will be different every night.”

“That’s the whole point: you get the rough with the smooth. Sometimes it’s not so good because the musicians are bored to tears, and other times it’s absolutely great. As somebody that’s spent some time playing shows where it’s note-for-note every night, I welcome that. It’s no bad reflection on Genesis but, for it to make sense to me, there should be a performance. I was talking to someone who did 232 dates with Dire Straits, which is very simple music anyway, and he said after 50 gigs he was just looking at his hands. Those people are suffering, they’re asleep on stage. Hopefully when Earthworks play, *nobody’s* asleep. The musicians may play wrong notes but they’re not asleep, I’ll tell you that.”

“It’s been fine so far except that we haven’t done quite as much work as I’d have liked. That’s partly because we’re under rock management and they don’t really know you exist without an LP. You might think people like me make LPs automatically, but I have to form a group like anyone else. I have to play in Japan, then in England so the management can see we can play and that we’re reasonable guys. Then you have to do a demo to get a record deal . . . Believe me, things don’t get any easier even when you’ve been around 20 years, but that’s OK, if the music’s good it’ll find a deal and if it’s not, it won’t.”

AND GOOD IT IS. Anyone who found Bruford’s liaison with Patrick Moraz just a little on the obscure side will welcome the honesty of *Earthworks*. There’s jazz in abundance, tempering the odd rock outburst, and only occasionally is the music guilty of the frivolousness that plagued jazz-rock in its heyday. But more than anything else, you can feel there’s something *going on* when Earthworks are playing.

“There’s a honeymoon period that all groups go through”, Bruford explains, with some enthusiasm. “It’s when the people on the stage don’t quite know what they’re doing, when they don’t know how it’s going to come out. It’s like a story book where you don’t really want to know the ending too soon. I’m talking about a spirit, it’s an attitude and all the people in Earthworks share that attitude.”

Unfortunately, no amount of enthusiasm will sell records. Bruford the recording artist falls uncomfortably between the categories of “old rocker”, “obscure jazz musician” and “technological innovator”. So who the hell is going to buy his records?

“You overhear these marketing conversations about which age group is going to buy what, and the reason they don’t allow musicians in on them is because they’re brutal. It has you guys out as idiots. We would like to treat you as adults, it’s commonsense. If I treat you as a grown-up, the music will have more meaning to you whether you know there’s a flattened fifth in the scale or not.”

“I was talking to someone who did 232 dates with Dire Straits, which is very simple music, and he said after 50 gigs he was just looking at his hands. Those people are suffering, they’re asleep on stage.”

Flattened fifths or no flattened fifths, a more major obstacle to Earthworks' marketability is the absence of a singer from the line-up.

"I'm a firm believer that it really isn't such a problem to listen to music without singing on it," says Bruford. "That has all been an artificial constriction of the record industry: it's either got a singer on it, in which case it's something, or else it hasn't and it's nothing. This whole New Age confusion, which is such a lamentable affair, has good sides and bad sides. Perhaps one of the good sides is that people now seem to be able to listen to music without singing.

"Traditionally the singer is the easiest person to listen to, next down is the alto saxophone, which is a beautiful instrument. We don't have a singer per se, but we do have a guy who sings on a sax. I think our stuff is friendly and exciting, I don't think it sounds as if there's some abstruse game going on that's designed to exclude the listener. There are no games going on that you can't understand, and I don't want to make the kind of music where there are.

"If you play music without a singer, the income to the group is that much smaller, which means that everything is that much tougher. No excuses, but you cannot have the rehearsal time and so on that you'd like. Now, that doesn't bother me because I'm sure the energy of a gig makes up for those things. For Christ's sake, this album was recorded in the time it took King Crimson to set up their gear. If you're interested in that kind of thing, you can hear the phone ring when the saxophone player is soloing and you can hear bass drum mics distorting, but that all comes with the music. Flaws always used to come with the music but these days standards are very high and, if it gets too scuzzy, people start to complain. If the John Coltrane Quartet recorded *A Love Supreme* and handed it in as a finished album now, it'd probably be slung out by the record company.

"I have always done my own marketing, in the sense that I would ask myself: 'Would I pay my own admission to an Earthworks concert and divert seven or eight bucks for their album?' Well, the answer is 'yes' in both cases, and I don't wish to be associated with any music where that wouldn't be the case."

AS WELL AS being recognized as a drummer of considerable talent, Bill Bruford has conducted a long-standing love affair with percussive electronics. Like many drummers, he tried the Simmons SDS5 when it was first introduced and, also like many drummers, he gave up on it.

"When I left electronic instruments in about '84, I'd been 'Crimsoned' to the eyeballs", he recalls. "I'd been struggling with stuff that was brutal to play, and I
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thought: 'to hell with this, I'll just get back to acoustics again and try to figure out what that's all about.'

"Two years later MIDI had come to drummers and things were getting much better. In the meantime my writing had stultified, I needed to write but I couldn't figure out on what instrument. The electronic set gave me something to write about.

"Now I feel like a musician first and a drummer second. I'm not sure I'm much of a drummer any more, I don't really know what I am, I suppose I'm a kind of electronics character. I do apply a percussive technique but I'm beginning to feel anyone in the band could probably do that. It doesn't matter to me that I'm a drummer; I've only a limited interest in five-stroke rolls. They're useful tools, but then so are a lot of other things. You can play your chords in five-stroke rolls and therein lies a new sound. What becomes of interest is the context in which it's used. I can play a synthesizer from a drum set entirely unlike a keyboard player would play it from the keyboard.

"A lot of what's happened to me recently has been influenced by Dave Simmons. He keeps producing these instruments that need playing. It's like having my instrument taken away and being given a new one. I respect Dave very much; I think he's a real jazz musician now, a real busker. He's causing all kinds of mayhem and confusion with instrumentation, which is the purpose of jazz, so I like that. I can't possibly not play his gear - it's too challenging. I got hooked on a rig of his which allowed a drummer to play chords and pitched notes. That particular device is all over this album . . .

"I have no general rules: what happens is I find a patch and a series of pitches or chords that sound good and I make a tune. That tune may end up as strong as the sax melody, which will then probably come as an obligato to it.

"Funnily enough, sometimes I think you miss the drum set. There am I drumming away like crazy and you're not hearing a drummer in the conventional sense, you're hearing some flutes or some scuzzy-sounding bent timpani. So you have the phenomenon of the drummer who doesn't sound like a drummer. I've had to re-voice things so occasionally a beat appears as well. That means I'm part-rigged for pitches and part-rigged for drum sounds. It's a bit of a maze."

On a purely technical level, Bruford's main current involves a Simmons SDS7/MTM rig. There are a total of 11 pads, one of which is stereo and four of which are routed directly to the SDS7 brain. The MTM takes care of the eight remaining channels, and allows a Yamaha DX21 synthesizer to be triggered from the drum pads. ▶





►“My chords and pitches come from the MTM pads, and the others are additional sounds. That creates a fair range – you could even argue too great because people like to have a reference for sounds. I’m really not sure about any of these things, but when the music works, it all seems the most logical thing in the world.”

Bruford claims the DX21 sounds “like junk” when played manually from a keyboard, yet comes into its own when fired off the pads.

“I got very lost with velocity-sensitivity”, he admits. “Firing it so the timbre will change with the strength of the stroke is essential to drumming. I think you need a second sense for figuring out what’s useful in sonic terms.”

“I can’t hear anything sounding good until I’ve played it with another person. I can understand when you’ve got some horrible frequencies present in a sound that make it unpleasant, but then I can find a use for all kinds of sounds. One of the nicest things is to provide rapid bursts of sound with ear-grabbing variation. If you’ve got 12 notes played very quickly, you try to select 12 different sources so the contour of the sound is exciting. My kit is set up to have unbelievable extremes of sound, so a rapid flurry produces the oddest combinations. At times I’ve felt it’s suicide, it’s absurd. Then, just when you’re about to give up, you get the most glorious spray of sound.”

“I must admit I haven’t found this easy work, but it makes sense for the future and it is terrifically exciting.”

“You know, I don’t know why we expect to be able to sort new technology and new techniques out so quickly. Maybe it’s the result of a marketing attitude: ‘Here’s your DX7, hey, plug it in and away you go’. You can do that, but there’s this other depth in

editing which very few people seem to be interested in at all. And on top of that, there are even more confines in that the record industry will only accept certain parameters of sound.

“Something that irritates me is the attitude ‘Oh, you play electronic drums, they’re machines aren’t they?’ There’s a sense of pressing a button and the damn thing starts. Well, I’m here to tell you it’s done by flesh and blood. You have to strike the thing to make it sound and the harder you strike it the more the sound changes, and that’s important. It’s funny that you can say ‘electronic drums’ and that means a drum machine, but if you say ‘electronic percussion,’ that’s OK.”

BUT, ACCORDING TO Bruford, it’s not only the attitudes of outsiders that are making the would-be electronic drummer’s life a misery.

“Watching some acoustic players moving towards electronics is painful. I was an acoustic player and I moved slowly, but I’ve got there. Keyboard players would insist on trying to play piano on a synthesizer. I never understood why, because it’s a completely different instrument. And there are drummers struggling to make an electronic drum set sound like an acoustic set, and it doesn’t and it never will. Instead of wasting all that effort, they should start doing something interesting with it. I look out there and it’s not nice for drummers right now, but they’ve only got themselves to blame.”

Enough, though, of where technology may or may not be taking drummers in the future. Let’s get back to this drummer in particular. Where will new technology take Bill Bruford next?

“The Simmons SDX, I think, is going to be a beast of an instrument. It’s not fully fired up yet, but I’d like to take one of those onboard in summer. Then I’ll probably have to disappear for another three or four months while I get it figured out.”

“After that I think my next direction will be sampling. I know drummers are late on this: keyboard players, as usual, are way down the line from us. I imagine producing sampled sounds and playing them will be ultimately wonderful. Playing DX pitches and chords is purely an interim phase, although this album is so dependent upon them that I couldn’t really play it on any other instrument; ‘Bridge of Inhibition’ cannot be played on any other drum set. If I progress to the SDX, I will have to keep this whole rig just to play that one song, so you can get caught in a technological time warp.”

“Eventually, I would like to play a drum set where the drummer’s skill is judged as much by his use of timbre as his five-stroke roll. I think somewhere there’s an ability to have the five-stroke roll and improvising sense plus, say, knowledge of sampling.” ■

“Traditionally the singer is the easiest person to listen to, next down is the alto saxophone, which is a beautiful instrument. We don’t have a singer, but we do have a guy who sings on a sax.”

READER TAPES

Reviewed by Yung Dragen.

"DON'T BITCH - THINGS can get worse" is a good modern-day translation of one of the main tenets of Karma. Last month I made a good deal of noise (two paragraphs worth) about such minor physical problems as shin splints and pulled muscles. Shortly thereafter, I broke one of the myriad of bones that make up a healthy human foot. Namely, a left one. No complaining this time - let's just say that I'm not dancing these days. So, this month we concentrate on more mental material - science fiction, revolution, and dirge rock.

I'm proud of the fact that I always start these reviews off on a high note - namely, I really dig the first tape. Taking honors this month is *Reactivation* by **Human Folly**. Human Folly is comprised of Alan Porzio on synths, computers, tapes, and vocals; Tim Fluharty on all of the above minus vocals; Max Urban on guitars; and Christopher Hoard on tapes and keyboards (Alan and Tim also did the production). Imagine something along the lines of '70s European progressive rock (Camel, etc.) with tapes as opposed to vocals on all but one song, "Tranquility" (nicely handled by Alan if not especially remarkable). Imagine a science fiction storyline about something called a "reactivation processor" (song titles like 'Reactivation Procedure', 'The Boys in the Machine', and 'Technoverload' give you the idea). And imagine it all done with slightly more modern sounds and edge (as opposed to psychedelia). All qualities I enjoy. They even went through the trouble of adding background dialog, noises, and bridging sound effects - in stereo, at that!

Not for dancing or headbanging, but a wonderful concept piece for headphone listening at night. Most important to us home studio warriors is that this very competent effort sounds like it was done without any seriously esoteric equipment - just fairly straightforward synths, drum machine, guitar, tapes, processing, and (uh-oh, this one's hard) imagination. Sounds refreshing instead of derivative. Or let me put it another way - I have never enjoyed any independently released tape this much on first listening. Even the color xerox cover was great. Our editor was of like mind - he almost didn't give me our one copy...

On to *Tomorrow's Rein* by **Amongst**. Conspirators here include Tommy King on bass, guitar, synths, and drum programs and Jeff Wilkins on guitar, synths, tapes, and (also) drum programs. Knowing the local group of musicians and bands that Amongst is from, I was expecting something a bit more wall-of-noise and dirge-like. What I got hit with instead was cheap rhythm box (replaced by heavy, processed effects on a couple of pieces), a bassline (sequenced, synth, or the real wood thing chorused), echoed monophonic synths on top, and overdubs of various types in a rather minimal brew.

On first listening (at night), I didn't like it. On second listening (during daylight) I lightened up a bit, and realized that the material was also lighter than I expected -
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there's even a "happy" tune ('Growth an Awareness').

I really did dig the dirge piece 'Free Speech' (complete with indecipherably processed voice tapes), and many of the other pieces wore better the second time around.

There were, however, a few regrettable pieces. 'Back Side' is corny - it may be cute live, but please don't waste my time being cute on a tape. And 'Back Beat' is just a boring drum program with the same (albeit interesting) sounds throughout.

And now for *The Collapse of the Empire and Other Erotic Fantasies* by **The Peace Mob**. The cover is a series of three black and white xeroxes with yellow marker and the caption "A Titan 34D explodes just seconds after its launch destroying a payload valued in the hundreds of millions of dollars".

Want more? A statement inside says that "The Peace Mob is us, is you, is whatever you say it is. If you think that war is a crummy idea, the Peace Mob may be for you. The Peace Mob is for all types, even animals. Especially animals!"

Even more? How about song titles like 'How Blue was your Zeitgeist when Iced You?', '10-Point Plan for International Anarchy', and 'America Can't Come?'

A little bit more? How about the "musicians" themselves? Greg Fain, "Poetmaster", raging against all sorts of governmental and societal evils in an animated cross between a smirk and passion (occasionally through echoes with a madman on the delay knob); Mike White, "Axemasteroid", on scabrous guitar through a slightly overdriven amp with occasional echoes, fuzzes, and phase shifters; and Robert Cult, "recording engineer" and aforementioned madman, mixing all this together without much taste for variation and not bringing White's guitar up in level until the second side.

Now, I happen to agree with about 90% of this band's opinions, but an hour of this minimalism and Fain's overly forced and cynical delivery made me shake my head and hit "stop". I felt no desire to get up and shake my fist along with him. Listening to a poet's political essays over guitar can work - dig Billy Bragg - but it doesn't here. I would be curious to hear what Mike can do on guitar without being buried behind distant miking and these distractions up front, but instead I can't really make a comment on his playing one way or another.

Next month, some rock 'n' roll - I promise. Until then, the backlog's almost gone - send in those tapes!

Contact addresses: **Human Folly** c/o Earmark Productions, Alan Porzio, 4269 Moore St., Los Angeles, CA 90066.

Amongst c/o Rarefaction, PO Box 390331, Mountain View, CA 94039.

Peace Mob c/o Crabmeat Recording and Publishing Company, 1035 Revere Ave., San Francisco, CA 94124.

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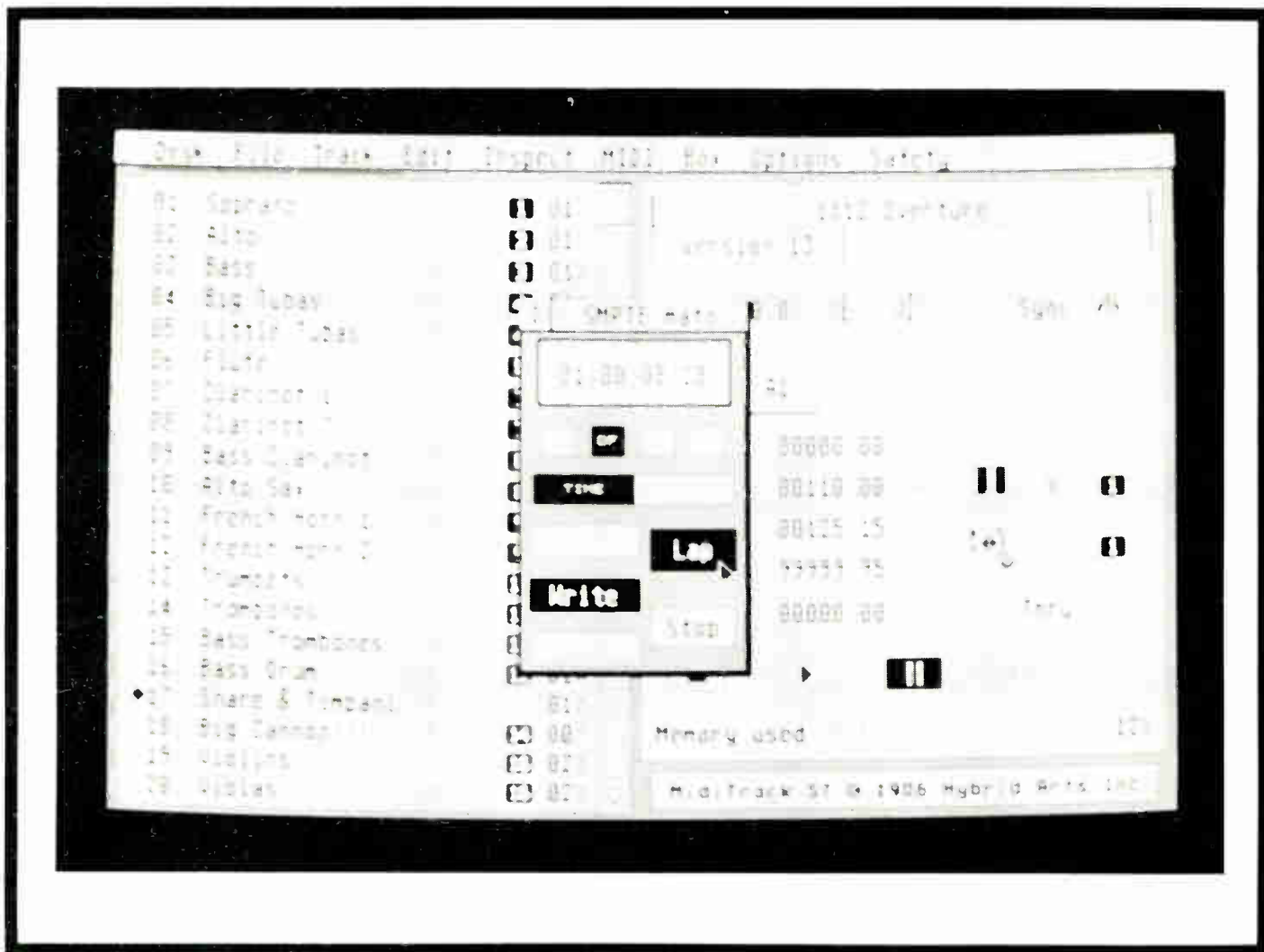
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Hybrid Arts' MIDITrack ST



Until recently, the selection of sequencer programs for the Atari ST has been quite limited compared with the number available for the Mac. Now Hybrid Arts has released a pair of ST-based sequencers which not only boast impressive editing features, but also support a variety of synchronization systems.

Review by Chris Many.

THE ATARI ST has been finding its way into more and more musicians' studios and homes lately. It's hard to pass up a computer that offers the features of the ST plus MIDI compatibility for less than \$1000, and the 520s have been selling for under \$500.

Consequently, when Hybrid Arts began developing their flagship sequencer for the ST

more than a year ago, people began looking at spending a lot less for a high-powered music sequencing system than they previously had. Comparable 68000-based computers, the Macintosh or Amiga, both cost hundreds more than the ST, plus they required you to buy an extra MIDI interface. Tack on the cost of a good sequencer program and we're talking an easy \$2000.

Unfortunately, it's been a long wait for Hybrid Arts' entry to arrive, but it's finally here. I know it's a cliché to say it's been worth the wait, but phrases become clichés because they state the truth eloquently. And the truth is, it *has* been worth it.

Format

MIDITRACK ST (MTST) is a 60-track sequencer, coming in two versions: SMPTETrack ST and SyncTrack ST. They are identical programs, the only difference being the synchronizing capability. With each package you get a hardware extension called the SyncBox (Beta versions of this product were dubbed the STync Box, but that didn't go over too big with the marketing folks at Hybrid).

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which handles all the sync pulse output (more on that later) and functions as a key lock for the MTST. In other words, the disks themselves are not copy protected, so you can make backups to your heart's content, but the program won't function unless it's hooked up to the SyncBox (either SMPTE or Sync, depending on your version of the program). Since it connects to one of the joystick ports and the RS232 port, you just leave it hooked up; a nice solution to piracy that doesn't penalize legitimate users.

When you boot the program up you're presented with a split screen; the left half is the track display, the right the control display. Across the top of the screen are headings for the main functions, which are accessed with the mouse or, in most cases, through direct keyboard input. You can see 20 tracks at any given time. To view or use further tracks you scroll down the screen, or use the scroll bar to move more than one track at a time. It's a very neat layout, and not too cluttered.

The program allows you to be up and running very quickly. Recording is simply a matter of pressing the space bar (or clicking on the play "button" with the mouse) to start the sequencer, playing some music into it, and then clicking the keep button in the control display when you've finished. Your music will be stored on whichever track you had selected. You don't have to decide which track you want to store it on first, though; you can play, stop the recorder, choose your track and then store it. To listen back, simply press the play button, or the space bar.

Overdub works exactly the same way - just place your overdubbed parts on different tracks. As you can see, the layout of MTST is analogous to that of a multitrack tape recorder, and thus seems to favor the linear method of sequencing. It is not limited to that type of operation, though, because it can also use a very flexible pattern method à la drum machines.

Each track can be named, assigned a MIDI channel, and protected from accidental erasure. The current state of every track is always on display, and you can easily see whether or not you've made changes since the last time you saved your work, when something is occurring on any given track, and how much memory a particular track takes up.

Operation *"The majority of commands are duplicated on the ST keyboard, so if you find it faster to work with single or double strike commands than with the mouse, it's just as easy to do."*

Tracks can be muted or unmuted by clicking the arrow indicators next to the tracks on or off, and solo'd in a similar fashion.

MIDI channel assignments are changed in the same way: go over to the MIDI channel indicator with the mouse and click the button to either raise or lower the channel number. (Keep in mind that the majority of commands are duplicated on the ST keyboard, so if you find it faster to work with single or double strike commands than with the mouse, or simply prefer it that way, it's just as easy to do. I find myself using a combination of both

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keyboard and mouse, but it's whatever feels comfortable to you.)

MTST is a very visual system, making it easy to keep tabs on just how you are laying out the structure of your work.

At the control panel, familiar tape recorder buttons are used to start, stop or pause the sequencer's operation. There is no record button, per se, as everything played is automatically stored in a buffer; if you want to save it, you do so as described above. If not, just start the sequencer again and record the

In Use *"It can get pretty involved, but the fact that you can run different loops concurrently with real-time recorded tracks makes MTST the most flexible sequencer I have ever worked with."*

part over until you're satisfied with it. In addition to a counter that keeps track of where you are (beat-wise), there are four additional counters which are used for punch-in/out and cueing up to a location in the track. This last function is what negates the need for a rewind button; you can instantaneously locate to any point in your music. By setting the location in beats and accessing the autolocate function (again by direct clicks of the mouse), you cue up to this point immediately. Whether it's 20 beats in or 2000, you are located to that point as if it were a start point. This makes linear-type sequencing as quick as if not faster than pattern layout, because you can keep moving your start points down the track as you build up your music.

The punch-in/out feature works the same as with most sequencers; you set your punch-in and punch-out points, point to the track you want affected, and play. Save the result to another track, or the same one if you want. MTST automatically places the appropriate note-off command at your punch points, so you won't get the dreaded MIDI drone notes hanging over if you punch in during the middle of a note, or if a legato passage really has no open spaces to punch into.

You can also enter your punch-in and punch-out points on the fly. This convenient feature allows you to avoid the meticulous searching for the exact start or end points that makes sequencer punching such a pain. If you do want to get an exact punch point, though,

you can step through a 96-clock resolution for each beat and find the precise moment when the MIDI datastream starts or ends.

Features

GLOBAL TRANSPOSITION, TEMPO, MIDI Thru channel selection, sync type selection (Internal, MIDI or Sync Box/SMPTE), metronome, patch changes and an overall memory usage bar are also accessed on the control display. In addition, there is memory set aside to store 27 register settings. These

will recall which tracks are turned on, the tempo and start/stop times (for autolocating). This is very handy while you're building up your tracks, as you can preset your locate points, or do an A/B comparison between two or more performances with an easy click of the register.

Section definition commands are also accessed at the control display. These parameters allow you to define your patterns if you want to use the drum machine method of sequencing. For example, let's say you want

to segment a part of a track that is currently 50 beats long, but you only want to make a pattern out of beats 8-24. Click on the section icon, select the start point (8), the end point (24), and point to the track affected. Voilà, beats 8-24 are now defined as section (or pattern) 1.

You have the ability to define 100 sections in this way, and you can create sections from as many tracks as you like. So if you want one section to comprise five tracks that include drums, bass, keyboards, horns and lead, it's done exactly the same way. You can also define multiple sections using the same tracks. In other words, any tracks can be combined, segmented or redefined in any way you want for as many times (well, 100 anyway) as you like. Sections can now be linked together by using the Assemble chain command.

This makes for a very flexible sequencing package: you can record and play back either as a pattern-type sequencer, or a linear recorder, or both at the same time. That's right - you can have a drum loop or an entire song laid out as a series of chained sections, and also overdub parts as you normally would on a multitrack recorder, without any attention paid to patterns.

The remaining functions are all easily accessed from the drop-down menus at the top of the screen. Normal sequencer features such as copy or mixing of tracks have become pretty much standard, but a helpful feature included here is the ability to unmix previously combined tracks. Providing that the mixed tracks had different MIDI channel assignments, you can separate them out again to the track(s) of your choice.

Quantizing tracks is done after the fact, and the results are saved to either the same track or to a different one (so that you can preserve your original performance). You can quantize to the nine values already provided (half-notes to 32nd-triplets), or use any value you wish. The duration of the notes can be set the same way, which is useful for those short sequenced passages.

You can adjust the velocity of the notes in several ways: shift the velocity values by a constant amount to make the entire track louder or softer; scale the track to expand or compress the velocity range; or set all the notes to the same velocity level.

Chain assembly is accessed from these ▶

▶ menus, as is section review. When you link patterns together, a different screen replaces the normal MTST display. Four columns of two pieces of information are provided, the first being the time the pattern you want played starts playing, the second being the number of the section. The fact that you can see 40 patterns laid out at once, plus the beat at which each pattern starts, makes song assembly a snap. If you need more than 40 link points, there are nine more pages available (for a total of 400 link points) so just scroll down to the next one.

MIDI

THERE ARE ALSO MIDI options which include input filters (so you can selectively record aftertouch or controller changes), a screen which lets you transmit a variety of MIDI messages (all notes off, tune request, and so on), MIDI output choices (song position pointers, echo MIDI events and the like) and patch limits (so that you can set MTST to accommodate your synth's patch format).

There is also an extremely handy command which lets you offset every track individually up to 96 clocks either early or late. This lets you adjust in detail the sync of tracks internally and with each other, so if your kick on track 5

song, you don't have to start your tape and sequencer rolling from the top. Or if you are writing music for film/video, you can have your music sync up directly to picture while you compose without additional synchronizers. Just take the SMPTE output which would have been previously recorded on your video (normally on track 2, or control track if your VTR has one accessible) and connect it to the input of the Syncbox. Set your offset point, cue MTST to SMPTE lock, and you're synchronized to video. Now you can see immediately if your music is going to hit right, and touch it up if it doesn't. And even if you are not working with video, SMPTE is the most stable sync pulse you're going to find in this day and age.

I will mention that other synchronizing pulses and methods are also available; Type O and R FSK, 24, 48 and 96 ppqn TTL, DIN gated TTL, a special sync tone called Hybrisync, and click. But if at all possible, just get the SMPTE version, as you'll never want to go back to using any other kind of sync.

Once you've assembled your song, you are asked to save this information to a track of your choice. The reason for this is that you can have more than one chain functioning at once. Put your drum loops together in one chain, your bass/keyboards or whatever on another,

note and you liked the natural flow of the music. Or you just didn't want to bother finding your in/out points. With the editing screen, you have complete control over all aspects of your performance, so you can go into that track, quickly locate that one note, lower its velocity by 20 or 30, and have it repaired within seconds.

The editing screen is neatly laid out, showing the time the event occurs, the hex information of that particular note or MIDI event, a representation of the note (which you can actually play from the editor by clicking it; very helpful in finding which note you're looking for), the actual note itself (A5, C3 and so on - a much easier form for musicians to understand than a MIDI note number), which MIDI channel the event is assigned to, and what the event is (eg. note-on/off, control change, and so forth).

You can change pretty much anything you want at this level: insert or delete events, extend notes, add sustain pedal activity where none exists, change timings...you name it, you can edit it. You can even get your tracks hocketing if you want to take the time to do it (assign every other note or event to a different MIDI channel and have the different channels playing different instruments - a solo line is something to hear when the timbre changes every note).

In short, then, MTST gives you control over every facet of your music. That's no mean feat in itself, but to implement it in such a way that it is easily achieved, and make it almost intuitive, is a major programming accomplishment.

Verdict *"The fact that you can do both kinds of sequencing (pattern and linear) in one package is great; that you can do them both simultaneously is simply incredible."*

seems to be a little ahead of the bass on track 4, you can lay it back slightly until you achieve the elusive "feel" that's so important when it comes to rhythm tracks. You see the relationship of all 60 tracks on one screen, so it's easy to figure out which needs to be adjusted forward or delayed.

There are safety features (which you can leave on or turn off) which alert you before making certain actions, like deleting or replacing tracks. You can also make the program create backup files automatically.

And to top it all off, this sequencer locks directly to SMPTE. A desk accessory, SMPTEmate, enables you to read and write SMPTE in any of the four accepted standards (30, 25 or 24 frames per second or Drop Frame). You can also dub timecode, so instead of just re-recording timecode from your video copy over to your 24-track (or 16-track) master, you can regenerate fresh code. Not only this, but user bits are also made available for you to add various forms of identification (eg. date, numbering reels or takes, and so on) along with the normal timecode that is generated.

To lock up to SMPTE, just set MTST to synchronize to it. You can select your start point to any time you want, then as soon as the timecode reaches that point, your sequencer starts. But one of the best points is that it is no longer necessary to start at the beginning of the tape to record your music. Because you're locked up to SMPTE, your music will follow timecode to where it belongs.

So if you want to punch in at the end of your

or add just a chain of tom fills. If you forget which tracks are assigned to which sections, use the section review function, which tells you the current state of all of your sections.

It can get pretty involved, if that's the way you like to do things, but the fact that you can run different loops concurrently with real-time recorded tracks makes MTST the most flexible sequencer I have ever worked with, bar none.

Tempo changes can be programmed in a similar fashion. A separate screen comes up and you enter the time you want the change to occur and the new tempo, and at that time the tempo changes. It would have been nice to see an easy method to accelerate or ritard the tempo (like a scale function from one point to another) rather than having to enter in each minute change for every beat, but still, this does give you complete control over any tempo changes you care to make.

A Glue feature lets you cut and paste portions of any track anywhere you want. Simply pick your start and end points, select the track to be cut, select the track and time you want the section pasted to, and it's there. So if you don't want to autolocate to that point and play some section of music over, just drop it in this way.

Events

AND THEN WE get to the micro-editing screen, which gets you down to the event and byte level of your music. One note out of 20 bars of music was played too loudly? You could punch in and out to repair this one note, but let's say the sustain pedal was on during the

Conclusions

EVERYONE DEVELOPS THEIR own sequencer of choice, and after working with SMPTEmate for some months, putting it through some very demanding and grueling projects, I have made this sequencer the center of my own music production setup. It is easy to use and learn, and packs so many features in that it becomes a standard to which other systems are compared.

That you can do both kinds of sequencing (pattern and linear) in one package is great; that you can do them both *simultaneously* is incredible. The fact that the package includes its own SMPTE reader/writer is an excellent value in itself, that it also synchronizes to SMPTE makes it one of the first of its kind.

In summary, then, MIDITrack ST is state-of-the-art sequencing at its best. The fact that anyone can get themselves a complete SMPTE-based sequencer like this one for less than \$1200 *including* the entire computer package, with *no* hidden expenses, makes this the best value on the market in my opinion.

Seriously, this amount of power in the hands of musicians is what computer-based music has been heading towards for years. It's finally arrived. ■

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RICHARD HOROWITZ & SUSSAN DEIHIM

Both Richard Horowitz and Sussan Deihim have associated with some of the greats of music and dance. Their latest work, *Desert Equations: Azax/Attru*, brings their unique electronic and vocal textures to vinyl. *Interview by Rick Davies.*

MUSIC AND DANCE have always gone hand in hand, and live performance has always been the most natural way to bring the two elements together. But take away either element, and one is left with only a suggestion of what is missing. So, perhaps the reason why Richard Horowitz' and Sussan Deihim's recordings are so satisfying is because of the extent of her contribution to the music – take away the visual element, and she's still there in the mix.

Now, I have to admit that I've never seen one of their performances, but after hearing their most recent album, *Desert Equations: Azax/Attru*, I'm not likely to miss the next opportunity to see them. The import LP exhibits some of the most intriguing other-worldly production it has been this pair of ears' pleasure to take in, and Richard's subtle keyboard textures and Sussan's distinctive vocals make this record like nothing you're likely to have heard before, let alone hear again. For the two appear to be preparing for their next project

already, and they certainly don't seem to be sticking to a formula in their compositions. Mind you, that's not at all surprising, considering their backgrounds in improvisational performance art.

During the '70s, Richard played keyboards with Alan Sylvas' Celestial Communications with Anthony Braxton, and upon his return to the United States in 1980, joined forces with Jon Hassell, AJ Dean, and Michael Brook. Sussan, on the other hand, worked with Maurice B'ejart in Paris and Lindsay Kemp in London, before New York's La Mama theater provided her with the type of support she needed.

Richard and Sussan finally joined forces on the track 'Queen of Saba' on Richard's *Eros in Arabia* when they discovered common ground. Richard had spent five years in Morocco studying the ney, or oblique flute, which works on a tuning system common to Arabic, Persian, and Turkish music; Sussan was from Teheran (where she was a member of the Pars National Ballet), and quite at home with

the genres that Richard had been integrating into his own music for many years. Performances around the east and west coasts then ensued.

As they were preparing for a new set of performances, Richard and Sussan explained how they go about making their own unique brand of music, and about the coincidences which pique their curiosities. Take, for example, the title of the new album, which Richard seems to have assembled from various sources . . .

"'Azax' comes from this night when we weren't getting along very well, and I was staying in a friend's loft. I was looking through some books, and there was one sculpture called 'Azax Axis Milo', which uses the same ratios that I've been dealing with. It was also used in *Metropolis*, the Fritz Lang film. There is this statue that everybody bows down to. I was reading about this, and reading about this article which had derivations of this particular ratio and the ways it is used – the same ratios that are part of Arabic music, part of ▶

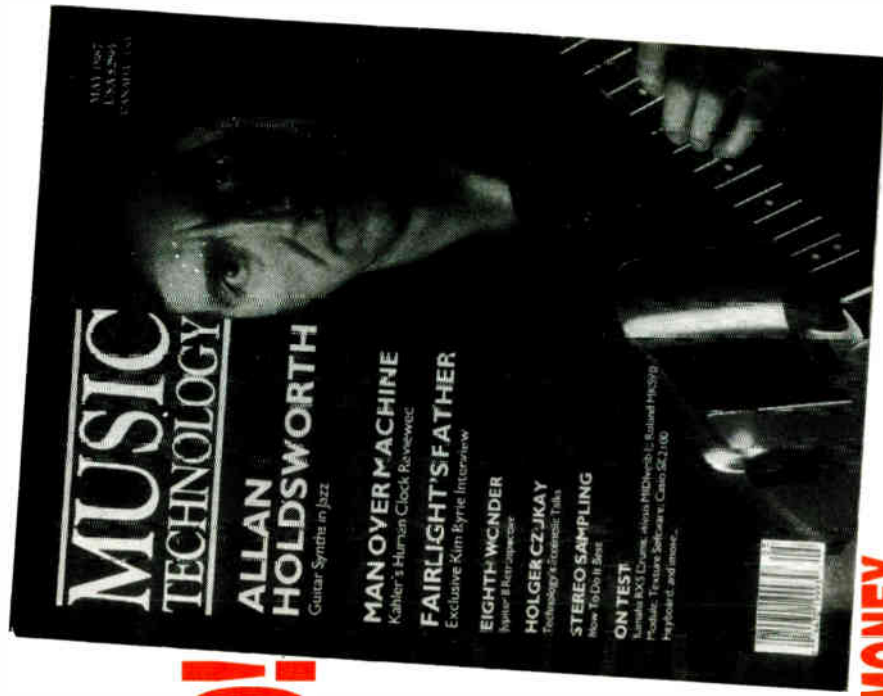
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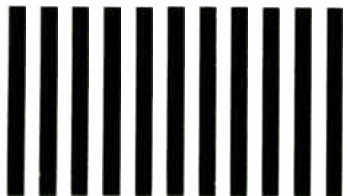
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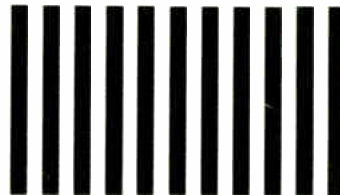
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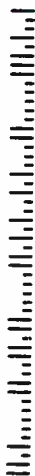
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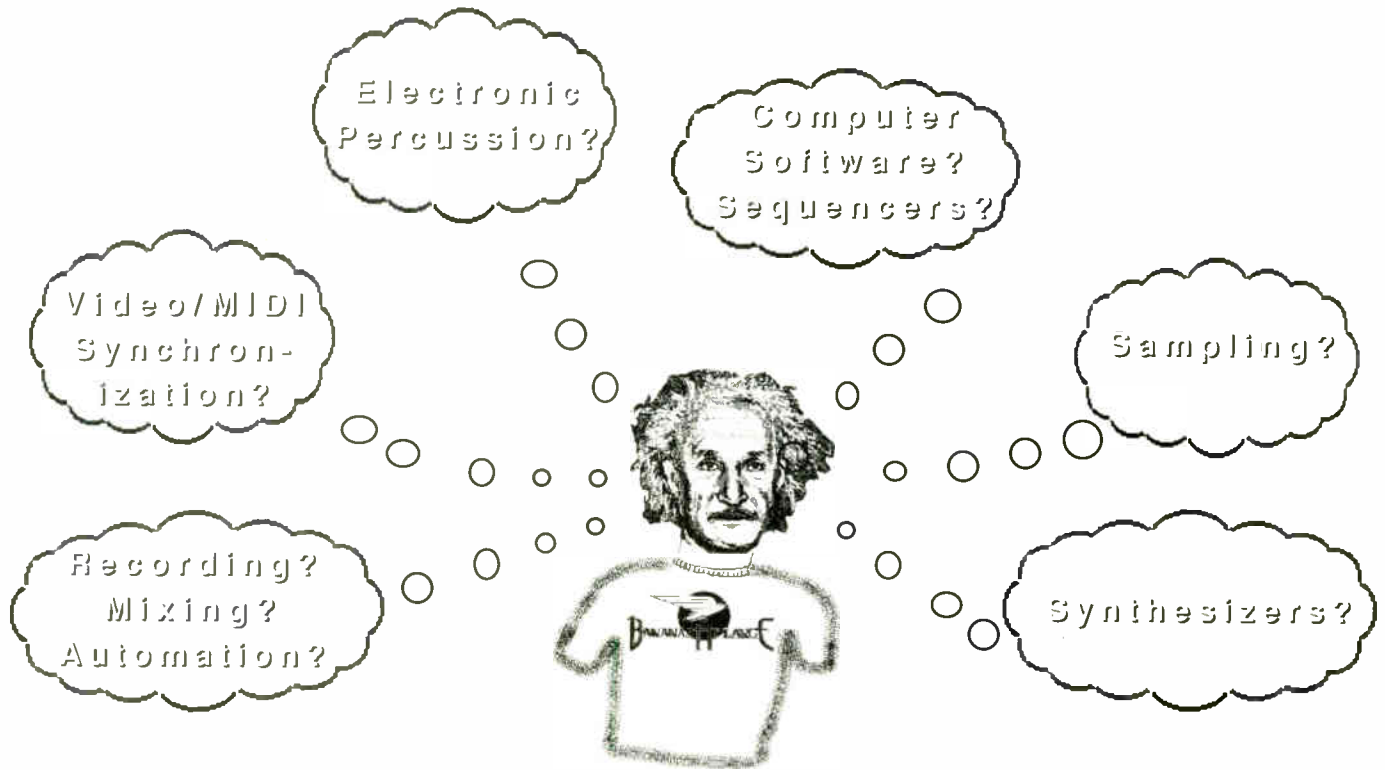
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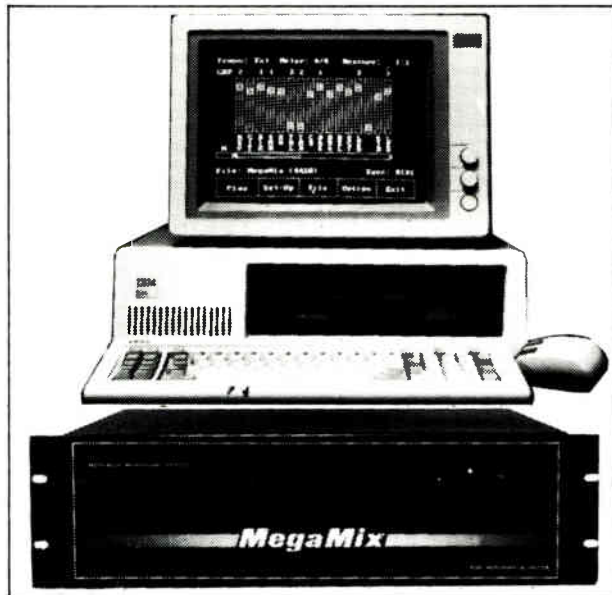
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► Egyptian music.

"It's a very popular subject right now. This whole thing about equal temperament; it's a very confusing term. First of all, they destroyed the gothic cathedral, and created equal temperament, and the next thing you know there were skyscrapers. That's why people in the west all have bad tempers." Richard laughs, but leaves the impression that there's a hint of seriousness behind this. "People think that if you have equal temperament you're going to have a good temper. But that's not true, because equal temperament makes people unhappy.

"It's like a reflection of the destruction of that whole cosmology; it's not just equal temperament - it's that whole world of all of those subtleties between all those notes and all those pure architectural spaces. The whole thing is pretty serious.

"This statue of 'Azax Axis Milo' happened to be part of that same field, and also had to do with *Metropolis*. I photocopied the page, showed it to Sussan the next day at rehearsal, and she said 'Gee, I just went to see *Metropolis* last night!' So I said, 'OK, that's a good coincidence'. I like to work with coincidences a lot.

"The 'Attr'a' part comes from the attraction quotients", says Richard, referring to the dozen or so odd equations included in the Horowitz/Deihim press pack. "The attraction quotients are just this funny thing. Some people look at them and try to understand, and then some people just get it and they start to snicker . . ."

Well, what would you make of this:

$$\text{seduce} = \frac{\text{elude}}{\text{deduce}}$$

$$\text{deluge} = \frac{\text{delux}}{\text{delude}}$$

or,

$$\text{seduce} \times \text{deluge} = \frac{\text{debutante}}{\text{debauche}}$$

$$\text{seduce} \times \text{debutante} = \frac{\text{debauche}}{\text{deluge}}$$

Snicker . . . "It all equals one, actually."

It seems that Richard and Sussan's 'Azax' episode was another in a series of interesting coincidences. Richard explains that at one point he went through his "oblique" period, which started with his playing the ney . . .

"The oblique flute, yes. There is one record I did called *Oblique Sequences*. Paris has this magazine called 'Oblique', and there is also a theater called the Oblique Theatre, and they publish this sort of performance art. I was really into this term 'oblique' for the whole time I was in Europe in the early '70s. Then when I met Hassell, he said 'I'm going to do a record with Brian Eno'. I didn't even know who Eno was, but of course it was he that put out *Oblique Strategies* . . ."

'Never Tech No Foreign Answer' was Richard's first composition following his return to the States in 1979. Both Richard and Sussan spent time working in Europe,

and oddly enough, now that they are based in the US, they are finding that Europe is expressing the most interest in what they're doing. In fact, *Desert Equations* is currently available as an import only, through Rough Trade, Important Records, and New Music Distribution.

The duo are now preparing for a series of concerts around Europe; it seems that alternative artists are still up against a good deal of hesitance in the USA, even in performance spaces which usually accommodate "avant-garde" performers.

"They tell us they are interested in 'more established' performers like Philip Glass, or Philip Glass, or Philip Glass...the fathers," says Sussan. "We're like the rotten kids."

Well, let's hope that changes, because "established" or not, this pairing's music definitely deserves attention, and *Desert Equations* even has some elements of "accessible" music that many a western ear can recognize. Richard and Sussan both laugh at the idea of this being their commercial album.

"We didn't feel we had to make any compromises, but we *did* use a snare drum. This is the first snare drum that I've used in

when it comes to deciding on which tracks to put on an album.

"I personally like what is on the record as much as the totally atonal, harsh music. I don't know why a record can't have ten kinds of different things on it; something that surprises you ten times. I don't know if that's a style, or a commercial rule for a record for people who don't like to be shocked in general, and that those who want to get shocked are a small number."

The pair's next recording project is most likely going to be a solo vocal album, and based on the calibre of the music on *Desert Equations*, one can rest assured that this will certainly be like no other a capella music you've ever heard before. This is obviously something that Sussan is looking forward to, and apparently, she's getting her sampling chops together for this next endeavor.

"We're working on that now - using the computer and the Akai S900 to get some ideas. I'm so happy because usually, since I am a singer, I don't really get into electronics. I just get into 'What is this? What does it do? I like this program.' That's my knowledge of gadgets. I just program



years! I don't know if you want to call that a compromise, or . . ."

"State of Art communication", Sussan interjects.

"It was fun." Richard sounds as though this was almost experimental for them. "What happened was: 'Gee. An SP12. Look at this! Phil Collins snare drum sounds! Boy, these sound great!" They obviously enjoyed making this one.

Of course, this record is not exactly typical of everything the duo has recorded lately, and a tape of some pieces they're saving for later reveals that they really *have* shown more restraint than they might let on to. In fact, they claim 30-40% of their work is much more abrasive than the pieces on *Desert Equations*. Yet Sussan does not feel this is something which is necessary

things that help the voice, but I don't use the computer. I've just started, really."

One might get the impression that she has already been using samples to produce the repeating rhythmic vocal lines on *Desert Equations*, but in fact, all of the vocal parts on tunes like 'Azax/Attr'a' are multitracked, not sampled - the result of stunning vocal techniques, as Sussan is adamant about making clear.

"This is not sequenced! This is not sampled! There is only one song, and there are only three times you hear a sampler on that one song. That's it! It's my life being spent on techniques! Also, nothing is processed so that the quality of the voice changes, except for some harmonizer effects."

Richard adds: "We had an Emulator ►

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► available to us, but an Emulator is not good enough to sample her voice, especially in the high end. It just wasn't good enough."

In fact, there are a lot of sounds on the record which are very hard to identify. Sampled percussion and the real thing are often combined, and it can be difficult to tell which is which – thanks to some creative processing, as Richard explains.

MUSIC "My favorite sound is one of Steve Sheehan's on the first piece called 'Ishtar', where he places Balinese gongs flat on the floor, and plays them so that you just hear the overtones. My favorite trick for processing percussion is with the Lexicon 224X's overtone-splitting program with no delays. I've been using the overtone splitter for a while, especially on the ney, which is very breathy with circular breathing. You can get into this thing where you can 'tune' the breath, so there's a 'shadow' around the flute. A lot of our work uses just the 224X with no delays."

... Indeed, the album is often dry in the reverb department, yet certainly doesn't suffer from a lack of ambience.

Many of the unusual textures on *Desert Equations* are the result of bringing together independent musical elements in the recording studio, and as Mr. Horowitz explains, this sometimes turns out to be part of the composing process as well.

"Each piece is different. There's no set rule to 'do this, then do this, then this ...' There's one piece called 'Jum Jum'; that piece was an Electro Harmonix 16-second delay loop of these *furious* drums and flutes in this rhythmic pattern that was in 40/8. Then, Sussan had this vocal piece that was done a year before, and that was in the same tempo. We put both of those pieces together through the 224X – it was just after the 224X came out – and split all the overtones. We didn't slow it down or anything, but it ended up sounding like this *drone*. There are all these formant qualities in the drone that just sound very unusual. We never know what we're going to come up with – although now, with the Macintosh it's getting a bit more formalized."

It seems, also, that there are also no hard and fast rules when it comes to Sussan's vocal pieces. Sometimes she develops ideas in the duo's eight-track "ideas" studio, and other times she develops her music from loops created on the Electro Harmonix delay.

"Some really nice pieces came out of that", she says. "There was a point when I had to work by myself; I was tired of doing just one vocal, then listening to it, then doing another. Then I started doing these delay loops, and four or five pieces came out of it."

Sometimes her loops are used merely as starting points, and other times, they actually appear on the final cuts.

"Sometimes it works out that you can actually re-record it. Sometimes, you never get the same thing. If it's too hissy, you've lost the piece."

Unlike so many other keyboardists,

Richard's interest in synthesizers didn't come from his desire to build on his keyboard techniques, but from his search for a way to extend the sonic abilities of his flutes. This may explain why *Desert Equations* does not sound keyboard-heavy, despite the numerous synths and samplers listed on the album cover notes.

"There are no piano-like sounds on the record, nor solos. I'm not particularly technically-inclined. I had done a little work with synthesizers when I was in Paris, but not much. So then I came back to the States, and Frank Serafine said 'Hey, I'm getting a Prophet 5 – you should check this out! It's really good, and you can tune it, too.' Except that the tunings weren't all that stable. I got one of those, and that's where I started."

For five years in Morocco, Richard studied ney, and now he is able to apply what he learned about Middle Eastern music to his own music. "The ney is the key to the Arabic, Turkish and Persian systems", says Richard as we sit in rush-hour traffic on the Bay Bridge heading for Oakland. "For a ney in C (there is one ney for every note in the scale), called the Duca, there is no note for E flat or E natural, there is only E half-flat and B half-flat, so the minute you can at least make a sound on the ney, you start hearing these half-flats because you *have to* when you lift your fingers up."

It becomes apparent that these overtones have naturally led Richard to applying the 224X's overtone splitting program to all sorts of instruments.

Yet although the ney also appears to be the key to Richard's involvement with technology, he is quick to point out that he is not interested in technology for technology's sake, and that his involvement with Middle Eastern tunings does not come from an intellectual curiosity. He first heard the ney in Paris when he was 19.

"I never thought it sounded warped or out of tune. 'Warped' is a funny word; it comes from Viking term 'wharpen' from

weaving terminology. Arabs say that the loom has a soul, that it breathes. So, maybe the sound of a warp is the sound of a soul modulating from one space-time dimension to another ... Does that sound too much like Shirley MacLaine?"

"This whole tuning thing is not an intellectual thing for me. I don't like the idea of thinking about it first; it was very much a matter of hearing the thing first, and really *feeling* it. There are hundreds of tuning systems out there these days, and with the new DX7 you can get very precise. With Jon Hassell, I learned about the Scalatron, which picks out *thousands* of overtones that you can tune to. It's made by Motorola; it's one of the original tuning synthesizers – a huge keyboard thing which can have 1700-something notes to the octave!"

"I've had to swallow the technical stuff because I'm interested in sound, not because I'm interested in technology."

When asked about the micro-tuning feature on the new DX7, Richard expresses optimism regarding the future of non-equal tempered tunings. "I think it's wonderful that there is all of this stuff out there that people can experiment with and get to know about. It's just that I was lucky enough to hear these things through historical context. I think it's good to be able to go back and see how it was used before. Say, for example, that I hadn't had the opportunity to be in those places and pick up on this stuff in the way that I did, maybe I would have just stayed in some apartment and listened to my warped records for ten years – probably would have had the same effect!" ■

RICHARD HOROWITZ DISCOGRAPHY

Oblique Sequences/Solo Ney Improvisations, Shandar Records, Paris, France.
Eros in Arabia, Ethnotech Records.
Desert Equations: Azax/Attrax, Crammed Discs, Brussels, Belgium.



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Casio FZ1

Sampling Keyboard

Low-cost 16-bit sampling has finally arrived – and it bears the name Casio. How does the FZ1 compare with what’s already available in the 12-bit arena, and how are pro musicians likely to react to it? *Review by Jim Burgess.*

MANY READERS ARE probably ready to flip to the next page right now. After all, how could a company like Casio make a truly professional sampler? Start changing the way you think of this huge Japanese conglomerate. Forget about the watches, calculators and toy keyboards. Casio is moving upscale, straight into the professional market, and with products like the new FZ1, it won't take long for people to start taking them very seriously.

Overview

THE FZ1 HAS attracted a lot of attention

since it was first shown at the NAMM show in January. That's not surprising; after all, the instrument sports true 16-bit linear sampling, a powerful onboard digital wave synthesizer, eight individual outputs, and (perhaps best of all) a built-in 96×64 graphic display screen for visual editing.

At first glance, the FZ1 looks like a pro machine with its sleek black finish. Its five-octave keyboard features both velocity and aftertouch, and you'll find the familiar pitch-bend and Modulation wheels right where you expect them to be.

The back panel offers a mix out, eight individual voice/channel outputs, and a mic

and line input for sampling. Also provided are jacks for footswitch/sustain pedal and a variable pedal that Casio likes to call "Foot Variable Resistance". All are ¼" phono jacks.

Getting around the FZ1 is a breeze. When the review unit arrived, I proceeded to give it the "acid test" – to see how far I could go with it without having to look at the manual. It's so logically laid out, I was able to use most of its features straight away. Although this approach certainly isn't for everyone, it's a great way to judge the instrument's user interface. Top marks are well deserved.

Casio has implemented a simple yet effective user interface that utilizes a ▶

MT JUNE 1987

IN PAST ISSUES

MARCH 1987

INAUGURAL ISSUE

• We talk to technology's champion Peter Gabriel, session musician Mark Isham, and Patrick Moraz.

On test is Sequential's Prophet VS, Akai's S900 rack-mounting sampler, the Simmons SDS1000 electronic drum set, Yamaha's SPX90 multi-effects processor, the Technics PX series of digital pianos, and the Alesis MIDlverb.

We introduce you to sampling theory and creative multisampling, explain FM synthesis and MIDI basics, guide you through your first recording session, marry the MIDI and SMPTE standards, and make the most of Mono Mode on the Casio CZ.

SEPTEMBER 1986

• Tony Banks reveals the sound secrets behind Genesis, while we catch up with Australian rock duo Icehouse, and avant-garde composer Harold Budd.

Reviews include the Ensoniq ESQ1 synth, Roland's RD1000 piano, the Oberheim Matrix 6R expander, Digidesign SoftSynth and Burner software, Hybrid Arts ADAP for the Atari ST, the Ibanez SDR1000 reverb, and Alesis MIDlflex.

We also show you how to make the most of studio time, continue our DX Explained series, explain the mechanics of sampling, and investigate Mono Mode on the Prophet 2000.

OCTOBER 1986

• We sample Depeche Mode's approach to technology, Vince Clarke's Erasure, and David Torn and Kurt Vortman's view of MIDI's place in modern jazz.

Put through their paces are Korg's DSS1 sampling synth, the Casio CZ1 synthesizer, the Dynacord Rhythm Stick, Elka's range of pro synths, the Boss Dr Pads, the Ashly CL52 compressor, Akai MIDI FX, and Yamaha's MCS2.

Mono Mode on the Akai S900 sampler is supplemented by a guide to looping, the third part of our FM programming series, a guide to sequencing, and a feature on the implications of sampling for the music business.

NOVEMBER 1986

• Synth king Howard Jones talks recording and programming, David Sylvian comes clean, and we track down The Philip Glass Ensemble, and touring keyboardist Greg Whelchel.

On test are Akai's MX73 master keyboard, the Ensoniq Digital Piano, the Unique DBM controller keyboard, the Fostex E16 multitrack, Dynacord's ADDone drum module, the Korg DDD1 drum machine, Steinberg's Pro24 sequencing software for the Atari ST, Yamaha's FB01 FM synthesis module, and the Roland DEP5 multi-processor.

We get the lowdown on mixdown, examine the SPX90's MIDI Mode 4, and continue our guides to sequencing, FM programming, and creative sampling.

DECEMBER 1986

• Paul Hardcastle takes time out to tell us what it's like being The Wizard, and we chat to Talking Heads keyboardman Jerry Harrison, jazz group

MT JUNE 1987

Steps Ahead, and producer Rupert Hine.

Reviews include the Roland S10 and S50 sampling keyboards, the Kawai K3 polysynth, Wersi's MK1 synth, the Fostex 160 multitracker, the J.L. Cooper MSB Plus MIDI processor, and a preview of the Palmtree Airdrums.

Features to ponder over include the MIDI Sample Dump Standard, Mono Mode on drum machines (namely the Sequential Tom), a guide to data transfer between sequencers, and the final episode of The DX Explained.

JANUARY 1987

• Synth-pop pioneers, OMD, feature alongside Heaven 17 and avant-garde composer Morton Subotnick.

The review roll-call includes the E-mu Emax and Akai X7000 sampling keyboards, the Kawai R100 drum machine, Yamaha's QX5 sequencer, Stepp DGI guitar synth, Tascam Porta Two, and Steinberg's ProCreator software for the Atari ST.

We start an overview of hard disk technology, conclude our series on creative mixing techniques, and see how guitarists can benefit from MIDI Mode 4.

FEBRUARY 1987

• The enigma of contemporary music - Frank Zappa - talks tech in a rare in-depth interview and Robert Irving III, keyboardist with Miles Davis, tells how he coped with the pressure of following in the footsteps of Herbie Hancock and Chick Corea. Also featured is Japanese composer/arranger Seigen Ono.

Reviews include the Oberheim DPX1 sample replay unit, Roland RD300 piano, Jam Factory & Dr. T KCS software, and the revolutionary Mandala video-MIDI instrument.

On the feature front we continue our investigations into the worlds of hard-disk technology and MIDI Mode 4 for guitarist, and take a look at how modern percussionists can keep in time with the times.

• We reveal why Adrian Belew is one of the world's most innovative modern guitarists, and the unusual method employed in recording Peter Hammill's latest album. Also in conversation are jazz-fusion keyboardist Jeff Lorber and film-soundtrack composer Michael Stearns.

Being put to the test are the Yamaha DX7II, Sequential Studio 440, Korg SG1 piano, Simmons SPM8:2 mixer, Barcus Berry processors, and MegaMix and Intelligent Music's 'M' software.

Bandwidth jargon is deciphered, MIDI Modes are dissected, and experiments carried out to the Sample Dump Standard.

APRIL 1987

• Mick Karn talks about bass playing, high technology and jazz, while we catch up with Ravi Shankar and Frank Serafine, a partnership of traditional Indian music techniques and applied American technology. We also put the spotlight on producer Hugh Padgham.

Reviews uncover the Yamaha DX7II, the Roland MKB200 keyboard and GM70 MIDI guitar, the Korg DRV2000 reverb, the Photon MIDI guitar converter, the MIDI Step bass pedal/foot controller, Sonus C64 software, and Auricle II film composer's time processor (C64).

A new series kicks off on programming drum machines, and we detail how samplers can produce new waveforms for use in programmable wavetable synths.

MAY 1987

• Allan Holdsworth, one of the leading advocates of guitar synthesis, and eccentric composer Holger Czukay, talk to our intrepid reporters, while Kim Rylie, Fairlight's co-founder, and Steven Randall, designer of the Stepp guitar, speak frankly about their technological achievements.

On test are the Casio SK2100 keyboard, Roland MKS70, Yamaha RX5, Kahler Human Clock, Alesis MIDlverb II and ART DRI reverbs, and Texture and ClickTracks software.

We assess the Apple Mac II, continue our drum programming series, and explain how your sampler can produce stereo samples. ■

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► hierarchical format to get around the various menus available. Mac users will recognize the similarity to Apple's HFS (Hierarchical File System), first introduced on the Mac Plus. Four cursor controls (up, down, left, right), a data slider, a numeric keypad with up/down increment keys, an Escape key and an Enter key provide the basic means to zip around from menu to menu.

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The FZI has two major modes of operation: Play Mode and Modify Mode. Play Mode, as the name suggests, is designed for performance. The single menu it provides permits selection of individual Banks (called Presets on most other samplers) or individual Voices (samples), and also offers a command for loading new disks within the Play Mode. Also associated with the Play Mode is a Master Tune menu and a handy Key Transpose function that lets you instantly transpose the entire instrument a half-octave up or down – without affecting the key assignments of the individual sounds.

The Second Mode, called Modify, is where the action is. Sampling, synthesis, editing, preset building . . . you name it, Casio has a menu for it.

Seriously, though, this is where the simplicity of Casio's hierarchical menu system really shines. Literally dozens of different menus and functions are buried in various levels of hierarchy – yet getting from one to the other is quick and easy.

Essentially, there are six sub-modes within the Modify Mode. Each has its own set of Function menus, and each of these has several Parameter/Operations menus – and many of these have a variety of Settings menus within themselves. Count 'em – that's *four* levels of hierarchy. Yet it's not nearly as complicated as it sounds. You use the up/down cursor controls to choose the sub-menu you want to access. Hit the Enter key and you're inside that parameter. The Escape key gets you back to where you were.

All of the FZI's functions are grouped together logically so that you work within certain sub-modes depending on what function you're using at the time.

Sampling

THE FZI IS an eight-voice instrument featuring 16-bit linear sampling at three selectable rates (36kHz, 18kHz and 9kHz). Fourteen-and-a-half seconds of sampling time is available at the highest sampling rate, and just over 58 seconds at the narrowest bandwidth. With the addition of the optional MB10 RAM board, the onboard sampling time can be increased to a whopping 29 seconds of high-bandwidth 16-bit audio.

The available memory may be divided in any manner amongst a maximum of 64 Voices or sound sources. To avoid confusion, it is worth emphasizing again that the FZI is an eight-voice instrument; that is, the maximum number of notes it can play at any instant is eight. What Casio (and the rest of this review) refers to as "Voices" is actually separate memory locations for sounds. Up to 64 sounds (Voices) can be held in RAM at once,

though only eight notes (voices/channels) can sound at any instant, using any combination of the 64 sounds available. Got it?

In addition to the Voice number, up to 12 characters are available to name the sound using the numeric keypad to access the letters of the alphabet. It could be worse; at least you don't have to use the data slider to scroll through the alphabet.

The sample time is specified in increments of 10msec, although the FZI always rounds off the specified time to the nearest multiple of 1024 samples (a number most computers seem to like a lot). The data slider/keypad or the instrument's keyboard can be used to define the original pitch and the high and low notes for the sample you're about to make. Interestingly, the FZI's five-octave keyboard specifies a range from C2 to C7, rather than the C1 to C6 that the rest of the world is used to from working with instruments like the DX7. Although I can't see any reason to be concerned about it, I was puzzled as to why they chose to specify this unusual keyboard range.

You're ready to sample now. The LCD turns into a mini-VU meter with its own peak indicator to help you set the input level accurately. You can enable the sampling function manually, or use auto-sampling for threshold triggering.

Sounds great, doesn't it? Hit the Display button and presto! The sample you just made is displayed on the LCD for your inspection. Besides impressing your friends, you'll be able to use this feature to tell at a glance whether the sampling time you selected was sufficient, and whether the level was set properly.

Speaking of peaking, the one difficulty I *did* encounter was that the small size of the VU meter on the LCD made it somewhat difficult to set the sampling level accurately. I found myself consistently overloading the A/D converter, even when I had been careful to set the sampling level conservatively. It would be especially helpful if the FZI let you know when you overloaded its inputs, either by saying so, or better yet, displaying the number of sample points that actually peaked during recording.

By the way, samples on the FZI may be played back over a maximum range of three octaves above and three octaves below original pitch.

Wave Synthesis

I WAS DELIGHTED to find a variety of powerful digital synthesis functions built into the FZI: an extra added bonus, so to speak. Casio has included four different means of using synthesized waveforms, each with its own menus and functions.

Just as in the sampling operations, the instrument requires you to define a Voice from within the 64 available, name it, and assign it to a range on the keyboard (if you don't want to do this yet, you can use the FZI's default assignment).

Now you're ready to make some synthesized sounds. If you feel particularly unadventurous, you might prefer to take the easy way out and use the Preset Wave

function to summon up any of the FZI's six internal preset waveforms. Don't look for too many surprises here; you'll find the waveform selection consists of sawtooth, square, pulse, double sine, saw pulse and random. Obviously these preset waveforms are intended to make it easy to create some of the more conventional analog-type synth sounds, and I think they do their job just fine. If you want a pretty picture of any of the preset waveforms, it's no farther away than pressing the Display button.

Many of us will prefer to make our own waveforms, though. To make this as painless as possible, Casio has provided three different functions for generating unique original waveforms: Sine Synthesis, Cut Sample, and Hand Drawing.

Sine Synthesis makes 48 harmonics available for generating waveforms. Each harmonic can be set to an amplitude level within the 256-value range provided. Although you don't have to use the graphic display to set up the harmonics, it is by far the quickest and most intuitive way to do it. By summoning the Display function, you are presented with a graph which displays amplitude on the vertical axis and the 48 harmonics on the horizontal one. Create your own waveform using the cursor to step back-wards or forwards through the harmonics, and using the data slider to specify the amplitude values of each harmonic as you go.

Once you're satisfied with the harmonic amplitudes you've defined, press the Execute command to prompt the FZI to compute the desired waveform. As soon as the waveform has been computed (it takes about a second), you can play it from the keyboard and see it on the screen.

The Cut Sample function lets you "cut out" a single cycle from anywhere within an existing sampled sound and use it as a new sound source. You can define the area within the sample that you want to cut from either by specifying the sample block numbers (coarse and fine controls provided) or, better, by using the graphic display function to see the source sample and position the cursor within it.

It's important to realize that because you're only dealing with a single cycle, chances are that the resulting sound isn't going to end up sounding very much like the source sample you took it from. Nonetheless, I did come up with some very interesting results using this feature. For example, I found a wealth of PPG-like waveforms by "cutting out" waveforms from various positions within a snare sample.

Rounding out the synthesizer section of the FZI is my personal favorite, Hand Drawing. Using the graphic display, you draw your own waveform by stepping through 96 positions and using the data slider to specify a value (positive or negative) for each point. You might prefer to just hold down the cursor control and step continuously across all 96 points, moving the data slider as you do so to literally "draw" the waveform in real time.

You can also use Hand Drawing to edit existing waveforms from the Preset Waves, Sine Synthesis or Cut Sample operations for unparalleled flexibility in waveform creation. ►

MT JUNE 1987

▶ Even with such a wide variety of powerful waveform creation capabilities, I must admit I found myself wishing the FZI went just one step farther in this direction. All of the techniques described so far do a very good job at creating a single static waveform. Unfortunately, static waveforms sound just that – static. Our ears prefer to hear sounds that change over time, the way real sounds in nature do.

Of course, you can add some motion to a single waveform using filtering techniques (analog subtractive synthesis is based on this premise), but the options would *really* multiply if you could create a wavetable – a continuous sound whose harmonic content changes over time. This usually involves selecting several individual waveforms as input and using the computer to interpolate smoothly between them.

Maybe I'm asking too much, but I suspect that the type of capability I've described could easily be implemented in a future software update.

Voice Editing

NOW THAT YOU'VE made some sounds by either sampling or synthesizing, the FZ-I's comprehensive editing capabilities are ready to be put to use.

Start out by choosing the Voice you want to edit. You'll need to know either the number or name of the sound you want, because the FZI won't let you select a Voice for editing by

playing it from the keyboard like many other samplers. Although this may not be a big deal, it makes it difficult if you're using someone else's disk and you don't know what name they gave to each sound.

You can specify truncation points by their sample addresses (coarse and fine), but I can't imagine anyone doing it this way when you can use the FZI's graphic display instead. Using the data slider, you can position the start and end truncate points anywhere within the sample. You can even zoom in on the display to line up truncate points precisely with zero crossings of the waveforms. When you're satisfied, you can delete the unused portion of the sound and reclaim the memory for more sounds.

Looping is done in a similar manner, so it's really easy to get great loops quickly. And although there is no provision for backwards/forwards loops, there's a cross-fade looping function built in to make it easier to remove those loop glitches.

Of particular interest is the FZI's ability to specify up to eight different loops for each sample. Each Loop Set can be a different size and location, and you can even specify how many times one loop is played before going on to the next.

For example, you might define the looping of a sample as follows: play through until the end of the sound and then loop back to the beginning (say, four times), play to the middle of the sample and loop over a small section of the middle (ten times), then go back to the beginning and loop continuously over the first

quarter second. That only uses three of the available eight loop sets!

The advantages of this kind of looping are obvious. No longer do sounds have to bear the tell-tale cycling that makes the loop stick out; you can easily set up totally non-cyclic loop patterns. In addition, complex rhythms can be set up using samples that are not continuous tones.

Casio's trademark eight-stage envelope generators are used for controlling both the loudness (DCA) and filter (DCF) parameters. Once again, use of the graphic display will be appreciated by those who don't want to deal with rates, levels and steps as numerical values. You can see the entire envelope shape at a glance, and hear the effect of any changes you make instantly.

You can also copy an envelope shape from the DCA to the DCF (or vice versa) to speed things up. This is especially handy if you want the same basic envelope for both filter and volume, but need to make a minor edit to the release time of one envelope or the other, for example.

The FZI's LFO section doesn't pull any special surprises. You'll find six LFO waveforms, an LFO sync on/off option, and parameters for the rate and delay factor. The LFO can be assigned directly, in varying amounts, to the oscillators, DCA and DCF in any combination.

Velocity may be assigned in either positive or negative values to the DCA Level, DCA Rate, DCF Level, DCF Rate and Filter ▶

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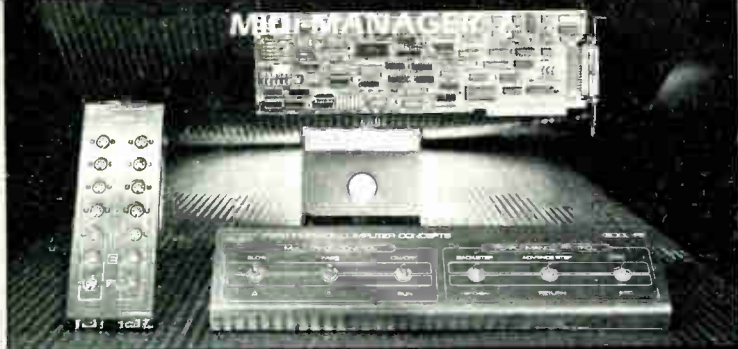


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Resonance (positive only).

Then there's Mix Write, an FZI feature that lets you combine samples together - with a twist. You can set the mix levels of each of the two samples, and detune them individually as well. Furthermore, you can delay the start of the second sample. That leaves the stage wide open for any combination of delay and chorusing effects.

Meanwhile, Cross Mix is a merge function that lets you blend one sound smoothly into another for a seamless splice. Like the Mix function, you can specify a level, detune and delay time for each sound. In addition, you can define the length of the crossfade zone to determine how long it takes for the first sample to fade out while the other fades in.

Needless to say, Casio has also included a reverse play option for playing samples backwards.

Configuration

THE FZI PERMITS eight independent Banks (commonly referred to as "presets" on most other sampling devices) to be defined in memory at one time.

Each Bank may define up to 64 Voices. Each Voice is assigned to its own Area (similar to the "Keygroups" another well-known sampler uses). Each of the 64 possible Areas defines a zone on the keyboard (Areas can overlap in any manner), velocity split parameters (more on these coming up), a specific MIDI receive channel (if desired), and the routing to any combination of the FZI's eight audio outputs/channels.

Creating a Bank is easy. Select an Area, assign one of the 64 Voices to that Area, then define the keyboard range of the Area (Original, Highest and Lowest Pitch) using either the data slider or by playing the notes from the keyboard. Each Area may be assigned a volume level to make it easy to balance the levels of the various sounds within a Bank.

Now for one of the FZI's most impressive features: multiple velocity splits. Many of you will be familiar with the velocity switch function found on most samplers. Casio has taken this concept much farther by allowing the user to specify a minimum and maximum velocity value for each Area to respond to, variable over the entire 1-127 range MIDI provides. For example, if you specify "minimum 64/maximum 80", only notes with velocity values within that range will cause the Voice assigned to that Area to play.

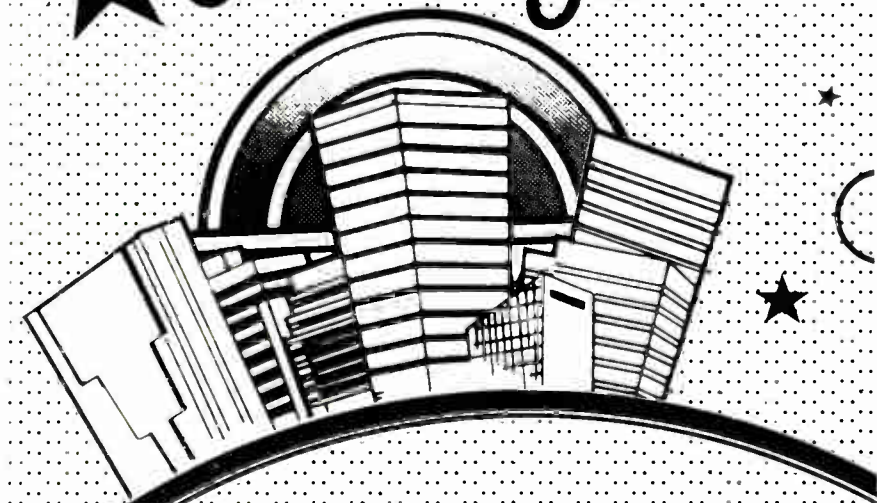
The potential applications for this unique yet simple system are tremendous. Rather than simply toggling between two different sounds, you can set up multi-layered velocity splits.

You might use this capability, for example, to construct the ultimate piano sound. Start by sampling the same note at four different keystroke levels from soft to hard. Now assign each of the four sounds to four Areas (each with the same key assignments) and set up the velocity ranges accordingly (ie. Softest 1-32, Soft/Medium 33-64, Loud/Medium 65-96, Loudest 97-127). Now the correct sample will be triggered with the appropriate velocity.

Another application might be to have one

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sound assigned over the entire velocity range, while others assigned to the same notes are only played within certain velocity ranges. This way, the first sound remains constant while the second sound it is mixed with changes depending on the velocity played.

Using a large MIDI system with a sequencer? Perhaps you'd like to access all of the FZI's 64 Voices without "taking up" more than one MIDI channel for the instrument. Velocity split makes this easy: set up eight different keyboard splits, each with eight Voices assigned to it. Set each of the eight Areas that overlap to respond only to a specific velocity range. Now use the editing capabilities of your sequencer to confine each track within the desired velocity range. Naturally, you lose some dynamic range this way, but you can't have everything.

MIDI + Storage

THE FZI'S MIDI implementation is complete and logical. In its simplest application, you may define a basic MIDI channel for both transmitting and receiving data. You can also enable or disable control and program changes.

If multi-timbral operation is more to your fancy, you'll be glad to know that the FZI makes no compromises there. Each Area (and therefore each sound) can be assigned to receive only on a specific MIDI channel. All controller changes will be recognized individually on the channels for which they're intended. Unlike conventional Mode 4 operation (where all voices respond monophonically), the FZI's implementation makes it a true Multi-Mode instrument. The eight voices can dynamically allocate themselves to any combination of 64 sounds instantly, provided you don't expect the machine to play any more than eight notes at any one instant in time.

The FZI also appears to have a complete MIDI System Exclusive implementation, including full sample dump capabilities. Unfortunately, I was unable to experiment with these functions in the time I had the keyboard for review.

Also contained within the Effect/MIDI sub-mode are the parameters which define how the FZI's various performance controllers are to behave. The range of the pitch-bend wheel, for example, can be defined in semitones. Additional controllers such as the modulation wheel, aftertouch and the Foot Variable Resistance Pedal can be assigned to any combination of destinations in varying amounts. For example, each of these devices may be used to control the amount of LFO modulation on the oscillators, DCF or DCA. Similarly, they can be assigned to directly control the DCF or DCA levels.

The standard FZI has 1Mbyte of memory onboard, expandable to 2Mbyte with the optional MBI0 RAM expander. Loading a full disk takes a leisurely 66 seconds, but who's counting? People who will want to use their FZI in demanding live applications, perhaps.

The data management capabilities of the FZI are comprehensive, though. Data may be routed to and from any of three sources: the

disk drive, MIDI, or the 25-pin port on the back of the instrument. You can Load, Save, Merge, Verify or Erase the entire memory contents of the FZI, or just certain types of data such as Banks, Voices or Effects.

Most of the data operations are self-explanatory, although Merge deserves special note: it loads new data into the available memory space of the FZI without erasing the existing contents of the onboard RAM.

The extensive data handling capabilities of the FZI mean that you'll save time from the boring routines of using a sampler. For example, if you take the time to set up a custom Bank for drums/percussion (complete with the desired key assignments and MIDI setup), you'll be able to load that data to other disks and use it with other sounds. Perhaps you have a certain performance set up for the Effects controllers - load it into any new disk of sounds and they'll be customized to your own playing preferences. And, of course, you can quickly assemble a new disk from sound sources located on other disks by loading the Voices into RAM one at a time.

Conclusions

THE FZI IS a killer machine. It's hard to find fault with it, especially when you consider its sub-\$2500 price-tag. It is logically designed and does everything it sets out to do flawlessly. And even though I was warned the machine I had to review was a prototype, all of its functions were working smoothly and I have yet to crash it.

The sound fidelity is wonderful - everything sounds crisp and punchy. I was most impressed with percussive samples. The portion of a percussive sample near the end of its decay is usually a trouble spot for most samplers, because when the signal amplitude is low, the resolution decreases and the result is usually noise. Not so with the FZI: all the percussive sounds I sampled decayed into silence.

Many people will wish the display was a little larger. You do have to get the viewing angle just right to see it properly, and I didn't find any way to adjust it from the front panel as is common with most LCDs. Nonetheless, that little screen is going to make a lot of people happy.

There's a couple of ways that the user interface could be improved. I really think you should be able to select samples for editing by playing them from the keyboard, preferably without having to leave the menu you're in. The option to select a number of samples at once for simultaneous editing would also speed things up.

These truly are minor criticisms, however. Every one of them could be corrected in software, and Casio has provided a blank menu called "optional software" and the word is that a few third-party companies are anxious to develop software for it.

The final verdict? Everybody should have one. Now. ■

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Korg SQ8

Eight-track MIDI Sequencer



This dinky little box of tricks brings stand-alone eight-track sequencing to a new price level. Has Korg cut too many corners to get it there?

Review by Bob O'Donnell.

DESPITE THE POPULARITY of many sequencing software programs, dedicated hardware sequencers seem to be making a comeback. Roland's MC500 is proving to be incredibly popular, and with the recent introduction of the company's less expensive PRI00 and Yamaha's QX5, the future of hardware sequencers is looking quite positive.

First-time sequencer buyers, in particular, seem to be attracted to the easy portability and overall affordability of stand-alone units. Even though many hardware units lack the editing capabilities of software programs, many first-time users prefer the simple operation of hardware sequencers. Korg has apparently taken notice of this phenomenon, and with the introduction of their inexpensive SQ8 eight-track sequencer, they're addressing this growing market in earnest.

Basics

THE GENERAL SPECIFICATIONS for the SQ8 include the ability to record up to 6500 notes with velocity on eight individual tracks, each of which can be set to its own MIDI channel; the ability also to record pitch-bend, modulation, program change and aftertouch data (which can also be filtered out); and the possibility of being operated in either real-time or step-time recording modes. Pretty basic, perhaps. But I did forget to mention one small point: it does all this in a package that measures a little over 7"X3"X1", and weighs less than two pounds.

Korg have added to the simplicity and convenience of operating the SQ8 by

thoughtfully incorporating a stand into it. As a result, it can either be laid flat on top of a keyboard or other nearby surface, or propped up for easier viewing. Unfortunately, Korg haven't applied this convenience principle to powering the unit. Despite the fact that it requires a mere nine volts to operate, the SQ8 does not offer the option of battery power. Korg do include an external power supply with the SQ8, but having to use an adaptor definitely decreases the unit's potential portability.

The SQ8's connections to the outside world are very simple: a MIDI In port, a MIDI Out port and a mini headphone jack for monitoring the unit's metronome output. In one of Korg's many cost-cutting measures, however, the SQ8 does not come with headphones. It doesn't have an internal speaker either, so if you want to listen to the metronome's click as you record, you'll have to supply your own Walkman-type headphones. Thankfully, the volume level of the click is adjustable, but that small benefit doesn't excuse Korg from omitting what should have been a standard accessory. To be fair, the unit does have a blinking visual display of the tempo, but how many people will really depend on that?

In addition to its compact size, one of the first things you notice about the SQ8 is its well-organised, uncluttered front panel. A row of multi-function keys runs along the bottom and right-hand side of the unit, and an informative, pre-printed LCD (much like those fitted to Roland's drum machines) fills the upper left-hand portion. All relevant information about tempo, time signature,

measure number, MIDI channel(s), track status, current function and remaining memory can be displayed at once, making it very easy to determine exactly where you are in the sequencing process.

Operation

THE SQ8 OFFERS six basic functions, each of which has an effect upon the sequencer's overall configuration or the status of individual tracks. To access any of these functions, you simply push the centrally-located Function key until the arrow points to the function you wish to use.

Thanks to its battery backed-up memory, the SQ8 displays all the information stored from the last time it was used as soon as you switch it on. The function cursor defaults to the Tempo/Beat location and allows you to reconfigure the basic recording and playback parameters quite easily. The tempo is variable from 40-192bpm, and the time signature (which Korg refer to as Beat) can be chosen from one of five possibilities: 2/4, 3/4, 4/4, 5/4 and 6/4.

Now, for 90% of the music you may want to record, these time signatures will probably suffice; but if you want to record that 7/8 groove that's been floating around your head, you're going to need another sequencer. Another limitation (pointed out in the very basic owner's manual) is that once you've started to record or play back at a particular tempo, you can't change it; the tempo remains fixed until you stop. Admittedly these are not major faults, but unfortunately, they are typical of the corner-cutting measures that are found throughout the SQ8's operation.

A much larger problem stems from the SQ8's inability to sync to the outside world. While it does output MIDI clock, start, stop and continue commands, it does not respond to any of those messages. Consequently, it must serve as the master clock for any MIDI system it is being used in, and in this context, its rigid tempo controls take on a greater significance, too.

The next section accessed by the Function key is MIDI Channel mode. This allows you to specify any of the 16 MIDI channels for each individual track. To do this, you simply hit the key assigned to the track you want to change the MIDI channel for, and then use the up/down buttons to choose the appropriate channel. The SQ8 only operates in the Omni Off/Poly Mode (Mode 3), so transmission and reception of MIDI data can only occur on the properly selected channels.

The Play Track function comes next for some reason, but I'll follow the example set by the manual and skip over that to discuss the Record Track function first. Once you've entered the record mode, all you have to do to begin recording a sequence on the SQ8 is select the track you wish to record on (you can only record on one at a time) and push Start. The bar indicator counts down two measures of whatever time signature you've chosen to record in, and the SQ8 then begins recording automatically. The letters "REC" initially appear blinking in the display next to the track you are recording on, but as soon as the unit begins to receive data, the display

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stops blinking. (This subtle little feature prevents you from missing that "incredible take" as a result of incorrect MIDI connections.)

To stop recording, you simply press the Start/Stop button and the record display begins blinking once more. You can then begin recording again from the point where you had stopped, but be forewarned that the SQ8 only works in complete measures. This means that if you stopped in the middle of a measure, the recording starts at the beginning of the next measure.

An odd feature which deserves mention is the SQ8's ability to record in fast-forward. I'm not really sure what purpose this serves, except perhaps to reduce the drudgery of recording whole notes, but it's there if you want it.

When you've finished recording a track, some of the more serious limitations of the SQ8 start to become apparent. To hear what you've just recorded, the owner's manual tells you to press the Reset key, which automatically converts the recorded information into "play" information (signified by a star next to the track number in the display). What it *doesn't* tell you, however, is that once you do that you've made it impossible to alter that track with the few editing features that the sequencer offers. Believe it or not, once you've converted recorded information into playable information, the only way you can change it is by erasing and re-recording the entire track. In other words, to hear if there are any mistakes, you have to put the information into a form that you can't alter anyway. Now, if this isn't a *serious* Catch-22 situation, I don't know what is.

If you are absolutely sure that you made a mistake, however, the SQ8 has a nice feature which does allow for some basic editing. Once you've stopped recording, you can press the Rewind button and the sequencer outputs the MIDI information in reverse (!), so that you can listen for the point at which the mistake was made. Once you've found it, you can punch in (recording can only start at the beginning of a measure, remember) and re-record the track to the end. Punch-outs, unfortunately, are not possible. If you made more than one mistake, make sure that you rewind to the point where the first one occurred, otherwise you'll have to record over your first punch-in.

One other small point that you need to be aware of (and which, again, the owner's manual doesn't address) is that the SQ8 erases as it rewinds in record mode, so if you rewind too far you'll have to re-record starting from the point you rewound to. Hitting the Fast Forward button won't do any good because it only starts to record in fast forward. Needless to say, this is a frustrating and serious drawback.

Returning now to the Play Track function, the SQ8 allows you to listen to or mute whichever tracks you want, as long as the selections are made before playback is started. This flexible setup allows you to record and store two or more individual songs in the unit, even though it has no special provision for this application. Making use of my trusty CZ101, I
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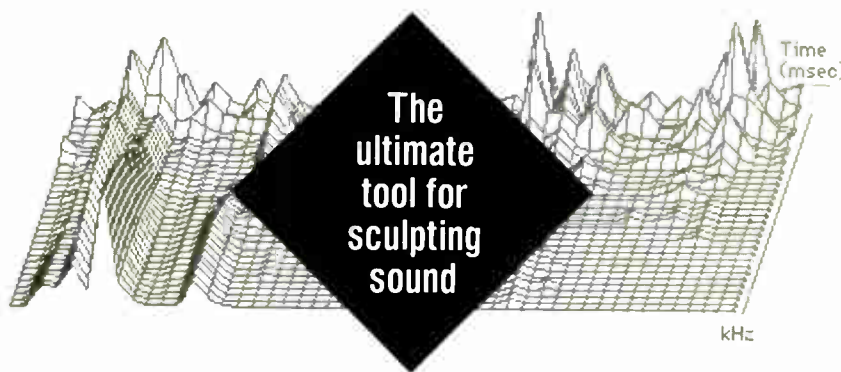
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was able to record one multi-timbral sequence on tracks 1-4 and then, while muting the playback of those tracks, record an entirely different sequence on tracks 5-8. A glamorous application of technology it is not, but given the SQ8's healthy 6500-note memory, it does represent a viable way of squeezing out as much performance from the machine as possible.

R Another nice feature available in Play mode is the Measure Memory function. What this allows you to do is locate a specific measure at which the SQ8 will automatically stop. With a bit of intelligent planning, you could also use this feature to record two independent eight-track sequences, one on each side of the marker. (To do so, you'd have to record track 1 of song 1, then track 1 of song 2, then track 2 of song 1, then track 2 of song 2, and so on.) Fast forward and rewind are also available in Play mode, but thankfully, they operate in normal tape transport fashion, without destroying any information.

E Erase Track is the fifth function which can be accessed by the Function key, and it operates just as you would expect it to. You can either erase tracks individually or do all eight collectively. The SQ8 also features a data protect switch, which allows you to prevent accidental erasure of important sequenced material.

V The final function is the ominously titled Step Write/Other. Like the rest of the machine's functions, the SQ8's step-time mode is somewhat limited and can be a bit frustrating to work with. The smallest

increment that you can use is a 16th-note, and every note that you input has to be divisible into 16ths, so triplets are not possible in step time.

The actual inputting process requires you to hold down the note that you want to enter, and then press the Up button as many times as there would be 16ths during that note's length. A half-note, for example, requires eight button pushes, while an eighth-note requires only two. If you don't hold the note down while you're pressing the Up button, the SQ8 interprets these button pushes as rests.

I'm happy to report that you can enter the step write mode from the real-time recording mode, but unfortunately, you can't do things the other way round. Once you leave the step write mode, you can only go to the unalterable play mode.

The Step Write/Other function also allows you to turn four general system parameters on and off. Key Transposition allows you to change the key of the sequenced data based upon a MIDI note input, but only if the machine is reset, stopped or repeating; Repeat On can be used for the entire sequencer's memory, or, in conjunction with the Memory Measure feature, for a small segment of a complete sequence; Echo Back allows the incoming MIDI data to be sent out of the SQ8's MIDI Out port, like a MIDI Thru feature; and Aftertouch Off tells the sequencer to ignore incoming (and memory-hungry) aftertouch data. For some unexplained reason, the status of these functions cannot be stored in memory, so they

have to be reset each time the power is turned on.

Verdict

AS A BASIC vanilla flavor, real-time recording sequencer the SQ8 does a perfectly respectable job. It offers very simple operation, a decent-sized note memory and, with eight individual recording tracks, more flexibility in recording than most of the competitors in its price range. It seems one of the main reasons behind the introduction of the SQ8 was to offer a machine which quickly and easily displayed the multi-timbral capabilities of Korg's impressive new DS8 synthesizer, and that it should do well enough.

So, if you're the type of musician who doesn't like to mess around with editing and you're in the market for a portable, inexpensive first sequencer, I suggest you take a look at the SQ8.

If, on the other hand, you're looking for a sequencer with a healthy selection of editing features and a bit of flexibility, I suggest you look elsewhere. The SQ8 simply overlooks too many minor details (and some significant ones too - like the lack of an external storage medium) to justify its addition to most sophisticated MIDI systems. In fact, the limitations it places upon the user can turn what should be an enjoyable experience into a tedious and frustrating one. ■

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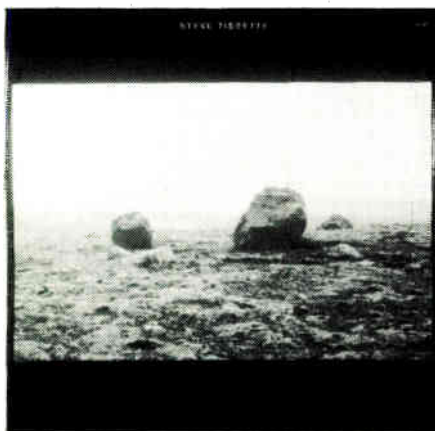
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NEW ALBUMS

Reviewed by Christopher Hoard.



Steve Tibbetts: *Exploded View*
David Torn: *Cloud About Mercury*
(ECM)

DESPITE PAT METHENY'S departure from the label, ECM flourishes as a pantheon for the electric guitar's freshest young voices. *Cloud About Mercury* and *Exploded View* represent the two best examples of a new generation of experimental guitarist.

Steve Tibbetts' ECM debut, *Northern Song*, failed to reveal the Minneapolis-based guitarist's vibrant potential. But *Exploded View*, Tibbetts' third ECM release, is a continuation of the contrasting hard-edged and placid pieces of his previous album, *Safe Journey*.

His fusing of a small ethnic percussion ensemble with either electric or acoustic guitar and tape effects (and now occasional background vocals) often revitalizes what could be considered outdated technology.

The image conjured by 'Name Everything', for example, is that of Hendrix testing his feedback to the limit in the company of fierce tribal drums - in this case a percussion and voice sextet headed by Tibbetts with co-leader Marc Anderson.

Some of the predominantly acoustic tracks prove equally pleasing, the best of them featuring the visually evocative textures of Tibbetts' tape loop effects.

Far from being contained in an identifiable jazz genre, Tibbetts' sound often straddles a space that blends folk guitar, pan-cultural percussion, and industrial noise. As a player, his technique on acoustic and electric guitar is one of the most refreshingly original to be found outside of the mainstream.

So while about a fourth of the recording delivers little more than tedious minimalism, many brighter moments justify the price of admission.

David Torn's ECM debut, *Cloud About Mercury*, is one of the most unconventional (assuming that there is a "conventional" ECM sound) new recordings produced by Manfred Eicher.

Torn achieves a sound and approach quite unlike anything else previously attempted (to this reviewer's ear), the album's primary attraction being the powerful and precarious balance of this quartet. The '80s King Crimson rhythm section of Tony Levin (playing Chapman Stick in the bass register for the most part) and Bill Bruford (playing Simmons drums with intermittent acoustic snare drum and percussion) provides the rhythmic juggernaut beneath Torn's diverse explorations on electric guitar. To balance the high end, there is synthesizer soundtrack whiz Mark Isham (Group 87) playing trumpet, flugelhorn, and synth on one of the tracks.

This recording's best moments recall an updated version of Miles Davis' early '70s fusion music, especially with Isham's superlative horn melodies and improvisations.

As might be expected, though, Torn dominates the spotlight, and his efforts fall between excess self-indulgence and inspired instrumental drama.

When Torn played on a recent Jan Garbarek tour, he used a Steinberger guitar to control a vast array of synth and processed sounds. The same remarkable abundance of textures is represented on *Cloud About Mercury*, on which the guitar player demonstrates immense promise as an arranger.

Yet for all of Torn's multi-faceted sonic wizardry, his contribution to the group can be overly capricious. While several compositions stand out, the extended jams seem to serve Torn's fuzzbox, rather than the other way around. Too often, blaring and beefy guitar screams wash over Bruford's and Levin's complex backing rhythms, rather than interacting with them.

And during the interludes and preludes, Torn opts consistently for amorphous, fluid chords, filling in an orchestral space with deliberate looseness and rhythmic irregularity. He may have consciously abandoned the guitar in its traditional role of synchronized hammering, but at times, the melody and chords stray too far beyond their rhythmic foundation.

Torn could also be criticized for sounding too derivative of many great mentors; most guitarists will pick out parts which owe to Holdsworth, Fripp, and especially Frisell. Yet he dreams up a healthy serving of his own amazing sounds, and his best efforts are exquisitely blended with these legendary sidemen. Bruford's tuned Simmons drums

provide a textbook for electronic percussionists, and combined with Levin's earthshaking Stick bottom, Torn has realized an effective alternative to traditional rhythm section instrumentation.

Like Tibbetts, then, Torn demonstrates he is worthy of a solo career as a group leader - even if his arrangement details still need a little fine-tuning to be genuinely, consistently inspiring.

Wayne Shorter: *Phantom Navigator*
(Columbia)

WHILE SHORTER'S PREVIOUS, brilliant solo release, *Atlantis* was a welcome outing from the sometimes overbearing technology of Joe Zawinul, his latest effort is a comparative disappointment - though this is said in light of the fact that any recording containing the tone of Shorter's soprano sax is worth owning.

Good points first. At least two of the tracks - 'Mahogany Bird' and 'Flagships' - remind us of the near total creative bankruptcy of the "jazz fusion" genre as a whole. They are classic, whimsical and enchanting Shorter creations that speak volumes when compared to an army of funk groove combos with a few bebop licks.

The two problems with *Phantom Navigator* are the production and the inevitable comparison to *Atlantis*. For while the latter arguably contained several of the best original jazz tunes of this decade, this new batch of six tracks comprise a weaker offering.

Shorter may deliver some of his best, fiery solo runs on 'Condition Red', and 'Remote Control' may be a sensuous blend of Mediterranean sounds cast over a boisterous funk backbeat. But excepting 'Mahogany Bird' (which features Chick Corea on piano), Tom Bechtlein's booming electronic snare and tomes intrude on the music's subtleties, rather than adding the intended techno-edge.

Synthesist Mitchell Forman, bassists Gary Willis and Alphonso Johnson, and percussionists Scott Roberts and Bill Summers contribute expertly to the album's better passages.

Yet though the album's better moments and its few finessed uses of sequencers and samplers elevate it above the level of failure, it is an unfortunate example of the increasingly audible struggle between fantastic musicianship and fantastic technology.

Phantom Navigator charts a firm course through battering waves of electronic innovations, but much of the music sinks too far beneath the surface.

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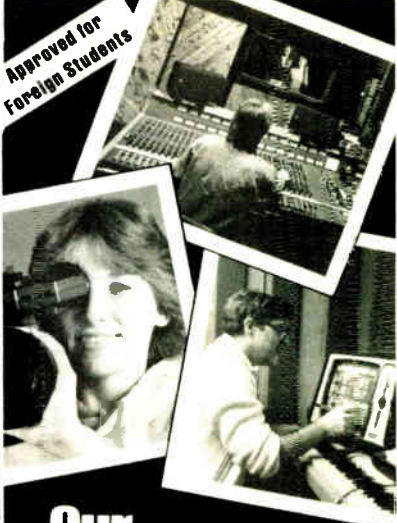
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