MUSIC
TECHNOLOGY

DAVE GRUSIN
The Electric Craftsman

YELLO
Oh Yeaahh!

SANCTUARY STUDIOS
New York Remix

SAMPLER TO SYNTH
Making Wavetables for Your Sampler

REVIEWS
Roland R8
Intelligent Music RealTime
360 Systems' Audio Matrix 16
Voyetra Sequencer Plus/C1

A LEGENDARY NEW CLASS OF SUPER-EFFECTORS

The SGE-STUDIO SUPER-EFFECTOR-A stunning new effector/dynamics processor that does 9 effects at once with a built-in exciter, compressor, expander, noise gate, envelope filter, pitch transposer (2 octaves), all the effects of the Multiverb II, amazing distortion and overdrive, and bandwidth to 20kHz! Full real-time Performance Midi®! **The MULTIVERB-EXT**-The new sampler/ super-effector with Performance Midi®, 2 full seconds of delay, pitch transposer, 200 memories, digital sampling, all the effects of the Multiverb II and ultra wide bandwidth! **The MULTIVERB II**-The year's hottest signal processor just got better! Performance Midi®, increased capability, full programmability, pitch transposing (2 octaves) ultra-wide bandwidth **The DELAY SYSTEM VII**-A brand new programmable sampler/studio digital delay that may be the finest sounding delay unit ever built! Totally accurate harmonic reproduction. 20kHz bandwidth! **The DELAY SYSTEM V**-The same amazing delay circuitry and audio specs as the VII at an even more competitive price! **The HIGH DEFINITION EQUALIZERS**-A new generation of circuitry provides incredible filter accuracy. There is minimum phase shift and no center point drift regardless of fader settings! XLR, TRS, term. strip connectors, failsafe hard wire bypass, Freq. response: 2Hz-165kHz, Signal/Noise Ratio (R.E. +20dBm) -115dB, THD <.005%.

Interactivity.*

EDITORIAL

ON MUSICALITY

CASTING A CRITICAL eye towards hi-tech music products is an interesting occupation, whether you're in the position of a product reviewer or a buyer. On the one hand, you need to (or at least you feel you ought to) know and understand the technology being utilized in products or the unique features of a particular piece of software. This is important so that you can properly appreciate the significance of whatever new piece of gear is being presented to you. You also need to have a decent understanding or at least appreciation of ergonomics, so that you can determine how well designed the user interface is. Finally, if the product produces an audio output you, of course, need to listen to it so that you can evaluate it on all important sonic terms.

But there's something that transcends all these various categories when it comes to evaluating musical products – something which often gets overlooked while writing reviews or making purchasing decisions – musicality. By musicality I mean a product's ability to contribute and its actual contribution to the music making process, whether that be through its sonic qualities or through the manner in which it works. And even though products which actually produce or effect sounds are most often classified in this manner, other kinds of products can earn this designation. A sequencing program, for example, can be very musical, despite the fact that it doesn't produce any sounds, because of the way in which it encourages and enhances the composition of music.

One very important part of musicality when it comes to instruments themselves is their capacity for expression. Though comparisons between acoustic instruments and electronic ones have become tired and beleaguered, it's worth always bearing in mind that the levels of expression possible with an acoustic guitar or piano far exceed those of MIDi controllers. Consequently, those acoustic instruments are inherently more musical than their electronic counterparts – in the right hands, of course. Even a non-velocity sensitive mini-keyboard can be more musical than a violin if the violinist has very limited playing skills.

Determining the musicality of a particular piece of hardware or software is often a very difficult task both because musicality is such an ethereal type of quality or characteristic and because it is very subjective. Nevertheless, I think it's extremely important to try and examine any and all products you intend to buy in this light. To his credit, Technical Editor Chris Meyer has often caught me speaking in a daze of excitement about a new feature I've seen somewhere only to bluntly ask, "But is it musically useful?" That's often a difficult question to answer, and one you should keep in mind.

Speaking of Mr. Meyer, it is with a touch of sadness that I must inform you that he will be leaving full-time employment of Music Maker Publications as of this issue. The world of engineering and design, specifically in the form of Tom Oberheim's Marion Systems has lured him away from us and so I'd like to give a public thank you to Chris for the last year of working together. Fans of his writing need not fret because he will continue to write for MT on a freelance basis, just as he did before he started working here full time.

As we were going to press we had just selected a new Technical Editor, an extremely well-qualified gentleman by the name of Scott Wilkinson. Stay tuned for more details on Scott in the next issue. In the meantime, think musical. ∎

Bob O'Donnell

MAJOR BREAKTHROUGH IN MUSIC TECHNOLOGY

Los Angeles, CA - Hybrid Arts, a leader in music computer technology, has again made history with the introduction of ADAP II...the direct to hard disk digital audio recorder/editor. ADAP is the acronym
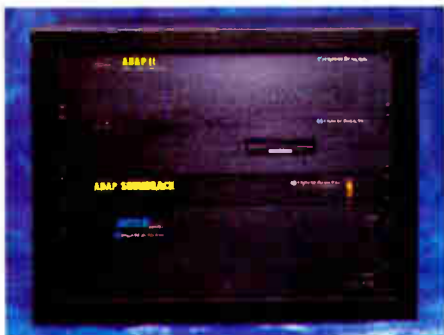
for Analog to Digital Audio Processor. In short, ADAP is a digital mastering device and audio work station, a 16 bit stereo sampler, a visual non-destructive sound editor with sample precise accuracy, a MIDI module, a SMPTE trigger, full EDL (Edit Decision List), a cue system and much more.

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

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

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

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

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

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

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

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

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

ARTISTS

TOOLS

STANDARDS

CONTENTS

TECHNIQUES

OUTSIDE

NEWS DESK

UH, ONE MORE TIME...

Brett Tuggle (MT January '89) actually uses the Yamaha RM2408 mixer at home, and the Hill 16-channel MultiMix live.

Also, in our review of the Lexicon MRC (MT December '88) MIDI Remote Control, we neglected to mention that the unit, and the Kramer synthesis macros for the DX7, were designed and programmed by Clarity for Lexicon.

ICD's FA-ST tape backup allows you to back up data from your ST's hard disk onto high density data cassettes.

SAVING TO TAPE

Remember tape back-ups, in the days before they started putting RAM cartridge ports and disk drives on things? Well, things have progressed a bit since then and now tape drives are being used to back up hard disks. The first one that's been released for the Atari ST is ICD's new FA-ST Tape Backup ($900), a device that, with an ICD ST Hold Adapter, will record your Atari ST data onto cassette. The system runs under TOS or MS-DOS, and will recover individual files with a graphic interface through GEM. Included are SCSI and DMA ports on the back of the unit

for daisy-chaining. FA-ST Tape Backup can be used with other computers as well. Specs include: 155.7Mb on a single data cassette, an average read/write speed of 116.2K bytes per second, data density at 12,800 bpi, soft error rate less than 1 in 10^8 bits, and hard error rate less than 1 in 10^{12} bits, which ICD explains is "as good as most hard drives." And speaking of hard drives, the unit is large enough to fit a hard drive in there, so ICD offers optional hard drives from 20Mb to 170Mb.
MORE FROM: ICD, 1220 Rock Street, Rockford, IL 61101. Tel: (815) 968-2228.

FIBER OPTICS MEET MIDI

Too many MIDI devices? Too few patchbays? Running into confusion, delays, and MIDI Hell in general? Then there's a new device coming out on the market soon that just may solve your problems. Called the MIDITap, it's a rack-mount or under-Macintosh box that has the following connectors: four (or eight) pairs of MIDI jacks, an RS232/422 computer interface (Mac or IBM), and two pairs of fiber-optic connectors. Any of these jacks can talk to any other, and up to 255 boxes can be linked up with fiber optics (running at 2.5MBaud) allowing extremely high speed, multi-directional, non-clogging, fully-merged MIDI communications over runs of several thousand feet. The interconnection protocol allows up to 32,000 MIDI "cables" (of 16 channels apiece) to be supported, and other types of data (such as SMPTE, video, digital audio, etc. – a "SMPTETap" is planned soon) can be carried

down the same line. Each MIDI channel on each MIDI In jack can be mapped to any of these virtual MIDI cables (called "groups"); any channel on any of these groups can be mapped (in virtually any configuration) to one or several MIDI channels per MIDI Out jack (with filtering of information happening in both directions). The MIDITap also has a good deal of intelligence, and has memory space inside for software to customize to its own specific needs. Early anticipated applications include medium to large studios and live performance. Initially, it is intended for pros (with a $1200 price tag), but consumer versions are also expected in the near future. The potential herein is considerable – as we see more, we'll keep you informed (including hopefully reporting on early studios that convert over to fiber optics). Stay Tuned.
MORE FROM: Lone Wolf, 1505 Aviation Boulevard, Redondo Beach, CA 90278. Tel: (213) 379-2036.

I² = MERGE

This simple equation boils down to the fundamental truth that Sonus Corp. has released a new MIDI merger and routing system called – (you guessed it) I² ($169.95). The I² features two MIDI Ins and eight MIDI Outs, which can be assigned to receive data from either of the two Ins, or a merge of both. Add it up –that's 24 routing

configuration permutations. This straightahead rack-mountable box also features easy access switches, LED lights (or as Sonus calls them, "MIDI data annunciators" – yes, the MIDI gods are speaking) to indicate the presence of MIDI activity within the I², and cool looks.

MORE FROM: Sonus Corp., 21430 Strathern #H, Canoga Park, CA 91304. Tel: (818) 702-0992.

NEW PIANOS

Casio has released two new piano-type products, the CPS700 ($799) 76-key sampled piano, and the CSM10P ($399) sampled piano module. The keyboard model features dynamic touch response and the module responds to velocity, and both units offer 16-note polyphony, tuning control, an output jack and MIDI compatibility. The CPS700 keyboard is designed

with light-touch keys, built-in stereo speakers, a sustain pedal with the optional CS30P stand, a headphone jack, and 45 demonstration tunes for that player-piano effect. The CPS700 and the CSM10P feature five preset instrument tones, including piano, harpsichord, vibraphone, electric piano, and pipe organ.
MORE FROM: Casio, Inc., 570 Mt. Pleasant Ave., Dover, NJ 07801. Tel: (201) 361-5400.

READERS LETTERS

Comments, gripes, questions and comments should be sent to: Readers' Letters, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.

Lab Feedback

Thank you very much for the kind review of *Red Zone* (Listening Lab, MT December '88). We worked very hard on this project, and it was nice to see it was appreciated by your magazine. We have received airplay all over the United States and Canada, so I guess people are enjoying it.

Unfortunately this is another record that may not show up in your local record store. Anyone interested in a copy should write to: Dolphin-Moon, P.O. Box 22262, Baltimore, MD 21203.

Please enclose $10 per copy requested. Make checks payable to Dolphin-Moon.

Your magazine is great! Keep up the good work.

McGregor Boyle
Ghent, Belgium

Al Di Meola

Congratulations to John Diliberto for a very informative article on Al Di Meola. This article was one of the better ones I've read. Di Meola is a true artist, both as a musician and a composer, and as a great fan of his, I would like to see him continue to put as much work into his compositions as his guitar playing. The pyrotechnics are fun, but the modern compositions are twice as exciting and ever-lasting. Keep up the good work Di Meola, and the same to Music Technology.

Dan J. McKenzie
Sunnyvale, CA

Job Search

I am an electrical engineering student who hopes to work designing musical equipment after I graduate. Any advice on what I should study, or on how to enter this field, would be most appreciated.

Also, I want to get a hold of photocopies of schematics for musical instruments, effects, amps, etc., especially: 1957-65 Marshall tube amps, Univox UniVibe Phasor (tube and transistor), digital flangers, delays, delay-based harmonizers, pitch-shifters, compressors (tube or transistor), preamps (especially tube), any electronic keyboards, and guitar and guitar-related gear. If any of your readers want to donate a schematic to me, it would be most welcome.

Joel Blevins
902 Linden Dr. Apt. 5
Auburn, AL 36830

I am seeking information on the background required to enter the field of music technology.

Currently I am a second-year electrical engineering student at Northeastern University in the process of fulfilling my internship at Los Alamos National Laboratory. I would like to see my curriculum geared more toward music technology, but this is not available to me at Northeastern.

Since I am unsure what the industry is looking for in the way of background and training for this profession, I would appreciate your advice on what course work to pursue as I continue my education.

Shannon Wilson
Los Alamos, NM

First off, before anybody gets their hopes too high, there aren't a lot of job openings in this industry. On top of that, the industry is in a bit of a slump right now (maybe it'll be better by the time you both graduate; maybe it won't), so you're going to have to be tenacious to get a job. Many also feel that recording is going to be the new growth area beyond synthesizers and samplers, so you might want to think about that too.

Digital Audio and MIDI are the big subjects in the music industry. You can get all you need to know about MIDI by reading the MIDI 1.0 Detailed Specification (available for $35 from the IMA, 5316 West 57th Street, Los Angeles, CA 90056) and reading Bob O'Donnell's MIDI series in these very pages (August-December

1987). For digital audio, get a copy of Ken Pohlman's book on the subject, and read up on reprints from the AES (Audio Engineering Society, 60 E. 42nd St., New York, NY 10165). The two main processors for DSP these days are the Motorola 56001 and TI 32025 – see if you can get anything on those (even just a data book and/or applications kit). A knowledge of SMPTE timecode is becoming more requested, so get a copy of the spec from the Society of Motion Picture and Television Engineers, 595 Hartsook Avenue, White Plains, NY 10607-1824.

As far as formal courses are concerned, take all the classes you can on digital audio and digital signal processing. Related courses include what was known as Signals & Systems (for frequency and time domain analysis of signals) and Differential Equations (for the pure math) where I went to school. Also, if your Computer Science, Sociology or Psychology department has anything on Ergonomics or User Interfaces, get a bit of that too – this is a weak area of too many products today.

If you're intending to get into hardware-based products, also study microprocessors, analog electronics, digital circuits and logic, assembly language programming (the 68000 is popular, but also look into the 8051 and 6801 – and open any instrument you have, and see what it's using too), and C language programming (the upper level language of choice these days). Understanding SCSI and disk systems will also be of help, with hard and optical disk recording becoming topics of interest as well.

If you're intending to get into music software, then pick a computer (Mac, IBM, Atari, or Amiga) and start studying how to program it. Again, C is a popular language across the board; object-oriented Pascal is also big on the Mac. Study a little assembly language for the native processor of your computer (80x86 family for the IBM; 680x0 family everywhere else) for when you need speed in a program. A bit of music theory will also go a long way, what with sequencers and algorithmic composition being so big. Mac cards are also getting more popular, so study Nubus and SE bus architecture.

The final things that will help you get a job is some example of your handiwork (a piece of software, or working hardware product or upgrade to an existing product), and a resume and cover letter that spotlights your skills. I was turned down for a job at Sequential Circuits for a boring cover letter; a new cover letter that mentioned MIDI and specific Sequential products (with the same old resume as the first letter) got me the job that launched me in this industry.
Good luck! – CM

INPUT OUTPUT

Q I'm an electronic tech still trying to learn the ins and outs of audio gear. I'm stumped by hiss (which I can't stand). I have just installed a Rane GE30 (equalizer), SP15 (parametric), and AC22 (crossover) in a PA signal chain. If I only use the GE30 and AC22, no hiss whatsoever can be heard from the PA speakers with the room empty and no vent/heater fan motors on. Adding the SP15 at unity gain adds noticeable but tolerable hiss. The big problem, however, is when I insert a Urei LA3A limiter between the Yamaha PM1000 mixing board and the GE30. The system then has massive amounts of hiss with the LA3A set for unity gain (a very low gain setting). The gain setting on the LA3A actually has little to do with the amount of hiss (it basically stays constant). I know all impedances are matched and cables are correctly wired. When using the same LA3A in a recording chain there is no hiss to this extreme.

I have the same problem trying to fix a home stereo receiver which has massive amounts of hiss at the speakers and headphones with the volume control set at zero. I have been told that bad (noisy) capacitors cause this problem. It also seems to me that when transistors get old they will start adding hiss, which means transistorized audio gear has a usable life span (no?).

How then does one track down the bad (noisy) capacitors or transistors when they check good on capacitance and transistor checkers? Also, since a lot of audio gear uses feedback loops, the hiss will be everywhere in the entire "black box." Therefore, using an O-Scope is no help either. I have tried to get information on this from local businesses, but they want me to bring the gear in (and thus pay money). I'm not about to pay them to learn the same thing I am trying to learn. I wrote another magazine, but they were of little help as well. Any advice from an experienced audio tech would be greatly appreciated. I'm interested (especially) in knowing which components usually go bad that would cause hiss, and where in the signal chain they are usually located.

Chris Pillar
Anchorage, AK

A More info is needed on your system's configuration before I could really take a stab at solving your problem. Questions need to be addressed, like: in using the Rane AC22 crossover, is the PA biamped in stereo or triamped in mono? And between which pieces of equipment is the parametric EQ being placed? I can only assume that your PM1000 mixing desk output is wired to the 1/3-octave Rane GE30 graphic EQ, which in turn feeds the crossover.

Each piece of active audio equipment in any system is going to contribute some "hiss," as you've called it. I believe what you're dealing with is thermal noise, which is inherent in any gain stage where electron movement is amplified by the power amps, creating a constant hissing sound.

With a console's system master fader down, amplifier inputs would not be seeing electron movement in any of the 24 or so input channels, so system hiss would be low. As you add and open channels from your console, thermal noise increases and is additive. Thus the need to take care in purchasing gear with a high signal-to-noise ratio.

As for the LA3A, it's an older piece of equipment, circa 1970s, which may not have the s/n specs of a newer, low noise, IC op amp-based limiter. If you're using the LA3A in the monitor chain, at your console's output and prior to the GE30 monitor EQ, it simply may be a weak, noisy link. If the limiter's primary use was to limit vocals by being patched through an input channel of your console, you may find it sufficiently quiet in this manner – as opposed to having it acting on the entire console output.

As for the stereo receiver, capacitors and transistors, what you were told is new to me and doesn't sound very likely. In checking several reference texts, I've come up with nothing to insinuate that caps or transistors of any age would elevate thermal noise. – *Gary Parisi, Audio Engineer at Loyola Marymount University*

Q I almost completed modifications to my new-type Oberheim Xpander when reality slapped me right in the kisser.

I was attempting to extract various control voltages from the Xpander to drive my old Oberheim Expander (Expander) module when I realized the new Xpander's components (VCOs, VCFs, etc.) are not being controlled by the industry standard's one volt per octave. What gives? My dreams of a MIDI-controlled, velocity-sensitive, programmable SEM1 are in the dumper.

Can anybody out there provide me with modification info to convert these exponential millivolts into a linear volt per octave scheme, or is this just a pipe dream?

Kelly Dunn
2525 Jefferson St. #B
Carlsbad, CA

A The old one-volt-per-octave standard was for *external* distribution of control voltages – it has nothing to do with the way synthesizers may work inside (just like a computer or synthesizer may not use MIDI inside to play its own voices from its own keyboard). I know of some parts that actually work off of a small, negative voltage for example; hardware inside the box translates electrically between the external standard and the internal needs.

Several people in the past have made dedicated MIDI-to-control-voltage boxes (JL Cooper, etc.); Roland still has one available for sale – the MPU-101. This is the much safer, saner, more stable path than butchering your new style Xpander . . . – *CM*

TEAMING TALENT AND TECHNOLOGY

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

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

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

Here is an example of how Total Control works:

LUDWIG

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

EditTrack - or - SMPTE Track

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

EZ-Score Plus

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

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

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

Let's go a step farther:

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

Additional modules for the Total Control package are being developed.

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

THE MODULAR MUSIC SOFTWARE SYSTEM

TOTAL CONTROL
Modular Music Software Systems
Hybrid Arts, Inc.

LUDWIG™	SMPTE Track™	GenEdit™	EZ Score Plus™
Compositional Program	Sequencer Program	Univeral Patch Librarian/Editor	Music Notation Program

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

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

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

A PICTURE-PE

Clearly, Kawai has developed everything you need to create bright, sensational sound on stage, in the studio or at home. Our line includes not only keyboards, but synthesizers, sequencers, mixers, a patch bay, monitor speakers and drum machines. Of course, each model is compatible with the others or any MIDI equipment you may have. All together, they produce show-stopping harmony that'll satisfy the soul. Here's the story:

M8000 MASTER MIDI KEYBOARD

You're the boss with this 88-keyboard controller. It gives you affordable, flexible control of your MIDI setup. You get four independent busses with independent MIDI channels, patch programmability, real-time mixing, and more. Three velocity curves plus velocity and after-touch sensitivity sliders let you set the keyboard response to suit your taste.

Arpeggiation and delay functions can control any or all of the instruments connected to the M8000. Spillover, Zone, Transposition and Detune add sophistication and subtlety as you like it. Program your setup into any of 100 memory locations for instant recall. Another option: Drive a drum machine from the front panel.

K1 DIGITAL SYNTHESIZER
K1m SYNTHESIZER MODULE

Whether you're a beginner or an experienced pro, the easy-to-use K1 multi-timbral synthesizer will reward your ears with amazingly natural sound. With 256 digital waveforms that include PCM samples of actual strings, vocals, drums, guitars and many more, you can call up an inspiring range of dynamic sound, fully programmable at your fingertips. In Multi-mode, create up to eight sounds into a combination patch that includes splits, layers and multiple MIDI channels. Combine this outstanding capability with the least expensive velocity and after-touch keyboard on the market, and you'll understand why the K1 could have a starring role in your next performance.

K5 DIGITAL SYNTHESIZER
K5m SYNTHESIZER MODULE

Many professionals sing its praises. And rightly so. The K5 with its additive synthesis design creates a brilliant, distinctive sound that sings above other instruments. With the 16-voice K5, up to 15 different instruments can be stacked, split, or divided across independent MIDI channels—multi-timbral specs that no other instrument can match. Add four assignable outputs, dynamic voice allocation, a weighted action keyboard with Alter-Touch, Attack and Release Velocity. Now you'll get an idea of the awesome power of the K5.

K5 and K1 owners have free access to Kawai's large sound library. Contact Kawai for details.

RFECT SETUP.
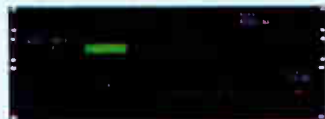
Q-80 MIDI SEQUENCER

This is one sequencer that's ready to jam as soon as you are, thanks to its Static RAM design. The Q-80 has been pulling rave reviews for its professional prowess, especially at its low price. Compare its features and you'll see why:

□ 26,000 notes of internal memory, 10 Songs, 10 Data Dump files.

□ 3.5" disc drive with 150,000 note capacity per disc.

□ Song Organization: 32 Tracks, one MIDI channel per track. Independent tracklooping, Tempo Track, 100 Motifs (melodic fragments that can be used in any track, similar to drum machine patterns) Chain mode plays songs in succession.

□ Real and Step Time Recording with Punch In/Out.

□ Bar and Event Editing. Need we say more?

MAV-8 MIDI PATCH BAY

The surprisingly affordable four-in, eight-out MIDI patch bay. MIDI assignments are easily made using the front panel sliders. A pair of jacks are also located on the front panel for easy access. Simply wonderful.

K1r DIGITAL SYNTHESIZER MODULE

One dynamite package with the same explosive sound of the K1. The single space rack is designed for maestros with tight schedules. Same specs as the K1m including front panel sound programming.

MX-8R MIXER

Our popular little eight channel keyboard mixer with 2 echo sends, input gain switches and XLR outputs. The MX-8R makes a roadworthy companion to any equipment rack.

R-50e DIGITAL DRUM MACHINE

The rhythmic sounds that spell encore: a full set of electronic drums, ambient "room" drums, a eurostyle Click. Bass Guitars and Orchestra Hits. In addition, on-board effects are programmable for every note in every pattern. Preset patterns and a serious MIDI implementation make the R-50e the right drum module. Optional sound chips also expand the sonic possibilities. Let 'er roll.

KM-20 MINI MONITOR SPEAKERS

No question. These mini power blasters will punch sound out for small studios or near-field monitoring. They boost a 12cm speaker in a bass reflex enclosure plus a 20 watt power amp, two rear panel input jacks (one switchable high/low), a bass boost switch and threaded sockets for easy mounting in any setup. Now you're wired for high performance.

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REMIX SANCTUARY

HOWARD KESSLER

In the center of New York City's too-hip Noho district, the creative crew at Sanctuary Studios is finding some innovative new uses for hi-tech musical toys – in the big gyrating world of dance edits.
Interview by Nick Armington and Lars Lofas.

THERE AREN'T A lot of recording studios in New York (or any other city, for that matter) with pink walls, lava lamps in the lobby, a large bedroom just behind the control room and a 1957 Philco television in the lounge. Then again, there aren't that many recording complexes which offer their clients two main studios, a separate MIDI programming area, two mixing/editing rooms, and a Synclavier suite – all on the same floor.

But for Sanctuary studios and its proprietors, Tom Silverman and Howard Kessler, those little extras are an essential part of doing business in

the gut-busting world of dance music – and Sanctuary, open for less than a year, has quickly emerged as one of the city's most prolific and successful studios.

All through the complex, one sees little touches which have been added to make Sanctuary's clients more comfortable – things like electronic door locks on all the major rooms ("so someone doesn't get interrupted in the middle of a perfect take"), trapezoidal mirrors everywhere, and even a window, deliberately placed in the largest studio's control room.

Silverman, the music business impresario behind Tommy Boy

Records who most recently brought you Information Society (MT December '88), and Kessler, a former DJ turned producer, set about to create a studio that would be a little different than other places in town. And with that determination, things took off.

Howard Kessler, who manages the studio, seems driven – the type of person who probably doesn't get more than a few hours of sleep on any given night. Growing up in Union, New Jersey, he found himself drawn into the radio world in high school and college, and at night, worked as a DJ to earn pocket money. This is an occupation he kept after graduating.

After starting a dance label offshoot from a worldwide children's record company, he ended up working in the music departments at two of New York's biggest radio stations, WKTU (better known as "Disco 92") and WAPP.

Contacts made over the years brought Kessler a job offer at EARS Studio in New Jersey, which meant access to a major studio facility and the chance to rebuild the studio's control room. While there, he helped build EARS into a mecca for dance mixers and DJ/producers, and started producing acts himself.

As a producer, Kessler combined his street smarts with the radio experience he'd gained in the city and accurately read the pulse of the dance markets, combining extensive tape editing with sampling and remixing to make records that were super-fortified versions of their former selves. In 1987, Kessler found himself nominated for a Grammy Award for his work with Third World on Columbia Records.

Looking around for business for EARS, Kessler contacted record company president Tommy Silverman (who, in addition to running Tommy Boy, is also a co-founder of the New Music Seminar). Silverman turned around and offered Kessler an opportunity and challenge he couldn't refuse – the chance to build a studio from the ground up and partial ownership of the business.

At the time, Sanctuary was just a set of blueprints and a dilapidated loft which had once been the headquarters of Folkways Records. Since Silverman and Kessler had worked in just about every studio in town, they made a list of pet peeves, and set about to build a recording complex that, in Kessler's own words, would have the atmosphere of "an exclusive hotel which just happens to have a ton of recording equipment in it."

Kessler elaborates: "When we sat down and planned this place out, the mentality was like that from the beginning. Let's face it – you go to a hotel, rent a room, and with that room comes all the amenities: the pool, the sauna, the gym, the restaurant, the service. The same philosophy works here – we actually call our clients 'guests.' They're renting a room and all our services – except they also get a console and a tape machine."

One of the other unique aspects of Sanctuary is that it has been designed with remixes in mind, particularly the type done by modern DJs. Being a modern dance DJ is better training for becoming a producer than many may think. Again, Kessler elaborates: "The DJ booth is pretty much like a control room. Normally, a producer will cut tape and remix it in the studio, but a DJ will do pretty much the same thing live. You're taking two and three copies of the same record and remixing them in front of five hundred people. That way, you start with a three-minute song, make it eighteen minutes long, and still keep it interesting because of the way you have changed it, by adding live echo and reverb, staggering, and doing multis.

"When that's going down night in and night out, a DJ can get immediate feedback from all those people as to what works and what doesn't, and after all those years of spinning, you develop your ears. To me it was inevitable that DJs would get involved with producing records."

Mixing is traditionally left to studio engineers. Not in the land of remixes and DJ/producers:

"Traditionally, remixing was always done just for the dance market," Kessler says, "but A&R guys are finally realizing what an effective marketing tool it is. You can take any song these days and have five or six remixes – a dance mix, an album mix, an adult contemporary mix, a pop mix, an edited mix, a video mix and so on.

"Usually, the album or pop mix is the first mix you do," he explains, "a 3½- to 4½-minute version. It's usually a really clean production, not too bass heavy because it's going to be played on the radio. Musically, it's very

"The video mix is often an extended version of the album mix – you try to make it entirely different. Michael Jackson, for instance, can take a 3-minute pop song and turn it into a 10-minute mini-movie.

"By doing all of these remixes, you increase the demand for a particular song. You'll hear the dance version of a song you have on the album, and then go out and buy the 12" single. Or you'll be blown away at the video version and want to buy that, too. All of these mixes are really effective marketing tools that let you open up entirely new audiences to the same song."

TO THIS END, Kessler and Silverman designed Sanctuary with editing in mind, installing a Synclavier for remixing, and two fully-equipped editing rooms, each with four Otari reel-to-reel mastering decks, a DJ-style mixer, turntable inputs, and plenty of editing supplies. "The problem with editing around town," Kessler explains, "is that you have to book a control room at full studio rates just to do tape edits. What we've created here are two rooms devoted just to tape editing – and the rates in those rooms are lower than our full studios."

While most mixers are content to work the old comfortable way, Kessler admits that an increasing number are thwarted by the limits of working with seemingly miles of analog tape. The power and flexibility of editing in a tapeless environment has opened up a new world for some editors – those who, according to Kessler, are willing to overcome the natural uneasiness that comes from working with new

Kessler: *"The problem with editing around town is that you have to book a control room at full studio rates just to do tape edits."*

smooth; you try to get in and out of the breaks while maintaining a strong continuity. It's a real straightforward mix.

"A dance mix, on the other hand, is usually 7½ or 8 minutes long, but you have to keep it interesting and creatively flowing for the length of the song. Often you'll cut an entirely new introduction, and a lot of times you even change the structure of the song. Sometimes you'll keep the vocal and start all over again with entirely new instrumentation and orchestration. Most of the time, the production is even hotter than the first mix.

technology.

"We saw the Synclavier as a tool which could advance the level of remixing far beyond what can be done conventionally," he explains, "and we use ours primarily as an editing tool. It's fantastic. We also use New England Digital's Post Pro workstation or a WaveFrame configuration. But the Synclavier is something you have to ease people into. It's not an easy sale to editors, because they still want to feel that razor blade and tape in their hand."

Sometimes, says Kessler, price can be a problem as well. "The Synclavier

is still very expensive – there's nothing else like it, even after all the years it's been around, and not everyone can afford one. To a person who's never worked on it before, it can seem complex, even intimidating. But it does a great deal more than anybody can do with just tape, and you can edit on the Synclavier in one-third the time it would take normally.

"Since all of our rooms are tied together, we can easily do a dump right into the Synclavier, and play around with things on it directly from the master. It has multiple outputs, so we've also kept an Audio Arts 8×24 mixer in the room for adding effects and monitoring things. The guys who

programmer, D550, Octapads, MKS50 and MKS70, SBX80, and TR808s; Yamaha DX7IIFD, TX802, TX81Z, and MEP4; Alesis HR16 and MMT8; E-mu SP12; Akai S900; Forat F16; Linn 9000; two Casio FZ10Ms; Korg EX8000; IBM AT with Voyetra Sequencer Plus software; an Atari 1040ST; and a KMX MIDI patchbay.

As we were sorting through Sanctuary's electronic toy boxes, we asked how far the complex had committed to that controversial new recording medium, DAT. Kessler noted that for studio managers, the format has its ups and downs. "Creatively, I love it. Why should I spend $75 on a ½" 30 ips master

Kessler: *"Why should I spend $75 on a ½"30 ips master which lasts 16 minutes when I can walk around with a whole album on a $15 DAT tape that fits in my shirt pocket and sounds just as good?"*

use this thing just camp out in here and manage to pull out the most incredible remixes."

Just about everything at Sanctuary is modular and ties into something else, from mobile effects racks that look like metallic milk cartons on wheels, to monstrous racks of MIDIized equipment that are also passed between control rooms.

"One of our design philosophies when we were putting this place together," notes Kessler, "was to have twenty-four hour maintenance and duplicate and triplicate of everything. That way, we know our clients will stay happy. It's the deluxe hotel idea again. When a client is creating, the worst thing that could happen is equipment failure. Having an extra reverb or MIDI module around makes all the difference – that keeps clients coming back. That and a good attitude from the staff."

The technology's certainly there, especially in Sanctuary's smaller studio "B," which Kessler affectionately calls The Dump ("'cause that's where people come and dump everything – to tape"). HAL would feel right at home in this place, amidst close to twenty MIDI modules, which, Kessler points out, contains "a representative of every food group – all the hot items. I call it the 'MIDI road show to go' on wheels."

That might be stretching it a bit, but it's a rack most musicians would be content to dream about: Roland Juno 60, Super Jupiter MKS80, MPG80

which lasts 16 minutes when I can walk around with a whole album – and then some – on a $15 DAT tape that fits in my shirt pocket and sounds just as good as the master, if not better?

"But for a studio owner, DAT can be very dangerous. A client could let the studio keep the 2" and ½" masters, while making a DAT safety that he can walk away with and take to a mastering plant. So why would that client have any incentive to pay his bill? DAT is tricky. If you let it out the door, the studio loses most of its leverage. That's why we're careful about letting clients use a DAT machine before their projects are done and paid for."

As bullish as Kessler is on just about all new forms of technology, he admits that sometimes things do get stretched too far – even in dance remixing, where stretching things out is the norm. "Twenty years ago, you played guitar and drums. Now you play a turntable, a sequencer, a drum machine and a sampler. But the end result is still the same. The medium is still music, it's just that the tools have changed.

"Technology will never make up for a shitty song. It just lets you make a slick shitty song, because technology does improve production. But the most important thing is that the song is well written. It's important to utilize technology without losing the human element. I tell everybody who comes in here, use technology as a tool to implement the ideas in your head." ∎

Roland R8
Human Rhythm Composer

**The latest in the company's long line of drum machines adds
quite a few twists to the equation, including relatively easy access
to that ever elusive intangible: feel.** *Review by David Crigger.*

EVER SINCE ALESIS redefined the cost vs. performance ratios of the drum machine market a year and a half ago, there has been great curiosity regarding what directions the Big Three (Roland/Yamaha/Korg) would go in to respond to the HR16's success. As far as Roland is concerned, the mystery is over. Instead of trying to win the war with even lower bargain basement prices, Roland has obviously decided to try to win the battle with features, features and more features – sixty-eight 16-bit sounds, stereo outputs *and* eight indi-vidual (but still polyphonic) outputs, a human feel function, user-defined macros for often repeated series of button pushes or rhythm/accent patterns . . . the list goes on.

Basics

The R8 comes programmed with 32 preset rhythm patterns and offers space for 100 more for the user to program. These can be strung together in any way desired to form up to ten songs of up to 999 steps. Pattern programming can be accomplished in real time or step time, and for the first time, Roland has come up with a scheme that allows the two modes to co-exist without limiting the machine's rhythmic versatility.

The real-time pattern record mode on the R8 now functions very similarly to most other drum machines – pattern lengths are defined in bars, time signatures are used instead of steps, and quantizing is defined using normal rhythmic values (1/8th, 1/16th, etc.) as opposed to the former scale method. Each pattern can be up to 99 bars long and can be in one of a multitude of different time signatures.

For those who are familiar with and prefer creating patterns in the more traditional Roland step-time style, don't fret. It's still here, though I don't think it will be as appealing as it was on Roland's earlier, less complex machines. The LCD display will only show the rhythms of four instruments at a time including the one currently being programmed.

After a pattern has been programmed there are more than a few neat features available to you. First are "pattern copy" and "pattern append." Both work very much like other machines, though pattern copy allows you to selectively copy only certain bars of a pattern, which is very nice. Pattern merge allows one pattern to be piled on top of a second, providing that they are both the same length and share the same time signature. In addition, "pattern extract" lets the performance of one instrument in one pattern be copied to another pattern, though, unfortunately, the new pattern must be blank for this to work.

Have you ever programmed a really great pattern into a drum machine, only to realize that you had started the pattern on the wrong beat, or the wrong bar for that matter? Well, the R8 will let you fix this problem with "pattern reframe" (a feature originally seen on the Sequential TOM drum machine, and unfortunately not copied until now). The beginning of the pattern can be reset to any location within the current pattern.

Other niceties in pattern mode include the "instrument change" function (swaps one instrument sound in a pattern for a different instrument), roll and flam buttons, the ability to mix quantize settings within the same pattern, and "multi assign" mode – this is where one instrument can be assigned to all 16 of the play buttons with each button representing a different degree

architecture is that you can switch between all five kits in a single pattern. Consequently, you could use up to 80 sounds in a single pattern.

After a pattern has been recorded, its performance data can be edited in great detail. This includes adjusting the pitch, volume, timbre, duration and panning of every single note of every single instrument *individually*. These parameters can also be adjusted in real time via the front panel slider, MIDI or through the use of a volume pedal which then duplicates the function of the slider. The timing of notes can be adjusted as well in increments of 1/96th note in macro editing or 1/384th note in micro editing – the machine's real-time resolution is 1/384th note (or 96 pulses per quarter note). Notes can be moved forward or backward in time, individually or in groups by instrument. Oddly, entering a positive number for a time shift produces a delayed performance, and a negative number creates a performance that's more on top of the beat – counter-intuitive to some, but that's life.

Sounds

You have to admit, Roland drum machines have always had an identifiable flavor in regards to their selection of sounds. If I could only use one word, it would be "fat." The R8's selection of internal sounds continue in that Roland sound tradition, yet add some of the bright, crisp transients you would expect from a 16-bit unit. There are nine different bass drums, ranging from dry, tight, single-headed drums to double-headed ones placed in large ambient rooms. The twelve snares range from deep, fat acoustics to high-pitched rimshot cracks, with a variety of different reverb and ambient treatments applied. There are three sets of four toms (plus a single "Doom Tom") called Dry Toms, Room Ambient Toms

backwards, making them very difficult to play by people who are right-handed without reassigning them in reverse order. Anyway, on to more sounds.

The two side sticks and three hi-hats (closed, open and pedal) all sound fine, as do the cymbals. There are five different cymbal sounds – crash, ride, mallet and two different cymbal bells. I couldn't hear much difference between the two cymbal bells, but maybe I was missing something. Also, I could hear a little bit of looping at the end of some of the cymbals' decays, though it was nothing extreme.

With 44 different drum set sounds, there are still 24 sounds left for percussion and sound effects. There are four congas (mute, slap, open low and slide), open drum, clave, cabasa, cowbell, tambourine, shaker, taiko (Japanese ethnic drum), gasoline can (hit with a stick), short and long whistles, agogo bell (regular and in octaves with itself) and finally the handclaps from the TR808 drum machine – probably the most popular handclaps in the world. There are three backwards sounds – snare, tom and cymbal. And finally, three sound effects (spark, surf and wheel) which are too difficult to describe, and the "rest," which isn't. It isn't difficult to describe because it isn't anything. Joking aside, a designated rest can be very useful for cutting off or choking the decay of other sounds.

Each of the sounds can be edited in terms of pitch and decay and most can also be edited with what Roland terms "nuance" (it sounds a lot like filtering of some sort to my ears). There are eight different velocity curves available to adjust the feel of the touch-sensitive instrument buttons, and each instrument's curve can be selected separately. One other nice touch is that the pads have aftertouch for producing crescendos and decrescendos while holding the roll button.

In addition to the preset sounds, the R8 includes 28 locations to store alternate versions of edited sounds. All edited sounds as well as patterns and songs can also be stored on optional RAM cards as well as via MIDI SysEx. On top of all this, there's also a ROM card slot for adding new samples as they become available.

One thing that adds immensely to the realism of the R8's sound is the use of dynamic voice allocation, allowing each sound to be polyphonic, monophonic or exclusive in the manner in which they interface with the R8's

Polyphony *"Dynamic voice allocation adds immensely to the realism of the R8's sound, allowing each sound to be polyphonic, monophonic or exclusive in the manner in which they interface with the R8's sound generating circuitry."*

of volume, pitch, duration or timbre (á la the E-mu SP12 and kits on the Studio 440 – except that those machines only have eight pads). Speaking of instrument assignments, the R8 has space for five global "kits" – assignments for the 16 pads. While this is an unfortunately low number compared to other machines, one benefit of the R8's

and Power Toms. The toms are all big and fat and their titles are all applicable. The only real weirdness regarding all the toms was the decision to break tradition (in both the drum machine and acoustic drum world) by numbering the lowest tom "1," and the highest tom "4;" and stranger still, their default placement on the front panel is

sound generating circuitry. In the past, most drum machine sounds have been monophonic, meaning that when a sound was rapidly repeated, it cut off its previous decay in order to execute each new attack. Real acoustic instruments don't tend to work that way. A real cymbal, for instance, will continue to vibrate from the first strike of the stick well past the second strike, creating a more complex, less choppy sound. When a sound on the R8 is assigned to function polyphonically, it will use any available voice circuits (from the impressive 32-voice polyphony) to produce each new attack, allowing the previous notes to decay their full length. The fact that this function continues to work even after the sound has been assigned to one of the eight individual outputs is even more impressive.

Exclusive voice assignment is typically used to group sounds that you would normally not want to sound at the same time. For example, with hi-hat sounds you normally want a closed or pedal sound to "close" or cut-off an open hi-hat sound. You can do this by assigning all of these voices to one of the R8's eight exclusive channels. Any sounds assigned to the same exclusive channel will not sound at the same time. With all of this being so powerfully implemented, it is surprising that a very common (and in my opinion, extremely necessary) function of having exclusive voices overwrite each other wasn't included. This means that if you have a pattern with eighth notes on the hi-hat and you wish to change the hi-hat from closed to open on the "and" of 4, you have to both record the open note and go back and erase the former closed one before you'll hear the open hat. This is not a good thing.

Output-wise things really couldn't be better though. Each sound can be assigned to either the stereo outputs with seven position panning or one of eight multi-outputs. As mentioned earlier, these outputs are polyphonic, allowing either small groups of instruments to be assigned to their own output or a single instrument to be assigned, yet still maintain the ability to make use of polyphonic voice allocation.

Human Feel

So much of what makes a performance sound real (or human) are the multitude of tiny inconsistencies created in the course of playing something repeatedly. Not so much inconsistent

time or rhythm, but variations of accents and color. The human feel function of the R8 attempts to provide a way to manufacture a certain amount of groove into patterns without having to carefully edit each note individually in pursuit of the perfect grooving drum program. Some may yell that this is cheating, but it's not really because if you don't know what you're going after, at least to some degree – this function isn't going to figure it out for you.

In fact, the first stumbling block is figuring it out (not the easiest task with a not untypical Roland manual as your guide). Basically you can create eight different human feel templates that can then be assigned to any number of patterns. Each template can be adjusted to affect the velocity, pitch, decay and nuance of up to eight different instruments. First, you select the length and rhythmic density of the template (for instance, 8 sixteenth notes or 2 eighth notes) and choose the eight instruments that will be affected by this template. Then, for each of the four parameters (velocity, pitch, decay and nuance) a map is created determining how much each step of the template will emphasize or de-emphasize each of the different parameters. The next step is to determine which instruments

don't change pitch much when you play them.

Macros

The R8 is singular in its ability to store and perform user-created macros. These come in two forms – rhythm and function. A rhythm macro consists of a singular rhythmic pattern (up to sixteen steps long) with associated velocity values, which can be recorded into a pattern on any instrument by pressing the desired instrument's button at the point the rhythm is to start. The R8 then executes the rest of the rhythm in perfect time while maintaining the pre-programmed velocity relationships. Ten of these kinds of macros can be created.

The other kind of R8 macro deals with more general button pushing. Let's say you're doing a new song made up of three-bar phrases of 5/4 and you know you're going to be erasing a bunch of old patterns out of the machine while programming it. Clearing the pattern, setting the time signature and the bar count for each new pattern in this song would normally require a considerable amount of repetitive button pushes. With the macro function, these can be recorded once and then played back at any time with the pressing of two buttons. This

Pads *"The buttons have very little give in them, so they feel very hard. Playing them for a long period of time could easily become painful."*

will be affected by which parameters. Some of the eight instruments might only be affected by velocity or pitch, while others might be affected by all four.

As described so far, the results might possibly be interesting (and in many cases, quite useful), but there would be no variations until we turn on the random factors. Randomness can be turned on or off and adjusted for depth and probability for each parameter separately. Needless to say, with things adjusted the wrong way, a human feel template could be used to make the machine sound less human than it did to start with. So, if you're expecting a button that you can push to instantly make all of your programming sound musical and funky, dream on. But if you're looking for the subtleness that is this feature's true strong point, this could be a very useful and powerful tool. One last thought – when going for realism, use the pitch parameter sparingly as most of the drum and percussion instruments available here really

could really be a time-saver. Pretty much anything that can be done from the front panel can be recorded into a macro, and again, ten of these can be created for use at one time.

Odds and Ends

There are so many cool functions on the R8 that it's nearly impossible to cover all of them in detail. Things like the real-time clock (hours:minutes: seconds) in song mode, that can calculate how long a song will last at a given tempo or that can set the song to an appropriate tempo to fill a desired amount of time. At this point I haven't discovered anything that should be included in a machine of this level that's missing. Yes, it syncs to tape, it follows MIDI Song Pointer, tempos of songs are programmable, songs and patterns can be named, the MIDI implementation appears to be very thorough, and on and on.

I'm personally not thrilled with the instrument buttons' feel. I had a little difficulty playing any kind of articulate

rhythms on them, though it seemed to help if I smacked them pretty strongly. This would be fine except for the fact that the buttons have very little give in them, so they feel very hard. Playing them for a long period of time could easily become painful.

In addition to the few things I've mentioned, though, I have nothing at all to complain about – except the manual. Arrrrgh!! At least it's comprehensive (at 230 pages), and in many ways it's definitely an improvement over Roland manuals of the past. But, the stiffly translated English ranges from being simply uncomfortable to down-right indecipherable. Oh, well – I am by far not the first person to raise this issue in print – but it's a shame that a company that produces such great gear insists on making their customers learn their machine in spite of the owner's manual, rather than with the help of it.

At this point I should also mention the R5, the R8's younger sibling. It has only four individual outs plus a stereo pair, a smaller LCD (minus the rhythm pattern display), and lacks the ROM card slot for future sound expansion (though it has more onboard sounds), but otherwise is identical to the R8. Oh, except for one thing; it's $300 less, which should make it quite attractive for those on a budget.

The manual aside, the R8 seems well-suited to professional recording work, yet it's not priced out of the home/demo market. And if you think it is, there's always the R5. There are a

number of features debuted on these machines that I think are destined to become standard features on all drum machines in the future.

Just when I was beginning to think that the drum machine was an idea that had possibly run its course, it's nice to see a new family of machines with not just a couple, but a bunch of creative, useful features. You should definitely check these two out. ∎

PRICES: R8, $995; R5, $695.
MORE FROM: RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

Fun in the WAVES

Creating sounds on a sampler which emulate the motion of natural samples but with totally alien sound sources – namely, wavetables – can result in some exciting new timbres. In the first of a two-part article, the process of building up component waves using additive synthesis is discussed.

Text by Tom McLaughlin.

NATURAL SOUNDS ARE interesting to our ears because of the fact that they evolve – they go from a "plick" to a "bzzzz" to a "hummm." And as modern musicians we all know that we can get quick access to those moving natural sounds with the aid of a sampler. However, what attracted many of us to synthesizers and, to a certain extent, samplers in the first place was not having something like a string or brass section under a few plastic keys, but being able to create totally alien, *new* sound textures.

To enter this zone of unique sonic textures we'll have to concern ourselves with mingling two techniques – first, we'll start with bits of hand-created synthesizer waves, and then use a sampler (and some tricks borrowed from "real" instruments) to create realistic "unnatural" sounds. The character of many instruments changes drastically even over short periods of time, and this means a good bit of button-pushing and mouse-moving with little guarantee of producing anything useful. I won't pull your leg – the amount of work involved to create these new sounds is not small. But neither are the rewards.

Groundwork

Designing progressions of wavetables and sampling go hand in hand. They employ the same sort of technology: the storage of audio waveforms as digitized computer "snapshots" of sound that, when played back in the order in which they were sampled or designed, will simulate or recreate moving sound. With "cut-and-paste" sample editing software we can rearrange these segments of digitized sound material at will, with total control over what we hear.

Table 1.

THE HARMONIC SERIES
(fundamental A = 110 Hz)

HARMONIC NUMBER	FREQUENCY (Cycles per second)	NOTE	OCTAVE	(Relative to fundamental)
1	110	A	1	Fundamental
2	220	A	2	Octave
3	330	E	2	Fifth
4	440	A	3	Octave +1
5	550	C#	3	Major Third
6	660	E	3	Fifth
7	770	G	3	Minor Seventh
8	880	A	4	Octave +2
9	990	B	4	Major Second
10	1100	C#	4	Major third
11	1210	D#	4	Aug fourth
12	1320	E	4	Fifth
13	1430	F#	4	Major sixth
14	1540	G	4	Minor seventh
15	1650	G#	4	Major seventh
16	1760	A	5	Octave +3
17	1870	A#	5	Minor second
18	1980	B	5	Major second
19	2090	C	5	Minor third
.20	2200	C#	5	Major third
21	2310	D	5	fourth
22	2420	D#	5	Aug fourth
23	2530	D##	5	
24	2640	E	5	Fifth
25	2750	F	5	Minor sixth
26	2860	F#	5	Major sixth
27	2970	F##	5	
28	3080	G	5	Minor seventh
29	3190	G-#	5	
30	3300	G#	5	Major seventh
31	3410	G##	5	
32	3520	A	6	Octave +4

Table 1 is a list of the natural harmonic series, displaying the pitch relationship of the selected harmonic to the fundamental or first harmonic.

Table 2.

TABLES FOR TYPICAL SYNTHESIZER WAVEFORMS

HARMONIC	SAWTOOTH	SQUARE	25% PULSE	TRIANGLE
1	100%	100%	100%	100%
2	50.00	–	50.00	–
3	33.33	33.33	33.33	11.11
4	25.00	–	–	–
5	20.00	20.00	20.00	4.00
6	16.66	–	16.66	–
7	14.28	14.28	14.28	2.04
8	12.50	–	–	–
9	11.11	11.11	11.11	1.23
10	10.00	–	10.00	–
11	9.09	9.09	9.09	0.82
12	8.33	–	–	–
13	7.69	7.69	7.69	0.59
14	7.14	–	7.14	–
15	6.66	6.66	6.66	0.44
16	6.25	–	–	–
17	5.88	5.88	5.88	0.34
18	5.55	–	5.50	–
19	5.26	5.26	5.26	0.27
20	5.00	–	–	–
21	4.76	4.76	4.76	0.22
22	4.54	–	4.54	–
23	4.34	4.34	4.34	0.18
24	4.16	–	–	–
25	4.00	4.00	4.00	0.16
26	3.84	–	3.84	–
27	3.70	3.70	3.70	0.13
28	3.57	–	–	–
29	3.44	3.44	3.44	0.11
30	3.33	–	3.33	–
31	3.22	3.22	3.22	0.10
32	3.12	–	–	–

Table 2 lists the harmonic content of typical synthesizer waveforms. Notice the similar 1/x relationship (except for the triangle wave) between the amplitude of the harmonic in relation to the fundamental.
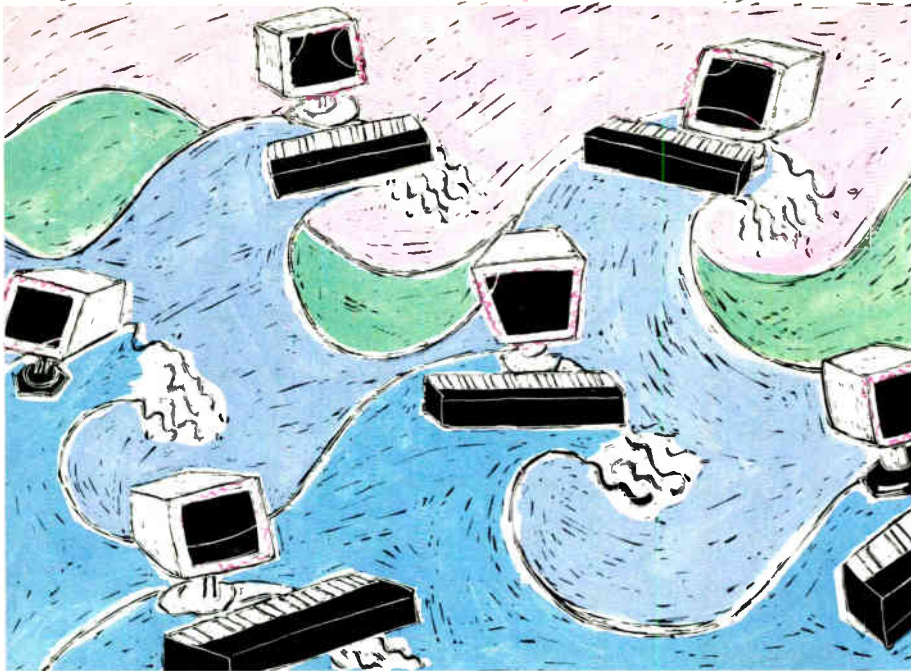
Outrageous harmonic and filter-sweep events are surprisingly simple to put together from separate waveforms. Correcting or adding new tone colors to existing samples can be accomplished with digital sample mixing. Specific portions of a sample can be enhanced or reinforced by keeping track of key timbre and amplitude transition points, and building a wave progression to match. Adding new and distinctive attack transients to percussive sounds doesn't consume very much time at all – all you need is an interesting "blip," "plick," "flick" or "swoof" for the beginning of a sound. Even more enticingly, seamless loops can be constructed – wavetable loops can be designed to smooth out existing sample loops.

The first thing to think about is gathering or creating a group of interesting segments to cut and paste. Wavetables can be constructed from segments of samples or digitally synthesized waveforms. The two can even be used together in the same wavetable, but unless you have sample rate conversion software or spend the time to create waves of the same pitch as your samples (or are just darn lucky), you're going to have some nasty jumps and warbles. (What about some software to make this easier, software designers?) Each of these sound segments can be one or several wave cycles long, but for a smooth transition (avoiding a click) between segments, start them all on positive-going zero cross points and end them

on negative-going ones (or the other way around).

It's getting easier to find software (i.e., Softsynth, SampleMaker, FDSoft, Turbosynth) that enables you to create waveforms (or strings of waveforms) on a computer and transfer them to a sampler for playback. If you have access to Kawai's K5 or any other additive synth, of course you can use them as well. Regardless of the source, once inside your sampler, the segment is treated as a sample – with, unfortunately, the accompanying characteristic of it getting shorter the higher it's taken from its "root" pitch and longer the further it's transposed down. This "munchkin-ization" is a drawback, but if you've grown used to mapping multi-samples for realism, you're already living with it comfortably enough.

Personally, I'm a fan of additive synthesis for creating wavetables. I've used additive synthesis to create interesting variations on existing instrument family "themes" and intermediary "bridging" tone colors impossible with subtractive or FM synthesis alone. For the past several years I've been creating additive waveforms and wavetables on my PPG Waveterm (with its 32 harmonics) and using them as powerful digital sounds in their own right, as well as mixing them with sample material. I've also started experimenting with additive synthesis software for the Akai S900. Take it from me, designing waveforms can be both rewarding and frustrating – setting out to create a wave that

sounds anything like a "real" instrument may prove disappointing for all but the most simple acoustic events. It's much faster and easier to sample the real thing.

On the other hand, designing sounds in the digital domain can be more fun than playing Pac Man. Remember to save as you experiment, holding onto tones that you like and maybe even those that you don't like so much. Single waveforms take up miniscule amounts of memory space. Hundreds can be stored on a floppy disk – even complex waveform multi-samples, with slightly different waveforms under each key, will probably take up less space than an average sample – and interesting multisample and wavetable transition material may often be found in waveforms you came up with on your way to discovering "the biggie."

The Harmonic Series

Hermann Helmholtz and Jean Baptiste Fourier have a lot to answer for. Between them, they deduced that complex periodic sound waves could be broken down into combinations of much simpler sound waves (called "harmonics") at any given time during a sound. These harmonics are themselves pure sine waves – the one waveform with no overtones.

Table 1 shows how the normal, integer (whole number multiple) harmonic series relates to musical intervals – the 2nd is the octave, the 3rd is an octave and a fifth, etc. Some pretty weird intervals, in relation to the fundamental, turn up above the 20th harmonic – see harmonics 23, 27, 29 and 31.

Table 2 shows what harmonics are used in what strength to build typical synthesizer waveforms. Note that the sawtooth, square (50% pulse) and 25% pulse waves are all based around the same mathematical progression; the fundamental amplitude is divided by a given harmonic number. The triangle wave is similar to the square wave in that only odd numbered harmonics are present, but radically different, as the fundamental's amplitude is divided by the square root of a harmonic's number.

If you're into simulating acoustic instrument tones, harmonic analysis of instruments can be found in many musical acoustics books (be wary of the accuracy of early works) and especially back issues of the *Journal of Audio Engineering* and the *Computer*

Table 3. HARMONIC	SYNTH BELL	OBOE (D# 311Hz)	CLARINET (D# 311Hz)	MONSTER SAWTOOTH
1	100%	80.70%	100%	57.14%
2	-	54.38	1.17	85.71
3	50.00	84.21	36.03	19.04
4	-	75.43	1.47	100.00
5	-	100.00	61.76	11.42
6	33.33	17.54	2.20	28.56
7	-	5.26	11.76	8.16
8	-	2.63	5.14	50.00
9	-	12.63	20.58	6.34
10	25.00	50.87	4.11	17.14
11	-	31.57	7.35	5.19
12	-	21.05	7.35	33.32
13	-	11.92	11.03	4.39
14	-	4.38	2.20	12.24
15	20.00	1.57	2.35	3.80
16	-	1.75	1.17	25.00
17	-	1.57	3.67	3.36
18	-	1.40	0.73	9.52
19	-	1.22	0.29	3.00
20	-	0.87	0.58	20.00
21	16.66	0.70	0.44	2.72
22	-	-	-	7.78
23	-	-	-	2.48
24	-	-	-	16.65
25	-	-	-	2.28
26	-	-	-	6.58
27	-	-	-	2.11
28	14.28	-	-	14.28
29	-	-	-	1.96
30	-	-	-	5.70
31	-	-	-	1.87
32	-	-	-	12.49

Table 3 shows the harmonic content of a few different digitally created additive waveforms, including a recreation of a clarinet and oboe sampled at a pitch of D #3.

MULTI-SAMPLE IN MINOR THIRDS
(Aah-type Formants)

Table 4.

Formant Peaks at: 700Hz (+20%)
1100Hz (+10%)
2600Hz (+5%)

MAP ROOT NOTE	FUNDAMENTAL FREQUENCY (Hz)	1ST PEAK		2ND PEAK		3RD PEAK	
A	110.000	6th +10%		10th +10%		24th +5%	
		7th +10%					
C	130.812	5th +10%		8th +5%		19th +2%	
		6th +10%		9th +5%		20th +3%	
D#	155.563	4th +10%		7th +5%		18th +5%	
		5th +10%		8th +5%			
F#	184.997	3rd +2%		5th +1%		14th +5%	
		4th +18%		6th +9%			
A	220.000	3rd +15%		5th +10%		12th +5%	
		4th +5%					
C	261.625	2nd +2%		4th +8%		10th +5%	
		3rd +18%		5th +2%			
D#	311.126	2nd +18%		3rd +4%		8th +3%	
				4th +8%		9th +2%	
F#	369.994	1st +2%		3rd +10%		7th +5%	
		2nd +18%					
A	440.000	1st +10%		3rd +10%		6th +5%	
		2nd +10%					
C	523.250	1st +15%		2nd +15%		5th +5%	
D#	622.253	1st +18%		2nd +12%		4th +4%	
						5th +1%	
F#	739.988	1st +20%		2nd +10%		3rd +5%	

Additional formant bands to experiment with are:

"Ooo"	300	625	2500	(All figures in Hz)
Oboe	475	1300	1700	
Clarinet	675	1000	2000	
Violin	400	1200	3400	

Table 4 shows the appropriate adjustments to make to various harmonics in additive waveforms to create a format-like effect.

Music Journal. Although much more realistic than subtractive synthesis imitations, you'll find, as with samples, if taken too far from their root pitch, additive things start sounding strange. The bottom line is that there isn't a "universal" waveform that will depict an acoustic instrument throughout its entire playing range.

Table 3 has a handful of waveforms to get you started. Again, remember that the numbers in the right-hand columns are the relative strength (versus 100%) of each of the harmonics: – Synth Bell is very simple and one of my favorites. Its harmonic amplitudes follow the formula for the sawtooth wave but with progressively more space between harmonics as they move upwards. – The oboe and clarinet waveforms were analyzed from samples with the amplitude of the loudest harmonic adjusted to 100%. Both were sampled at D# 311.126Hz (the D# above middle C on the piano). To my ears they sound most realistic when played within a fifth of the root. The oboe, by the way, is a good example of a sound in which the fundamental is not the loudest

harmonic. – Monster sawtooth demonstrates how three octaves of sawtooth wave can be layered upon themselves in the same waveform, loudest harmonic again adjusted to 100%.

Ignoring the naturally-occurring decrease in amplitude in higher harmonics (as the Synth Bell more or less does) makes building super-bright waveforms possible. This is unique to working in the digital domain, and you won't find sounds quite like these anywhere else. Be adventurous, too – for example, try bridging the gap between instruments by averaging their harmonic values for an "Obonette" (or whatever) tone color.

Sampled Sine Waves

Even if you don't have software for additive or wavetable synthesis, you still have plenty of scope to experiment in this area using sampled sine wave progressions. FM synthesizers have either four or six sine waves available at the same time that can have their own frequencies and, admittedly, limited, amplitude envelopes. Eight-voice, four-oscillator multi-timbral FM

synthesizers such as Yamaha's TX81Z can stack up to 32 harmonics in one pass. The same applies to almost any multitimbral synthesizer able to play its voices in a stacked or "mono" mode.

Work out your progression for the first few harmonics, sample these, then repeat the process for the next batch of harmonics. Once you've sampled these separate "clusters" of harmonics, they can be mixed via sample editing software (some samplers have onboard mixing facilities, too). If you don't have mixing software but still have the creative urge, you can record and mix harmonic clusters using multitrack tape and sample the composite wave.

This sampled harmonic method makes experimenting with non-integer harmonics (harmonics that don't follow a nice, neat, tuned progression) and the assignment of pitches to harmonics a breeze, especially with FM synths where oscillators can be detuned, given a pitch envelope, or even modulated. Rapidly modulating the pitch of selected harmonics or harmonic clusters gives a fuzzy feeling to sounds and can be of help in simulating vocal or instrument breath,

bow scrapes, and even colored noise. (John Chowning, father of FM, has a demonstration where a bell tone changes to a voice and back again just by warbling some of the harmonics.) When you find a composite progression that you really like, remember to back-track and record a multi-sample of it to keep the time/pitch ratio more constant.

Don't underestimate the power of this method of sound synthesis. Although it is laborious, I don't think the computing power and programs needed to create the type of wavetables we'll be constructing are quite with us yet. (Someone, somewhere must have, or be working on, a piece of software that gives more freedom with operator envelopes, maybe even software allowing something like a TX81Z to be used as a 32-harmonic additive synthesizer. It'd be nice.)

Beyond the Puritan approach is Free Fundamental Additive Synthesis. Until now, we've been dealing with simple sine waves as harmonics which contain no overtones whatsoever. Wolfgang Palm with his PPG Waveterm may have been the first (followed by the Prophet VS) to introduce the concept of building complex waveforms using any waveform for its harmonics. The alternative waveforms available in any multi-oscillator instrument should give you room to experiment in this area. Also remember that waveforms from any source can be combined with sample-mixing software to make composite tone colors.

Formants and Resonance

Once waveforms are in your sampler, they can be treated in the same way as samples: with looping, DCF, DCA, vibrato, automatic and manual pitch-bend, detuning between layered sounds, and so on. If you've found a tone color you really like, you might want to take the time to construct a multi-sample of it, spreading copies of that waveform across the keyboard. Multi-sampled waveforms have considerably more warmth and character than single waveforms covering the entire keyboard range.

One thing you can simulate with additive synthesis and multi-sampling are the resonant peaks that occur naturally in instruments, known as "formants." These peaks stay at fixed frequencies, regardless of the note being played – much like playing your samples through a graphic equalizer with a few select bands run up. To

simulate this, selected harmonics need to be adjusted in amplitude to recreate the formant/resonance bands. Creating a multi-sample means that these artificially boosted frequencies don't wander too much with transposition from their "home" frequency.

Table 4 shows how to adjust an additive sound to create an "ahh" formant. An "ahh" has frequency peaks at 700, 1100, and 2600Hz. These peaks translate to an increase in amplitude of 20, 10 and 5% at their respective frequencies. Start with a vocal-like sound, and create a new wave every minor third using the root pitches in the table. Go down the columns to the

right to see how much to boost which harmonics. Table 4 also includes a few other formants for you to try out.

Wave Goodbye . . .

So, that wraps up tips on how to build some interesting sounds and waves using variations of additive synthesis. Next month, I'll go into how to combine these waves with samples and each other to create those weird new sounds I was talking about. Take care and happy wave building . . . ∎

(For more information on additive synthesis, read the All About Additive *series in the April and May '88 issues of* MT.)

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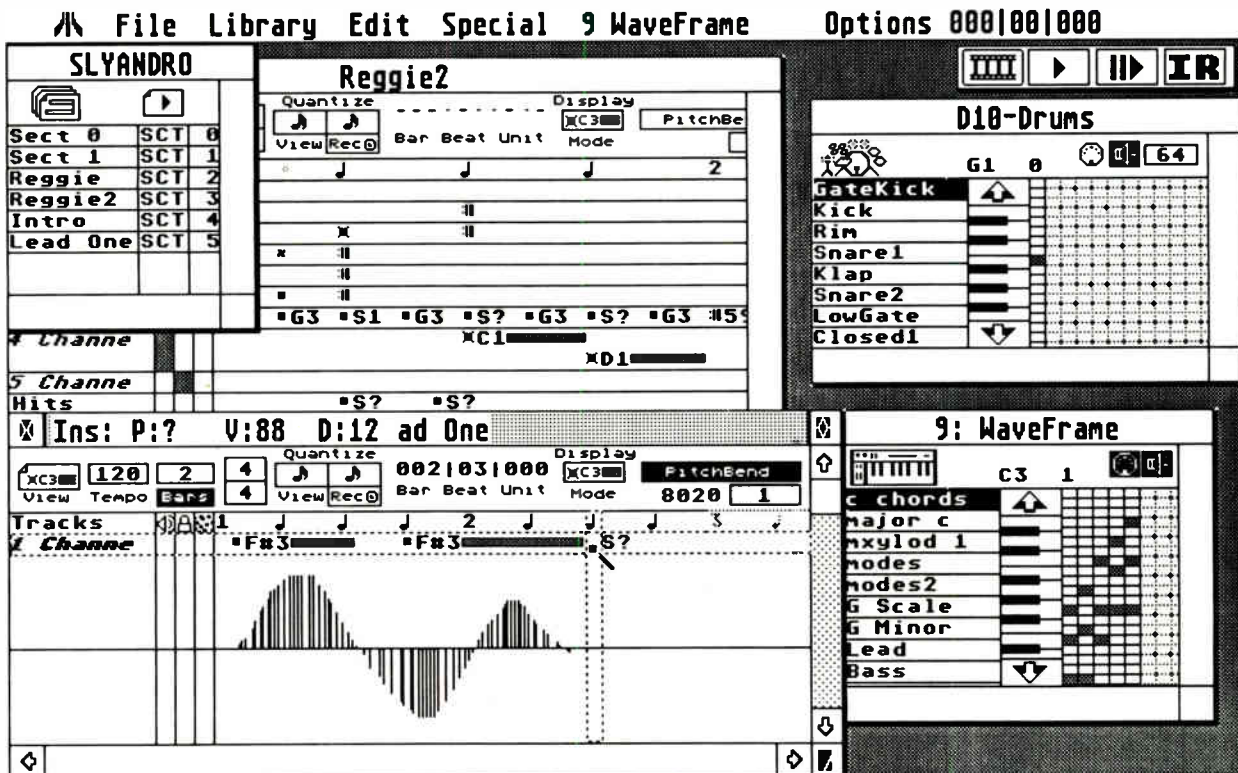
From the pioneers in algorithmic composition comes an intelligent sequencer for the Atari ST that can act as a co-composer. *Review by Chris Meyer.*

THERE ARE SOME trends in sequencers these days that I don't like. Namely, they seem to be getting more complex, and require more user-intervention to get a song out the other end. These trends have been masquerading under the titles "features" and "improvements." And I guess it's all very well for the songwriter who knows exactly what he or she wants to do before sitting down to record and edit. However, my songwriting ideas are a lot more muddled and indistinct – maybe a phrase here or a sketch there; maybe something I've stumbled across jamming on the keyboard – and these complex sequencers scare me off.

The idea behind RealTime seems to be creating a sequencer that *encourages* muddling and experimentation. It has a friendly graphically-oriented interface, and most of the normal sequencer editing features you would expect. It also allows you to make your edits while a section is looping (to hear the changes at once), has several "blurring"-type editing commands to add a bit of human feel to your work, and has a few algorithmic composition tools thrown in to boot. It's also impossible to describe all it can do in under four thousand words – the friendly-but-to-the-point manual is over 150 pages long (and creates more questions than it answers), plus Intelligent Music seems to be actively involved with updating RealTime. Nevertheless, here

goes at attempting to give you a feel for the potential (and potential frustrations) of doing sequencing the "Intelligent" way:

The Whirlwind Tour

RealTime is a GEM-style Atari ST application that comes on a copy-protected disk (send off your warranty card and you get a backup plus hard disk installs). As mentioned, the program is heavily graphically oriented. You can choose several ways to display notes, with the most common being a little head (whose shape gives you a rough idea of the velocity), followed by the note number and a gray bar denoting the length. Percussion tracks have just the head (you can define if a ►

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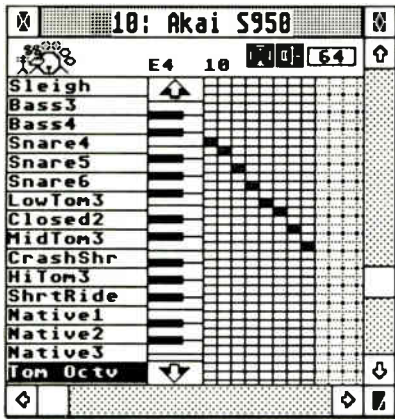
Devices

This one feature in RealTime that looks to be the cleanest, simplest "good idea" in reality turns out to not only be the feature with the most potential; it's the most potentially frustrating in the whole program.

The basic concept is simple – for each of the 16 MIDI channels, you can create a "device." Not only can you name this device (so that the name of the synthesizer, sampler, drum machine, etc. on that channel always automatically appears as the track's name), you can state if it's a drum machine or a keyboard device. This affects how the events for that device are displayed in RealTime's Main view (see body of review).

If it's a drum machine, you can create sub-devices for individual sounds and assign them specific MIDI key numbers – i.e., the snare always comes in on C3, etc. A track can now just become "the snare drum on MIDI channel x," and you can paint in a drum pattern with the Striker without having to worry about what MIDI note the sound is assigned to. Better than that, when you record from a drum machine that has a properly-built device, it will automatically open and fill tracks labeled with the appropriate sub-device names for each sound. (If a note comes in that hasn't been assigned a sub-device, a blank sub-device is created, track opened, and unassigned note painted in – but it's all but useless.)

These sub-devices don't have to be restricted to just one MIDI key – and this is where the fun (and frustrations) come in. Along with a MIDI note number, each mapping for a sub-device has a "step" number. For a sampler with a drum set spread out across the keyboard, you can define the (for the sake of argument) octave that the snare is spread out over as 12 different steps. When you record, the step number appears as part of the note's definition (as opposed to an "absolute" pitch, such as C3). If you randomize the pitch of something recorded as a step pitch, only pitches with steps assigned to them are "legal" – in other words, you don't have to worry about a random pitch playing out of range and triggering a kick drum by mistake.

The steps can be pitches in a melody for a keyboard-style device. Or notes can be piled up on a step, and each step can be a chord – all handy for those who prefer to paint in their notes, or want to use the algorithmic/random facilities in RealTime to vary a progression. These mappings get remembered per *track*, and can be edited or swapped with others after the fact.

Problems? If you define a keyboard sub-device with steps and record the track via MIDI, the step numbers *won't* be entered into the track – just the absolute pitches. That throws the full marriage of MIDI entry and algorithmic variation out the window. They'll record as steps if you call it a "drum" sub-device, but then they don't get displayed or treated as real notes with durations and all the note-like trappings. This prejudice against those who would prefer to play a normal instrument than enter everything at a computer is common to the computer music crowd, and one of the things that makes me computer-shy in the first place.

The potential I see in Devices include: 1) creating a sub-device for every preset of every sampler disk I have (particularly the ones that have more than one sound spread across the keyboard), and 2) creating sub-devices for every scale and key known to mankind and being able to swap key and scale by merely dragging a new device over a track. But I *can't* – as long as I insist on at least pretending to be a musician, as opposed to a computer operator. The good news? RealTime's creator Eric Ameres seems to agree, and you may indeed see these changes within the next few months. – *Griping by Chris Meyer*

tinuous controller of your choice can also be displayed (graphically) per track. You can define the display resolution, and either manually scroll across your work or have RealTime do it while running. RealTime also does many things automatically, such as opening a new track as soon as you start recording. All in all, very friendly.

A "section" is the current fragment you're working on. It can have up to 999 bars (with a wide range of time signatures) and up to 256 tracks. Any track can be muted or "locked" (protected from accidental recording or editing). Sections can be strung together and looped into songs. A song may also include another song, and a standard MIDI file can play back in parallel with a song. You can take a "movie" of a section or song, save that as a MIDI file, re-open it as a new section (all the MIDI channels will sort themselves out into the appropriate tracks), and record over it if you so desire. RealTime also makes it Real-Easy to save or load individual sections or the entire work in progress, and contains all the typical cut/copy/paste/ merge/shift functions you would expect.

RealTime loops in record mode. You can auto-correct before or after recording, and looped recording can add to or replace what was there previously. Resolution is 192 ppqn. RealTime will wait on you to play something to start recording, or start off immediately upon you telling it to do so (by the way, you can set up specific MIDI controllers and notes to remote-control RealTime's transport and tempo). Real-Time syncs to MIDI clocks (including song position pointer), MIDI Time

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Figure 1. The section edit toolbox.

Code, or Dr. T's Phantom (it can also run by itself). When running by itself or against SMPTE, you can set up and graphically edit a tempo map of speed variations. Individual tracks within a section can loop independently, or the whole section can loop in sync.

Graphic editing is a bit of fun, and includes a number of "tools" (see Figure 1) which are always just a pair of mouse clicks away. The first is the

"Striker" – this is for painting in specific notes in specific places (Real-Time makes a graphic and functional distinction between performed and painted events). You can position the tool and play the desired note and/or velocity over MIDI, or type in the note value or "step" in a table of pitches (again, see sidebar on Devices). The velocity and duration of the notes you strike in can also be selected by clicking on one of the five preset velocity and articulation palettes (see Figure 2 – the upper row are velocities; the lower are "articulations," or lengths). The values each of these
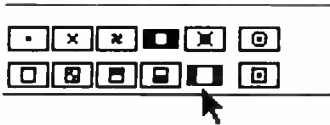
Figure 2. Velocity and articulation palettes.

icons represent may be edited elsewhere. The sixth icon to the right of each row represents a totally random number.

The monkey wrench tool is my personal favorite, and is for adjusting notes already recorded – clicking and dragging edits a note's pitch, velocity, and duration in fairly intuitive ways. The next tool is the eraser, for blotting out mistakes; the next is a rest, which is of occasional help to some of the algorithmic functions; the next is for placing a loop marker; the next is for selecting a region to edit or move as a whole; and the final one is for adjusting an event's position in time. When editing continuous data, the striker, wrench, loop tool, and rest tool turn into crosshairs for reshaping the data (the others work as you would expect). By the way, there's also a menu command for thinning controller data in a selected region.

While moving around inside a section's workspace, a set of grid crosshairs show you what time division and track you're in (the display resolution autocorrects your edits – to tweak the time of an event just a little, you need a very fine display resolution); on the upper left line of the section window are numbers that show you the pitch, velocity, and duration of the note most recently selected. Your current "time" is also always displayed. You'll give your mouse hand a workout, but in the end I prefer graphic editing to retyping numbers in an event list – particularly since the ▶

▶ section keeps playing while you edit it.

For those who prefer a more numerical form of editing, there's "smart" editing with the Edit Transforms (see Figure 3). You can pick what type of event you're editing (performed notes, painted notes, and all the various controllers), their pitch/value range, velocity and duration (in the case of notes), and where they fall in time. RealTime will then take this and convert it into the event type (notes must remain notes), change their values (set
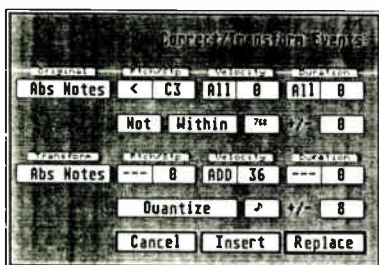
Figure 3. An Edit Transform window which increases velocity and quantizes in one pass.

them to an absolute value, add or subtract a fixed amount, quantize their value, or scale them by a percentage), and quantize their placement. This covers about every change-value type of edit you'd want to perform, although it means you have to go through this entire process to do relatively simple things like permanently transpose a line or quantize it after the fact. And no, SysEx recording or editing is not supported (although Intelligent is looking into it).

Speaking of transposition, you can temporarily transpose a track within a section. You can also shift it in time, to add a leading or lagging feel or make it
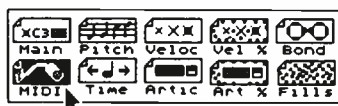
Figure 4. The "View" palette.

for a slow sampler or synth. Altering these is done in their respective "views." A view is what type of information is currently being displayed for the tracks in the current section. You have eight views to choose from (see Figure 4), with the most common being the "Main" (velocity/pitch/duration) view (as seen in the header screen dump). The Pitch and

Time views also allow a bit of blurring (which I'll get to below); the Velocity and Articulation views allow you to customize the values represented by the icons used for hand-painted notes (see the Striker tool above). The Velocity and Articulation percentages are for blurring the strengths and lengths of all notes; Bond and Fills are algorithmic-oriented things (all of which will be covered in the next section). Finally, the MIDI view allows you to set the channel, default patch number, and initial MIDI volume level for each track – a real handy feature.

I'm sure I left something out, but it's time to move onto where RealTime starts going beyond being a normal sequencer.

Blurring and Voodoo

As alluded to above, you can have RealTime blur what you've entered into it, as opposed to always playing it back with computer precision. This goes a *long* ways towards making your one-bar bassline hold up to 137 looped repetitions (and I don't care how clever the notes are – it's going to get boring otherwise). You can enter a plus/minus range for velocity, pitch, duration ("articulation"), and timing. There are no time-variable templates (as opposed to Jam Factory's 'Time Distortion' maps – pity, that) – i.e., you can't say hold the downbeats steady and vary the notes in between, or set patterns for how events vary over the course of a bar – but it still helps loosen things up quite a bit. Blurring pitch is usually useless, but when used to play back a percussion sample (with the legal notes bounded by the track's device range – again, see sidebar on "Devices"), you can have fun with conga and other ethnic percussion lines (I've had great fun with a tabla disk and this feature).

Aside from blurring occurrences of notes, you can also have them just plain not appear, or scramble their order. You can set a percentage probability that successive notes will or will not play. Again, this is useful for percussion (for thinning out overly-busy percussion lines, and making them sound different on each pass), or for "bonded" tracks (see below). If you entered notes with the Striker, and told them to play the notes in a Device in order (yet again, see that all-important "Devices" sidebar), you can set a probability of how often that order gets scrambled – for creating variations on a melodic theme. Even loop points can

have probabilities – maybe set up a straightahead looping bassline or tom beat, and have it occasionally open up into a fill or variation on the theme. All of these are fun, and don't take too much mental involvement (with the exception of scrambling the order of notes) to experiment with and reap the rewards from.

Time for "Track Bondage" (I give Intelligent credit for coming up with intriguing names for their new features). This is very simple – you can assign a track to not play its own notes, but the notes of another track. Simple layering? Not when you take time and pitch shifts and the ability to only play some of the notes into account. During my very first session with RealTime, I spent about a half hour getting a bassline monkey-wrenched into shape (really concentrating on its feel, etc.), and then bonded a vocal patch to it. I set it a little bit ahead of time (to compensate for its slow attack, and to lead the bassline a little), transposed it an octave above the bassline, and had it play just 20% of the notes – instant accompaniment. And believe you me, I wouldn't have thought of *playing* that; this is where RealTime becomes a co-composer for musically-impaired individuals like me who don't have song arrangements spring full-blown into their heads.

Now for some real fun – Fills. RealTime will create extra notes to play between the ones you've already recorded. You can set a percentage for how often they happen, a time division for how many notes RealTime tries to cram between existing ones, what track's sounds are used to perform the fills with, and other rules concerning the timing constraints of the fills. In its simplest mode, RealTime looks at two successive notes, and tries to repeat the first note "x" number of times between its original occurrence and the next note. (*Unless* you created a "step" note with a device – then it'll just pick a random step for the fill. Okay for percussion, but often senseless for melodic work.) For example, if you have a snare beat on half notes, and "x" (the Fill time divider) set to 2, RealTime will occasionally put snare hits on the quarter notes in between. It'll also shorten the duration of the first occurrence of the note, so it won't overlap with the fill note. Sound overly simplistic? Try it. It doesn't create grace notes of pitches between existing ones or rave-ups into the chorus, but it does help a bit.

The other weird feature about RealTime is the ability to run another GEM application while RealTime's still around, and control RealTime's transport while its desk accessory ("DA") is open in that other application. Real-Time won't let you record while in another application; it'll either ignore you or bomb (which it did to me while in WordWriter, a popular and common ST word processor). Marrying Real-Time with even a basic word processor would be nice, because there's no "notepad" area for reminding yourself what sampler disk to load or how to set up the knobs on your mixer; as it is now, it's basically just for playing your own background music while muddling about in another application.

Speaking of bombs, RealTime isn't the most bulletproof application I've seen in my life. The above bomb is the only out-and-out crash I've "legally" had (I also killed it when I accidentally set up a MIDI feedback loop – no fault of its own); I have had a handful of display bugs, some data got trashed when I overfilled a disk, and other minor head-scratchers. On the other hand, Intelligent Music seems honestly concerned and diligent about fixing anomalies and adding "needed" features, so I feel pretty confident that

RealTime will continue to grow (and eventually become rock-solid).

Is It Worth It?

I'm not 100% in love with RealTime. The sketchy manual (credit where credit is due: the tutorial is great . . .) means I'll have to spend a(nother) month of pure experimentation to figure out what all it can do. About half of the program (fortunately, the half I use 90% of the time) is real quick and intuitive to use, but the rest makes me keep the manual and hidden-function chart nearby. The rough edges need to get sanded off, and Devices need to offer to keyboardists what they do to hand-painters of notes.

I also, in general, have a problem with Intelligent's pricing policy. I see most of their programs (M, Upbeat, Jam Factory, etc.) as accessories in general, and I personally look at Real-Time as a middle step between generating raw ideas jamming with Dr. T's Tunesmith and polishing off the final composition and mix in C-Lab's Creator (and Intelligent concurs that this is what RealTime is intended for). If the smaller programs all listed for $99.95, and RealTime for $199.95, I'd buy up several of the little guys (for raw ideas)

and tell everyone to go out and buy RealTime for more fully-cooked ones. But at $350 (not to mention typically over $200 apiece for the little guys), many ST users are going to want RealTime to be their only sequencer – and if Intelligent Music globs features on top of RealTime to make it a be-all sequencer (as many are now requesting), I'm afraid it'll lose its current breezy, easy-to-use feel.

Have I managed to properly temper my praise of RealTime? Good – because in reality, I'm excited as all get out about it. And after extensive talks with Eric Ameres (RealTime's creator), I feel confident that the rough edges are going to get sanded off, and my current reservations cured – so much so, I'm planning on it being the main program in my setup. For people like me who are better at muddling than pre-meditation when it comes to making music, RealTime is a gift from above. After nearly four years of muddling and being scared off by big sequencers and having to do everything myself, I'm finally recording music again. Thanks, Intelligent Music. ∎
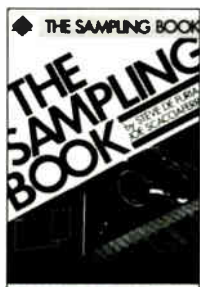
PRICE: $350
MORE FROM: Intelligent Music, 116 North Lake Avenue, Albany, NY 12206. Tel: (518) 434-4110.

360 Systems

Audio Matrix 16

Photography *Rose Rounseville*

A MIDI-controllable 16×16 audio patchbay turns out to be a rather handy device in a MIDI studio, as our reviewer explains.
Patching by Lorenz Rychner.

THE BEAUTY OF a standard protocol like MIDI is the fact that crafty people will use it for purposes other than the initially envisaged ones. Remember when MIDI was about Note On messages, and stuck notes reminded us painfully that it was also supposed to be about Note Off? It wasn't very long ago. Soon afterwards, however, came MIDI-controlled lighting systems and hand-held triggers for percussionists, wind players, guitarists – you name it. All that time we had to remind ourselves that MIDI wasn't dealing with sound, that no audio signals ever entered the MIDI picture. Well, think again, because now we have an audio patchbay that is MIDI-controlled, with enough memory to store 100 ways of connecting up to 16 sound signal inputs to 16 outputs.

Let's clarify one thing right up front: this is a patchbay, not a mixer. No signal "summing" is going on; no two input signals end up coming out of the same output as a blended signal. All audio connectors are ¼" female, unbalanced, mounted on the rear of the 2-space high rack-mountable unit. Channels 15 and 16 are duplicated on the front panel, cutting out the rear

connections when activated by an inserted plug. MIDI In and Out and the fixed power cord complete the rear.

The left half of the front is taken up by 16 small white squares where the user can scribble some reminders about the 16 connected signals; very low-tech and analog, but certainly handy. The right half is divided into three large two-character LED readout areas, each with its own pair of increment/decrement tabs. A list of six operating modes is accompanied by a Mode Select tab, and three more tabs take care of Bypass, Enter, and Store functions.

Patch Select is the normal operating mode. This can be done with the mode tab and with the up/down tabs on the unit, or a patch change can be sent to the Audio Matrix over MIDI. A patch is put together in an edit buffer in the Audio Path mode, and only when the result has been found to be satisfactory does it need to become a memorized patch with a number from 1-99. Patch 100 is a bypass patch that is meant to be the basic configuration of your hook-up. Incoming MIDI program numbers 101-128 select patch chains, where each chain can be set up as a

sequence of up to 32 patches, in any order. The chain footswitch that connects to the front panel can select these pre-sequenced patches in an endless loop. A nice touch is the fact that, upon power-up, the operating system looks to the footswitch and sets itself to the opposite of the current switch status as the activating status. This does away with the annoying fact that, according to Murphy's law, you always have a "normally open" switch when you should have a "normally closed" switch, or vice-versa. Here it doesn't matter.

A patch consists of 16 audio paths, for each input. An input can be routed to one or more outputs without worry about load increase or other changes to the signal. So when you call up a new patch number you're doing an elegant version of an ugly task, that of pulling out and plugging in a bunch of audio cables. But that's not all (other manufacturers take note, please): the Audio Matrix 16 can transmit up to 8 memorized MIDI program changes with each audio patch, all mapped to the right MIDI channels. What more do you want? How about the ability to transmit and recognize System Exclusive data dumps of the current RAM contents for future use? If your sequencer allows for the recording and playback of SysEx data as track data, you can send the Audio Matrix a new RAM's worth in a matter of seconds.

This versatility invites more inventive configurations than I can even start to list in this space (but of course, I'll try): multiple alternative effect sends in the middle of a sequence, audio muting of synths or tracks not currently used, and assigning one sound to more tracks and busses than the board allows are all possibilities that come to mind. The audio specs are impressive – signal to noise of 102db – and bore themselves out in practical use. I couldn't fault it at all sonically in the time I had to play with the unit. The manual is explicit right down to the very last MIDI byte.

So, is it worth the $700 to increase the virtual number of inputs and routings of your system? Think about it – a good mixer costs more, and even an expanded system forces you to plug and unplug cables. This box will perform tricks for you that you haven't even begun to think about. ∎

Rehumanize
YOUR SEQUENCES
Part 4: Wind Instruments

Illustration Toby Goodyer

The fourth piece in our series on sequencer-assisted simulation covers wind instruments and includes special tips on using breath controllers. *Text by Travis Charbeneau.*

THE NOTION OF using mechanical sounding sequencers to recreate expressive wind instruments may seem anathema to many musical conservatives, but there is a way to bridge the gap between the two camps. Creative use of sequencer step-editing techniques, as have been discussed throughout this series, in conjunction with a little breath power can help you produce realistic sounding wind parts. This is particularly appropriate nowadays because some of the most convincing samples and synth patches (unless you're a wind player, of course) you hear are for wind instruments: french horns, brass sections, trumpets, flutes

(including the now-dreaded shakuhachi) and, more recently, sax.

The saxophone is arguably the most expressive wind instrument going, and, if you're an all-instrumentalist, a good sax patch can stand in very well for lead vocal. In order to really articulate the patch, though, a wind controller is definitely in order. If you own any DX-series instrument, you're really missing something if you don't take advantage of Yamaha's very inexpensive breath controllers. Their held-in-the-mouth BC1 goes for around $35, the somewhat more convenient, headset-mounted, gain-adjustable BC2 can be obtained for about $60. With a little practice in combination with the

pitch-bend and mod wheels, these nifty little puffers provide nearly all the real-time control of expensive, dedicated wind controller setups. And in sequencing, where pitch-bends and mod can be overdubbed, much of the difficulty involved in operating a breath controller can be overcome.

The most important effects of breath control do not merely involve swelling the note volume as you blow harder on the BC (breath controller) mouthpiece, although that's a great addition in itself. The real fun comes in articulating a timbre. Even the stock DX factory BC patches are very well written to provide an unfolding timbre which mimics at least some of that great sax "flatulation" (almost sounds like a musical term, doesn't it?) which starts to growl in or rasp as the note blows hard. This certainly doesn't cover all

the nuances of sax timbres, but with a little creative patch-shifting even those can be approached.

Stepping In Blips

First though, a few non-BC techniques, beginning with step entry of the characteristic "blip" evident in a lot of blown instruments, especially the flute. Even an uninspired-sounding patch played with blips in all the right places can sound convincing. Assuming you can't "blip" in real time (refer to the October '88 MT to get some hints on how to program 'em), go into your lead track and look especially for notes that are held long enough to justify the treatment. A lightning-quick flurry of 32nd notes may just not be suitable. But on any held note, back up and insert a 32nd note (or two, or four – whatever works) one semitone (or two, or four, etc.) in the scale below the target note. This gives you a quick blip note, or a series of blips, simulating the player rapidly fingering keys up to the target. This is effective even if you're working on a polyphonic part.

If you're working in mono, you can take the technique one step further, emulating the classical "flutter" so typical in, say, baroque playing. The mono setting is adept at mimicking this, allowing you to rapidly alternate between two notes by simply holding one and tapping another. This is great for getting little trills in real time, and a slightly slowed tempo while sequencing will give you even greater precision. The slope and character of attack will have a lot to do with whether or not a given patch will lend itself to this technique. Too steep a bite on a horn or too much "bottle breath" in a flute attack can end up sounding wholly artificial in a flutter. But most patches will work just fine. The key to making them sound convincing is knowing just where to put the trills. Go back and listen to Handel's Greatest Hits or something. Generally, this flutter is employed sparingly, on the way to some destination. Throwing them in gratuitously can easily lead to caricature.

Again, we have one more area of virtuoso instrumental technique which was once the mark of great concentration and perhaps years of practice, but which is now available with "push-button convenience" to any klutz with a synthesizer. However, like quantization, speed playing, etc., one can easily slip into overkill, particularly if one has never played the real instru-

ment. This is the case 99 percent of the time, so, as ever, use some taste and restraint (and those flappie-thangies on the sides o' your head).

Stabs and Jabs

Horn stabs are another area where we just have to rely on our ears. A lot of us use our great profusion of good brass patches strictly for pads, mixing them just beneath that window on the fader where they would begin to peep out over the mix. It's a legitimate function, too, providing great subtleties in shading to what might otherwise be a stark and "contrasty" arrangement. But in a lot of our favorite pop music, the horn section is used to put those little soul stabs in there. As the word "stab" implies, for this approach you need an ensemble patch with a pretty nasty bite to it. You're providing a rhythmic function here, as much as a melodic one, and a sharp attack will put you on target, make the point and get you out again as gracefully (or viciously, depending on what you're going for) as possible. Me, I'm hopeless when it comes to stabs, having never been much of a horn section man. But listen to a few old Motown sessions or Tower of Power outings and you may have better luck.

The humble harmonica (and, with somewhat less success, its hand-blown sister, the accordion) have also been nicely synthesized. When working with a harmonica patch, remember what's probably the most obvious point: the range of notes is pretty much limited by the size of the player's mouth. In other words, work within the appropriate confines of register or you won't fool anyone. Harmonica uses lots of two note intervals (i.e., major and minor thirds), so for comping "chords," stick pretty much with these. For lead parts, remember to put lots of tremolo in there and be sure to go nuts with your pitch-bends. (Magic Dick lives!)

Mouth-harp players, of course, have that wonderful, decidedly non-baroque, blues'd-out flutter they do by holding the harp still and wiggling their mouth back and forth over two notes. As with the baroque flutter, though, you can likewise approximate this effect by step-entering a "mono on" controller (controller 126) at the appropriate place and duplicating the flute flutter technique described above. Get yourself a "poly on" (controller 127) to nail in afterwards so you can return to comping. By alternating these

sections in rapid succession, you can pull off some pretty convincing licks.

For accordion, unless you've got better patches than I've so far heard, try laying on a doubling-type of flange (not too much depth or regeneration) and sticking to harmonica-style voicing. This will at least give you a pretty good "squeezebox," and if you step enter a few good old Lawrence Welk-style runs up and down scales where they'll fit, it might just pass for accordion. Again, this is one of those judgment call areas, where you may not want this effort standing out in front of the arrangement, but rather, comping underneath. Like a lot of simulation of "real" instruments, positioning, volume level, signal processing, extent of play time, etc., can make the difference between a convincing performance and a self-evident fraud.

Before we get to the breath controller stuff, one tip regarding the french horn and perhaps some other deep brass patches. DX french horns, including the four-operator variety, have a wonderful warmth and even a mysterious depth that's just too nice to pass up. Unfortunately, like a lot of DX patches, especially the four-op variety, there's a lot of unpleasant harmonic buzzing going on, particularly objectionable when the patch stands alone. On the french horn this can be easily eliminated by brutally axing your high end. There is no high end to lose on this patch (maybe on a real horn, but not here). It's all dark and round. By slashing the treble end of things with EQ, you lose the buzz and the patch itself comes through clean and intact, even when standing solo. Place it alone in a wash of reverb with a little delay and it sounds like Achilles calling from hell.

BC Maneuvers

Almost all of the aforementioned synth patches, and likewise, samples of wind instruments, will generally not benefit from the use of a breath controller. In real life, and unless grossly overblown, most wind instruments tend to achieve their timbral character early on and retain it. The BC on these patches will generally only give you swell. That's a great real-time feature to enjoy, but mere swells can be achieved with the trusty volume pedal, or through mapped or even step-entered MIDI volume (controller 7) commands, maybe saving you some memory (see below). Some sequencers may provide a transform which spreads a range of con- ▶

►troller 7s along a specified number of bars, or even a single note. A capable mapper may even be built in, allowing you to roll the pitch or mod wheel and have those converted to 7s. And, of course, external mappers will also do the job. Alternatively, if you have enough notes in the spread, a velocity transform will provide a simulated swell or crescendo. In any case, the real beauty of breath control on a keyboard is not swell but, as noted above, the articulation of timbre.

Bear in mind that the breath controller for keyboards seems to be a Yamaha exclusive. Roland and others do not offer BC, and their instruments and modules by and large do not accept BC data from another source. Korg puts the axis on their joystick that moves in the opposite direction of mod wheel out over MIDI as a breath controller; some machines receive breath controller as aftertouch (dig out those MIDI implementation charts, or give the IMA a ring). Samplers, too, lack BC implementation, although, if the trend towards deeply-layered and velocity-mixed samples continues, we may yet see the day. I hope so.

MIDI mappers may partly overcome the problem by changing BC to velocity data. However, unless the patch is set up to kick in timbre as well as loudness shifts upon receiving velocity changes, this is a useless exercise, only yielding the aforementioned volume pedal-style swells. Hopefully, as the Yamaha BC and dedicated wind controllers become more commonplace, we'll see BC implementation become more widespread. The fact that BC data is controller 2, right after mod, at least indicates that somebody up there had it high on the original MIDI wish list.

The sax "flatulation" I referred to earlier, and the mellow-to-ear-ripping evolution of a blown trumpet patch are what BC is currently all about. These offer a world of control and expression, which, when combined with pitch-bends and mod, can convince people who should know better that a sax or trumpet is indeed being played. The BC does require some care and feeding, however.

First off, being a continuous con-troller (controller 2), like pitch-bend, it's a memory pig. If you've got a rolling mod wheel, pitch-bends and breath control all going at once, look out! Like most computer-based sequencers, the one I run has a little "memory remaining" window. Blow the controller, or roll your pitch-bend wheel, and watch the numbers in that sucker drop like the gas gauge on a fuel-injected '62 Corvette. The good news is that, even on my 512K PC, rolling all three, I've only once run out of memory. Of course, I compose tunes which generally run no longer than

> "Breath controller, like pitch-bend, is a memory pig. Blow the controller, or roll your pitch-bend wheel, and watch the numbers in an available memory counter drop like the gas gauge on a fuel-injected '62 Corvette."

three to five minutes. If you're working with great densities of MIDI data, on longer pieces, take care to occasionally filter your BC-riddled tracks. (Be sure to save first, in case the filter turns into Jack the Ripper and you lose what you were after.)

Secondly, unlike the EWI, WX7 and other all-in-one, dedicated wind controllers built for real blowers, running BC on a keyboard requires perhaps more widely-diverted concentration than many of us are used to. Most obviously, you've got to time your key hits with your breath, which is pretty awkward at first. Performing those two functions, while bending, modulating and maybe changing a patch or two, is like walking and chewing gum while patting your head and rubbing your tummy.

Thirdly, getting my blip effect above, or merely getting into the editing screen and fixing a late note presents unique challenges when coping with BC data. Like all controllers, BC data runs alongside your note on/note offs. Unlike the most common modulators, though, which generally come on the tail of a note, BC data also turns the note on up front. Therefore, to manually slip a note forward to a missed beat also means manually slipping the data. As noted above, this data is very dense, so manually slipping enough of it (if you don't have graphic cut-and-paste editing of controllers) to retain your original feel may just not be worth it, forcing you into a punch-in. Unless you have the capacity to quantize at the single event level, where the computer slips your 200

different BC levels along with the single note you're trying to fix, you're probably better off with the punch. Likewise, lengthening notes past the point where the BC has died can be a hassle. Like manually editing a broken pitch-bend to some semblance of smoothness, this can present some difficulties.

The good news includes the fact that, in the coordination department, you can always overdub your pitch-bends and mod, particularly the latter, so there's no need, apart from live performance, to attempt to do too many things at once. Further, a BC patch can be programmed to modulate as well as blow the timbre, so you get a two-fer there. (It will also affect pitch bias on a DX or TX synth, but I have yet to get anything useful from this function, short of a rather monotonous swooping up to pitch.) Finally, in editing, if you're going full blast, the simple insertion of a 127 value in front of your fixed note will blow the note. Likewise, a 90, or some other suitable level will hold it steady for a prolongation. A lot of BC data is simply redundant, which is why it will tolerate filtering in the first place.

The greatest challenge with the BC, though, involves milking the controller to get the most out of the patch. The first thing anyone with a new breath controller will do is stick it in their mouth and start puffing just to get the synth to sound. But merely "blowing" won't do. In brief, this is not a horn, but a very sensitive electronic device. Just tapping the case on the BC1 will cause controller data to be sent. You must, therefore, carefully take the measure of each patch, learning the spectrum of

neighbor's register is a trademark of the instrument. If you get nothing else right, get this.

Killing the note abruptly, with what *Aftertouch* refers to as a "tut" articulation, abruptly chokes off notes. If you're going at full blast and do this, you can actually get the little bugger to emit a satisfying little, bird-like squawk.

An important thing to remember is the BC's interference with the normal note on/note off character of a patch's envelope when blowing notes in sequence. Should you blow the end of one note over the start of another, you'll change the characteristic note-on attack of the second note. Normally, so long as it satisfies the ear, no problem. There are times though, like lickety-split runs, when you may want each attack articulated separately, no slurring. In these cases, while going to mono may be an option, I prefer to just go into edit and shorten notes until there are no overlaps. So long as BC data is anywhere near consistent throughout the phrase, you'll get a nice, distinct articulation on each note, no matter how fast you're going. If BC data is inconsistent, too low, or has shut down completely, just go in and delete it until your new note has a clean opening. I don't know this for a fact, but I imagine this high a degree of enunciation is difficult to achieve on a real sax.

Difficult to achieve on a synth sax (in real time, anyway) is variation in tremolo. Rolling the same old mod note after note gives the show away and limits your expression. Those of you who've kept up with this series know I'm a big proponent of "patch shifting," setting up a bank of a dozen

envelope, or where the overall timbre is brighter or duller. By shifting among all these in a lead track, you can achieve new vistas of expression and, of course, patch shifting will work wonders for any non-BC instrument you're going after. Variations in flute mod, for example, really add sparkle.

Duets

Finally, we come to the neatest and easiest part of all, those wonderful twin lead parts. You've probably already figured out that, by entering edit, you can make a copy of any lead note and simply move its clone to a harmony position. Presto. As a refinement, I recommend using a 64th-note units setting to position harmony notes just behind the originals to simulate human inaccuracies and retain the variation of timbre. Simultaneous note starts, even if harmony is distinct, tend to blur identity, so listen for traces of lock-step overkill. If you find both "players" goose-stepping along like the Wermacht marching into Poland, alter the parts enough so that we hear two individuals following a common line in their own manner.

Changing these start times under BC turns the slurring referred to above into a real advantage, since the "late" player not only comes in a little late, but provided you've properly milked your BC, he/she attacks his/her note somewhat differently from the first player. Further, continuously holding harmonic notes in company with an originally-blown, broken phrase will give a better simulation of two players at work (provided the BC data doesn't cause objectionable drop-outs in the added part). Just keeping the harmony part silent for half a bar can help impart a more human feel to a double-lead segment.

When these are completed, however, beware the resultant increase in volume, particularly if you've written into a higher register than the original and especially if flange is used. Two notes are louder (and, on the DX, buzzier) than one, and you may wish to go in at the beginning of your double-lead and insert a lower MIDI volume controller value to keep the two mixed just right. It'll save you headaches if, like us other peons, you currently lack automated mixdown.

Next month, I'll end the series with a look at drum programming. And, by the way, if you hear a good bagpipe patch, BC'd or not, write in care of this station. Until then, happy sequencing. ∎

"You're providing a rhythmic function with horn stabs, as much as a melodic one, and a sharp attack will put you on target, make the point and get you out again as gracefully (or viciously) as possible."

expression available. At what pressure levels do the timbres start to shift from a round tone to something a bit more raspy? Work carefully within this spectrum for maximum expression.

You'll also want to "tongue and spit" for more explosive attacks. A recent edition of Yamaha's *Aftertouch* advises practicing with "ta" "ka" and "da" attacks, with "ta-ka" for a nice double-tonguing effect. Alternately, you'll want to slowly sneak up on a note, especially if you can blend it in with another instrument already in the mix. The growling sax creeping up into its

variations on the same patch and using the sequencer to send out rapid patch changes. (You'll definitely need a librarian for this.) Off the factory BC sax, program several variations of mod: some fast, some slow, some with real wacky pitch modulation, some with only a slight deviation, some with shallow amplitude mod, some very deep. Don't forget to program a few pitch-bend variations in there apart from the standard two semitones, and, if you're really adventurous, try setting up timbral variations, where rasp is introduced earlier or later in the BC

SQUARE ONE

The topic under consideration in this month's edition of our new beginners' column is that magical, mystical recording process called sequencing. *Text by Bob O'Donnell.*

SEQUENCING – *the process of recording and editing the MIDI information generated by MIDI controllers such as keyboards, MIDI guitars and MIDI drum pads.*

ONE OF THE greatest benefits, and worst potential curses, of the widespread adoption and popularization of the MIDI (Musical Instrument Digital Interface) standard is MIDI sequencing. Without a doubt, sequencing has probably had a greater influence on the way music is being written, played and recorded nowadays than any other development. The two main reasons for this are: one, sequencing removes the physical constraints of playing ability, allowing anyone with musical ideas (and access to a fair amount of equipment) to realize their creation; and two, sequencing permits you to work with musical ideas and correct mistakes in ways that are simply not possible with normal recording techniques. Before I get into why these things are true, let me explain the basics.

First of all, sequencing is done with a device called (obviously enough) a sequencer. The end result of anything you record into such a device is called a sequence. Several companies produce sequencers that take the form of stand-alone boxes (often referred to as "hardware sequencers"), such as the Alesis MMT8 and the Roland MC500 series, but many people are now gravitating towards using their computer and a sequencing software program. The reason for this is that sequences consist of large amounts of data (which is put, or "sequenced," into a long list) and the large visual displays provided by computer monitors generally prove to be much easier

to work with. Nearly every brand of computer on the market has MIDI sequencing software available for it – most have numerous options in this regard.

The set up for sequencing with MIDI equipment is as follows: the MIDI output of the controlling instrument, generally a MIDI keyboard, is plugged into the MIDI input of the sequencer or the computer's MIDI interface, and then the sequencer's MIDI Out is connected to the synthesizer's MIDI In.

As mentioned above, what a sequencer does is record the MIDI data generated by devices which output MIDI information – MIDI keyboards, etc. Most sequencers work on an analogy very similar to tape recorders: you select a track, hit record and start to play. When you're done recording, you hit play and the MIDI data recorded into the sequencer is sent out through the sequencer's MIDI out port and into the synthesizer's MIDI in, which plays back the recorded data à la a player piano (generally without the moving keys, however).

Remember that MIDI signals do not carry any audio, which means that sequencers do *not* record audible sounds. This is an extremely important point, because it's easy to confuse the digital recording which a sequencer does with the type of recording done by digital tape decks. They are not the same. A two-minute long held note, for example, requires two minutes of tape time, whereas it only takes two messages in a sequencer: a Note On message which tells the connected synthesizer to start playing the note, and a Note Off message which tells the synthesizer to stop playing the note. Also, because MIDI sequencers just record data and not sound, you can do

things like adjust the tempo of a song without affecting its pitch, etc. Yet another benefit of this approach is that you can enter notes or chords into the sequenced list one at a time, in a process called step-time recording. Most sequencers allow you to combine standard recording techniques (real time) with the step input method, so you can work to your own level of playing ability.

The real beauty of a sequencer is not the recording process, however, it's what you can do with what you've recorded. Different sequencers have different features (including what type of MIDI information they can or cannot record – not all sequencers can record all types of MIDI messages), but most allow you to do things like "correct" the timing of the notes recorded with a function called "quantization" so that everything lands on the beat, and adjust the length and pitch of individual notes via different editing functions. Quantization, which works by moving the note's starting time to an exact sub-division of the beat, can be a great tool for cleaning up inaccurate performances – but if overused, it can rob the music of any human feel. The complaints about a lot of synthesizer-based music being lifeless, in fact, can really be traced to overuse of this function.

Creative use of quantization and other cut and paste-type functions that sequencers provide, however, can allow you to quickly create entire songs – often including parts that you couldn't possibly play in real time. The bottom line is that using a sequencer in conjunction with a MIDI-equipped synthesizer offers tremendous musical opportunities. It's really what MIDI and modern music making is all about. ∎

World Radio History

CONTEMPORARY CRAFTSMAN

Not many musicians have the opportunity to be nominated for Academy Awards or to run their own record company, but for Dave Grusin, it's all in a day's work. *Interview by Deborah Parisi.*

DAVE GRUSIN OCCUPIES a choice seat in the house of the almighty music business, one which combines the dreams of anyone who's ever seriously struck a few chords: solo artist (and multiple Grammy winner), film composer (and five-time Oscar nominee), TV theme composer (for *Good Times, Baretta,* and *St. Elsewhere,* to name a few), co-owner of a prestigious independent record label, producer and executive producer of scores of albums, and an internationally acclaimed performing artist in his own right. Far from being satisfied with his past accomplishments, however, Grusin pushes forward with dreams for himself and for the other artists on GRP Records.

The morning I spoke with him, he had been awakened by a phone call informing him of his latest Academy Award nomination, this time for his score of *The Milagro Beanfield War.* "It's kind of amusing," he chuckles in a characteristically gentle, soft-spoken manner. "I think that perhaps the director, Bob Redford, wasn't totally

pleased with the score when it was all over. I don't know whether it was his feeling that it was too romantic or didn't do the job for the film, or what. I'm not sure what ended up in the theater; I haven't seen the final version. But the ambience, I thought, was right. So, I don't know . . ."

Grusin's film scores have won him four previous nominations from the Academy: *Heaven Can Wait* (1979), *The Champ* (1980), *On Golden Pond* (1982), and *Tootsie* (1983). Other scores are just as well known – ranging from *The Graduate* to *The Goonies*, from *Three Days of the Condor* to *Tequila Sunrise*. All tolled, somewhere between 40 and 50 films are carried by music created by Grusin.

It would be logical to conclude, then, that Grusin's home studio would be killer – after all, he can afford anything he wants. But the details prove a bit of a shock . . .

"I have a real simple setup here," he says, sounding a trifle embarrassed. "I have a rack that I put together for the road last year which is pretty good. It's got a Hill 16-track mixer, and a Roland digital piano – which on the road I was using with a Kawai electric grand – and I have an old Super Jupiter, an SPX90, and the DSP128. It was a really simple system to take on the road and now it's working really well here.

"I've got a couple of DX keyboards – an old DX and an DX7IIFD. And then the Yamaha RX5 drum machine, and a little Fostex four-track cassette recorder. I run it all with Hybrid Arts' SMPTETrack for the Atari, which gives me 60 tracks with sync output. It'll run off of any of the exterior generating SMPTE things, so it's really terrific. It'll generate sync tones that I lay down on a multitrack tape so that whatever I put down on a tune is in sync. I think most programs do this stuff now, but I'm really happy with the Hybrid Arts program."

But *why*, pray tell, does he use the Atari? I thought all the *cool* people had Macs: "I suppose that's true," Grusin laughs. "I ended up with the Atari because of the software, actually. It was just easy and fast to use. I don't know if it's any better or any worse, or if it's as versatile, or if it doesn't do as many things, does more things . . . I just don't know. But I haven't run into any snags yet, and I've had it for a couple of years. What I really need to do is get into the computer itself now with some other programs, some word processing and some database stuff. I

am obviously not from the computer generation – my kids all grew up with that stuff so they're normal – but I had to learn it from the back end coming this way."

The other "glaring omission" in the setup is the absence of a sampler: "No, there's no sampler, and there should be," he says. "Sampling and sound sculpting are really fascinating, but I'm afraid that if I got into it the way I would like, I wouldn't have time to do the music. I would love to be able to tailor all this stuff, but I have to stop myself so that I can get some work done.

"I don't have an ethical problem with sampling, because I'm not that interested in using acoustic samples to replace players. It doesn't quite work. It's interesting to try, but overall in terms of time spent and money spent and energy spent trying to do it, at least professionally, there's very little difference in cost. You can bring in a string section and sweeten four tunes in a three-hour session, and you would probably spend as much in the studio trying to accomplish the same thing with samplers as well, with all the best equipment.

"I like using samples that mix digital and analog combinations, but mostly I like the idea of samples to make new sounds that normally wouldn't be thought of in music and incorporate that in some way. I did that on the *Night-lines* album using the Fairlight, and recorded a bunch of pots and pans and assigned them to the keyboard, and used them as percussion for a song called 'Kitchen Dance.' That was fun; I'd like to do some more of that."

When you are your own company, time is most definitely money, and Grusin remains sensitive to the number of hours it takes to tweak and twiddle. "I find that working with electronics is tremendously time consuming," he says. "It will do so much, so of course you have to do it all, you have to use it to its full capability. It's so interesting to be able to do that kind of microscopic editing that you just *have* to do it. It's a cycle that has to do with the basic motivation of making the music as good as it could be – and maybe making it better than it could have been five or ten years ago. The danger is, of course, that it is possible to edit yourself into the sort of perfection that loses its musicality.

"You know how this stuff works," he chuckles. "Instead of quantizing

everything, you try to be judicious about that and leave some stuff a little looser than other things, and then when you play it all back together you find it doesn't quite feel good because the bass track was quantized, so you make another bass track that isn't quantized, and try to get it to fit with the new stuff. You can just spend hours and days and weeks and months doing these things."

But is he anti-sequencing? Hardly. "The best part of sequencing is that it does save a performance," he concludes. "It saves what you did at that given moment."

GRUSIN'S A LOT like the rest of us when it comes to songwriting and composing – he regards it as work, plain and simple. "I rarely wake up feeling like writing," he smiles. "Playing tennis or skiing or fishing, but not writing. I wake up knowing I have to work and I have to write. If it's a record project, I'll turn on the toys and get a drum pattern going and play to that. If it's a film, I might get a string patch up and mess around for a moment, but usually it's better away from the keyboard, at least for writing orchestral music. Hearing an instrument is not the same as hearing a keyboard – it sounds more like a French horn in my head than if I'm playing it with an electric piano sound. So now I'm kind of used to hearing lines without the keyboard.

"After I've written stuff down, I'll go back to the instruments and check stuff and see if it feels like I think it does. With the toys here, I can take a videotape of the movie I'm working on that has SMPTE numbers on it, and without really going all the way with syncing it up, just with the VHS format look at the sequence I've written. And when I have it figured out, I can lock it with the film, see if it works, see what doesn't work, see what's problematic. That's a real nice use of this stuff. Not that that's the final – this is all making just demos or blueprints of the thing."

Most of the films Grusin works on do include an orchestra, although he has done one completely synthesized score. "It was for a little picture called *Lucas*, which was all done on a QX1, which drove me crazy just trying to learn that instrument. Drove me nuts. Now it's sitting here with a cover on it; I haven't touched it since I got the software. *Lucas* took a long time; around four weeks in the studio, one

track at a time. We didn't use tons of equipment, either, but it was fun."

Grusin's approach to writing to picture has changed a bit since *The Graduate*, both from a technical and philosophical standpoint. "And it continues to change," he says. "Because of VCRs we can have a copy of the film at home which we could never have before – we used to just have the timing notes, which are a written description of what's going on with the timing. Now we have a lot more aids to help us work. The technology of 3ft of film for every two

seconds of time hasn't changed; you get used to working in that medium and don't think about it very much. But recording techniques certainly are better, sound is better, digital recording for films is marvelous because you do lose enough generations by the time the picture gets to the theater with transfers and making prints that it's great to start with as clean a sound as you can get.

"I'm fascinated by the stuff that music can do to an audience," he says, moving over to the psychology involved in scoring. "It's not always a

conscious thing, but works in the subconscious, too. It can say things in a film without using words, and it's kind of dangerous because of that. Frequently it says things you never intended it to say, and it gets in the way of the intent of the director. But that's also a part of what makes it fascinating . . . you think you're just writing music because the scene needs some heightening dramatically or because, frequently, there's awkward cutting and you need to do something to take attention away from something that isn't technically working quite

THE GRP STORY

IN 1976, DAVE Grusin and Larry Rosen started GRP (Grusin/Rosen Productions) in order to produce records on a freelance basis. They made four records for their first client – Earl Klugh – on Bluenote Records, and decided to sign a few artists as producers during that time. The second guy they signed was Dave Valentin, who's now on GRP Records. Searching for top-class musicians that they can stick with and develop as solo artists is what GRP's all about.

Deborah Parisi (MT): *Why did you decide to start your own label, as opposed to remaining independent producers for other labels?*
Dave Grusin (DG): "We made Dave Valentin's first record for Polygram and basically found that our tenure at Polygram wasn't what we had originally hoped for. I think that we even bought his master back and it was eventually released on Arista.

"Around 1978 we formed our first label agreement with Arista Records, and we were there for five years. That was basically a glorified production deal, with our own logo (Arista/GRP), and at the end of the five-year deal we found that with the advent of compact discs, we were in a better position as independents to make decisions and to make quick moves than we were with a big label."
MT: *What did CDs have to do with it?*
DG: "It took the majors quite a while to figure out that CDs were here to stay, and during that time they were mostly servicing their major clients – for CBS, for instance, it would have been Streisand, and Springsteen, and the big pop people, whereas the audience for CDs was mostly people who had great stereo setups at home – the hi-fi fans – and they liked classical music and jazz."
MT: *Had you always dreamed of owning your own label?*

DG: "No, not at all. We really just wanted our records to be successful. And our first experiences with Earl Klugh had taught us that maybe he needed to be marketed in a different way from the way everybody was used to marketing all their records . . . he had a target audience and you really needed to identify that and concentrate on that to break him. We were frustrated a lot because we really didn't have anything to say about that. So we learned a lot about it, and when we had our chance to try out our marketing ideas, we found it worked pretty well."
MT: *How does owning your own label differ from working with a major?*
DG: "Well, we have to be pretty efficient, because we're not in the mainstream of the pop record business, and we can't afford to go out and spend a quarter of a million dollars promoting some record, because it's not going to come home in those amounts even if it's a success. So we have to be careful about where we spend the advertising bucks and who we address. And that's why media like your magazine is a key target for us, because some of our audience reads that. They also read *Time* magazine, but a lot of people read *Time* magazine that don't care anything about this kind of music. So I think we've done a really efficient job of marketing."
MT: *You mentioned your early involvement in CDs, and you've certainly followed that up with a very early involvement with DAT (GRP had pre-recorded DAT as early as 18 months ago). Do you still feel positive that DAT will find a home in people's hearts and homes?*
DG: "Yes, I do, I feel positive about it, and I think Larry feels the same way. It's a matter of timing at this point. We feel that the technology is just wonderful, and it's there, it's already developed, and now it's political, and it'll take a while. But at some point, because it works so well, it will be a reality. They couldn't legislate the hydrogen bomb to keep it from existing and I

don't think they'll be able to do it with DAT.

"We clearly misjudged the timing. I thought it would be here by now. But it's already standard in everybody's studio as a working tool, and I think it's going to find its place in the home market as well."
MT: *In general, I think of GRP artists as musicians' musicians.*
DG: "Yep, yep. Our oldest artist is Dave Valentin; he's been with us through all these different manifestations of GRP, and he's there 'cause we really believe that he has a valid musical statement to make, and he always comes up with it. We try to get people who don't sound like everybody else. If somebody came along that played just like George Benson, even if he played better than George Benson, if he sounded like George Benson it wouldn't make any sense for us to do it. So we look for unique talent, and I think we've been pretty lucky.

"I really get a big kick out of the fact that a lot of our artists – Lee Ritenour, Tom Scott, Diane Schuur – are all younger than I am and they all continue to inspire me. So, the label has been a wonderful outlet. It's been full of panic in terms of trying to keep a business going and keep the cash flow straight and financing and all that – it's grown so tremendously in the past five years that it's scary. We just keep trying to catch up to the business side and make sure that we're solvent at the end of each month . . ." ∎

The GRP Roster:
Dave Grusin, Lee Ritenour, Diane Schuur, Chick Corea and the Elektric Band, Special EFX, Omar Hakim, Tom Scott, David Benoit, Kevin Eubanks, Eddie Daniels, Yutaka, Mark Egan, Daryl Stuermer, Gary Burton, John Patitucci, Eric Marienthal, Szakcsi, Deborah Henson-Contant, New York Voices, and the Rippingtons.

right with the film. Then you come away making some sort of statement.

"The major way my approach has changed, though, is that I finally understand that film music is not an art, but a craft – a craft like set building or cinematography. The art is the film, and once we understand that it makes life a lot easier. The music is really there to support the film, and not to be the element that gets the attention.

"For a long time I would be disappointed by having things either dropped or altered or moved around where they were never intended to go, but finally you say, 'Well, wait a minute; that's what the job is.' I try to get the concept of the director so that I'm not doing something that countermands what that attention is. But frequently, through nobody's fault, even when you're really conscientious about it, things happen that finally get down to two points of view, and guess who normally wins. If you let that bother you, then you're in for a rough ride." One way of avoiding the ride is not going to see the films in the theater, of course.

"But it's not a terrible thing for me – it's fraught with mystery and jeopardy and peril for a producer, or even for a director. But for a composer, we're

Photography courtesy GRP.

really fortunate that we have something that's already formed the basis for what we have to do. It's not like writing something without any parameters at all, which I think is the hardest thing to do."

Though Grusin's musical style varies dramatically from film to film, from album to album, it's safe to say that what he's really about is jazz, in all its forms. And given his head, Grusin runs off with his concerns for the

restrictions imposed on musicians.

"I think that we, as a society, have become kind of a TV/magazine society," he says, "not literature and not cinema. We're used to so much stuff happening in such a compressed time. People who are being signed as pop artists are expected to break sales records in some way – expected to achieve certain sales plateaus – expected to spend a lot of money cutting records. People who make films . . . you can't make a little film anymore. They'd rather put all their eggs in one basket and spend a fortune making a film that's going to knock everyone else off the block at Christmas time. And it's kind of too bad, because all of that affects music. I think that it keeps young musicians, who have any business sense at all, in an area that they think they *should* be in rather than let them free to wander around and fall off the edge of things and make mistakes.

"That's why, while I'm not a big fan of New Age music, I'm really grateful that it exists, because it covers a whole lot of ground that doesn't fit in anyone else's category. It allows a lot of people to come along and experiment and write stuff that's not always satisfying to me, certainly, but has a lot less

restrictions on it than a lot of these formalized kinds of categories.

"Jazz has always been with us for that same reason. I think it's carried a stigma of being rebellious in some way, of being free. But even that gets people in trouble because the purists think jazz has to go, 'dang danga dang dang.' But to survive, it shouldn't; music should *always* keep moving and *always* keep evolving."

A bit like Grusin himself. ∎

System Control

The 1989 Winter NAMM Show Report, Part II Software

The second half of our report concentrates on all those little disks and related peripherals that let your computer make music, tweak sounds and all sorts of other fun stuff. *Report by Bob O'Donnell, Chris Meyer and Dan Rue.*

APPLE

Though the Macintosh has been a very popular computer among musicians for the last several years, only during the past year or so has Apple really made itself felt as a direct influence in the music market. With the introduction of the very promising new Apple MIDI Management System in Anaheim, however, they've made a resounding impact on the future of Mac MIDI software. The MIDI Manager is a virtual MIDI patchbay that runs under Multifinder which allows multiple MIDI programs to run simultaneously, share MIDI data, and operate with the same set of MIDI input and output ports. Now that in itself is great, but what's really important about this development is that Apple will be making AMMS (code-named "Calamari" while under development) a part of the Mac's system software, thus ensuring that it will become the standard which all Mac software will have to adhere to. Several competing systems with similar functions are available on the Atari ST, including Steinberg's new M•ROS, (*see Atari Sequencers section*), but until ST developers agree to a standard (and to their credit, Atari themselves are trying to encourage this), chaos will rule on that side of the fence.

In other Apple news, a new Macintosh was introduced at the MacWorld Expo in San Francisco (which ran during the same weekend as NAMM – unfortunate timing indeed). The Mac SE/30 includes the new 68030 microprocessor found in the Mac IIx, a single 1.4Meg floppy disk, optional 40 or 80 Meg internal hard disks, the 68882 math co-processor, the stereo sound chip found in the Mac II and the capability to expand to up to 8Meg of RAM. A basic 1Meg model without a keyboard lists for $4369; it's $4869 for a unit with a 40Meg internal hard disk. – *BO'D*

ATARI

Atari was the first computer manufacturer to build MIDI ports into their machine; they were also the first to book space at a NAMM show (Apple and Commodore also do so now). The front "wall" of their booth was a reenactment of their recent ads, with a huge stack of TV monitors running demos of Atari music programs. Various manufacturers were manning personal demo stations inside their booth, and the Atari ST presence on the floor was strong too. However, what stole both their booth and a good deal of NAMM as well was not a computer or a program, but a brand new *MIDI controller* that Atari is co-designing and marketing with producer Jimmy Hotz and drummer Mick Fleetwood.

As Mick Fleetwood puts it, he has spent years frustrated as a drummer in Fleetwood Mac – he would have musical ideas, but since his primary axe was percussion, he had no way to relate them to others.

What Jimmy Hotz has designed is a generalized flat surface that's divided into a number of velocity-sensitive squares, rectangles, and "keys." A program running on an Atari computer maps those surfaces to specific MIDI messages – notes, chords, pitch-bend amounts, etc. Program changes received by the Atari changes the mappings. The way Hotz and Fleetwood were demonstrating the controller was by using setup maps of notes that harmonically fit in a specific musical key. A sequence of backing tracks was played (which changed the controller to whatever key the song was in as it progressed), and people were brought up to essentially just bang away, and what they played automatically fit the song. The idea is that the player does not have to have the mechanical skill of knowing what fret or black-and-white key to play to make a progression work. Of course, with such a generalized surface and control possibilities, it becomes quite a flexible controller indeed (particularly if it was hooked up to, say, some algorithmic composition software to boot, or in combination with Roland's new Pro 8 – see Roland report last month). Initial units will cost several thousand dollars; Atari hopes to eventually spin the unit down to become the ultimate home musical instrument.

Atari also unveiled their new Postscript-clone language, Ultrascript. Postscript has widespread acceptance on the Macintosh as the way to manipulate and resize text and graphics both (Postscript always prints out with the maximum resolution of the target device – say, a laser printer – regardless of how coarse or fine the monitor it was created on is). Postscript and Ultrascript are not compatible, but apparently close enough to make transferring code from the Mac to the Atari easy. Dr. T's already has Copyist running with Ultrascript and Atari's new Ultrascript laser printers.

As the year wears on, we can expect to see some new computers from Atari – a battery-powered laptop with a built-in track ball, and a family of 68030 machines with higher resolution displays. Atari wants to be taken seriously as a music *and* business computer. We'll keep you updated on how they're getting along. – *CM*

AMIGA STUFF

Commodore has received all kinds of support recently for their Amiga 500 and 2000 computers, and software companies have paid especially-close attention to making use of the Amiga's multitasking, 4096-color graphics-orientation, four-voice sound, and built-in speech synthesis. The booth showed a number of Amigas

with MIDI programs from various manufacturers (no, we didn't see any C-64s, but no one seemed to mind).

In addition to the Amiga 500, which retails for $799, has 512K of RAM (expandable to 1Meg), 3.5" disk drive, 94-key keyboard and mouse control and the Amiga 2000, which retails for $2195 and comes with 1Meg of RAM (expandable to 9Meg), built-in 3.5" disk drive, RS232 serial and Centronics parallel connectors, two RCA audio output jacks, and a slot for an optional Bridgeboard to make it compatible with an IBM PC/AT, the company

also had their new Amiga 2000HD ($2499) on display, which includes an internal 40Meg hard disk. In addition, the company mentioned their new 68020-based machine, the Amiga 2500 ($4699), which also includes a 40Meg internal hard disk and a 68881 math co-processor, but did not have one in the booth.

The Amiga 2000 is designed largely for desktop presentation of graphics and video, with the capability to easily add NTSC compatibility, animation and genlocking functions, and real-time frame capture. Taking excellent advantage of

these features were the folks over in the **Imagine Music Group** booth, who were displaying Amiga TV (ATV). This desktop video package for the Amiga includes the appropriate genlock and video frame grabber hardware, and Invision software ($899 for the package), which gives the user a template of special effects and the ability to design custom effects as well. Professional-looking, home-made music videos may not be very far off . . .

Quite a bit of other software was announced in Amiga format, including Big Band,

the automatic music composition program (*see review of Atari version in MT November '88*) from Imagine, and Master Tracks Pro from **Passport**. **Spirit Technologies** released some non-SCSI hard drives (IBM-type Seagate drives) and RAM boards for the Amiga 500, giving it up to 3Meg of internal memory.

To flaunt the Amiga 2000's video capabilities, Commodore had a "video wall" made up of about two dozen monitors running television and live video images – great for watching the Superbowl on Sunday. – *DR*

IBM STUFF

Though it's often maligned by those trendy Atari and Mac musicians, the IBM PC continues to hold a strong position in the MIDI software marketplace. The recent release of Yamaha's PC-compatible C1 computer has raised the stakes even more. Proof of that came in the higher profile the computer had in Anaheim with several companies displaying programs running on it. Included in that group were **Yamaha** themselves – they were showing a Japanese-penned multitrack sequencer called, obviously enough, Sequencer ($295) for the C1. Only preliminary information was available, but it seemed fairly workmanlike (i.e., no graphic editing, but tons of

tracks and screens – along with taking full advantage of the C1's sliders, MIDI ports, and SMPTE capabilities). **Passport** with Score and Master Tracks Pro (running under Windows); and **Magnetic Music** with one of the several new versions of Texture ($299 for C1 version) they unveiled at the show were also part of that contingent. The C1 version of Texture and another that runs on normal PCs operates under Microsoft Windows, and supports 32 MIDI channels via the Music Quest MQX32 MIDI interface or via the extra MIDI outs on the C1.

On the other end of the price spectrum, Magnetic unveiled Prism ($99), a 16-track sequencer (which can

also run on the C1) with windows and mouse support, event edit lists, loop recording, on-line help and unique scaling graphs that allow you to alter various parameters in real time. The program also has an Undo command and supports Texture files.

Dynaware showed two very attractive-looking packages for the PC crowd. DynaDuet ($245) is a combination sequencer/score editing program geared for the low end of the market. Music can be entered into the program's fairly basic 16-track sequencer and then transcribed into standard notation, or you can enter individual notes with the mouse or via step-time MIDI entry in Score mode.

Ballade ($195) is a combination sequencer and MT32 editor that turns the little Roland sound module into a complete music-making system. The voice editor section of the program offers graphic display of envelopes, the score editor/sequencer offers standard music notation, and the play mode has a very nicely done mixer screen to control volume, panning and reverb para-meters while a song is playing.

From **Computer Music Supply** came word of Music Creator ($495), an automatic composition program that allows you to create music by combining one of several hundred different styles. Look to an upcoming *Newsdesk* for more on this program. – *BO'D*

ATARI STUFF

On top of all the goodies Atari themselves were showing, several companies had interesting new products for the ST. At the top of the list are two generic patch editor programs that will allow you to edit any MIDI synth that can respond to and dump its parameters via MIDI SysEx data from a single program. That's right, pretty soon there'll be no need to buy separate E/L's for every synth you own – you can just use palettes for existing

instruments or create your own for new instruments. Needless to say, I think this is a very positive development.

The entry from **Dr. T's** is called XOr and **Hybrid Arts'** program will be called GenEdit (files will be compatible with GenPatch, by the way). XOr has librarian, patch tweaking, and patch randomization facilities built in; GenEdit also has a set of patchable software faders that may be attached to a sound's parameters for editing.

Neither one was quite ready, but both are expected to arrive some time in late spring or early summer and both are expected to retail for about $200.

Over at the **Sonus** booth, the big news was M1 Command ($169), a version of the popular D50 program which has extensive patch generating capabilities.

Across the aisle from us at the **MIDIMouse** booth was UltraMIDI ($229), a complete

MIDI system organizer that includes a generic librarian and a utility to load and play standard MIDI Files. UltraMIDI also offers remote control operation via MIDI commands, and has the capability to process and or reroute any MIDI data in real time. Though I didn't get a chance to completely explore this program, I like the options that it offers.

Yes, things are getting interestinger and interestinger. – *BO'D*   ▶

In addition to all the Mac sequencers and notation packages on display at Anaheim, several other Mac-related hardware products made their presence known. First off, over at the **Steinberg/Jones** booth, a Mac version of the Lynex stereo digital sampling system (approx. $1900) was being put through its paces. The basic system includes a plug-in card for the SE or Mac II, a rack-mount box with one Meg of RAM and eight individual audio outs, and the editing software. Additional RAM is available and a direct-to-hard disk recording option is being planned. Two playback rates are offered: at 50K eight voices are available (four stereo voices) and at 33K sixteen voices are available (again, divide in half for stereo). The Lynex doesn't include any filtering or LFOs per voice, so it's really intended for direct recording and post-production applications. The company also announced that Blank Software is planning to support the Lynex system in Alchemy, and that in conjunction with Apple's new MIDI Management System (*see Apple section*), the system will work with any Mac sequencer.

Over at the **International Music Company** (IMC) booth, hidden amongst the Akai equipment was the new MIDIA Music Box ($999). Inside this innocuous looking package is a built-in MIDI interface for the Mac, or the Apple IIGS, or the Amiga, as well as a 26-voice 16-part multitimbral synthesizer. Over 1000 sounds are available divided amongst 500+ two-oscillator analog patches, 250+ four-operator FM patches, 36 sampled drum sounds and room for several hundred user-programmable patches. Six individual outputs as well as stereo outputs and a headphone jack are included on this beast and they even throw in a demo of Passport's Master Tracks Pro Jr. for good measure. If you're just starting into computer music, this may be an excellent first choice. Watch for an upcoming review. - *BO'D*

NOTATION

Music notation programs continued to sprout like wild flowers in Anaheim, with new packages appearing on every major computer, and refinements or ports of existing packages demanding quite a bit of attention as well. On the Macintosh and the ST, the biggest surprise was Beethoven ($229 for ST, $399 for Mac), a new program by 'Art of the Few' being distributed by **Samson Technologies**. Beethoven supports a huge library of symbols, including Medieval neumes, allows you to create your own music fonts, permits kerning (adjusting the spacing) of text, accepts single line real-time MIDI input and instantly displays it, supports the Atari Laser Printer and HP Desk Jet printers, offers control over page layout and more. Look for a review in an upcoming issue.

In the **Passport** booth, Encore ($495), a combination scoring/sequencing program for the Mac made a more formal debut (it was first shown at the Atlanta NAMM). Encore can transcribe Master Tracks Pro and standard MIDI Files if you just want to use it as a notation package, but it will also function as a sequencer if you prefer to work in a purely notation-based environment, with features like quantization and the ability to adjust the velocity and duration of notes. Music can be entered in real time or in step-time via MIDI and up to 64 different parts can be supported. Passport also introduced Escort ($250), a companion program for their IBM-based Score notation package. Escort permits files created with Master Tracks Pro or any other sequencer that offers MIDI File support to be imported into Score and transcribed.

The folks at **Dr. T's** announced support of Atari's Postscript clone, Ultrascript (*see Atari blurb elsewhere*), for their ST version of the Copyist Professional, allowing much higher printing quality. As with KCS on the ST, the Copyist now also offers full GEM implementation with pull-down menus.

One program I didn't get to see but heard good things about was Theme for the IBM from **Electronic Courseware Systems** (ECS). Look for more details in upcoming issues.

Several other companies offered sequencers which include some basic notation features as well, so you may want to check the various computer and sequencer sections to check out other packages which offer notation. All in all, though, there was plenty to keep us busy transcribing for several months. - *BO'D*

MAC SEQUENCERS

The big words in Anaheim for Mac sequencing were Portrait and Vision. Portrait ($495) is a brand new program from **Resonate** which has a very unique graphic orientation. It allows you to view your MIDI information in one of 15 different formats for various types of graphic and list editing, and allows you to add numerous types of markers and names to your MIDI information. The program also permits you to customize drum pattern grids for your own drum machines – a very popular feature at this show – and lets you put together patch lists so that you can choose programs from any of your synths by name instead of number. Portrait also supports up to 240 tracks, has user-definable macros, allows many editing operations to occur in real time, and permits you to create, after the fact, a tempo track which works with free-form improvisations that you play into it. Finally, Portrait is based on a modular design and plans for the future include additional modules, such as a MIDI mixer or MIDIMouse-like compositional tool, which users will be able to buy independently and integrate into their existing packages.

Vision (also $495) is the latest sequencing development from **Opcode**. Though it's based on Sequencer 2.6 (whose owners, by the way, can upgrade to Vision for $200), the 3.0 version of the software has so many new features that they decided to rename it. Most notable are all the graphic editing capabilities – notes can be seen in familiar piano roll notation and velocity and controllers in their own type of bar-graph display. Event edit lists are also available and any changes made in one area are immediately reflected in the other. The program also has editable transposition maps, supports 32 assignable faders to generate any type of MIDI data, offers 480 ppqn resolution, has an editable tempo track, can record and playback SysEx data and has some onboard algorithmic composition features. In addition, you can now loop in

record for drum machine-style sequencing and you can separately enter pitch and rhythm information if you don't have very good keyboard skills. The MIDI Keys function lets you perform nearly any Vision command from a MIDI keyboard for remote operation.

In conjunction with Vision, Opcode also introduced Studio 3 ($459), which integrates their Timecode Machine SMPTE/MIDI converter and Studio Plus Two two-in, six-out Mac MIDI interface into a single rack space unit. The Studio 3 also has inputs for two footswitches and one controller, which can be assigned to run various Vision commands, and an audio input which can be used to trigger MIDI notes.

All the packages are starting to offer extremely sophisticated (and friendly) new options for users at various degrees of playing capability. What remains to be seen is which one will meet your sequencing needs. The race is on. – BO'D

ATARI SEQUENCERS

In the continuously growing world of the Atari ST, the big news was Steinberg's M•ROS (Music•Real Time Operating System), which allows multiple MIDI programs to run simultaneously, share the same MIDI data and use the same hardware. So, for example, you could run a sequencer, a MIDI mixing program and a voice editor at the same time (as Steinberg displayed) and the MIDI information for all three could come out of the same MIDI port. The operating system shell also permits certain basic functions, such as record, stop and play of the sequencer to be initiated from within any program. Current plans seem to indicate that Steinberg will let other software developers have access to M•ROS to allow them to add compatibility to it, but that may change. Let's hope a standard for multitasking on the Atari can be developed (see last month's Other Side column in Outside MT for more on this topic).

In conjunction with the introduction of M•ROS, Steinberg also announced their new sequencer, Cubit ($490), a very graphic – orientated program that actually bears some resemblance to the concept of Resonate's Portrait for the Macintosh (see Mac Sequencers). Sections of songs are played in and named and then you can proceed to move the named blocks representing the sections in any way you want. You can edit MIDI information in one of four overlappable windows – Score Edit, which offers real music notation; Key Edit, which displays piano roll notation; Drum Edit, a customizable grid for drum patterns; and Grid Edit, an event list and bar graph display. Cubit features up to 16 groups of 64 tracks, offers a resolution of 384 ppqn , reads Pro24 files and supports the MIDI File standard.

Steinberg also announced 12 ($69), a low cost, 12-track (with 16 MIDI channels per track), cut down version of their Pro24 program. Twelve includes the ability to record in real time while looping or in a linear fashion, as well as supporting step-time recording, the ability to shift tracks by single clocks and a Score Edit page, which displays tracks in standard music notation.

In a slightly different vein, Intelligent Music displayed version 1.0 of Real Time ($350), their slick-looking combination sequencer/ algorithmic composition package. In addition to supporting all the standard sequencing functions, including 256 tracks, the ability to shift tracks by individual clocks, 192 ppqn resolution, looping in record and support of the MIDI File standard, Real Time can automatically generate fills, create variations on existing sequences and perform other creative manipulations of MIDI data. It also supports user customizable synth and drum machine lists and painting of tempo and control change data, offers multitasking functions and can sync to MIDI Time Code. Look for a full review in this issue.

Over at Dr. T's, the big news was a much nicer look and a full-GEM implementation – including drop-down windows – for their Keyboard Controlled Sequencer (KCS) sequencing package. The company also introduced a new Multi-Program Environment (MPE) module tentatively called TIGER ($149) (The Interactive Graphic EditoR) which brings piano roll-like graphic editing capabilities to KCS sequences. TIGER (which may undergo a name change by release) emulates many graphics programs, in that you can select a group of notes as you would an image, and then copy or reposition them in time and space. It also features the ability to display a note and its velocity with one figure – the note is in standard horizontal piano-roll notation, and its velocity is displayed as a variable-height vertical bar at its front. Edits can be performed (and new data, such as velocity and pitch-bend, drawn) in real time on several tracks and the program also supports the MIDI File standard for use with sequences created on other programs. TIGER will probably see two levels of release, just as KCS has normal and "level 2" incarnations. Dr. T's also unveiled the MPE-compatible Clicks ($199), a film and video composing tool that allows you to create event lists and tempo tracks and import them into KCS and vice versa.

Hybrid Arts introduced a new edition to their line of sequencing programs called EditTrack ($199). Based on the popular SMPTETrack and SyncTrack, EditTrack offers identical features but lacks the sync-to-tape features of the former (of course it still sends and syncs to MIDI clocks). The new program supports the MIDI File standard.

All in all, features, options and programs continued to move steadily upward for the ST crowd. – BO'D & CM

SAMPLE EDITORS

This show saw three of the major players in the computer sample editing sweepstakes stake out different ground – ST developer Interval Music Systems (formerly known as Drumware) was showing off some stereo special effects with their new GenWave/16; Blank (Macintosh) was showing all sorts of enveloping, time stretching, and pitch shifting algorithms in Alchemy 2.0; and Digidesign (also Mac) seemed to be concentrating on hard disk recording and editing with Sound Designer 2.0 (part of their "Sound Tools" lineup of hardware and software).

Previously, GenWave supported a host of 12-bit mono samplers. The new upgrade now also handles 16-bit samplers (Casio FZ, Akai S1000 and Marion-equipped S900/S950, Dynacord ADS and ADD-two, Simmons SDX, EIII, and sample dump standard). Left and right channels may be unlinked or treated in parallel, and special stereo treatments includes tricks like panning. The list price has gone up just $50 to $350.

Blank has made a few interesting moves with their sample editing "environment," Alchemy. For one, they have frozen the features in the "old" Alchemy ▶

Interval Music Systems, formerly Drumware, introduced GenWave/16, a sample editor for the Atari ST which offers compatibility with 12-bit mono and 16-bit stereo samplers.

► and have renamed it Alchemy Apprentice – with a new low price of $345. Alchemy 2.0 (retailing for $695) has several new features, including support of Digidesign's Sound Accelerator Card, the ability to change pitch without changing the length of the sample (including being able to auto-detect the pitch of a sample), the ability to change the length of a sample without changing its pitch, and the ability to impose any pitch or amplitude envelope on a sample. These envelopes may be drawn or extracted from other waveforms. Possibilities

that fall out from all of this include the ability to make one sample stretch across an entire keyboard without the infamous "chipmunk" effect, retuning and detuning samples for layering or flanging, and stretching sound effects and speech to match edited video. Truly a powerful package.

Digidesign was showing a more finished version of their new hard disk recording/ playback environment. Sounds may be recorded in stereo, extensively edited (including EQ, looping, mixing, time compression/

expansion, etc.), and made to play back in any order in cue-list fashion (again, in 16-bit stereo). This "Sound Tools" system (AD In, Sound Designer 2.0, and the Sound Accelerator combining to list for $3285) starts to seriously alter what we all thought digital recording, editing, and playback meant.

Not meaning to slight anyone, there were a few other interesting developments in the land of computers and sound – namely, Digidesign now has their Turbosynth synthesis program up and running on the Atari ST, and MIDImouse Music showed Wave, a synthesis program that looks like a cross between

Turbosynth and Dr. T's SampleMaker. It runs on the Amiga, and supports the Sample Dump Standard over MIDI ($250). For you IBM types, Turtle Beach Softworks was showing a very handy little eight-bit D/A converter with an audio output jack housed in a parallel printer port called the DP8 Digital Playback port. What it does is allows you to hear any edits you make to a sample without having to send the sound back to the sampler. The price for this great convenience? A mere $95. Also, Hybrid Arts finally has their ADAP 2.0 stereo hard disk recording system up and running on the ST. Entry level price is around $4000. – CM

THE END

All told, this was an excellent NAMM show. A good amount of new products were introduced to keep things moving ahead, companies seemed to be in a positive, but realistic type of mind frame, and there was an overall upward mood for the industry. And on top of that, MIDI officially celebrated its fifth anniversary in Anaheim with a rousing party

sponsored by the International MIDI Association (IMA) and the MIDI Manufacturer's Association (MMA). Yes, believe it or not, it's only been five years. If you take a look at how far things have come already, just imagining what the next five will offer is intoxicating, heady stuff. Here's to the future. – BO'D ∎

MORE FROM ...

Here's where to find all the companies listed in this second part of the NAMM Report.

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

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

Blank Software, 1477 Folsom St., San Francisco, CA 94103. Tel: (415) 863-9224.

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

Computer Music Supply, 382 N. Lemon, Walnut, CA 91789. Tel: (714) 594-5051 or (800) 322-MIDI.

Digidesign, Inc., 1360 Willow Rd. #101, Menlo Park, CA

94025. Tel: (415) 327-8811.

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

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

Dynaware Corp., 1163 Chess Dr., Ste. J, Foster City, CA 94404. Tel: (415) 349-5700.

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

Hybrid Arts, Inc., 11920 West Olympic Blvd., Los Angeles, CA 90064. Tel: (213) 826-3777.

Imagine Music Group, 751 A South Kellog Ave., Santa Barbara, CA 93117. Tel: (805) 683-3340.

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

Interval Music Systems (formerly Drumware, Inc.), 12077 Wilshire Blvd. #515, Los Angeles, CA 90025. Tel: (213) 478-3956.

Magnetic Music, RD 5 P.O. Box 227A, Myrtle Dr., Mahopac, NY 10541. Tel: (914) 248-8208.

Marion Systems, 1317 5th St. #200, Santa Monica, CA 90401. Tel: (213) 451-8910.

MIDIMouse Music, P.O. Box 272, Rhododendron, OR 97049. Tel: (503) 622-4034.

Music Quest, Inc., 1700 Alma Dr., Suite 260, Plano, TX 75075. Tel: (214) 881-7408.

Opcode Systems, 1024 Hamilton Court, Menlo Park,

CA 94025. Tel: (415) 321-8977.

Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94019. Tel: (415) 726-0280.

Resonate, Inc., P.O. Box 996, Menlo Park, CA 94026. Tel: (415) 323-5022.

Samson Technologies Corp., 485-19 S. Broadway, Hicksville, NY 11801. Tel: (516) 932-3810.

Sonus Corp., 21430 Strathern #H, Canoga Park, CA 91304. Tel: (818) 702-0992.

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

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

Voyetra Technologies
Sequencer Plus Mark III/C1

```
========================== Main ==========================
 Tsig  SMART
 Tk  6 1st DX7 SWEET SYNTH    BPM 100   CK: INTERNAL    [STOP]   Mem 264201
                                                         1:0

Trk Name            Port:Ch Grp Prg  Trans Quant Loop Mute  Offset      Bars
  1 GUIDE TRACK        1  3   A   21  ----- ---   ---  MUTE  -------   1  152
  2 METRONOME          1  4   A  103  ----- ---   ON   MUTE  -------   2    1
  3 ---------------    1  1   A   40  ----- ---   ---        -------   3    0
  4 BASIC OPENING      1  3   A   21  ----- ---   ---        -------   4    8
  5 New Track          1  2   A    0  ----- ---   ---  MUTE  -------   5   14
  6 1st DX7 SWEET SYNTH 1 6   A   45  1:00↓ ---   ---        -------   6  147
  7 1st BASS TX SOUND  1  4   A  103  ----- ---   ---        -------   7  147
  8 1st BASS ?         1  2   A    0  1:00↑ ---   ---  MUTE  -------   8   97
  9 1st VERSE          1  1   A   40  ----- ---   ---  MUTE  -------   9   40
 10 1st BASS ?         1  1   A   40  1:00↑ ---   ---        -------  10   16
 11 1st TX81Z SOUND    1  4   A  103  ----- ---   ---        -------  11  147
 12 D-50 1st VERSE C-46 1 3   A   21  ----- ---   ---        -------  12   40
 13 1st K3M DIG PIANO 1 1  7   A    0  ----- ---   ---        -------  13  147
 14 1st BASS K3M       1  7   A    0  ----- ---   ---        -------  14  147
========================= Main Menu =========================
 Record   Delete  Mute  Loop   Name  Solo  Tempo  Chase  GROUP  EDIT  FILES
 VIEW  XLIBRARIAN  OPTIONS  PUNCH-IN  H_MULTI  Quit

     SPACE BAR: Start/Stop    ↔ select item    ↑↓ select track
  Press 1st letter of item to select MENU or Command.  "?" - menu command Help
```

The main screen from the C1 version of Voyetra's Sequencer Plus Mk. III allows you to see fourteen tracks at once.

One of the first third-party sequencers to jump onto the Yamaha C1 bandwagon is the latest version of this popular PC workhorse. *Review by Dennis Miller.*

QUICK, SP3+C1 – What's that spell? Can't guess? Well, we're talking about putting Voyetra's Sequencer Plus Mark III v.2 together with Yamaha's new C1 computer – and that adds up to a pretty healthy dose of music production power.

Sequencer Plus Mark III is the high-end model of Voyetra's sequencer line. It runs on all models of the IBM and requires an MPU401 or compatible interface. A slightly revamped version of it is also among the first professional level programs to work on the Yamaha C1. It's loaded with features that you won't find elsewhere, and offers tremendous power over the music

making process. It allows up to 64 tracks, has a multitrack record mode, 11 memory buffers, a hefty 354K workspace, note pad, jukebox mode, and something else which few other programs offer right out of the box – a ton of randomizing features which can be set to effect rhythm, duration, velocity, etc. As an integrated companion program to Voyetra's Patch Master Plus Voice Editor Series, and soon M/PC (an IBM version of Intelligent Music's "M"), it can easily serve as the centerpiece of a software "workstation." But watch out – its price is as "professional" as its features, and you're going to have to decide if you really need all those options.

Because the IBM and C1 versions of the program share so many features, I'll begin by discussing what they have in common. Then, we'll get a closer look at how well Voyetra has implemented the additional capabilities of the C1.

At a Glance

Like other IBM sequencers (there were some forty commercial programs at last count), SP3 allows you to work and view your data in several different modes. After loading the program (which, by the way, is copy protected), you are taken to the Main Window where you'll get a clean, uncluttered
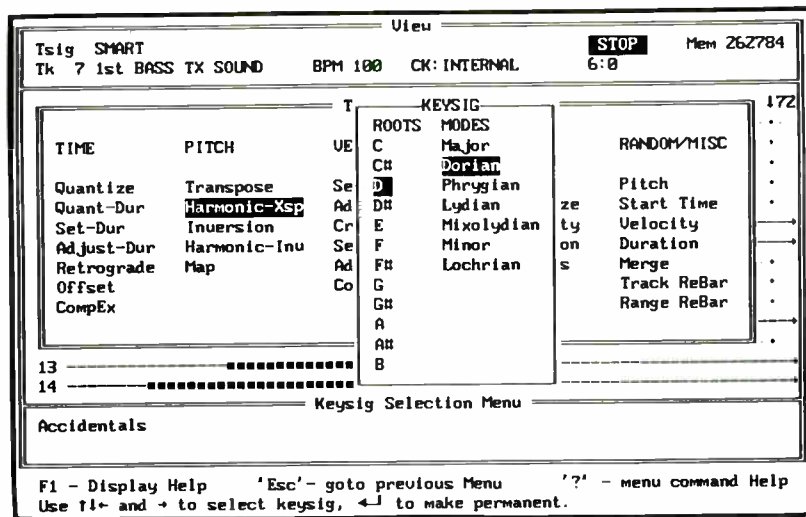
Sequencer Plus has numerous editing facilities, as can be seen with the Key Signature menu overlaying an edit menu.
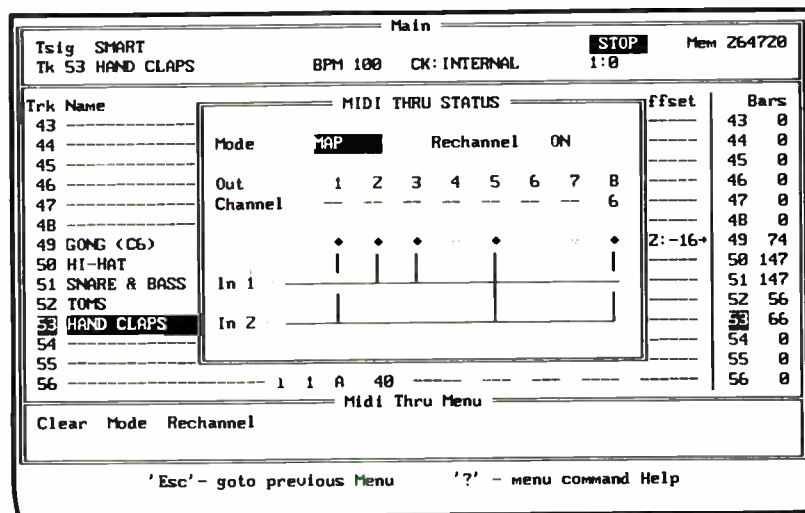
The MIDI Thru screen found on the CI version allows you to reconfigure its MIDI inputs and outputs.

display of track names, MIDI channel and voice assignments, available memory, and amount of bars in each track. There's a status area which shows your time signature and clock source, tempo setting, and measure and beat counter. If you have SMPTE display enabled, you can also see timecode here (only on the C1 version). At the bottom of the screen is the menu area where numerous other functions can be accessed, usually with a single key press. If you want, you can choose to have a short description of each function appear on the screen when it is selected, or you can get more extensive help at any point by hitting the F1 or F2 keys. There's no mouse option in SP3, but you might not mind because the command key layout is really very logical and intuitive. However, I still think it's about time

that all software developers included some mouse implementation in their programs.

You can easily record from the Main screen by hitting "R" and then the space bar (at present, record starts the second you hit the spacebar; I'd like to see a "wait for note" feature included where the program won't start recording until it gets a note-on message from your controller). Unlike some sequencers, SP3 records program changes as well as note-off velocity, among other things, and will also read your controller's MIDI channel directly from the incoming data. It's also easy to record events coming from different channels through a patchbay or merge box by using Multi-Track Recording. SP3 will either send the data from each channel to a separate track on a "first come, first

served" basis, or you can manually assign which tracks will receive the data from each incoming source.

So Let's Hear It

Playback from the Main Screen, which always begins at measure 1, presents you with some pretty interesting options. First, there's a Track Grouping function where you assign any recorded track to one of 26 groups – this is real handy if you want to solo or mute a bunch of tracks at once. (Other operations can also be performed on a group.) Also, you can sort your tracks by group and have them reappear on the screen in consecutive order. This is especially useful when you plan to do Block Edits which only work on successive tracks, but I'll talk more about editing later.

Next, you can preview the effect that transposing, quantizing, looping, offsetting and tempo changes will have on your music without actually changing any data – sort of like "trying before you buy." Transposing, which works over a range of 10 octaves, quantizing, from a quarter note to a sixty-fourth note triplet, and changing tempo can all be done while your sequence is playing. Looping can be set on a track-by-track basis.

To Edit or Not to Edit

After recording, you'll probably head over to the View Screen to start editing your tracks. This window shows you the bars in each track represented as graphic symbols – nothing fancy, but real useful for keeping yourself oriented. You get a very respectable 32-track by 72-bar display with an IBM EGA card, or an adequate 32-by-32 display with CGA or Monochrome. One of my biggest problems with SP3 is its lack of any MIDI data column display or event list – I'm pretty picky about how I get to view my work. Fortunately, there are a number of different edit windows to peek into so that I (almost) don't mind not seeing all the various parameters at once.

In the View Window, record or playback is initiated from any bar by simply putting the cursor there and starting the function. Unfortunately, you can only start from the beginning of a measure. SP3 has a handy Punch-In feature which lets you compare your original take with a new one before deciding which you want to keep. Setting a Playback Range is also a snap – just hit F5 and set your boundaries. I found that combining Playback Range and Punch-In was a kick, because I could determine exactly how many bars would precede my punch-in point (that way, I could get a real nice groove going before I started to record). SP3 also has a Tempo Track, useful for automatically controlling tempo while a song is playing. Normally, you're limited to one tempo per bar, but you can get around this by inserting a few measures of very short duration, say 1/16th, anywhere you want, then changing the tempo for only those measures. This would get you some pretty subtle time changes, and by making use of the program's ability to rebar the measure prior to any short insertions to 15/16, would allow you to avoid potentially horrendous sync problems.

Most of your large-scale editing will

be done from the View Screen. As mentioned earlier, there are a whopping 11 memory buffers which you can use to store different segments of data. You can Copy, Delete, Insert, Replace or Zap any range of a single track. The differences among these options mostly involve what happens to the data in the range you select. For example, Delete puts the selected data into a buffer, removes it from the track, and shortens the track accordingly; while Zap copies the range to a buffer and leaves behind empty measures. Then you can Insert the data from the buffer into any bar of any track, or Replace (overwrite) the range you want. That sort of flexibility is typical of the control the program gives you and makes me believe that its authors understand that people have different working habits. You can also work on data from many tracks simultaneously by using the Block Moves Menu. The commands here are similar to those of the Buffer Menu, but these changes are permanent – SP3 has no Undo command. Still, the program is nice enough to ask you "Are you sure?" or to "Please Verify" before it deletes any chunk of data.

And Now, The Details

Speaking of edits, let's get into the heart and soul of the matter –the ability to transform the recorded data, which as far as I'm concerned is the key to any program. SP3 really delivers in this area.

There are two basic fine-edit "arenas" in SP3: the first consists of several Edit Windows where individual note and MIDI data can be manipulated, and the second (my personal favorite) is the Transforms Window. In the Note Edit screen, you can work on individual pitches by selecting them with the cursor; with Note Trigger On you'll hear each event as you select it. For each note, on and off velocity, pitch, start time, and length can be fine tuned. To change a note's start time or length, for example, you first set a default "Time Unit," anywhere from a quarter note down to a single "click," which can be as little as 1/192 of a quarter. Then, you select the note and use the "+" and "−" keys for a single time-unit adjustment, or the "[" and "]" keys to adjust the value by four time-units. Moving around in this screen usually involves a single keystroke – the Tab key gets you to the next note, Home skips to the next measure, etc.

Adding new notes while in the Edit screen is done using the Insert Note Buffer, which has adjustable settings for a note's length and on and off velocity. You can also easily add notes with a whole set of programmable Control key combinations – the defaults are Control-W for a whole note, Control H for a half, etc. I'm sorry to say that this is as close as SP3 gets to step-time recording – for some reason Voyetra has chosen not to include this fairly standard feature in the program.

The MIDI Edit Window does just what the name implies – you'll see a graphic display at the bottom of this screen which shows you where all program changes, bender data, aftertouch, and other MIDI events occur, but you can only see or change the actual values for one class of events at a time (where's that MIDI event list?!?). If you want to save memory and filter out all or just a percentage of any MIDI event, you just state your pleasure at the "Density to Filter?" prompt and you're all set. You can also play back your sequence from this screen (or the Note Edit window) by hitting the spacebar.

The Transformer

For most purposes, the Transform Window will present you with the most useful editing tools. After seeing lots of new and upgraded sequencers hit the market recently, I'm still convinced that SP3 offers the greatest number of possibilities of any IBM program I'm aware of. Compressing or expanding, reversing, inverting, splitting or combining, offsetting, transposing and mapping are all one or two keystrokes away, and the randomize functions which I mentioned earlier also raise the ante to new levels.

Hitting an "X" from the View Screen gets you into the Transform Window, where you are presented with five columns labeled Time, Pitch, Velocity, Split, and Random/Misc. In most cases, you can use these functions on a range of measures spanning several tracks or more. If you choose Quantize, for example, you'll be prompted for the range you want, quantize value (from a quarter note to a 64th note triplet), and – get this – the percentage of quantization you'd like. Choose 50% and your start points will move halfway to the time value you've chosen. You can also choose to quantize note start points and leave all other MIDI data unaffected. Now *that's* got possibilities . . .

Numerous other goodies are

available in the Transform Window, some of which are more useful than others. You can set the length of all notes in one or more tracks or merely adjust their duration by a few clicks, and you can Offset a track by any value equal to or greater than 1/192 of a quarter note (the "click" value). Using Compress/Expand, you can fix a ratio between the time values of a new track and an old one, and if you were to play them both back at the same time, you could get some really nice poly-rhythms or phase effects. I found it very easy to learn these and the other Transforms functions because they all work in essentially the same way. I'll give the program an "A" for consistency in its user interface.

A quick look at the Pitch Transforms includes intervallic or harmonic trans-position, intervallic or harmonic inversion, and pitch mapping, whereby you might convert all "Ds" below middle-C into "F#-7s". Velocity Transforms offer the standard crescendo/decrescendo effects, a Set or Adjust Note-On feature to fix all values at a certain level or just raise or lower them some amount, a Set or Adjust Note-Off option, and an interesting Compress/Expand feature, where you could move all note-velocities in a track closer to or farther from an average amount.

Split Transforms were added to version 2.0 of Sequencer Plus and are among the most useful editing tools in the program. In theory, you've got five different variables which can be used to determine whether a note will be removed from your current track and sent to a destination of your choice. The first, and simplest, is Pitch Split, which merely takes all notes within a set range and moves them to a new track – very useful for creating drum tracks or pointillistic effects; next are Duration and Velocity Splits, which remove any notes below a pre-determined length or within a velocity range; Quantize Split removes notes that are within a certain proximity to any time value you set (you could remove all notes within 10% of an eighth note); and finally, Modulus Split, which lets you remove every "nth" note. Modulus could be used to give your sequence some very unusual accentuation patterns – you could split out every 3rd note, assign them to a new track, then randomize their velocities. Next, you could merge the affected track with the original, or merely play them both at the same time, and wham, you've got some crazy offbeat accents.

If you really want to get into some craziness you can use SP3's randomize functions – though I personally think that having the computer write for you is a kind of cop-out. On the other hand, I think a slight bit of randomization to add a "human" factor can be very useful to bring tracks to life. As for the complete randomizing, I guess I'm just not convinced that the Quick and Easy Technique of Writing Music is the way to go, especially when it comes at the expense of other features, like step-record, which I think have much greater practical uses.

In any event, besides Pitch Randomize, you can also randomize Start-Time, Velocity, and Duration. The results are, well, random; but after all, it's a free country . . .

Friendly User

Numerous other features included with SP3 seem to make the program especially "hospitable." You can con-figure dozens of variables like selecting the number of measures you want as a lead-in or choosing between a single or double-clicking metronome. You can also opt for a no-frills, wide-view display or a smaller screen full of help prompts. There's also a massive owner's manual which is filled with applications and tips and which lets you work your way deeper and deeper into the program at your own pace. In general, it seems that Voyetra has worked hard to make this a "Have it Your Way" type of program and I think they've pretty much accomplished that goal. Everything works as advertised and the program "feels" solid and dependable.

Sequencer Plus and the C1

As one of the first sequencers available for the Yamaha C1, Sequencer Plus and its developers deserve praise for the level of C1 implementation which they have achieved. At the top of the list is the program's full-featured SMPTE synchronization which in-cludes reading, writing, and syncing in all four frame rates. You can also specify frame offsets for both tape and display right down to the sub-frame. In addition, you'll find several useful options for SMPTE-counter display including Absolute mode, where the counter shows actual frame numbers recorded on tape; Relative mode, where you can specify the SMPTE time you want displayed at the start of a song; and Off.

SP3/C1 also takes full advantage of the C1's eight MIDI Out ports and lets you set port assignments in the Main Window right along with your channel and voice assignments. The program supports up to 64 independent MIDI channels via the multiple MIDI outputs of the C1. While you're recording, you can access a very versatile MIDI Thru Window to route your controller's output to any of the eight outs. In Multitrack record, both of the C1's MIDI input ports are enabled and the program will sort by both port and channel, but in Single-track mode, the second port can only be used as a MIDI Sync input.

On the downside, SP3 doesn't take advantage of the C1's two continuous sliders. Also, while the C1 is a very quick 286 machine with 1Meg of memory standard, its screen is very narrow and you can only see a paltry 14 tracks maximum. The screen redraw is also slower than the IBM which is a bit of a bother; but hey, it's a portable, remember? All in all, I think the program works very well on the C1, though I do see room for future upgrades and improvements.

Conclusion

When you add it all up, SP3 and the C1 prove to be a very powerful combi-nation for anyone doing serious sequencing. With its tremendous range of editing features, built-in randomiz-ing options, flexible user interface and high-resolution SMPTE sync on the C1 version, SP3 ranks way up on the long list of IBM sequencers. Still, it lacks a few key items (a MIDI event list, step-recording, full mouse implementation, macros, an undo command, MIDI File support), and it needs to take better advantage of the C1's potential (sliders) – especially at this price. The sequencer wars are getting hot and heavy with new products sporting new features appearing, it seems, on a monthly basis, and Voyetra will have to work hard to maintain its edge on the pack. Based on my experience with the company's previous releases, I'm pretty sure they will meet that challenge, but only time will tell. ∎

SEQUENCING
with a MIDI Guitar
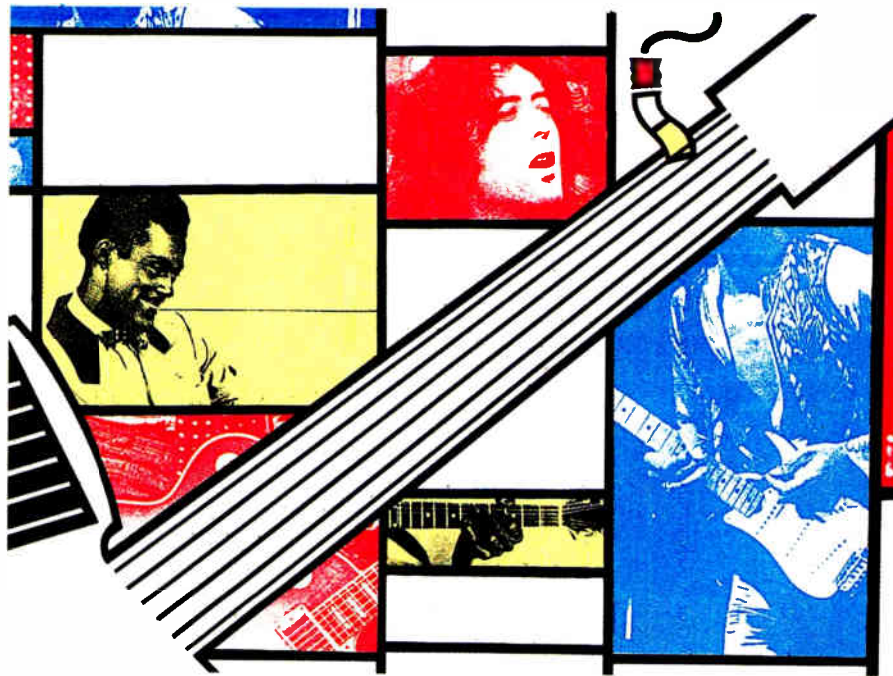
Illustration: Clive Goodyer

The combination of a MIDI guitar system and a computer-based sequencer offers some serious musical potential, as long as you're aware of the potential pitfalls and problems. *Text by Paul White.*

MIDI GUITARS HAVE, in general, enjoyed a somewhat checkered history. And to be quite honest, I still don't think they're entirely together yet. But they do offer an excellent alternative if as a guitarist, you weren't blessed with particularly impressive keyboard technique. In a studio/recording environment particularly, a MIDI guitar can save you from the hassles and frustrations of bad keyboard playing or constant step editing. They do offer some unique problems of their own, as I'll soon relate, but as long as you're aware of them, they can be easily overcome.

The majority of affordable MIDI guitar systems work on the "pitch following" method. In addition, there are the so-called guitar controllers which (sometimes) look like guitars, feel roughly like guitars but are most definitely not guitars. Included in this latter category are the Stepp DG1 and DGX (though Stepp is now out of business), the SynthAxe, the Yamaha G10, the Beetle and of course Casio's budget models (*not* the PG380 or MG510). The main restriction imposed by these controllers is that they can't be used as a regular guitar, so there's no way to change from your guitar sound to a synth sound mid-song, short of swapping instruments. Of course this is less of a problem in the studio, as the

guitar parts and synth parts can be committed to tape at different times.

Because the pitch-tracking systems are still far more common than other methods of conversion, and because my own experience is mainly with those type of instruments, I'll limit the scope of this article to the discussion of using those type of instruments in conjunction with MIDI sequencers. Most of what I have to say, though, can also be applied to other forms of MIDI guitar.

Pitch Following

Pitch following systems all rely on a split (or hexaphonic) pickup: one

section for each string. Firms such as Passac, Korg and Roland produce a system that may be fitted to your own guitar, whereas Casio produces a complete system integrated into the guitar. For the sake of this article, I used a system that mounts to a standard guitar.

The pitch-to-MIDI conversion used in these systems works as follows: the output from the split pickup is processed in order to extract the fundamental frequency for each string. This in itself is no easy task, as guitar strings produce a wide range of harmonics which must first be stripped away if they are not to confuse the tracking process. This fundamental frequency is then measured and output as a MIDI code, including the string velocity and the note on/off times. Unlike a keyboard instrument, the guitar doesn't have a clearly-defined note off time; the notes simply die away, and so a threshold system has to be used to detect when a string is playing. When a string is picked, the level exceeds the threshold, and so a note-on code is sent. When the note fades below the threshold level, the note-off command is sent. That should give you a clue as to one of the

problems with MIDI guitars of this kind: there is no way of knowing how long a sustained note will last.

But probably the most discussed and least understood problems associated with tracking systems is delay. The problem stems from the simple fact that the string must be vibrating for a certain minimum time before its pitch can be measured. Most older systems require at least one and a half cycles of the fundamental frequency to elapse before a meaningful measurement can be made. (Some newer systems, such as Roland's stand-alone GM70 conver-

ter, their new GS50 combination synth/converter, the Passac Sentient Six and Zeta's Mirror 6 system actually claim conversion in half a cycle, which is a significant increase.) One and a half cycles may not seem like a lot, and on the higher notes it is insignificant, but on the bottom couple of strings the

delay can be measured in tens of milliseconds, which is long enough to cause a problem when you're playing fast passages. Even so, if you have the normal guitar playing through an amp at the same time, this will prevent the slight delay from distracting you. Live, this might be a problem; after all, you might not want to hear the normal guitar, but in the studio you can monitor it without recording it. The other alternative is to set the synth you are controlling an octave or two lower and play the part an octave or two higher where the delay is negligible.

"Sorting out problems caused by the premature decay of individual notes is the one area where you are likely to have to get into the edit list."

However, what many people perceive as delay is not really delay in the tracking system at all – it's the attack characteristic of the sound they are controlling. It never ceases to amaze me how many guitarists try to strum a guitar synth, even when there is a slow string patch set up. You can't strum a ▶

string section, so why should you be able to strum the synthesized equivalent? Even so, most pitch-tracking machines don't interpret strumming too well – picked arpeggios sound much better. The secret is to play in the style of the instrument you are trying to imitate. Otherwise, no matter how good the sound of the patch, you'll end up with something unrecognizable and usually disappointing.

While still on the subject of limitations, you do have to be careful how you lift your fingers off the frets because it's easy to re-trigger the open string as you do so. If this is a problem, you might be able to improve matters by tweaking the sensitivity presets on the guitar-to-MIDI converter to make the whole thing a little less sensitive. Of course this will also shorten the sustain time of notes, so you have to find the right compromise. The other artifact associated with sensitivity is double triggering. You might find that if you pick a note harder than is necessary, you'll get a very short note which will then re-trigger and play normally. You might not even hear it, but a look in your sequencer edit list will show you that it's there.

Most MIDI guitar system handbooks give a detailed guide as to how they should be set up and this should be followed religiously. Otherwise, you might end up with a system that works very badly and you'll end up (unfairly) blaming the manufacturer. It is equally important that the guitar itself be well

personal choice and most of what I have to say will apply equally to the Steinberg, Dr. T's, Hybrid Arts and the other excellent packages currently enjoying popularity. There is also no reason not to use a MIDI guitar with a stand-alone sequencer, though some may not have all the editing functions you need.

The cleanest way to use a MIDI guitar is to set it to straightforward chromatic, polyphonic operation where all the information comes out on one MIDI channel and no pitch-bending is allowed. If you do try to bend a string, it will increase in pitch by semitone jumps only. This may seem like a limitation, but the truth of the matter is that a good many synthesized or sampled sounds don't take too kindly to inexact tuning (which is what you'd get if the guitar pitch were to be followed too exactly). This is not only due to inaccuracies in tuning or setting up, but also because strings are often stretched slightly when fretted, pulling them slightly off pitch. This is so much a part of the guitar sound that we have come to accept it, but believe me, it doesn't translate at all well to a pipe organ patch.

Another consideration is that of notes that sustain after the string has been released: glockenspiels, bells and so on. By working in the chromatic mode, these decays are held exactly on pitch, but if you use a true pitch-following mode, the decay pitch is likely to be slightly off, as the action of

> *"A good many synthesized or sampled sounds don't take too kindly to inexact tuning, which is what you'd get if the guitar pitch were to be followed too exactly."*

set up, with no buzzes or rattles, and the spacing between the hex pickup and the strings properly set (this last point is particularly critical).

This list of shortcomings and dire warnings may appear daunting, but most can be gotten around by a little practice with the instrument. You don't have to consciously change your playing style with a MIDI guitar, but subconsciously your picking will become cleaner and more even, leading to more consistent results.

MIDI and the Sequencer

My own sequencing setup consists of an Atari ST on which I run C-Lab's Creator software. This is purely a

taking your finger off the string confuses the converter. Even with this limitation, you're now in control of something that is roughly equivalent to a velocity-sensitive MIDI keyboard with no modulation controls. Some MIDI guitars, however, do provide you with a MIDI whammy bar so you can apply pitch-bend and vibrato from there. One positive advantage of working in chromatic mode is that you don't waste a lot of sequencer memory storing pitch-bend data. One note with pitch-bend might take up ten times the memory of one without.

The next mode to experiment with is polyphonic with bend, and again all the information goes over a single

MIDI channel. Due to the machinations of MIDI, all notes will get the same bend – even if you're bending just one string.

The most adventurous way to use the instrument is to use a separate MIDI channel for each string. This is usually described as "Mono" mode, because each string in effect controls its own mono voice in a multitimbral sound module such as the Yamaha TX81Z or similar. These voices may be set to the same sounds or different sounds for each string. Now you can bend as many strings as you like simultaneously, but be warned – the pitch tracking won't be quite so steady and any fret buzz will cause the pitch to waver, making the whole thing feel somewhat precarious. Also, sustained notes with long decay times are likely to go a trifle flat on occasions. Of course, if your guitar is perfectly set up and you have had experience with the instrument, giving you a chance to get used to its little ways, then you may be OK – but beginners are likely to find themselves skating on thin ice in this mode. The chromatic mode provides a very comforting safety net and the lack of pitch-bend might steer you away from those well-worn guitar licks. And to work with a sequencer in Mono mode, you have to have a sequencer that will record on six MIDI channels simultaneously, which not all will do.

Cleaning Up

And now for the interesting part. How can the sequencer help us to get around these little foibles that even the best MIDI guitar has?

The MIDI and conversion delay business is easiest to correct. If you listen to a mix of the synth and the regular guitar output as you record, your own timing won't be off, and so the result will be near enough correct to tighten up using the quantize function in the sequencer. If you don't want to rigidly quantize everything, you can go through the edit list and just quantize the bottom octave or so, or even leave everything as it is and apply a touch of negative delay to the whole track to bring it forward a touch. This latter approach is a compromise as the higher notes will then sound slightly early, but it may be enough.

A glance at the edit list will probably show quite a number of short notes that you hadn't intended to play. These are caused simply by the movement of your fingers on the strings while changing chord shapes or performing

runs (and then there are the double triggers caused by picking too enthusiastically). The Creator program has a "delete short notes" function where the minimum length can be specified by the user, and also a "check doubled notes" feature which will ensure only one note of any given pitch plays at any one time. Calling up both these functions will clean up a track extensively. It is also possible to set a minimum note length so that any wanted notes that have cut off prematurely can be lengthened. Actually, sorting out problems caused by the premature decay of individual notes is the one area where you are likely to have to get into the edit list and manually insert the correct note lengths, and in this respect a computer-based sequencer seems to be the most flexible.

Summary

For those who were brought up (as I was) in the guitar era and who find keyboards difficult instruments to come to terms with, the MIDI guitar – despite its foibles and imperfections – can be a useful, creative tool (especially where sequencers are being used). Because of the wide range of rich sound textures that can be obtained from even the most inexpensive MIDI synthesizer, the guitarist can use very simple musical phrases to paint an effective backdrop over which to display his or her conventional guitar playing skills.

A guitarist left to him or herself tends to use the same rock licks and chords and can easily end up in a deep musical rut. MIDI guitars can change all that by setting you thinking in new directions, and any limitations imposed by the instrument can also be creative. The fact that MIDI guitars don't take too kindly to Van Halen playing techniques, for example, might persuade you to slow down and give more consideration to the actual notes you are playing and how they fit in with the overall picture.

Don't fall into traps on the other side of the fence either, though. In other words, just because you have a 64-track MIDI sequencer and a four-foot stack of sound modules, doesn't mean you have to use them all at once. Maybe all the song needs is one or two additional parts, so don't yield to the temptation to create an impenetrable wall of sound just because you have the technology. Just make good music.
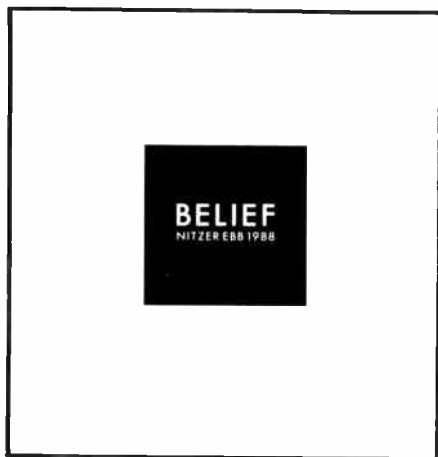
■

LISTENING
LAB

Be it the techno-beat of house or the cold solemnity of contemporary classical, this month's column presents the best on the market for learning the tricks of the trade.

Pick of the Month

NITZER EBB
Belief
Geffen

With wicked rhythms reminiscent of Kraftwerk, this techno-punk British duo's second album is hook-laden with some of the meanest, unabashedly computer-driven analog riffs I've heard since the early '80s. The synths are layered with cool samples and haunting, half-sung vocals a là Bauhaus to provide an intensely energetic backdrop equal to the songs' serious themes. Overcoming manipulation through self-belief (hence the album's title) is the big message here: 'Hearts and Minds' speaks out against government manipulation; the club-hit 'Control Im Here' confronts mind-games and domination in personal relationships; and my personal favorite, the trance-dance hypnotic head-stomper 'Blood Money' decries the religious exploitation of individuality. It's heavy stuff, but smartly thought-out and well-produced overall, rendering the album quite powerful – even inspiring. This band will certainly be making some waves in the club-scene, but there's enough creative substance here to distinguish them from that genre's stereotype. ■ *Dan Rue*

GENTLEMEN WITHOUT WEAPONS
Transmissions
A&M Records

Digital sampling has become a mainstay in modern music, with orchestral stabs and sampled horns fast becoming a big 'ho-hum,' and the creation of unusual sounds the *thing to do*. On *Transmissions*, Gentlemen Without Weapons (G.W.W.) has amassed the most impressive collection of found material sounds I have ever heard. The credit list for each song is headed by a lead vocalist, backing vocals, and then a list of featured creatures (up to 20) and a list of natural noises. The creatures come from every class of the animal family, from termites to elephants, humpback whales to peacocks, rattlesnakes to camels, et cetera. Natural sounds include streams, ocean waves, rubber bands, fire, and so on. All sounds were recorded on a Sony F1 and compiled on AudioFile.

But collecting a bunch of sounds means nothing if you can't use them in a musical fashion. G.W.W. has done this. The songs themselves are fairly simple pop tunes, but the addition of all this Mother Nature makes them very interesting indeed. The lyrics are also thought-provoking, crying out about acid rain, endangered species and general destruction of our planet. The hard facts which accompany each tune on the liner notes offering a sobering note to the otherwise enjoyable songs. The recording quality and performance are excellent. The writing is lacking a little, but this novel approach makes *Transmissions* a worthwhile listening experience. ■ *Rick Huber*

JOHN CHOWNING
John Chowning
Wergo WER 2012-50

Germany's Wergo label, long known for its commitment to new music, has launched a "Music with Computers" CD series. *John Chowning* contains four classic works by the inventor of Yamaha's FM synthesis technique.

These FM pieces have nothing to do with DX7s, however. They were realized on Stanford University's powerful computer system, with a range of expressiveness far beyond MIDI. 'Sabelithe' (1966/71) is an early exploration of the FM technique; the moment at which a "snare drum" gradually transforms into a "trumpet" is a technical and a musical triumph. 'Turenas' (1972) uses spatial location as a structural element. 'Stria' (1977) explores the interaction of timbre with a unique tuning system. 'Phone' (1981) presents a superhuman range of human vocal sounds.

All the pieces are demonstrations, in the best sense, of some synthesis problem: technological innovation presented with musical intelligence. Chowning takes pains with the tiniest of details; this music is gem-like in its precision, and of great cold beauty.

Other individual composers in the Wergo series include Michael Obst, Jean-Claude Risset, Morton Subotnick, Michael McNabb, and Barry Truax. There are also two compilation CDs. ■ *Carter Scholz*

SERIOUS 1
Dance Music Compilation
Low Fat Records (English import)

You've read our hip hop (September '88) and house (March/April '89) music specials; it's time to pick up some of the best of the music. Almost every cut on this album is good, and

represents a wide variety of styles (from hip hop to acid). Notable cuts include Bomb the Bass' 'Don't Make Me Wait' (a change from his cut-up 'Beat Dis,' this is a cleanly produced straight dance and vocal number with some great noise gate tricks on the guitar and vocals), EPEE M.D.'s 'Strictly Business,' (a hypnotic rare groove plus a great sample splicing job on the lead vocal), Phuture Pfantasy Club's 'Slam' (pure acid, with noodly resonate analog synths and subsonic drums), Steven Dante's 'Just My Imagination' (analog bass, good backing keys and stereo tricks, and the best TR808 programming I've heard in awhile), the rare Kevin Saunderson cut 'Bounce Your Body to the Box' (early techno – a thinned out Kraftwerk with an annoying repetitive vocal), and the wonderfully produced 'Why Should I Love You' by Jacqui Jones. It's a two-record import set (14 cuts; most remixes) for the price of a domestic two-spinner, and the best sampler of what's new on the floors that I've heard so far. ■ *Chris Meyer*

CAMOUFLAGE
Voices and Images
Atlantic Records

A lot of bands these days are going back to their roots, be it the Irish folk of the Waterboys, the rockabilly of the Wilburys, or the Zeppelin of Kingdom Come or Guns & Roses. Camouflage is a German trio who have gone back to the new romantic techno-pop of the early '80s. Reminiscent of early Ultra Vox and OMD, they have put together a collection of meaningful pop tunes with a minimalist approach.

Sequences play a big part on the album (Atari is named on the credits). Simple basslines and monophonic melody lines are all sequenced, but never smaller than a 16th note – and those are rare. String washes (from a string ensemble?) and a little brass complete the synth sound. There are also some striking samples, most in the percussion realm. Drum sounds go from cheesy Roland to Simmons SDS5 to big modern sounds.

No credit is given to what each member does – I'm guessing one is the vocalist, one the synthesist, and one drummer/programmer, with credit given to additional keyboard players and a flugelhorn player. The mood of the songs is generally pretty dark: lost loves, lost lives, planetary destruction

and racism are counter-balanced by an instrumental for ballerinas. The lyrics are printed in both English and German, but if you want the true words read the German, as there are several translation errors.

All in all this is a very pleasant album. If you enjoyed the new romanticism of the early '80s, you will like this. ■ *Rick Huber*

ROLAND
A Sound Approach

The concept? Take a group of product specialists who are generally acknowledged as providing some of the most musically entertaining demos to be heard at industry trade shows, have them use all the company's gear and put together a 40-minute CD of their music, explain all the details and intricacies of the production in a handy 24-page booklet, and sell the whole package at music stores. The result? Well, once you get past the fact that it's a bit of a soft-sell advertisement, it's a tremendously informative disc that happens to have a *lot* of good instrumental music on it.

The music on the CD leans toward fusion – it's stuff written by musicians for musicians – but because there are several composers represented, it's thankfully lacking the type of homogeneous feeling that ruins many fusion albums. In fact, there's quite a variety; from the truly fun industrial funk of Craig Sibley's sampler inspired 'Nothing Continues to Happen' to the rollicking shuffle of John Campbell's '9th St.' Of the 12 tunes on the CD, six were written by Eric Persing, who also did a very nice job producing the clean-sounding project. Persing has tremendous playing and programming chops (not to mention some of the best guitar emulation technique on keyboard I've ever heard), as 'Kingdom Come,' and 'Just Kidding,' the opening cut, demonstrate.

Percussionist Efrain Toro's two impressive offerings include the progressive, latin-tinged jazz of 'Living on the Edge' while Todd McKinney glides through a 15/8 feel in the disarmingly pleasant 'Only For You.' Finally, Larry Garcia's 'Worlds Apart,' co-written with Persing and guest guitarist Scott Andrews, manages to segue from samples of scuba gear to a happenin' R&B groove. You go figure.

An informational bit of entertain-

ment or an entertaining package of information. Either way you look at it, it's worth having. ■ *Bob O'Donnell*

THE BEATNIGS
Television
Alternative Tentacles

"One nation, under one God, has turned into one nation under the influence of one drug. Television. Why most people think Central America means Kansas, Communism means unamerican, and apartheid is a new headache remedy ... where toothpaste and cars have become sex objects and where Sesame Street is more real than Hill Street!"

I don't have The Beatnigs self-titled LP at hand, yet am so blown away with the single from it, 'Television,' that I would categorically recommend searching it out. Anyone programming a drum machine would do well to listen carefully to the three percussionists making electronic rhythm salad here – a delicious concoction of mesmerizing industrial thwacking and punk/thrash insensibility. Television samples abound, of course; a game show host gives away a check for $7000; familiar TV themes are interlaced with the lyrics. Vocals are rapped rather than sung, though there's no rhyme scheme, then played at slow speed to obfuscate, punctuate and dramatize.

One of the nice bits which comes from purchasing the single is getting four mixes of the same tune: a radio edit (great, although I'm not sure which stations would spin it), one called 'Jazzy Beats' (the shortest version, yet the most "normal" in its production, the most musical in its orchestration, and the most rhythmically interesting, if that's possible), the 'On-U Sound Dance Mix' (the most raunchy, using the most interesting sound effects and synth/sampler creations) and the dub mix (if you like heavy metal guitars with your industrial funk).

Warning should accompany: if you're offended by the lyrical selection which started this review, you'll *hate* the total package. Not intended for the weak or faint-hearted. (*For information on this and other Alternative Tentacles records, which are admittedly difficult to find, write to ATR, P.O. Box 11458, San Francisco, CA 94101. Try ordering the sampler LP. Depending on who you are, you may be ecstatic that you did!*) ■ *Deborah Parisi*

Savant Audio

Tweak It!

A program/desk accessory for the Atari ST that gives it 16 programmable software MIDI faders. *Review by Chris Meyer.*

EVERY NOW AND then, some little product comes along that makes you go "Yeah! Great idea!" Tweak It!, while not perfect in execution, is one of those ideas.

In short, Tweak It! is a program that draws 16 faders on your screen that you can grab with a mouse and move up and down. In response, Tweak It! sends out a programmable MIDI message (up to 20 bytes long) that has the fader's newest position included somewhere within (along with a few other tricks, like programming a "checksum" that some devices require, and "nibblizing" to deal with the LXP1). Across the top of the screen are 17 "devices," which are configurations of sets of messages that each fader sends (clicking on one brings up a new device). You can memorize individual devices, "setups" (groups of 17 devices), and "mixes" (fader positions).

What would you do with this? Well, an indication is given by the default device in Tweak It! – a set of faders that sends MIDI master volume (continuous controller #7) on each of the 16 MIDI channels, respectively – a remote MIDI mixer. I also quickly constructed a device that controls the

eight faders and mutes on a Twister VCA box in my rack. Another is for remote programming of synths – the fader value can be imbedded in the middle of a SysEx message. Many synths allow individual parameters to be tweaked with individual SysEx messages or "unregistered parameters" (free-agent MIDI continuous controllers). Tweak It! comes with devices for several synths and effects devices; Savant adds to the list as users send them in. And the manual is great – lots of programming examples, and written in real human terms to boot.

You need to run the program version of Tweak It! (copy protected with a joystick-port key) to design your own faders. After that, you can run just the un-protected DA (desk accessory) while inside other programs. I've encountered some slight redraw bugs while doing so, but such is life. If you're running an old-ROM 1040ST (like I am) where the mouse routines are slow, sometimes you'll miss a fader knob, and the knob will *slowly* crawl to catch up with you (a GEM bug) – drink less coffee. Also, some GEM conventions (like double-clicking) aren't always followed.

What's missing is a good way to have a sequencer running at the same time to record your moves. If your sequencer doesn't recognize MIDI DAs, Tweak It! will take over the MIDI out to send its messages, resulting in occasional hung notes. Tweak It! has a MIDI Thru function that only turns off if it detects another MIDI routine out there (and it's not perfect); the user can't turn it off manually. When I tried to route the output of my ST back into the input to record Tweak It!'s actions

in Intelligent Music's RealTime, I got an endless feedback loop that locked up the system. Savant says the only person they've heard of who makes it work was running C-Lab's Notator. Oh, for the equivalent of Apple's MIDI Manager on the ST, so programs could coexist and I could patch one to the other . . . Tweak It! could also stand to take up less screen real estate (it currently eats the whole thing), and the program needs a resizeable or moveable window (alas, difficult with DAs) so I can keep it on-screen while running something else.

However, Tweak It! has its uses, is cheap, and its creator (Rick Hickey) is constantly "tweaking" it himself (bad pun). If you're an ST MIDIophile at all, it's worth having around. ∎

PRICE: $50

MORE FROM: Savant Audio, 2140 Bellmore Avenue, Bellmore, NY 11710. Tel: (516) 826-6336.

Prelude Software

MIDIEdit

A voice editor/librarian for the IBM PC and the Yamaha TX8IZ/DXII, DX2I/27/I00 and Roland MT32. *Review by Michael Andreas.*

VOICE EDITOR PROGRAMS are generally rather expensive nowadays, particularly when you have to buy several programs, so it's nice to see somebody offering a cost-effective alternative. The instruments included in this program are a nice eclectic group of synths, any two or three of which is likely to be found in the average MIDI setup, and the low cost of the program makes this a very attractive offer. Although these editor/librarians lack certain features found in some of their more expensive counterparts, they perform quite satisfactorily and are a great way of cutting down on one's software expenses (which can become sizable when spending $100-plus on software for each of your synths).

To run MIDIEdit you will need an IBM PC/XT/AT or compatible with

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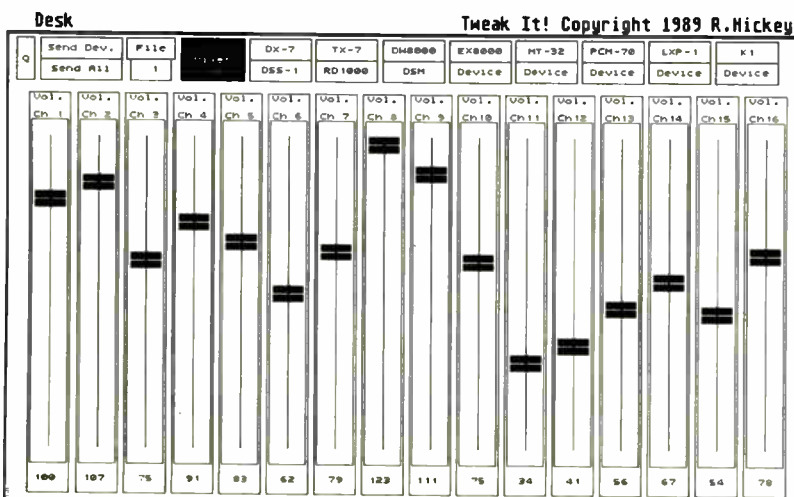
384K RAM, a Roland MPU-401 or 100% compatible MIDI interface, and one of the synths listed above. Ye mouseless ones will be glad to know that this program doesn't use one. All maneuvering is done via the arrow keys and most basic functions are controlled via the function keys (including one which allows you to audition a timbre from the computer keyboard). The program utilizes a set of basic commands which is used for each synth's program. After learning one of these, the others come with relative ease. Learning time should be no more than a few hours and there is a telephone support line available.

I found these programs to be both useful and user friendly. However, there are a few improvements that would make this package truly exceptional: increase the timbre auditioning speed (presently, auditioning an edit takes a few seconds and there is no way to audition an edit in "real time" as it is being performed); allow individual voices to be sent or retrieved from a synth (presently they must be sent/received as parts of files); and finally, I'm used to using the + and − keys to change increments, it would be nice to

retain that option along with the function keys that presently accomplish this task.

The basic MIDIEdit package consists of a 5.25" floppy disk which contains the programs for all the supported synths and a manual (a three-ring binder, no less!) which despite needing a little reworking, is surprisingly complete. There is even a glossary of terms for the Roland MT32 (a thoughtful addition). Refinement of the package is an ongoing process. The manual arrived with several loose update and correction sheets and in the few days I've had the software, I have already received two updates. For registered

owners all updates are sent out automatically at *no charge*. The next update (due Summer '89) will have an "intelligent random patch generator," a faster method of auditioning edits (a good choice!), and the ability to edit Program Change, Microtune Tables, etc. on the TX81Z and DX11 (presently MIDIEdit can send and receive these but cannot edit them). The bottom line is the package works and if you own several of the synths supported, it's very cost effective. ∎

PRICE: $79
MORE FROM: Prelude Software, 1200 River Avenue, Suite 5-D, Lakewood, NJ 08701. Tel: 1 (800) 545-6661.

Spare Change Music
TZQuad 2.0

A memory expansion modification for the Yamaha TX8IZ. *Review by Mark Davis.*

WHAT IS TZQUAD? Well, it's a hardware upgrade for the Yamaha TX81Z that increases the memory space by 4 times. Not just the voice memory, mind you, but performances, microtunings, effects, and system. TZQuad's memory is organized into four separate sections called "TBanks." Each bank is the equivalent of an entire TX81Z's memory system – much like the E! board for the DX7, only smaller and without changing the normal operating functions. Each TBank retains its own system setup message, voice data, performance data, effects, microtuning, MIDI channels, and SysEx On/Off flag, so each bank will contain complete system setups for your performances or sequencing sessions.

When it arrived, my TZQuad spent only moments in its box while I prepared my TX81Z for installation. Within 15 minutes it was installed and operational. Installation is extremely simple, requiring only a Phillips head screwdriver and some wire cutters. The TZQuad itself is a small, high quality, circuit card with a few chips and wires with clip leads on the ends. About the most difficult thing you need to do is place the TX81Z's

existing ROM in a socket on the TZQuad. Some TX81Zs apparently have the ROM soldered in place, which makes things a bit more difficult, but simple soldering technique will get you through this with no problem. I was also pleased to learn that there are no additional switches or buttons to install.

Upon power up, the TX81Z selects TBank 1. Everything functions as normal. Accessing the other three banks is done one of two ways: from the front panel, or from SysEx commands that are included in the documentation. From the front panel, you would access the next TBank by pressing the two master volume buttons simultaneously. After five seconds, the next bank is ready to play. (This delay is the time required by the TX81Z to reset and read all of the new TBank data.) Pressed in rapid succession, you can access the second or third banks without waiting for the five-second delay for each bank. Rather than use up precious character space to display the TBank you are in, the designer chose to cause the LCD to pulse, so while in TBank 1 the LCD flashes once periodically, in TBank 2, twice, etc. (The pulsing may be eliminated by clipping a resistor on the TZQuad board.)

Everything you need to know about the installation and operation, by the way, is in a neatly-organized, 16-page document. Even if you run into trouble, there is a help section and phone number to call if you need to go that far. TZQuad is documented to work with TX81Z ROM versions 1.1 through 1.6. (The manual even tells you how to determine which version you have without opening the unit.) In short, the TZQuad is well worth the price for the convenience it adds to your live and sequencing work. ∎

PRICE: $99
MORE FROM: Spare Change Music, 427-3 Amherst St., Suite 402, Nashua, NH 03063. Tel: (603) 882-8711; or (508) 263-6906.

Programming Compleat

PART 4

Illustration Rick Lohnes

This fourth installment in our series on programming focuses on the nitty-gritty of tuning, and exorcising aliasing noises. *Text by Lorenz Rychner.*

WELCOME BACK TO another dose of hardcore FM programming. I'm delighted to hear the favorable comments from readers since the first article in this series appeared. To those who commented on the condensed manner in which I present the subject, let me just say that you're getting, on a few pages, the essence of my ten-week workshop at the Grove School of Music. And that class doesn't exactly crawl along, either. So take your time, go over things several times, and if you're new to this magazine check out the last three issues and play catch-up at your own pace. The variety of parameters can be bewildering.

Here's a slightly over-simplified way of looking at them – it could be said that you're only ever doing one of two things to an operator: either you're adjusting the operator's output (making it weaker or stronger), or you're tuning the operator higher or lower. This really pulls together the whole programming process, and it only leaves certain housekeeping chores as functions that don't fit into this scheme of things. Let's see what parameters we've dealt with so far that make the

contribution from individual operators weaker or stronger.

Operator Output: Rule By Committee

With the parameter Operator Output Level you set up a potential maximum, meaning that the operator can never exceed the value you gave to its output level. I say "potential" because it requires cooperation from a whole range of other parameters before the output level value is actually reached. Think of these parameters as the directors of the board, each with his own department and veto power.

The first parameter with power over the output level is the EG. If none of the four EG levels ever reach a value of 99 then the operator can never reach its programmed output level, no matter how high or low that value is. Don't relate the numbers directly, though – their relationship is more complicated than simple arithmetic. There's also velocity sensitivity. Even if the EG lets the programmed output level become a reality, velocity sensitivity amounts of more than zero reduce that output level, and only those notes that are played extra hard will produce the full

programmed output.

Next comes amplitude modulation in its two variants – by way of the LFO, or through EG Bias. Each affects the operator's output as long as the operator is programmed to be amplitude modulation sensitive. Next in line with veto power: keyboard level scaling. You explored this in the second of these articles, when you split the keyboard during the preparation of the Three-In-One practice voice. There you used the conventional scaling with either the linear or the exponential curve. On the DX7II and on the TX802 there's another scaling technique available, called "fractional." You'll explore this later in this article.

Tuning Parameters

So far you've dealt with coarse and fine tuning ratios, where the ratio is a certain pitch relationship between the key you're playing and the pitch of the operator's sine wave. For example, when you play the key of A3 (the third A from the left of the keyboard), you expect to hear the pitch of A440 (in Hertz), the normal pitch for the A above middle C. For that to happen, the operator must be tuned to a ratio of 1.00. If the operator is tuned to a ratio

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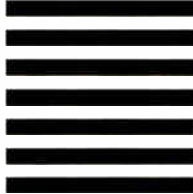
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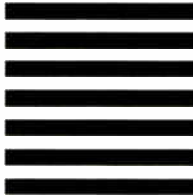
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of 1.50, the same key will produce the pitch of E660 (1.5×440), 2.00 produces A880 (2×440), and so on, according to the relationships of nature's harmonic series. As a rule of thumb, the carrier's tuning determines the pitch you hear, while the modulator's tuning determines the waveform you hear.

Remember the basic ratios and their resultant waveforms – 1:1=sawtooth, 2:1=square, then various pulse waves result from 3:1 on up, and inverted ratios provide extra bite, like 1:4 and similar. The assumption all along is that you can hear carriers by themselves, but not modulators. Well, this becomes a different story as soon as you get into the other kind of operator tuning – not ratios, but rather, *fixed pitches* expressed in Hz.

Fixed Frequencies

Once you change Ratio into fixed (tab 17/tab 8), you have only four values on the frequency coarse screens: 1Hz, 10Hz, 100Hz, 1000Hz. Fine frequency gives you access to 100 increments upwards from any of the four coarse values.

Look at Figure 1 where I list the infamous DX7 factory voice 'Referee's Whistle' (Rom 1A #29/Rom 3A #29).

(If you don't have it in your library, punch it in, it makes a great samba whistle.) All operators are tuned to different fixed Hz numbers, and Alg. 18 causes the carrier's 2089Hz to be modulated by all kinds of other frequencies. Try adjusting some of them, and play with different output levels – the results vary, but the pitch always sounds the same no matter what key you play.

Look at Ops 5 & 6 with their 1Hz and 10Hz numbers. These frequencies are well below the threshold of audible pitch. Now change from Alg. 18 to Alg. 31, and increase the output level of both Op 5 & 6 to 99, turn off Ops 1, 2, 3, 4, and listen to the volcanic noises caused by these low frequencies. These are just some examples of how fixed frequencies can be used to create sound effects. But it also pays to introduce fixed frequencies into many musically usable voices, for a number of reasons. Most common is the use of a fixed frequency between 1Hz and 4Hz for the carrier, with the modulator(s) at the usual ratio numbers to achieve a desired waveform.

So what's the point in choosing a tuning frequency that you can't hear? As you'll see in a minute, the slow

pulsations that represent the low frequencies become part of the overall sound and add a dimension that would otherwise be hard, or even impossible, to achieve. That low frequency can be in a carrier or in the middle of a stack. I made up a voice called 'VaryMayhem' to show both ways (Figure 2). It's a study in off-the-wall tuning relationships, with Op6 playing the minor third above whatever key you play (ratio 1.18), but only in the upper octaves. Op5 plays the fourth below any key you play (ratio 0.75), but only in the lower octaves. Op4 adds a severe pulsation (1.622Hz) that is partly cancelled by Op2 (2.042Hz). Op1 is playing the whole sound from the first stack an octave lower than the pitch of the keys you're playing (ratio 0.50), and the keyboard is transposed down another octave (middle C (C3)=C2). In addition to the pulsations from the two fixed operators, I added a touch of LFO for pitch and amplitude modulation, the latter only affecting Op1. Try different values on rate 4 for Op2 – this can change the subjective feeling of the reverberated room by changing the fade time of the sawtooth wave from Op3 as it modulates the low frequency from Op2.


```
'REFS WHISL'  Alg:18  Fdbk:2
0
P R1 L1 R2 L2 R3 L3 R4 L4  OL  TUNE
6 94 96|56 78|24  8|55  8| 78  10*00+0 F
5 99 99| 0  8| 0  8| 0  8| 64   1*000+0 F
4 94 96|68 89|24  8|55  8| 75  6607*+0 F
3 68 99|39 99| 8 99| 0  8| 66   46*77+0 F
2 68 99|39 99|28 99|45  8| 93  33*88+0 F
1 68 99|39 99|28 99|49  8| 98  2089*+0 F

P 38 39|67 58|95 58|68 58|  Osc sync: on

      Level Scaling      Rate Vel Mod
   Left    BP    Right   Scl Sns Sns
6 -LIN  8  A -1  -LIN  8   1   8   8
5 -LIN  8  D  3  -LIN  8   8   8   8
4 -LIN  8  A -1  -LIN  8   1   8   8
3 -LIN  8  A -1  -LIN  8   4   8   8
2 -LIN  8  A -1  -LIN  8   4   8   8
1 -LIN  8  A -1  -LIN  8   4   1   8

L  Wave S/H   PMD   8   PMS 6
F  Speed 99   AMD   8   Mid C= C 3
0  Delay 8    Sync  on
```

time:1/4s

Figure 1. Parameters for Referee's Whistle.


```
'VaryMayhem'  Alg:18  Fdbk:7
0
P R1 L1 R2 L2 R3 L3 R4 L4  OL  TUNE
6 88 99|99 99| 4 88|38  8| 75   1.18+7 R
5 81 99|99 99| 8 98|28  8| 85   0.75+8 R
4 78 99|99 99|99 99|38  8| 99   1*622+8 F
3 78 99|58 95| 9 68|12  8| 82   0.58+8 R
2 65 99|45 95| 4 68|24  8| 83   2*842+8 F
1 68 99|45 95| 3 68|35  8| 99   0.58+8 R

P 99 58|99 58|99 58|99 58|  Osc sync:off

      Level Scaling      Rate Vel Mod
   Left    BP    Right   Scl Sns Sns
6 -EXP 99   F 6  -LIN  8   8   8   8
5 -LIN  8   C 1  -EXP 99   8   8   8
4 -LIN  8   A -1 -LIN  8   8   8   8
3 -LIN  8   B 2  -LIN 14   8   4   8
2 -LIN  8   A -1 -LIN  8   8   8   8
1 -LIN  8   A -1 -LIN  8   8   8   1

L  Wave SIN   PMD   8   PMS 2
F  Speed 14   AMD  18   Mid C= C 2
0  Delay 25   Sync  on
```

time:1/2s

Figure 2. Parameters for VaryMayhem.

► Look for low frequency examples among your voice library – you'll find many, mostly in the carriers. But higher fixed frequencies, in the audio range, are often used to simulate the knocking of mallet heads, or the scratching of bows, and other quasi-realistic noises that are fixed in their frequency, as opposed to the pitches of those instruments. These frequencies are usually given to the modulators on top of algorithm stacks, so that their higher energy permeates the modulation process right down to the carrier.

If you have a DX7II or a TX802, look for the factory voice 'PianoBrite,' where a modulator with 100Hz is modulating a carrier at 1Hz for a knocking sound, not unlike that of a knuckle tapping the body of an acoustic piano; or the factory voice 'Violins,' where two carriers are at low frequencies (1.096Hz and 2.884Hz) to provide a low, pulsating warmth, and the highest modulator imitates the bow scratching with 2042Hz.

The pitch of the whole algorithm, as opposed to that of individual operators, can be manipulated with a number of parameters, some of which you've already seen in these articles: Pitch EG (4 rates, 4 levels, level=50 is true pitch); LFO pitch modulation; Pitch Bend wheel; Portamento; Pitch Bias (DX7II/TX802 only) for pre-programmed pitch-bend from after-touch or a breath controller; Random Pitch (DX7II/TX802 only) where con-

relative to an overall offset of −127 to +127). What this means is that one operator can sound fully when you play C#, D and D#, *not at all* on the adjacent keys E, F, and F#, and then fully again (or softly, or whatever) from G onwards.

This is useful in a number of applications – splits don't have to be such a compromise anymore because a carrier can stop sounding altogether from one key to the next. However, since both the DX7II and the TX802 can deal with splits between entire memory voices, this use of fractional scaling to create splits from within just one voice becomes almost redundant in these synths. I find it most useful for fixing unwanted aliasing noises that are often worse on some notes than on others.

About Aliasing

You've heard aliasing – the appearance of unwanted secondary pitches that don't follow the scale of the main pitches, usually in the upper octaves, and often going down in pitch when you play up the keyboard. They are the result of lots of high energy that exceeds the critical threshold of 30kHz in frequency (half the 60kHz sampling rate of the DX), and gets wrapped around. Here's an example: say a modulator and a carrier produce an intense waveform with a lot of upper harmonics, by using a high output from the modulator. Let's see what

that you won't waste your time on future gremlin hunts, select the function Voice Initialize. Stay with Alg. 1, leave Op1 as it is, and give Op2 an output of 99 and a freq. ratio of 5.00. The upper half of the keyboard is now full of aliasing pitches. Reducing the output level of the modulator helps, but there comes a point where certain keys are still *so* noticeable that you would have to shut the modulator down almost completely. Instead, try reducing the modulator's output on just that cluster of the three semitones affected, using fractional scaling, so that you don't lose it altogether. It's a time-consuming process, and the result must be stored on a separate cartridge that's dedicated to just fractional data, but when all else fails, this can save the day.

So For Now . . .

This is where the FM programming lesson must end for now. Just a few words on Yamaha products of the FM kind. The DX7 is no longer produced, although the thousands out there are still doing a fine job, and are well worth your hard-earned dollar. But that hard-earned dollar will soon buy you the "new" DX7II at used prices, because Yamaha has discontinued that line as well, including the IID and the IIFD. The two-rack space high TX802, which offers eight individual outputs and multitimbral operation for sequencing, will still be made.

The later DX7IIFDs were available with the smart replacement chip called E! from Grey Matter Response already installed. This adds a lot of features, including a sequencer, multitimbral capabilities, multiple layers and zones on the keys, and a lot of other goodies.

So is the six-operator FM technology dead, or what? No way – we've already seen the successor at the NAMM show in January (*see NAMM Show Report, MT March/April '89*). It's called the V80, and while it's still a 6-0p/32 algorithm instrument, it's also taking a bow towards the current trend towards "all-in-one" instruments, often called *workstations*. Another newcomer, the V50, will do similar things for the 4-operator market.

Next month I'll get into FM from multiple waveforms, as found on the 4-op instruments like the DX11 and the TX81Z, and we'll look at FM on instruments that don't come from Yamaha, including an interesting and challenging newcomer from Casio. See you then. ∎

"The assumption all along is that you can hear carriers by themselves, but not modulators. Well, this becomes a different story when you get into the other kind of operator tuning – fixed pitches."

secutive notes can be programmed to be slightly out of tune from each other, letting you simulate quasi-pitched instruments with inherent intonation problems, like congas or talking drums; and microtuning (DX7II/TX802 only), where scales other than the equal tempered scale can be built.

Fractional Tuning

On the DX7II and on the TX802 you have the famous fractional scaling (from tab 10 on the first pressing, change "normal" to "fractional"). This lets you adjust the output for each operator across the keyboard, in clusters of three semitones each, on a scale from 0 (silence) to 255 (maximum happens when you play the highest

happens when you play the highest key on the keyboard (C6), which is roughly 2093Hz. The frequency of the 16th harmonic is 16×2093=33,488Hz. The highest frequency that the DX can produce (in theory, anyway) is half its sampling rate, or 30kHz. The amount by which our example exceeds the 30kHz limit, namely 3488Hz, is wrapped around 30kHz and produces a pitch that amount of Hz numbers lower. This results in a new, unwanted sound at 26,512Hz. While this is too high to be heard, that new pitch, in turn, influences its lower multiples. I only chose, quite arbitrarily, the 16th harmonic, but there's bound to be many other frequencies at sufficient energy levels which cause trouble.

To hear aliasing once and for all, so

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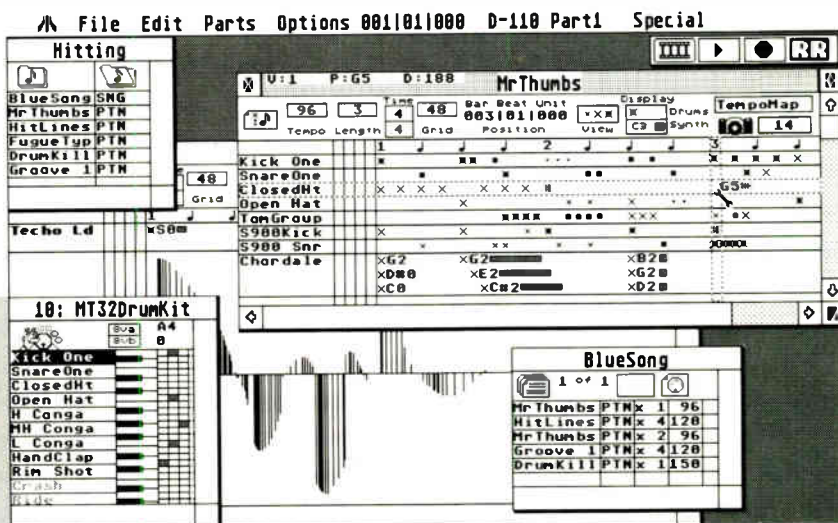
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In America they're best known for the deep, resounding 'Oh Yeah' from *Ferris Bueller's Day Off.* **In Europe, they're regarded as one of the most innovative and influential bands of the decade. Ladies & Gentlemen, we give you: Yello.** *Interviews by Nicholas Rowland and Tim Goodyer.*

HORSE OF A DIFFERE

W HEN FELLOW SWITZERS Dieter Meier, Boris Blank and Carlos Peron had to think of a collective title for their imminent debut gig, they decided to take inspiration from the brand names of children's toys. Consequently, in deference to such international playtime favorites as Lego and Duplo, they made their first appearance at a Zurich fashion show under the title "Yello."

The sobriquet is pure fantasy, strictly throwaway, yet the idea of sounding like a toy is intriguing and peculiarly appropriate to Yello's eclectic and sophisticated style. For nearly nine years they have been engaged in producing an inventive, thoughtful and infectious catalog of electronic pop, assembled with colorful building blocks of sound and musical influence. It selects its moods from a variety of disparate sources: Eurodisco, film noir, bubblegum rock 'n' roll, jazz schmaltz, '30's cabaret and latin. While their music does not defy description, it certainly defies categorization. Sometimes it's the Kit Kat Club, sometimes the Copacabana, sometimes Rick's Café Americain; and occasionally all three rolled into one.

In many ways, Yello lives up to its toybox inspiration, appearing to be as inconsequential as the latest craze: to be discarded when broken or outgrown. But there are too many worthwhile moments for their efforts to be dismissed out of hand. These moments usually occur when the ephemeral subject matter is brought sharply into line by the sheer quality and inventiveness of the recorded sound, whether it be a synth patch, a sampled voice or an obscure sound effect. There are times when Yello seems to have discovered what exactly all this hi-tech gear was put on the earth for: to create startling

new music which grabs you by the imagination and doesn't let go.

Five minutes into conversation with Boris Blank reveals that the pursuit of new sounds is what his part in Yello is all about. Indeed, it was precisely this interest which brought about the collaboration in the first place. Back in 1979, Herr Blank, ex-signwriter, ex-TV repairman and ex-truck driver (and wrecker), was recording the incredible shriekings of a car shredding plant just outside Zurich when he chanced upon someone else doing exactly the same thing. This turned out to be one Carlos

Peron. This unlikely coincidence provided them with an opportunity simply too good to waste.

They started to record together – Blank supplying the music, Peron providing "found" sounds and effects. Then, clutching their demos, they set off for San Francisco and came back with a deal from Ralph Records. A friend who owned a Zurich record shop gave them two further suggestions: one, they would benefit from a vocalist; and two, he knew just the man for the job.

Enter Dieter Meier – performance

NT COLOR

artist, writer, film director and, by his own admission, extremely anarchic front man who could never bear to sing the same song the same way twice.

One of Meier's previous escapades included a piece of concept art which involved taking a week to sort 100,000 pieces of metal into a hundred sacks of 1000 pieces each. As a result, he was invited to New York, where he set up a street stall offering to purchase the word "Yes" or "No" from any passer-by for the sum of one dollar. Another "work in progress" involves a plaque set into the pavement outside Zurich

station which promises that Meier will be standing on that exact spot on March 23rd, 1994 from 3pm to 4pm. If you've any questions after reading this interview, you might like to catch him then.

FROM THEIR FIRST imaginative and extremely successful debut album, *Solid Pleasure*, through all the subsequent ones – *Clara Que Si* (1981), *You Gotta Say Yes To Another Excess* (1982), *Live at the Roxy* (1984), *Stella* (1985), *The New Mix in One Go* (1986), and *Flag* (1988) – Meier has provided a direction for Yello's music through his emotive and often hilarious lyrics, which either set or counterpoint the musical mood.

Peron departed in 1984 to set up his own studio. He now produces other bands in Zurich and is shortly due to release a solo album. However, the relationship between Meier and Blank continues, despite the fact that the former is often involved in other projects – primarily films. Blank explains the mechanics of their working relationship:

"Mainly I work alone in the studio. I hate it if other people are around. If others are hanging around, I can't be very creative. That's why Carlos left; he wasn't really happy just to do a few effects and a few thunderstorms. He wanted to get more involved musically as well, but he was not really on the same wavelength. I think you'd say the problem is that I make music like an egomaniac.

"But once I've finished the basic music, once I've found the overall construction of the piece, the hook and so on, then I'm very open and flexible if people have good ideas. I invite Dieter to sing to it and, more or less, we create the whole thing in the process. We listen to the music and we decide what sort of a mood the whole voice should be. Dieter spontaneously writes the lyrics and then goes behind the microphone and starts singing. It's not like all those groups who spend all their time rehearsing." But while the performance side of recording is often carried out very spontaneously, getting to that point can involve hours of diligent programming.

"I first hear a piece when Boris has the first sketches done – maybe a rhythm, maybe a bassline or just a sound – and he asks me what I think of it," Meier elaborates. "I encourage him.

I tell him why I like it and give him ideas – verbal ideas, how he could go on with it.

"It's basically an encouragement for him to continue and not to worry too much. He is such a perfectionist that he sometimes loses his best sketches because he thinks they are not good enough. In the early days he was even too shy to play his ideas to me – it made him feel too naked. Now some of our ideas, like 'Tied Up' and 'The Race,' are made out of sketches that would have been thrown away.

"Probably my only quality in music is that I have a very strong imagination for how something could sound at the end – whether something is rolling or not. I'm a very rhythmic person, I can dance very well; anything that has to do with throwing and moving I'm very good at."

Because Dieter is often away from the studio, working on films or his own artistic projects, he once described the process as rather like two chess players corresponding by mail. However, Blank is quick to point out that they consult each other much more frequently than this might suggest. Consequently the vocal and musical ideas often overlap, with the result that the composition can be inspired as much by the lyrical ideas as vice versa.

Although the Yello studio in Zurich is as well-equipped as a major professional studio, Blank lacks any elitist attitude towards the gear or the recording environment, preferring to work in a, shall we say, *relaxed* atmosphere.

"When I met Boris he had his studio in a kitchen and it looked like a musical garbage tip – truly," recalls Meier with obvious amusement. "He'd drilled a hole through the wall and the recording room was in his bedroom. And he had all kinds of weird instruments – broken guitars, rusty trumpets, an old flute, a drum kit that was absolutely ridiculous. He's never had a decent instrument all his life, everything was *kaput*, even now his guitars, everything, is *kaput*. He's just bought himself a real bass but he has to demolish it before it's *his* bass.

"He likes to work out of a mess. It's very important – he hates clean studios. We got a fabulous new studio about two years ago and it took him about one year to create a substantial mess in there. He has a sound library ▶

▶ in the Fairlight of about 10,000 sounds that he's created. Each sound has a name, and when you read the names of his sounds it's like a novel on its own. The names of his sounds are so funny. And he doesn't have a register anywhere – all these diskettes and streamers are flying around the studio."

The effort of explaining Blank's working environment is obviously too much, and Meier pauses to regain his composure before continuing.

"It would take an engineer probably five years to get the studio in order after a year of Boris' messing it up. You can't walk in the studio because it's a cable salad. In Mickey Mouse they had an inventor who invented nonsense things in his little lab. This is how Boris works. But he needs it, it is his world, his home.

"Also acoustically it is ridiculous. We have just two very cheap old JBLs and they constantly are moved around by some cleaning lady. And the studio is just a room like this, no acoustic specialties – it's all bullshit anyhow, all this Eastlake, Westlake . . . But we have a nice room, you can open the

windows and walk out into the garden and this is very important for us. Another engineer could not work in there, not a second.

"We had this visitor, some important producer, he was talking to Boris and, after about half an hour, he said 'Now, Boris, can we see your studio?' because he couldn't believe this dirthole was the studio."

Nor are Blank's extraordinary studio antics limited to the mess in which he works. Like any true artist, he pursues his quest religiously. Meier continues, inspired by his partner's eccentricity.

"When he mixes he doesn't have a track sheet, the bastard. One-hundred-and-twenty tracks, can you believe it? He hires in as many multitrack recorders as he needs – we used 120 tracks for 'Tied Up' –he starts knobbing around and he knows what's there for more or less every second of every track. It's unbelievable. He worked without a track sheet when we had an eight-track machine – okay, you can remember eight tracks – but now this guy is like a conductor who can conduct a 150-piece orchestra after

having read the symphony just once or twice. No track sheet!"

THE SPIRIT WHICH led Blank to the car shredder in 1979 is still very much at the heart of his music making in 1989. Since 1981, he's been conducting his experiments with sound creation on the Fairlight, first the Series II and more recently the Series III. There are synths in his studio too: the Oberheim Matrix 12, the Casio CZ5000, the Korg DW8000 and an old but still revered ARP Odyssey. He's also acquired the Roland D50 (and PG1000 programmer), an instrument he praises for its internal sound architecture.

Where sound creating gear is concerned, Blank's philosophy is this: if it's not easy to program, then don't bother with it.

"That's the difference between playing an instrument and something being played *from* an instrument. I like to get involved in the middle of the heart of each synthesizer and see what's possible. There are some synthesizers which are inspired and which I use. There are some pre-programmed synths which are really quite boring and which I just don't use.

"My basic instrument is still the Fairlight. Often, when I'm programming other synthesizers, I record the sounds into the Fairlight because it's so easy to lose a program. So in my Fairlight sound libraries I have the sounds of various synthesizers as well as sounds I've created myself."

"The Fairlight was there in our heads before the Fairlight was there in our studio," Meier continues. "It was just much more time-consuming to work. Now, for someone who works the way Boris works, the Fairlight is just the most incredible machine in the world. We used some little synthesizers on *Flag*, but it is very misleading to call us a synthesized band because we use all kinds of sounds that exist in nature – we form them in such a way that the color that comes out is usable for our sound painting. Synthesizers are probably only 10% of our sources; the rest is sound sculptures the way Boris does it. At the start of each piece there is no melody, but there is Boris' week or month-long work on the quality of one sound or one note. Sometimes he

World Radio History

works for four days on one bass note – like a painter has a dream of a dark purple color that represents for him this and that."

Blank's English idiom for the act of creative programming is "knobbing around" – which, while unintentionally indelicate, somehow conveys the essence of his eagerness for the process much more forcefully than the prosaic "programming." The most stunning results of this programming must be the huge percussive sounds which have characterized Yello compositions for a number of years now. In creating these voices, often using quite unrelated sounds as the starting point, Blank is not seeking to use sampling techniques to imitate the sound of "the real thing." Instead, he sees the true value of sampling as enabling musicians to come up with their sonic equivalents: sounds which have the same character as acoustic ones, but which are unashamedly electronically created. It's a process which he put into a manifesto-like form back in 1982 shortly before the release of Yello's third album, *You Gotta Say Yes to Another Excess.*

To quote: "For quite a while I have been trying to get away from the system in popular music whereby the percussion, bass and all instruments in general have to relate to one another. I've been trying to create a new rhythm which would turn you on. I'd like to create tension differently to the way it's been done in the rock and blues pattern. I believe that the moments of tension are expressed more drastically and dynamically if they are integrated as initially disparate articles. That is my goal and I have not yet reached it."

Reading this back to him several years later, he nods in total agreement. "Yes. I still like to do things this way, to replace frequencies with other frequencies. Instead of the hi-hat, something which has the same pitch as the hi-hat, but not the attack and absolute note of the hi-hat. Take the bass drum: the warmness which the bass drum has can be replaced by something which still has that warmness, but which uses an absolutely different source for the sound.

"An example: I smash my hand on my leather trousers. I record it into the Fairlight, then I transpose it two or three octaves and see what the sound looks like. Then I start modulating the sound, maybe adding another sound as well and in the end I've got a strange form of snare. I don't know I'm going to get this sound. I mean, there are a lot of surprises, very interesting surprises."

He denies that this is a particularly original use of sampling techniques, but in the face of those who use sampling merely as a method of avoiding orchestral fees, it seems that it is at least making the most of what the technology has to offer.

"It's for you to say whether I'm using it in an original way or not. I don't know. All I know is that other people seem to have started to do the same thing as I set out to do years ago, so it shows I'm not on the wrong planet with my ideas. And it is something I will continue with; it's not just a one-day or a one-year idea. I think it could be a whole life. I think it should be a way for a lot of musicians to work, instead of rehearsing together in a room every second night. Instead, you can work with your own brain and your arms can become a whole Philharmonic Orchestra."

Whether you agree with his advice or not, Blank's enthusiasm for the Fairlight leaves him very little time for anything else.

As for keeping tabs on what everybody else is doing . . . "The whole day my ears are full of music, so I don't particularly want to go home and listen to what the other kids are doing. I mean, I listen to the hit parade in the car but I don't have time to get involved in how they create *their* sounds. I prefer Harry Bellafonte, James Brown, Count Basie, Duke Ellington . . . I like this kind of structure in music, anything which has heart. But I could also take my inspiration from Indian and Hungarian folk music or negro spirituals. And Latin music, too. I went to Cuba twice and was very inspired – oh, how I fell in love with the rhythm of the Salsa. So I listen to these records and try and improve on the sounds and the tunings. I also learn a lot from my own records."

"Yello is anarchy and precision – which is what Switzerland is all about," Meier concludes. "Yello is very provincial; it's not an expression of any musical trend. You can't group Yello in any musical category."

"Humor is very serious," Blank says unexpectedly. "Melodrama is also very serious. But I would like people just to feel the music and not take it too seriously. They should use their imagination and just see pictures in the music.

"Is the music like a toy? Why not? I'm still working like a child on the Fairlight. I started playing with Dinky toys and now I'm playing with the Fairlight. Somehow, it's not a serious game, but it's a game for my soul and my satisfaction."

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More From......

See something mentioned in this issue of MT that you'd like to know more about? You can write or call any of the manufacturers listed below for complete product literature.

1000 HX/1000 SX Expander: Kurzweil Music Systems, Inc., 411 Waverley Oaks Rd., Waltham, MA 02154. Tel: (617) 893-5900.

1084S: Commodore Business Machines, Inc., 1200 Wilson Dr., West Chester, PA 19380. Tel: (215) 431-9100.

AC22: Rane Corporation, 10802 47th Ave. West, Everett, WA 98204-3400. Tel: (206) 355-6000.

Amiga: Commodore, see *1084S*.

ARP 2500: formerly made by ARP, Inc.

AudioFile: AMS/Calrec (Advanced Music Systems), P.O. Box 31864, Seattle, WA 98103. Tel: (206) 633-1956.

BC1/BC2: Yamaha Music Corp. USA, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9011.

C1: Yamaha, see *BC1/BC2*.

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

CZ101/CZ5000: Casio, Inc., 570 Mt. Pleasant Ave., Dover, NJ 07801. Tel: (201) 361-5400.

D50/D550: RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

DG1/DGX: formerly made by Stepp.

Dr. Pad: Roland, see *D50/D550*.

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

DW8000/EX8000: Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

DX7/DX7II: Yamaha, see *BC1/BC2*.

E!: Grey Matter Response, Inc., 15916 Haven Ave., Tinley Park, IL 60477. Tel: (312) 349-1889.

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

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

F1: Sony Corp. of America, 9 West 57th St., New York, NY 10019. Tel: (212) 418-9427.

F16: Forat, 11514 Ventura Blvd., Studio City, CA 91604. Tel: (818) 763-3007.

Fairlight CMI III: Fairlight Instruments, Inc., 15-19 Boundary St., Rush Cutters Bay, Sydney 2011, Australia.

FD Soft: Lyre Inc., 1505, Ch. Ste-Foy, Suite 101, Quebec, Que. G1S 2P1, Canada. Tel: (418) 527-6901.

FZ1/FZ10M: Casio, see *CZ101*.

G10: Yamaha, see *BC1/BC2*.

GE30: Rane, see *AC22*.

GM70/GS50: Roland, see *D50/550*.

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

Jam Factory: Intelligent Music, P.O. Box 8748, Albany, NY 12208. Tel: (518) 434-4110.

Juno 60: Roland, see *D50/550*.

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

KMX MIDI Patchbays: KMX, 67 West Easy Street #134, Simi Valley, CA 93065. Tel: (805) 582-0485.

LA3A: JBL/UREI, 8500 Balboa Blvd., Northridge, CA 91329. Tel: (818) 893-8411.

Linndrum & Linn 9000: formerly made by Linn Electronics.

LXP1: Lexicon Inc., 100 Beaver St., Waltham, MA 02154. Tel: (617) 891-6790.

M: Intelligent Music, see *Jam Factory*.

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

Matrix 12: Oberheim-E.C.C., 2015 Davie Ave., Commerce, CA 90040. Tel: (213) 725-7870.

MC500/300: Roland, see *D50/550*.

MEP4: Yamaha, see *BC1/BC2*.

MG510: Casio, see *CZ101*.

Mirage: Ensoniq, see *ESQ1/M*.

Mirror 6: Zeta Music Systems, Inc., 2230 Livingston St., Oakland, CA 94606. Tel: (415) 261-1702.

MKS50/MKS70/MKS80: Roland, see *D50/550*.

MMT8: Alesis, see *HR16*.

MPG80: Roland, see *D50/550*.

MPU101/MPU401: Roland, see *D50/550*.

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

Multiscan: Sony, see *F1*.

Notator: Digidesign, see *Creator*.

Odyssey: formerly made by ARP, Inc.

Patch Master Plus: Voyetra Technologies, 333 5th Ave., Pelham, NY 10803. Tel: (914) 738-4500.

PG380: Casio, see *CZ101*.

PG1000: Roland, see *D50/550*.

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

PM1000: Yamaha, see *BC1/BC2*.

PostPro and Direct-to-Disk: New England Digital, 49 North Main St., White River Junction, VT 05001. Tel: (802) 295-5800.

PPG Wave 2.3: formerly made by PPG GmbH.

Prophet VS: formerly made by Sequential.

QX1: Yamaha, see *BC1/BC2*.

R5: Roland, see *D50/550*.

RX5: Yamaha, see *BC1/BC2*.

S900: Akai, see *EWI*.

SampleMaker: Dr. T's, see *Phantom*.

SBX80: Roland, see *D50/550*.

SDS1/SDS5: Simmons Electronics USA Inc., 2630 Townsgate Rd., Suite H, Westlake Village, CA 91361. Tel: (805).

SEM1: Oberheim, see *Matrix 12*.

Sentient Six: Passac Corporation, 759 Ames Ave., Milpitas, CA 95035. Tel: (408) 946-8989.

Sequencer Plus Mark III: Voyetra, see *Patch Master Plus*.

SMPTETrack ST: Hybrid Arts, Inc., 11920 West Olympic Blvd., Los Angeles, CA 90064. Tel: (213) 826-3777.

Softsynth: Digidesign, see *Creator*.

SP12: E-mu Systems, 1600 Green Hills Rd., Scotts Valley, CA 95066. Tel: (408) 438-1921.

SP15: Rane, see *GE30*.

SPX90 II: Yamaha, see *BC1/BC2*.

Super Jupiter: Roland, see *D50/550*.

Synclavier 3200/9600: New England Digital, see *PostPro*.

SynthAxe: SynthAxe Limited, Four Seasons House, 102b Woodstock Rd., Witney, Oxfordshire, OX8 6DY, England. Tel: (0993) 76910.

TR707/TR727/TR808: Roland, see *D50/550*.

Tunesmith: Dr. T's, see *Phantom*.

Turbosynth: Digidesign, see *Creator*.

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TX7/TX216/TX802/TX81Z: Yamaha, see *BC1/BC2*.

UpBeat: Intelligent Music, see *Jam Factory*.

V50/V80: Yamaha, see *BC1/BC2*.

WX7: Yamaha, see *BC1/BC2*.

Xpander: Oberheim, see *Matrix 12*. ∎

updates & upgrades

Keep your equipment and software up to date with the latest revisions and enhancements for the following products:

■ **480L:** Lexicon has released Version 3.0 software for the 480L digital signal processor. The new software features new parametric digital equalizer programs, including stereo 2-band and mono 4-band equalization, and adjustable Q, boost/cut, and frequency for each band. Low frequency bands can also be used as notch filters, offering a Q of 32, and 36dB of boost/cut. Rate changing samplers on the 480L can now be controlled by "MIDIplay," a program which corresponds all rates to MIDI note values; also, MIDI "Reference Note," which transposes rates anywhere on the keyboard; and "Pitch Mirror," which inverts the direction of those transpositions.

Additional features on the new software include reverse playback for both mono and stereo SME (Sampling Memory Expander) rate changing samplers, and "scrub" mode for continuous playback. Rate is adjustable from −100 percent to +199 percent with stereo, and −200 percent to +199 percent with mono SME sampling.

– Lexicon Inc., 100 Beaver St., Waltham, MA 02154. Tel: (617) 891-6790. Version 3.0 software is available for $125 through Lexicon Advanced Products dealers.

■ **TC 1128:** TC Electronic's programmable equalizer/spectrum analyzer now has an optional PC board which will allow you to view the display on a computer monitor, or any monitor with an RCA video input. All IBM-compatible color monitors are supported, and a choice of background color is offered. Also, the TC 1128 can be installed with optional SMPTE capabilities, allowing you to read and write SMPTE code, and a SMPTE cue list can be edited and dumped for external storage.

– TC Electronic, 1 Serpentine Rd., Tenafly, NJ 07670. Tel: (201) 568-1820. Owners can buy the PC board for $699; SMPTE option costs $699.

■ **Auricle:** Auricle Control Systems' popular time processor program is now available for the Yamaha C1 music computer, as Auricle III. Also, the Tesla genlock streamer generator is available, enabling Auricle to overlay streamers, punches and flutters by reference to bars and beats, rather than SMPTE.

– Auricle Control Systems, 3826 Woodcliff Rd., Sherman Oaks, CA 91403. Auricle III retails for $1495. The Tesla generator lists for $1995. For more info contact Tesla, Tel: (818) 990 - 8442

■ **Copyist:** Dr. T's has released version 1.6 of their music transcription and scoring program for the Atari ST. New features on the Professional version include: GEM support with pull-down menus, HP Deskjet printer support, user-definable macros, user-definable clipboard, support of Standard MIDI Files, and a new, fully-indexed manual. The DTP version now includes all of the above, plus the Adobe Sonata font and support for Imagen Ultrascript, a PostScript "clone."

– Dr. T's Music Software, Inc., 220 Boylston St. #306, Chestnut Hill, MA 02161. Tel: (617) 244-6954. Owners of the current version can update for $10 by sending the program and purchase receipt to Dr. T's. Without the receipt: $30. Owners of version 1.4 or older can update for $60.

■ **DSP128:** A new ROM chip from DigiTech updates the 128 to the DSP128 Plus' programs, allowing four effects to run simultaneously.

– DigiTech (DOD Electronics), 5639 South Riley Lane, Salt Lake City, UT 84107. Tel: (801) 268-8400. The DSP128 Plus update ROM lists for $50.

■ **EPS:** From PA-Decoder comes two memory expansion packages for the Ensoniq EPS – the "4x" and "2x" memory expanders, each of which integrate a hard disk interface for the PA-Decoder Hard Disk. The packages are easy to install, with no soldering and no modification to the EPS required. Three double-sided disks can be loaded into the 4x, which will permit a sampling time of 19.8 seconds at 52.1kHz, and up to 176.0 seconds at 6.25kHz. The 2x provides 9.9 seconds at 52.1kHz and up to 88.0 seconds at 6.25kHz.

– PA-Decoder USA Ltd., 1801 N. Curson Ave., Los Angeles, CA 90046. Tel: (213) 850-6901. Memory Expansion 2x retails for $520; 4x retails for $1350. The Hard Disk is not yet available.

■ **Finale:** Version 1.2 of Coda's music notation and transcription program has been released. New features include: "Smart Shapes" which lets the user specify starting and ending points for slurs and crescendos, with automatic wrap-around at the end of staff systems; Multifinder compatibility; broader EPS (Encapsulated PostScript) file compatibility; and the mending of several "bugs." Finale VS 1.2 expands the program to two disks, thus requiring the use of a minimum 20Mb SCSI hard disk to operate.

– Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. Tel: (612) 854-1288. Finale VS 1.2 update is free to current owners. Finale retails for $1000.

■ **K1 Editor/Librarian:** Interval Music Systems (formerly Drumware, Inc.) has released their version 1.2 of this Atari ST ed/lib. New features include triggering menu commands from the keyboard, a MIDI Thru function for K1m and K1r owners, new Multi Edit layout, and improved MIDI Transfer functions to eliminate ST lockup. Also included are four new sound banks.

– Interval Music Systems, 12077 Wilshire Blvd. #515, Los Angeles, CA 90025. Tel: (213) 478-3956. Registered owners can update to version 1.2 for $5 for one double-sided disk ($7 for two single-sided disks) plus $3 s h. No need to send the original disk.
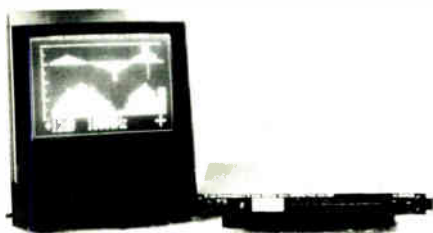
A hardware card for the TC Electronic 1128 EQ/Spectrum Analyzer allows it to display its graphics on an IBM-compatible monitor.
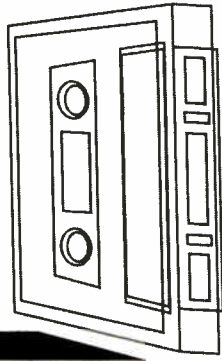
In this tragic episode, our mystical anti-hero admits to turning into a yuppie. *Highly questionable advice by Yung Dragen.*

REMEMBER THOSE HIGH times in the late '70s when punk and new wave ruled? If you were a young, budding "hip" musician, you could do almost anything – a little thrash rock, curious little minimal pieces with strange vocals and electronic noises, etc. – laugh at it, and call it music. Some of the stuff even accidentally held up over time, but most of it was an amusing outlet for unfettered creative energy.

Adam and Ned are still living in that era today. Their tape, *Scenes from Little Pictures plus a couple o' Big Pictures*, is a venting of some of that energy with the help of thrash drums and guitar, odd little noises from a CZ101, Dr. Pad and Simmons SDS1, and vocals (when not warped) that almost remind me of a young Lou Reed. The "Little Pictures" (a collection of 42 mini-songs – they inflicted just five on me, including the likes of 'Rumpel Rumpel,' 'Poppy the Little Goldfish,' and 'Kartwheel Kelly') vary across all the extremes mentioned in the lead paragraph. Their two "Big Pictures" (full-length songs) are a bit

better, with 'Weeds in the Garden' actually showing some promise as a medium blues-rock drama, and the tongue-in-cheek a cappella do-wop of 'Yes You Do' rounding out the set. Being a bit of a yuppie myself these days, I basically just look back on these times with fond remembrance; if you yourself still have that irreverence of a decade ago, you'll enjoy these. They certainly seem to have enjoyed making them. And by the way, Adam mentions that lychee nuts are a fruit just *begging* for tricks (remember that I asked for grapefruit tricks a while back).

The most professionally produced of this month's batch is *Passion Versus Sleep* by multi-instrumentalist **Tim Harman**. Tim writes in a fully-orchestrated, slightly-progressive, humorous rock style, and likes to throw a bunch of sounds and tricks in – sometimes too many (orchestra stabs and breaking glass samples to randomly over-emphasize a downbeat, slightly over-acted vocals or guitar runs, etc.). However, it's mostly laid-back and fun,

so don't let me scare you off – and there's something to be learned here by people who are *under* producing their works but don't know why. Notable is the solid drumming provided by **Sam Hooff**.

A different approach to tapes is the *Music from the Cabin* series by **Don Malone**. Don (director of and composition professor at the Electronic Music Studio of the Chicago Musical College of Roosevelt University) custom-builds a "concert" for you from compositions he's done over the past umpteen years (mine had ones from 1981, 1975, and two from 1988). The style is minimalistic electronic avant-garde (bleeps, bloops, and a lot of space). Some of the percussive stuff I found nervous; the legato stuff (namely, the second half of 'Janitor 'n a Drum') was nice; an old piece done with an Arp 2500 ('Frills and Circles') was rich. Don also programs for the Commodore C64 computer, and sells his own sequencer/algorithmic composition program (Algy) and a set of 112 "electronic" CZ101 patches (ElectriCZ).

So much for the main courses – let's sample some dessert:

– **Ellsworth Hall**/*The Ls:* Mainly adult-oriented light progressive/jazz/rock numbers with tasteful keyboard chops, fairly intelligent song structures, and competent vocals. Drumming on the angry number 'Mole' is very energized; most of the rest is laid-back drum machine. Okay.

– **ATL**/*Give Him My Best:* An adult-oriented (AM radio variety) hurt-love song. Faux strings are well done; unfortunately, digital bass and trashy snare in the verses (and gated reverb toms in the choruses) overpower the song. Vocal is one of those cracking ones that sounds vulnerable and untrained, when actually it's (almost) well controlled. Pass.

– **Eddie Caballero**/*Uphill:* Bombastic progressive rock (half instrumental/half vocal) with noisy, buzzy synths and a voice that sounds like a strained imitation of early Neil Young. An improvement over his earlier efforts, but still not there yet. Sorry.

– **Neil Haverstick**/*eight-song demo:* 'Boogie at B-bop Falls' is one of those noodly be-bop numbers that goes nowhere. The rest of the tape is full of interesting, relaxed songscapes that are heavy in synths and fuzzed guitar. A bit more polish, and we've got one heck of a guitar/synth record here. (And by the way, Neil, I don't work at
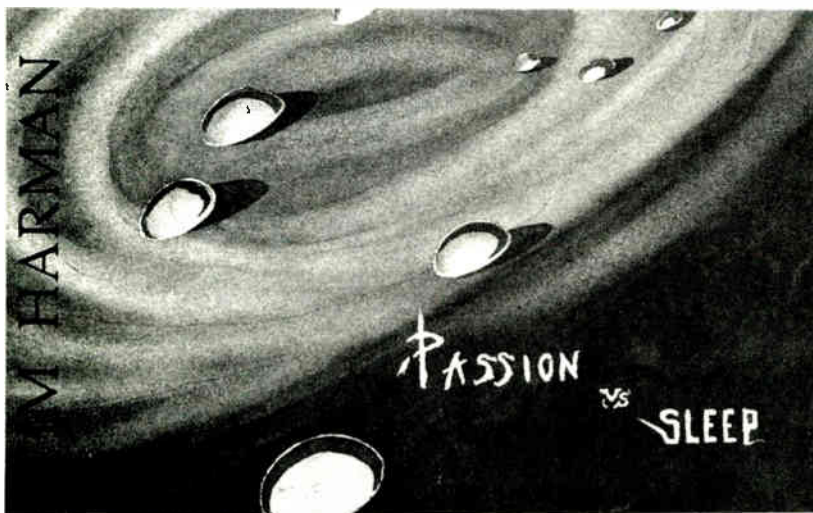
Tim Harman

the Music Maker office, so stop trying to contact me there – I got your messages and threw the other tape away.) Recommended.

– **Jack Freilicher**/*Tape 3:* Open, free-jazz synth and drum machine work with a classical bent. Stated influences are "Bach to Stravinsky, Varese, Lester Young, Bill Evans, Bird." The scary, moody piece 'Goblet' (replete with breaking glass samples) is worth the price of admission; he also loosens up and swings a bit on 'A Happy Blue.' Goal is to put an album out and "get a shot at doing a movie score." Jack, now 68, mentions that "since buying this equipment (TX802, TX216, D50, TR707, TR727, ESQM, Mirage, Voyetra Sequencer Plus Mk III) I have forgotten how to draw a staff. It has opened a lot of dreams." Optional choice.

– **Boyd & Drummond**/*three-song demo:* "No sequencers were used on this demo." Listen up: nobody cares about that anymore. Lightweight dance/funk numbers with a slight Prince-like feel. First two have a cluttered, hazy recording quality; 'Annie Vanity' sounds a bit heavy-handed and the recording is very distorted. Drum machine work is passable; backing fuzz

guitar on verses of the first number is tasteful; keyboard comping on the second number is lively. Next time?
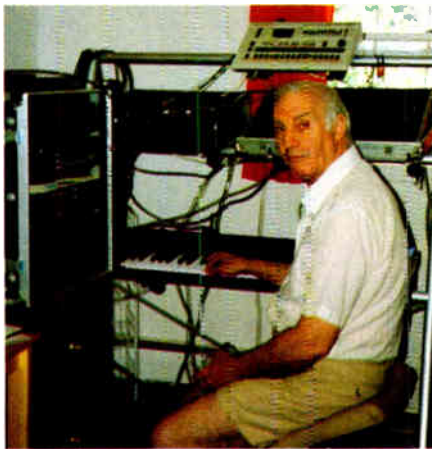
Jack Freilicher

– **Paul Alan Smith**/*two-song demo:* This month's sleeper. The first number ('I'm Finally') is a swinging mid-tempo rocker apparently about being bored with one's home town; it has a great synth solo in the coda and a big drum sound. The second number ('Christine') is a cute, mildly quirky love song with a happy, bobbing synth arpeggio in the background and equalized/echoed vocals. Although he sounds

nothing like him, the spirit of Don Dixon comes to mind. Those trying to do (or find) interesting pop music would learn quite a bit from this pair. A must-have.

So – any heavy-metal rappers out there? ∎

Contact addresses:
Adam & Ned, 1935 McAllister, San Francisco, CA 94115. Little Pictures costs $3 ppd.
Tim Harman c/o Magic Bean, 910 2nd Street, Lancaster, OH 43130.
Don Malone, 21806 River Road, Marengo, IL 60152. Tel: (815) 568-7185. A "concert" costs $10; ElectriCZ costs $10; Algy costs $25.
Ellsworth Hall c/o Plimpton Recordings, 522 Harwood Avenue, Baltimore, MD 21212.
ATL c/o John Lambert, 91 Rumson Road, #30C, Atlanta, GA 30305. Tel: (404) 261-2075.
Eddie Caballero, 5300 Cypress Drive, #38, Laredo, TX 78041. Tel: (512) 723-8019.
Neil Haverstick, P.O. Box 150271, Lakewood, CO 80215.
Jack Freilicher, 109 Ellery Street, Brentwood, NY 11717. Tel: (516) 435-2154.
Boyd & Drummond, 12530 Del Amo Blvd., #1306, Lakewood, CA 90715. Tel: (213) 860-1868.
Paul Alan Smith, Tel: (408) 356-8597.

If you want to help drive this man to the brink of lunacy, send your tape, name, address, equipment list, a photo (if you have one), and reasons for doing what you do the way you do it (again – if you have one) to: *Readers' Tapes, Music Technology,* 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.

PATCH WORK

KAWAI K1/m/r
Clip-A-Hoo
Andrew Schlesinger, Synthetic Productions

■ This is a patch from a new MASTERAM 64 collection Andy's working on. It's a combination of three distinct sounds – try to imagine a high, plucked xylophone, a slightly chorused synth-brass, and a breathy "hoo" sound layered together. The feel is happy and uplifting, something Howard Jones (remember him?) would have come up with. (See *Patchware* review below for address.)

KS CURVE

VELOCITY CURVE
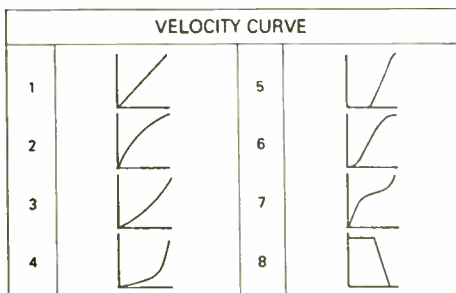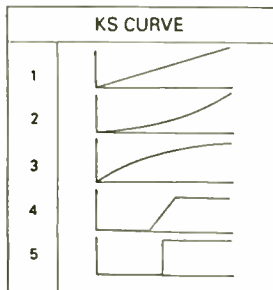
K1 SINGLE PARAMETERS

EDIT		1 VOLUME		2 NAME				
COMMON A	1 SOURCES -VIBRATO-		4	-AUTO BEND-	-18	1 PRS –FREQ	-11	
	2 DEPTH		50	7 DEPTH	0	2 PITCH BEND	2	
	3 SPEED		41	8 TIME	0	3 KS CURVE	1	
	4 SHAPE		SQR	9 VEL–DEPTH	0	4 POLY MODE	PL2	
	5 PRS–DEPTH		0	10 KS-TIME	0			
	6 WHEEL		DEP					
	PARAMETER			S1	S2	S3	S4
FREQ B	FREQ	1 COARSE		O	-12	11	-12
		2 FINE		-22	0	24	0
	FREQ MOD	3 KEY TRACK		ON	ON	ON	ON
		4 VIBRATO AUTO BEND		OFF	OFF	OFF	OFF
		5 PRS-FREQ		ON	ON	ON	ON
		6 KS-FREQ		O	O	O	O
WAVE C	WAVE	1 WAVE SELECT		153	65	237	235
	AM	2 AM S1 S2		OFF	OFF	OFF	OFF
		3 AM S3 S4		OFF	OFF	OFF	OFF
	COPY	4 COPY FROM					
ENV D	ENVELOPE	1 LEVEL		100	100	73	100
		2 DELAY		O	O	O	6
		3 ATTACK		O	18	35	18
		4 DECAY		14	56	55	59
		5 SUSTAIN		O	30	O	O
		6 RELEASE		O	30	33	25
	VEL CURVE	7 VELOCITY CURVE		1	1	1	1
	LEVEL MOD	8 VEL–ENV LEVEL		90	80	32	80
		9 PRS–ENV LEVEL		O	-7	9	-7
		10 KS–ENV LEVEL		O	O	O	O
	TIME MOD	11 VEL–ENV TIME		O	O	O	O
		12 KS–ENV TIME		1	-25	-29	-19

NEWS: If you are looking for a most bizarre percussion potpourri, check this out. **Blank Software**, a friendly promoter of Medieval *façon*, has released **Anatomy of an Automobile**, a collection of sounds "created entirely by, in, on or around an automobile." The collection, available on CD-ROM, is the first to appear in the Macintosh Audio IFF format. The price, unfortunately, is unavailable at this time, but the contact address isn't: *Blank Software, 1477 Folsom St., San Francisco, CA 94103. Tel: (415) 863-9224.*

For those with a more conventional percussion palette, **East-West Communications Inc.** has developed their **Pop-Rock Sample Compact Disc** ($99 plus shipping), "chock full" of over 700 sounds, including 40 snare drums, 40 kick drums, 60 toms, 14 banks of percussion sounds and 18 fully matched drum kits. The CD's sounds are partitioned off in sets of ten, with a "track select" at every 11th sound. While East-West recommends that reverb be added at the users' discretion, sounds range from wet, heavily-effected discotheque drums, to dry, close-in sounds. Something for everyone. For more info, contact: *East-West Communications Inc., 8515 Hollywood Blvd., Los Angeles, CA 90069. Tel: (213) 650-8972.*

A private word to **Kurzweil** owners – Kurzweil has just released the **SXA Sound Block**, for the **1000 SX Expander**, and the **HXA Sound Block**, for (you guessed it) the **1000 HX Expander**. The SXA Sound Block adds a wide variety of sounds, including flutes, oboes, bassoons, clarinets, French horns, timpanis and digital wavetables. The HXA Sound Block includes soprano sax, soft alto sax, medium alto sax, baritone sax and brass stabs, as well as digital wavetables. Both Sound Blocks are "easily installed by any authorized Kurzweil dealer" and retail for $495. Contact address: *Kurzweil Music Systems, Inc., 411 Waverley Oaks Rd., Waltham, MA 02154. Tel: (617) 893-5900.*

For the bran'-spankin'-new **Yamaha V50** comes **Sound Source Unlimited's Digital Textures** ($39.95), a collection of 100 performance patches and 100 single voices. The diskette has been under production for about a year now, obviously in conjunction with Yamaha. The Performances are multi-zoned for multitimbral utilization, and the voices play upon the V50's ability to create complex textural, atmospheric and melodic sounds, as well as lead guitar sounds, analog synths, and classic FM timbres. Further details can be obtained from: *Sound Source Unlimited, 20825½ Roscoe Blvd., Winnetka, CA 91306. Tel: (818) 882-2574.*

Roland D50 owners should check out the new **Sonicflight D50/550** collection of 64 patches, some of which appear on Debbie Gibson's new hit album (ooh! . . . aah! . . .). The collection includes a host of professional-quality sounds, including synths, strings, bass, brass, choirs – the whole shootin' match – all organized in the banks by category. Sonicflight D50/550 is available on ROM cards ($59.95), RAM cartridges ($99.95), and Atari ST disks ($29.95) which allow you to load into the synth without a librarian program. Your contact for the sounds of the stars is: *MIDImouse Music, Box 272, Rhododendron, OR 97049. Tel: (503) 622-4034.*

Correction: In MT February '89 we announced the release of Synthbank Volume 2 from Cybersoniq. The product is now called **The Synthesizer Collection**, and the new contact address is: *Cybersoniq, The Synthesizer Collection, P.O. Box 1771, Madison Square Station, New York, NY 10159.*

REVIEW: When third party companies specialize in producing new patchware, they are basically addressing two types of customers: those who buy sounds in the hope of discovering exciting programming techniques, and those who haven't the time (or desire) to program sounds of their own. **Synthetic Productions' MASTERAM-64** ($79.95), a collection of 64 Single and 32 Multi patches on a RAM card for the **Kawai K1/m/r**, caters to the latter group.

The primary focus of this generally well-constructed collection is inarguably upon *useful* sounds, tried-and-tested timbres ideal for Top 40/pop-rock orchestrations, with a handful of FX patches thrown in for fun. Included are a whole host of "classic" sounds with acute attention given to such important details as velocity, modulation and aftertouch controls, as well as panning and sonic "usefulness" across the keyboard.

Prime examples would include 'Analog K1,' with a delayed attack and thick timbre quality that rings dead-on with Led Zeppelin's 'All My Love'; or 'Full Ranks,' an organ patch big enough in all registers to fill your local cathedral. Other patches – 'Short Cello' and 'Hammond 1' for example – are exactly what you'd want them to be, no surprise nor compromise.

The 32 Multi patches were a bit less satisfying. 'Combosound' uses a split keyboard arrangement to offer two compelling sounds which I simply cannot conceive of being used in the same musical context. Several other Multis suffered from this as well. Synthetic has far greater success with the layered Multi patches. '4 Voice' layers four similarly-mellow tones to produce an immensely full, warm straight-timbre; and 'LuvlyLayer' blends bells, strings, and organ for a wonderfully soothing effect.

The unrealistic hope that Synthetic somehow got around the K1's high noise-factor was soundly diffused (no pun intended) on a couple of the patches. 'Yoo Too' is an eery, "aliens-are-invading-my-planet" atmospheric patch that works beautifully until the digital-quantization rears its ugly head. And 'Jingle Bell' is a shimmering timbre that offers hundreds of uses in hundreds of songs, but the unmaskable digital noise will limit its use to heavily-orchestrated incorporations.

The "notable exceptions" to the utilitarian approach include 'Land Voice,' a psycho-string sound mixed with some wild vibrato and truly creative use of the K1's detuning capabilities; 'Fullead' – "awesome" is the first word that comes to mind – an absolutely enormous, gargantuan monophonic lead sound; and 'PPG Bass,' which doesn't necessarily sound like a PPG, but *does* sound like the Killer Techno-Bass From Hell, sharp and evil.

When I talked with Andrew Schlesinger, the programmer of MASTERAM-64 K1, he concurred with my observation that this is essentially designed to be a users' collection. He certainly succeeded in that department, but the "notable exceptions" whetted my appetite for a collection targeted at programmers – patches that pull the K1 by its teeth. Contact address: *Synthetic Productions, 13 Laurel Ave., Tenafly, NJ 07670. Tel: (201) 568-8282.* ■ *Dan Rue*

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MUSIC TECHNOLOGY's free classified section is designed to help private sellers find buyers and bands find other musicians. If you buy and sell musical equipment or sounds as part of a small business, please contact the Advertising Department to place a regular classified ad.

KEYBOARDS

AKAI AX60 programmable polyphonic synth, good cond., $500. Tel: (612) 869-2876, leave message.

KORG TRIDENT II, $750. Jupiter 8, $900. Both include cases. TX216, $800. ARP Odyssey; ARP String Ensemble; all exc. cond. Tel: (919) 489-8430.

ROLAND JUNO 106, $450. 360 Systems MIDI Bass, $250. Southworth Mac MIDI interface, $75 plus shipping. Dean, Tel: (601) 447-2867.

ROLAND MKB1000 controller keyboard with stand, 88 keys, acoustic action, exc. cond., $950. Scott, Tel: (404) 971-2824, leave message.

ROLAND MT32, $395. Tel: (404) 587-0607.

SYNERGY II+ additive synthesis and excellent MIDI controller. Kaypro software incl., exc. cond., $1250. Tel: (919) 489-8430.

YAMAHA DX7IIFD, case, Roland Jazz Chorus-77 speaker, exc. cond., $2000. Simon, Tel: (608) 264-2734.

SAMPLING

EMULATOR II+ w/hard disk, Sound Designer, large library, and ATA flight case, perf. cond., $3500. Tel: (216) 356-6256.

ENSONIQ MIRAGE, $500. Wanted: Moog modules, other older modular gear (Paia, Polyfusion), good prices paid. Tel: (318) 292-5482.

ENSONIQ MIRAGE digital sampling keyboard, second model, 35 sound disks, $1150 obo. Eric, Tel: (817) 381-0252.

ENSONIQ MIRAGE keyboard, over 60 disks, road case, studio-kept, mint cond., $700. Bob, Tel: (312) 289-4317.

SEQUENCERS

MC500, $650; RX11, $300; DX7, $650; all three, $1500. All exc. cond. Will split. Dave, Tel: (313) 534-6243.

MC500 USERS: Hundreds of song sequences available free. '50s – '80s. Also, wanted: MC500 and software packages. Ms. L. Abata, 1902 Crose St., Iron River, MI 49935. Tel: (906) 265-5705.

DRUMS

1963 4-PIECE LUDWIG jazz kit, 20" bass drum, exc. cond., $200 obo. Todd, Tel: (419) 353-4355, after 5:30 pm.

KORG DRM1, DDD5, compatible with one card, exc. cond., asking $600. Tel: (201) 792-3385.

KORG DRM1 rhythm module, drives sounds from pads, mikes or MIDI, extra sounds incl., $500. Tel: (615) 698-7988.

ROLAND TR505 drum machine w/ac, manual, hardly used, in box, $150. Tel: (415) 863-2829.

SEQUENTIAL DRUMTRAKS digital drum machine, individual tunings, separate outs, MIDI In and Out, perf. cond., $300. Tel: (818) 763-3535.

COMPUTING

APPLE IIe, Passport MIDI interface, Mirage VES, Passport Master Tracks, Dr. T's KCS, Dr. T's DX Edit, Yamaha DX Pro, MIDIdump, $200. Omar, Tel: (408) 922-6113.

ATARI DR. T'S ESQAPADE program, $75. KCS 1.6, $150. Roland MicroComposer rhythm, performance software, $80 each. Tel: (415) 522-5426.

DIGIDESIGN SOUND Designer software, Softsynth Digital Synthesis software, for Emax and Mac 512K, $150 – $50. Tel: (602) 968-8115.

FOR APPLE II+, Passport MIDI interface, Dr. T's Caged Artist for DX100/27/21/FB01, and Advanced Software D50 Editor/Librarian, $150. Tel: (203) 438-1803.

PASSPORT MIDI 8 plus Polywriter and Polywriter Utilities for Apple IIc, $250. Allen, Tel: (919) 477-5283, leave name and number.

SMPTETRACK, official release version, $275. Farhad, Tel: (619) 461-5427.

RECORDING

REVOX A77 ¼ track (2 of them), $350 each. Abbott Loop Christian Center, Chris Pillar, Tel: (907) 349-9641

TWO OTARI 4-TRACK recorders (MX5050/BII), exc. cond., like new, $2800 each or $5000 for pair. Tel: (407) 778-5192, 24 hours.

PERSONNEL

HANDS ON WORLD MUSIC is accepting artists' profiles. 54 Nicoll St., New Haven, CT 06511. Tel: (203) 772-4212.

HELP! Wish to correspond with veteran keyboardist for constructive criticism. Contact: Darren Ewing, 8251 Roselawn, Detroit, MI 48204. Tel: (313) 834-8725.

MISC

ATA RACK, 18 spc., 18", $300. Roland TR626 drum machine, $300. Tel: (412) 795-6554.

KEYBOARD MAGAZINES, 1975 thru 1988, 150 issues, $100. Rex, Tel: (713) 930-1887.

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ATTENTION SAMPLING FREAKS, Twin Cities musician looking to swap samples with others (I have an Emax). Krypton, Tel: (612) 872-7322.

AVANT-INDUSTRIAL MUSIC, starting tape label with compilation. Send cassette to: John Gore c/o Tortured Tapes, 4615 W. Albain Rd., Monroe, MI 48161-9510.

CZ101, I will pay $200 C.O.D. for a used Casio CZ101 in perfect working order. Joel Blevins, 902 Linden Dr. Apt. 5, Auburn, AL 36830.

DAVID SYLVIAN ARTICLES, Xerox copies OK, exchange. Write: A. Florentino, 804 West 180th St. #34, New York, NY 10033.

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