MUSIC TECHNOLOGY

CHICK COREA
From The Inside Out

PATRICK O'HEARN
Discovering Eldorado

WINTER NAMM 1990
Back To The Future

REVIEWS
Yamaha SY77
Waldorf MicroWave
JL Cooper FaderMaster
Intelligent Music UpBeat 2.0

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04

EDITORIAL

FUZZY MIDI

AMONG THE MANY events that contribute to the relentless pace of NAMM shows (at least for me) is the meeting of the MIDI Manufacturers Association (MMA). This august body consists of representatives from various manufacturers and developers of MIDI products. One of its mandates is to oversee and coordinate efforts to revise or add to the MIDI Specification, the technical bible that includes all of the official details of MIDI.

At the meeting this year in Anaheim, proposals for new continuous controllers, System Exclusive messages, and other standardized ways of doing things abounded, and many were actually voted upon (much to the amazement of all present!). But there was one proposal that particularly caught my attention. It was submitted by Smythe Davidson, Chief Engineer for $V_r$oom Electronics (about whom you can read in the interview by Chris Meyer elsewhere in this issue). He calls his proposal "Fuzzy MIDI."

In the interview, Davidson discusses the concepts of Fuzzy Logic and neural networks being developed in Japan's continuing computer R&D efforts. The basic premise of these concepts is to abandon the digital on/off, 1/0, yes/no left brain binary orientation and instead process information in a parallel right brain manner, using variables with many possible values. In this approach, many variables can also be considered simultaneously, each weighted differently to affect the outcome of the operation. Of course, this requires much more computing power, but then again computers are getting more powerful every day.

Davidson's proposal to the MMA applies these concepts to MIDI with many new and revised MIDI messages. For example, a new message called Note Percent would indicate the *percentage* by which the note is on or off. As a key is played on a keyboard, its entire movement from the Off point to the On point is tracked and used to control any number of parameters. Also, one of the undefined System Real Time messages is finally defined in the proposal: Rubato.

This message allows fuzzy sequencers of the future to follow your lead as you play with widely varying (or absent) tempos.

One could argue that MIDI is already a bit fuzzy. Most of the variables in MIDI can take any of 128 different values, and some many more than that, in order to simulate analog continuity. But it doesn't always work very well, and most variables are limited to seven-bit resolution. In response to this, the proposal suggests that an analog control voltage representation of MIDI messages be created for true fuzziness. This provides infinite resolution and can even be transmitted on the two unused wires in a standard MIDI cable.

Also included in the proposal are the preliminary design specs of a Fuzzy MIDI mapping device in which many variables are considered before the mapping is established. For example, you could program it to accept Mod Wheel, Aftertouch, and Note Percent messages, establish their effect on the mapping (in which any or all of the input messages could dynamically affect any or all of the output messages), and send out Pitch Bend, Breath Controller, and Volume. You could even control the mapping program remotely via MIDI. Such a device has obvious application in algorithmic composition as well as live performance and recording.

Well, the furor that followed Davidson's presentation was phenomenal. It reminded me of the premiere of Stravinsky's *Le Sacre du Printemps*, at which the audience literally rioted. There were many fuzzy thinkers in the group who defended the proposal at the top of their lungs, while those opposed to the idea accused its supporters of being neurotic about neural networks.

The ruckus was still raging as I stole away and returned to my room at the Weisenheimer Inn. I was intrigued by the ideas presented at the meeting, but I wanted to peruse the proposal without having to avoid flying bran muffins and juice pitchers. It's great to see MIDI moving again! — *Scott Wilkinson*

Patrick O'Hearn proves that bass players needn't always stay on the bottom.

PEOPLE

FEATURES

Join the expectant crowds gathering now as we stop here on Convention Center Way for the annual buying frenzy at Winter NAMM.

Smythe Davidson takes us back to the future by revealing a truly new sampling technology for the '90s – and beyond.

STANDARDS

TOOLS

The classic PPG Wave gets a new lease on life in the form of Waldorf's rackmount MicroWave.

TECHNIQUES

Intelligent Music updates their UpBeat Realtime Rhythm Sequencer to version 2.0 with lots o' cool new features.

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READERS' LETTERS

Numania

I've just purchased the December '89 issue of *Music Technology*, and I wanted to thank you for a great cover and article on Gary Numan. I've been a great fan of his since '79. I went on a six-month cruise to Europe. Our liberty port was at Plymouth, England, where I bought Numan's 1988 cassette called *Metal Rhythm*. The latest Numan 1989 LP is called *The Skin Mechanic*, recorded live in London. Well, thanks for the great issue. My shadow in vain!

Anthony N. Lopez
N. Charleston, SC

Thank you for the interview with Gary Numan. I've been a faithful fan since 1980, and am also a bit miffed that his last album released in the US was in '82. I hope Gary knows he still has many fans here, and that he should tour the states, even if only at dance clubs. With so much formula music out there nowadays, it's nice that there are a few people who have the balls to defy the doldrums of mediocrity. Keep it up, Gary!

Michael Tressler
Connellsville, PA

A Sample Commentary

I'm writing regarding the opinions expressed by Mr. Sample in your January '90 issue of *MT* concerning the applications of electronics in music. His statement, "In a worst case scenario, synths and sequencers operate as a veil for deficient musical prowess, or even replace the musician altogether," is not an uncommon sympathy among members of the music establishment – i.e. the Musicians Union, schools, etc. Many feel that the aural art created with these tools and instruments, which is purely contemporary in style and substance, is somehow inferior to the rigidly-structured musics of those who have spent their time in the disciplines of traditional study.

Granted, it is absolutely necessary for any musician to spend a great amount of time and energy in the mastering of any instrument. I contend that the massive hours/energy spent in the understanding and application of electronics in sound is just as well spent. The new music made with these electronic instruments is no less legitimate and in no way inferior to the more conventional types of music. As anyone who has worked extensively in the programming and construction of electronic sounds and music will confirm, the assumption that these new forms of music are easy or automatic is simply not correct. To claim, as many have, that sampling and sequencing will bring the end of the conventional musical disciplines is also incorrect.

Historically, an analogy could be made between the advent and proliferation of electronics in music and its impact on "conventional" music, and the development (pardon the pun) of photography on the practices of portrait and landscape paintings with oils.

As in photography, the new electronic tools sometimes imitate, sometimes ignore the methods and modes of their predecessors – while the purpose is always to express the feelings of the artist, in whose hands the tool becomes an implement for the communication of those feelings.

The validity of the artforms remain intact. Photography expands to become a new means of expression, not replacing painting, but undoubtedly greatly expanding the visual arts. The analogy with the new electronic arts is obvious.

Most of the music created by individuals who have not spent sufficient time practicing their chosen craft, whether it be piano or software/hardware applications, does sound amateurish and unimaginative. That, however, is a byproduct of their lack of expertise, and not totally inherent in the medium.

And as with photography, the new audio arts make the production of material more efficient. However, without the photographer's expertise in light exposure and chemistry, the photos will be a waste of paper, chemicals, and time. Most of all, without the artist's keen eye and sense of design, the resulting photos will neither capture the image, nor convey the feelings intended by the artist. Of course, almost anyone can take some good pictures, and by having them developed by someone who has the training in paper and chemical manipulation, by chance some good photos may result. Without the practice necessary, the results are unpredictable at best.

In music, as in the other artistic fields of expression, the impact of the work on an audience is the true judge of success. It is not, as some contend, ultimately judged by the artist's peers and imagined "competitors."

No offense intended toward Mr. Sample (or those other members of the "legitimate" music fields who feel that "musical prowess" is the measure of musical artistry), but a growing number of individuals feel that the new music is just as valid, just as acceptable. And, contrary to Mr. Sample's impressions, a growing number of artists have found that the new instruments are far less restrictive than the tonality and tunings of the acoustic piano. Personally, I feel that the condescending attitude and self-importance displayed by members of the music "establishment" toward the new forms of electronic instruments simply shows their closed-mindedness.

Jaxon Crow
Dallas, TX

Extra! Extra! Read all about it! Products acquire new and improved features! Get the latest scoop right here!!

■ **ADAP II:** Hybrid Arts announced software enhancements for its ADAP II digital audio recorder and editor. Variable crossfade editing allows the user to specify the duration and type of crossfade (linear, log, and reverse log) that will be applied to a sound. ADAP II now also supports full SMPTE chase lock, while the MIDI Performer Page allows for sounds to be played back in response to commands from any MIDI keyboard. With the MIDI Performer Page, the system can mimic a MIDI sampler, eight mono or four stereo sounds can be triggered simultaneously, and MIDI pitch and volume control commands are supported. A graphic display lets the user assign up to 128 different sounds (which can be in discontiguous blocks).

Hybrid Arts has also announced the availability of their EditTrack II and SMPTETrack II MIDI sequencer programs for the Atari ST. New features include Cycle Record Mode, real-time control of MIDI parameters (volume, pan, pitch-bend, modulation), and time quantization during recording. Also included are Song Sets that allow the user to specify a list of songs to be played sequentially.

– Hybrid Arts, Inc., 8522 National Blvd.,
Culver City, CA 90232. Tel: (213) 841-0340. Crossfade editing and SMPTE chase lock are available to current owners at no charge. The MIDI Performer Page retails for $400. Upgrades to SMPTETrack and EditTrack are available free, if purchased after August 15, '89. Otherwise, upgrades are $75 for SMPTETrack and $29 for EditTrack.

■ **C-Zar:** C-Zar, an editor/librarian for the Casio CZ-101, CZ-1000, and the CZ-1 and the Commodore Amiga, has been updated to Version 2.4. C-Zar's envelope editor allows envelopes to be displayed on a logarithmic scale. New features enhance its functionality in the Amiga's multi-tasking environment. Preset sounds and operation memories have been added, and the list price has been lowered to $99.

– Diemer Development, 12814 Landale, Studio City, CA 91604-1351. Tel: (818) 762-0804. Registered owners can upgrade by sending their original disk and $10.

■ **Oview/Proteus:** Turtle Beach Softworks has begun shipping version 1.01 of their Oview/Proteus synth programmer, now compatible with the E-mu Proteus XR, and also the new Proteus/2. The program includes a full-featured bank editor, which supports up to four banks of 32 presets simultaneously, a 250 note sequencer for auditioning changes, a real-time mouse MIDI controller and Preset Stretcher (combines different elements of two existing presets). Oview requires an IBM PC, XT, AT or compatible, 640K RAM, a graphics card, and a mouse. Compatible MIDI interfaces include Music Quest, Voyetra, CMS, or Roland MPU compatibles, Key MIDIATOR, or a Yamaha C1.

– Turtle Beach Softworks, P.O. Box 5074, York, PA 17405. Tel: (717) 757-2348. Registered owners can update for free. Oview retails for $149.

■ **Rhapsody:** Green Oak Software has released version 2.0 of Rhapsody, their sequencing software for the Macintosh. New features include an automatic display scrolling during playback, the ability to play selected notes, and improved redraw performance.

Green Oak Software, 4446 Salisbury Dr., Carlsbad, CA 92008. Tel: (619) 434-0823. Registered owners of version 1.2 can update to version 2.0 for free. Rhapsody retails for $149.
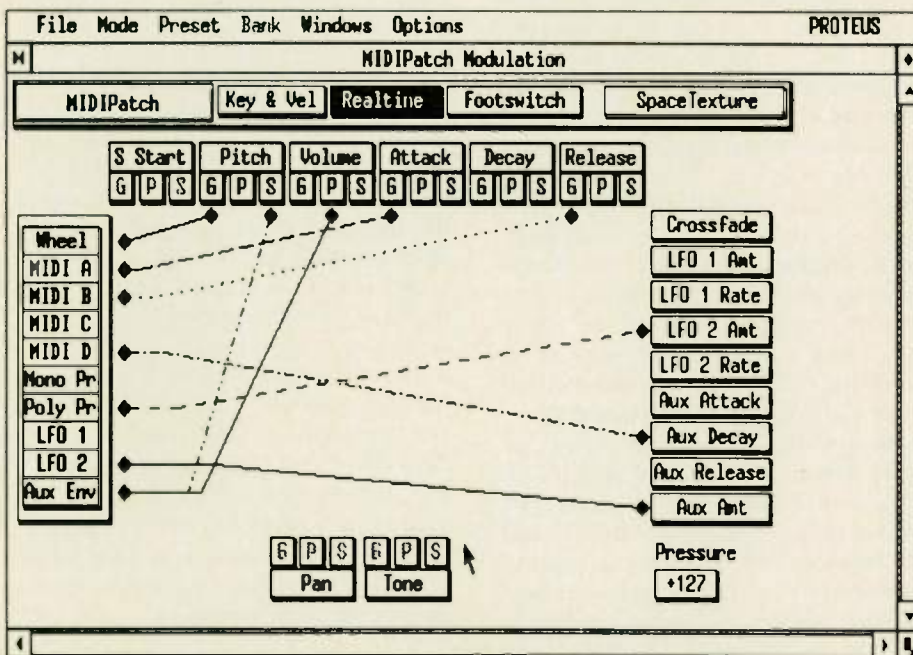
■ **VFX:** Ensoniq has announced v2.0 of the VFX that offers sonic enhancements, improved buttons and advanced software features. Other features include seven new effects algorithms, from concert reverb and warm chamber to dynamic hall. Ensoniq has also announced O.S. v1.3, an operating system for the Ensoniq VFX[SD].

– Ensoniq Corp., 155 Great Valley Parkway, Malvern, PA 19355. Tel: (215) 647-3930. Both VFX version 2.0 and O.S. version 1.3 are free upgrades.

Intuitive bank editor

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Using MIDI CONTROLLERS
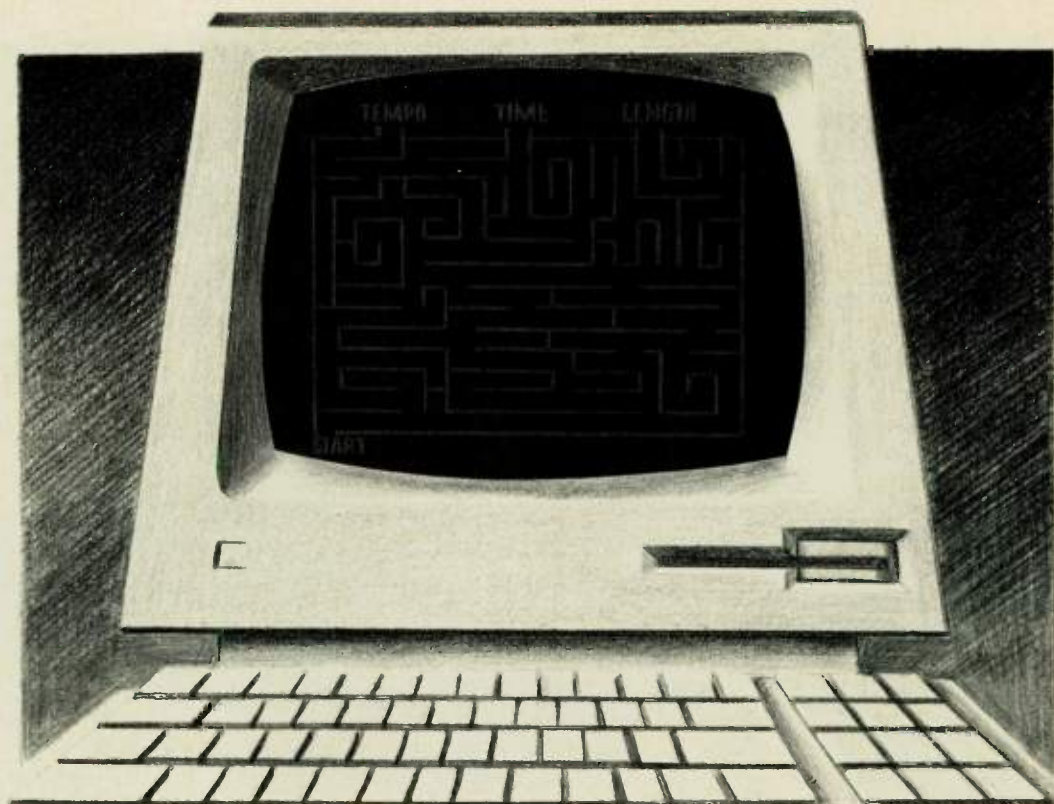
One part of the MIDI spec that's often overlooked is MIDI controllers – among their many applications are MIDI-controlled signal processing and mixing.
Text by Vic Lennard.

AMONG THE MANY types of information represented by MIDI (Note On, Note Off, Program Change, System Exclusive, etc.) are the messages by which musical expression is communicated. These are known as the *Control Change* messages. Each time you step on a sustain pedal or move the modulation wheel (two examples of what are often called "controllers," not to be confused with instrument controllers such as keyboards and guitar synths), data is sent out to control a particular function or functions in the device on the receiving end of the MIDI cable. Theoretically, there is room in the MIDI spec for 128 different control change messages, numbered from 0 to 127, but some of these are used for other purposes, while others have no function assigned to them as yet.

Controller Types

Consider a light switch. The light is either on or off depending on the position of the switch. But what happens if the light is controlled by a dimmer instead? When rotated fully counter-clockwise, there is no light and this could be said to represent a value of zero. Rotate the dimmer slowly in a clockwise direction and the light intensity slowly increases until the light bulb is fully on. In MIDI controller terms, "off" is represented by a value of 0, "fully on" is represented by a value of 127 and anything in between is represented by a value between these extremes.

MIDI controllers can similarly be divided into two categories. The first of these are *switches* such as Sustain Pedal (controller #64). These are usually operated by a switch mechanism of some kind, be it a foot pedal or a toggle on a keyboard. The second category includes *continuous* controllers such as Modulation Wheel (#1), each of which are normally operated by a slider or variable pedal of some sort. Actually, all MIDI controllers are termed "continuous controllers," but for the sake of clarity we'll split them into these categories.

Transmission & Resolution

In terms of hexadecimal bytes (with decimal equivalents in brackets), all controller data has the following format:

Bn NN XX

where B indicates a MIDI controller, n is the MIDI channel 0–F [1 to 16], NN is a number specifying which controller is being operated, and XX is the value that the controller is sending at that moment. For instance, B4 07 7F indicates that controller 07 (MIDI Volume) is being sent on MIDI channel 5 at its highest possible value 7F [127]. This would have the same effect as moving the volume slider on a keyboard to its maximum level.

Although I said earlier that controllers can take any value between 0 and 127, this isn't always true. Controllers 0 through 31 can actually be represented by two controller messages if increased resolution is required. For instance, MIDI Volume is controller #7, with a value between 0 and 127. However, another byte can be used in

conjunction with this message, providing a total of two bytes with which to specify MIDI volume. This extra byte, known as the Least Significant Byte (LSB), is sent with a Controller #39 message. Used together, these messages provide 16,384 possible values for MIDI Volume.

Usually, 128 values are sufficient for most controllers, so the primary controller message (also known as the Most Significant Byte, or MSB) is all that's needed. However, this is not true of pitch-bend, which requires the extra sensitivity that 16,384 values can give. Depending on the pitch being bent, our ears can hear small but discrete steps as the pitch changes if only 128 values are used.

It must be pointed out that pitch-bend is not part of the control change messages. It is represented by its own message in the following format:

En LL HH

where E indicates pitch-bend, n represents the MIDI channel, and LL/HH are the LSB and MSB of the value. For example, E1 00 40 means pitch-bend on MIDI channel 2 with a value of 4000 (in hexadecimal notation – notice that the bytes in the message are in reverse order to what you might expect). This equates to 8192 in decimal and represents the central position of the pitch-bend wheel (negative values are awkward to encode).

Setting Up

So far we've seen that a MIDI keyboard transmits data as numbers, which are interpreted by the receiving device. For example, push the pitch-bend wheel to its maximum position – how many semitones did the pitch rise? This depends on how the receiving device is set up. For example, the Control Edit page on a Roland D-50 allows you to set a value from 0 to 12 to specify the number of semitone steps by which the pitch will be bent at the pitch wheel's maximum position.

Most of the MIDI controllers require similar parameters to define how they will affect the receiving instrument. Akai's S900 sampler has a page within Edit Program for setting the maximum LFO (low frequency oscillator) depth that can be achieved using a remote Mod Wheel. If you set this parameter to 50 (in a range of 0–99) and crank the Mod Wheel to its maximum position, the S900's LFO will be working

at half of its maximum depth.

An instrument's audio output level is usually determined by three variables. The volume control on the front panel adjusts the loudness available from the internal pre-amp, the MIDI output volume parameter sets the maximum level when controller #7 is set to full, and the actual value of this controller dictates the level that the synth produces.

In Control

One of the benefits you can gain by using a sequencer is that controller data can be entered after the notes. Take the situation in which brass chords are to swell in volume. Record the notes first, move to a separate sequencer track, and use the keyboard volume slider to produce the swell (assuming that your keyboard transmits MIDI volume in response to the volume slider). Got it wrong first time? Do it again and again until the required result is achieved, then merge the tracks together.

There's one mistake that's often made with MIDI controllers. Let's say that you've used a volume slider, originally at its maximum setting, to fade out a particular instrument in the middle of a song. At the end of the fade, the final MIDI volume memorized by the MIDI device on that MIDI channel will be zero until it's changed. This means that, if the instrument is used later on in the song, it will not be heard

"One of the benefits of using a sequencer is that controller data can be entered after the notes."

unless the MIDI volume is set higher than zero. The situation is worse if the sequencer is stopped halfway through a fade and restarted from another point. MIDI Volume data is the most common culprit, but modulation and pitch-bend can also cause highly anti-social sounds in this scenario.

MIDI effects units are now appearing that allow their parameters to be controlled via MIDI. DigiTech's DSP-128 and the Alesis QuadraVerb are just two examples. Reverb time, decay, diffusion, mix and so on can all be controlled in real time using a MIDI controller, although it's advisable to avoid processing an audio signal at that moment since an audible glitch may occur.

For example, say you want to give the reverb on the snare drum a pre-

delay for two beats in a song. At the appropriate time, open the reverb pre-delay using a MIDI controller and then close it again after two beats. Record the controller data on a sequencer to make it available on mixdown. If the length of pre-delay offered by the unit is insufficient, you could set up a digital delay before the reverb and control the delay time instead. Again record the data in a sequencer track and then move it slightly if a glitch is heard as the reverb from the previous snare decays. The advantage of this tech-

"MIDI controllers can be divided into two categories: switches such as Sustain Pedal, and continuous controllers such as Modulation Wheel."

nique over simply patch changing to a different program is the time it takes for the hardware to react – which is guaranteed to cause glitches.

Comparisons between two heavyweight master keyboards of yesteryear, the Roland MKB-1000 and Yamaha KX88, illustrate just how advanced the latter instrument was for its time. The KX88 featured sliders and switches which could send a variety of user-assignable MIDI controllers. Currently, Akai's MK76 and Roland's new A50 and A80 provide these capabilities and then some.

Other new devices include Anatek's Pocket Pedal (reviewed in the Sept. '89 issue of MT), which allows you to incorporate an extra pedal and switch into your system, and JL Cooper's FaderMaster, which gives you eight sliders, each of which can be set to send any MIDI controller message.

Finally, much of what has been mentioned here is already fully implemented on computer-based sequencers. C-Lab's Creator for the Atari ST and Opcode's Vision for the Macintosh are two examples of programs that include "virtual sliders." These sliders can be assigned to any of the continuous controllers on any MIDI channel. Also, many computer-based sequencers include graphic editing pages that allow you to "draw" in specific controller data with a mouse.

I encourage you to experiment with the MIDI controllers available in your system. Their applications are many and varied, and the rewards are enhanced productions and more control over your equipment. ◆

BACK TO THE FUTURE

Winter NAMM 1990

The music industry decides that life's not so bad after all, revives some solid technologies from the past, sells tons of gear, cooperates like never before, and throws one hell of a party. *Report by Lawrence Ullman.*

WINTER NAMM SHOWS have always reminded me of a circus. First off, the show floor of the Anaheim Convention Center is divided into three rings (er, I mean rooms), there are plenty of people dressed up like clowns, and this year's show even had a big-top complete with elephant! But seriously folks, I've attended NAMM shows for many years now, and this one was the best yet.

As I'm sure you know by now, the last couple of shows have not been particularly inspiring. The pace of innovation seemed to have slowed to a crawl, sales were down, and nobody was throwing huge parties. The last show in Chicago was even dubbed "The Wake on the Lake." Well, the pendulum has swung back, and happy days are here again.

Big-Top NAMM

If attendance serves as any indication, then this show was wildly successful. From the minute the doors opened, they were packing the aisles. Sometimes it got ridiculous – the glassed-in Korg demo room looked like a phone booth-stuffing contest in progress. Every

manufacturer's rep I talked to had a big grin on his or her exhausted face – the buyers were living up to their titles.

And the manufacturers did their part to generate excitement. Booths were huge and lavish, parties abounded, spirits ran high (and freely), and people were genuinely excited about the future. The entertainment highlight of the show was the huge bash thrown by Alesis to celebrate their fifth birthday. The event was held in a big-top tent just outside the convention center, and partygoers were treated to food, drink, live music starring the Rippingtons, and elephant rides courtesy of Dixie.

Oh well, back to work. As usual, several important trends surfaced. Seeming to take a cue from world events, joint ventures and cooperation between manufactures were evident everywhere. To name just a few: Opcode/Digidesign, Korg/ Sequential, Warner New Media/Passport – even Lone Wolf joined the pack, teaming up with Opcode. As you'll see, some of the most important new products shown are the result of these cooperative efforts.

A "Back to the Future" theme quickly became obvious as well, with several excellent old technologies popping up in new guises (Vector Synthesis on the Korg WS, a PPG Wave in a rack, even a new *analog* synthesizer). Also harkening back to the good ol' days were the many products offering digital simulation of analog irregularities. Some good examples are Roland's "Warmth Control" on the Digital Space Echo (I'm not kidding) and the "Analog Feel" function on the D-70.

Before we dive head first into the bottomless pit of product descriptions, it's time for the obligatory NAMM report disclaimer. There's no way to

see *everything* at these shows (even with our speed control set to 11), much less fit a description into the space allotted here. And rather than include a miniscule description of millions of products, we've opted for a more thorough description of those products that we feel are of greatest significance and interest to our readers. Note that our sister magazine *Home and Studio Recording* also runs a NAMM report, and they will be covering the many new signal processors, tape decks, mixers, amps and speakers that were introduced. Finally, note that prices, names, even actual product existence are subject to change without notice.

Digital Audio Products

Never displayed at the show, but previewed for dealers and the press at the Roland dealer meeting, was arguably the most significant product introduced this year – the **Roland DM-80 Hard Disk Recorder/Digital Audio Sequencer**. For a breakthrough price of $5000–$6000, this stand-alone unit will come standard with four tracks and a 100Meg hard disk yielding over 16 track-minutes (i.e., 4 minutes × 4 tracks, 8 minutes × 2 tracks, etc.) of recording time at 48kHz. The 3U module is internally expandable to eight tracks. A SCSI connector allows external storage including optical disk to extend recording time, and digital I/Os will enable a DAT to function as a "hi-tech cassette interface" for backup.

The separate remote controller has a large LCD, tape deck style controls, a ten-key pad, and an Alpha dial. Tracks are dynamically assigned to disk(s) and allocation will be fully transparent to the user, thus optimizing use of disk space. A built-in digital

mixer is included for ping-ponging, and there is an onboard digital EQ. Memory is used only when sound is present on a track. Cutting and pasting a section several times doesn't use additional memory as pointers are used to replay sections.

Perhaps most importantly, the DM-80 syncs to MIDI, MTC, and SMPTE without any external hardware. Rather than using a linear tape recorder model, the unit is organized to work like a MIDI sequencer – audio data is recorded and manipulated using actual bars, beats and ticks. Just connect the system to any sequencer and you've seamlessly integrated multitrack digital audio with MIDI.

Another marriage of state between **Opcode** and **Digidesign** has borne fruit. **Digital Audio Vision** (under $1000) integrates a special version of Opcode's Vision sequencer with Digidesign's SoundTools hard disk recording system for the Macintosh. The combined products will allow you to integrate stereo digital audio seamlessly into a sequence. Actual acoustic instrumental or vocal tracks can be recorded, edited and aligned to sequenced MIDI events, or vice versa.

Microsound is an IBM PC/AT-based hard disk recording system from **Eltekon Technologies**. Three versions are available. The MicroSound AT-2 system ($3495) includes a DSP Board that installs into the PC and a separate rack mount I/O Module that contains the A/D and D/A converters. Microsound AT-2+2 ($4195) includes AES-EBU connectors in the I/O module. The AT-4 ($4529) system replaces the AES-EBU board with an additional ADA board for four channel quad. Don't already own a PC? The Eltekon 386 is a rack mount 80386 PC available in

three speeds: 16MHz ($3249), 20MHz ($3599), and 25MHz ($3799). All three include a VGA mono monitor and a SCSI controller optimized for use with Microsound. Eltekon also manufactures a complete line of rack-mounted SCSI hard disks to provide storage for this or any other disk-based system.

Spectral Synthesis, Inc. previewed their **Digital Studio System**, a combination of hardware and software products for the IBM PC/AT environment that creates a "Complete Digital Audio Workstation." In addition to multitrack hard disk recording, the system offers synthesis, sampling, sample editing and lots more. The SynthEngine/386R is a complete system including a 25MHz, 80386-based PC with 4Meg of RAM and an 80MB high-speed hard disk. The whole shebang lists for $17,895.

The **56K Digital Recording System** from **Turtle Beach** is a stereo IBM PC/AT-based hard disk recording system made up of several hardware and software components. Hardware includes the 56K-PC Digital Processor Card ($1295), 56K-D Digital Interface Box ($745), and the 56K-A Analog Interface Box ($995). **SoundStage** software ($649) ties the whole thing together and provides graphic cut-and-paste editing of digital audio.

Synthesizers and Samplers

Cheetah, well known in the UK for reasonable quality at an affordable price, now has distribution in the US. The **SX-16 Sampler** ($1389 w/512K, $2429 w/2Meg) is a 1U rack-mount 16-bit stereo sampler with a 48kHz sample rate. Specs include 16-voice polyphony, 8-voice multitimbral operation and eight audio outputs. It's also

compatible with S900 disks, and a video display card (using a standard TV) can be added as an option. The **MS6 Multi-Timbral Synth Module** ($669) is a good ol' fashioned 6-voice analog synth in a single rack space. Each voice has two DCOs, a four-pole filter, two envelopes, and an LFO.

E-mu announced the **Proteus II** ($1495). It has a full 8Meg of ROM containing orchestral sounds from the EIII. The Proteus IIXR ($1795) adds an additional 192 user presets.

Kawai had a number of mysterious products that no one there was able to tell me much about. The **K-4000** ($TBA) will be something like a K-4 with an 88-note weighted keyboard "plus other features yet to be decided on." The **KL-1 Synthesizer** ($TBA) is a Strap-on keyboard (20 lbs.) with 26-voices, 14-voice multitimbrality, drum sounds and an arpeggiator. A half-space module version, the **KL-1m Synth Module** ($TBA) was also displayed.

One of the big hits at the show was the **Korg WS Wavestation Synthesizer** (approx. $2500). This excellent sounding 61-note keyboard synth was developed by Korg's newly acquired San Jose R&D Group (comprised mainly of former Sequential Circuits engineers). Features include: 16-Bit Vector (VS) and Component-style Synthesis, 32-Voice polyphony, "Wave Sequencing" (produces sounds similar to 'Digital Native Dance' on the D-50, but with controllable tempo), a real-time Joystick mixer (remember the Prophet VS?), digital effects (up to four at once) with real-time control, and more than 500 multi-sampled waveforms in ROM. When asked about a rack version, Korg gets rather defensive – I heard their product specialist reply "If we made it, would ▶

► you buy it?" Let them (and us) know your answer.

Kurzweil introduced three new modules, each with a different assortment of sounds. The **1200 Pro I** ($1795) is a "general purpose expander" with 163 sounds aimed at live and home studio players. The **1200 Pro II** ($1695) has 184 orchestral sounds. The **1200 Pro III** ($1495) has an assortment of "backup" instruments (guitars, basses, saxes, brass and synth sounds) and is intended for users who already own a "general-purpose" keyboard. Also shown

The new Roland DM-80 low-priced four track hard disk recorder.

was the **K1200** ($3195), an 88-note keyboard with 24-voice polyphony, 16-part multitimbral operation and 163 internal ROM sounds.

Also making a positive impression was **Roland's D-70 Super LA Synth** ($2895). Basic specs include a 76-note keyboard with release velocity, 30 voices, 6-part multitimbrality with a separate rhythm part, large LCD, built-in reverb and chorus, a Solo key mode with a Legato setting that won't retrigger the envelope, and four complete tones per patch that can be split, layered or zoned across the keyboard. A Tone Palette Editing System provides easy access to programming parameters. The filters are multi-mode (high, low, and band pass) with resonance, and an "Analog Feel" function emulates the "fluctuating pitch of an oscillator on an analog synth."

New from **Rhodes** is the **Model 760 Synthesizer** ($1995). Designed for live performance, it has a 76-note weighted action keyboard, 128 RS-PCM sounds and a ROM card slot, 30-voice polyphony, 6-part multitimbrality, a split mode that can layer up to six sounds, and an arpeggiator whose speed can be controlled with aftertouch.

Tired of lugging your trusty Hammond B3 to gigs? The **VOCE DMI-64 Mark II** ($795) is a single rack space additive synth module optimized for Hammond organ-style sounds. It's 64-voice poly and 16 channel multitimbral with dynamic allocation. Built-in effects include vibrato,

chorus, rotating speaker (controllable from mod wheel), key click, distortion, and tone wheel percussion. **DMI-64 Soft Control** IBM-PC software can be used to create new waveforms graphically. You can input actual drawbar settings from a B3 and the software will generate wave data to match.

The PPG Wave 2.3 was a great synthesizer with a unique sound, but it suffered from a closed-system design and a high price. Now a new company, **Waldorf Electronics**, has put a PPG 2.3 into a 2U rack mount chassis. Distributed by Steinberg and dubbed the **MicroWave** ($1995), it's an eight-voice polyphonic, eight-part multitimbral synth with a sexy design sporting a bright red rotary parameter knob (see review, page 22). There are enough programming possibilities for the most ardent sound-hacker. Voice architecture features 30 factory wavetables yielding close to 2000 waveforms, four-pole analog filters, two oscillators per voice with three modulation inputs each, and three different envelopes (ADSR, ADSR plus delay, and an eight stage, loopable modular envelope).

The SY77 should already be familiar to many of you (see review, page 48). **Yamaha** knows a good thing when they see it, and the spinoffs have already arrived. The **SY55** ($1595) is sort of an SY77 without the FM. It has a 61-note keyboard, 16-voices with 16 part multitimbrality, 74 waveforms in ROM (up to four can be layered per voice), multi-mode Filtering and EG similar to the SY77, 64 preset patches, 16 preset multi-play setups, an 8000
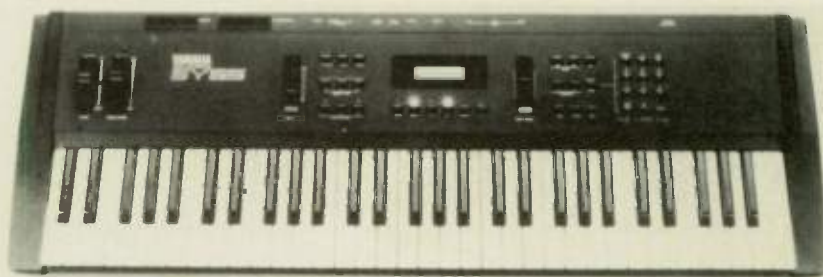
Yamaha's newly announced SY55 sample playback keyboard.

note 8-track sequencer, drum sounds in ROM, and 34 effects programs. Also announced was the **TG55** ($995), a rack-mount version of the SY55 without the sequencer.

Software

A huge number of new software programs and many upgrades to existing products made their debut at NAMM, and most look to be of extremely high

caliber. An important development is the Macintosh community's sudden love affair with Apple's MIDI Manager system software, which has spawned a whole new breed of software, and everyone is rushing to add compatibility.

Digidesign had several new products. Atari owners will be pleased by the Atari version of **Sound Tools** ($2995). Two new utility programs for Sound Tools Macintosh were also announced. **Master List** lets you assemble a playlist of soundfiles, playlists, or regions, even when they are located on different SCSI drives. **Live List** allows any MIDI event or Mac keystroke to trigger a playlist, soundfile, or region. Both programs are available on one disk for $95.

C-LAB is now shipping new versions of **Creator** and **Notator**. New features include the SoftLink multi-program environment, an auto load/play function for live performance, a key command to disable the notation part of the program to free memory for sequence data, a "Dynamic Groove" function to capture the velocity of a track and impose it on another, and "smart" rest and loop symbols that affect playback when added to a score.

Dr. T's had a couple of new goodies to show. **Beyond** ($319) is a major new Macintosh sequencer with all of the powerful graphic display and editing features we've come to expect in a high level package. **Tiger Cub** is a new entry-level sequencer for the Atari and Amiga. For an amazing price of only $99, you get 12 tracks, excellent real-time graphic editing, and notation editing and printing. They also announced many upgrades to KCS, Level II, and X-oR.

New versions of **SMPTETrack II** ($495) and **EditTrack II** ($99) were announced by **Hybrid Arts**. A new Digital I/O Module for the **ADAP II** ($895) has both AES/EBU and S/P DIF formats and sample rates of 32, 44.1, and 48kHz. The module mounts inside the ADAP II. **SysXpress DA** (Free from Hybrid's in-house BBS, 213-841-0347)

loads SysEx data from disk and sends it out over MIDI. New software for the ADAP II includes variable crossfade editing, audio "scrub" editing, play lists, and a MIDI Performance page ($400) that emulates an eight-voice stereo sampler and allows sounds to be triggered via MIDI. A $5495 Erasable Optical Disk option was also announced for the ADAP II.

Developed jointly by **Intelligent Music** and **IRCAM** in France, **Max** ($N/A) is a "graphic programming environment in which complex applications can be built by linking together simple modules." Basically, the program consists of a tool box of sliders, buttons, MIDI inputs and outputs, and so forth. You connect elements together using "patch cords" to create a program, testing as you go. It can be used to create or prototype custom software (a special run-time version can be licensed for distribution with the programs you create).

HookUp! ($149) from **Hip Software Corporation** is similar to Max, but is intended more as an entertaining learning tool rather than a development system. Included in the program are sampled sounds and animated

characters that can be made to interact with MIDI data or mouse input in real time. As an educational tool, the program has many possibilities.

Mark of the Unicorn announced a new version of **Performer 3.4** ($495). This veteran sequencer now has a standard musical notation editor and
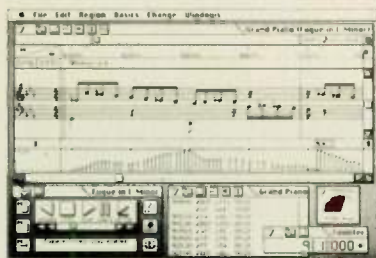
The standard notation editing graphics on Mark of The Unicorn's Performer 3.4.

support for the MIDI Time Piece (described later).

Including many of the best features of Vision, **Opcode's** new **EZ Vision** sequencer for the Mac ($149) has 16 tracks, piano-roll graphic editing of note data, graphic editing of controller data, a song arrangement window, a mixer window with real-time faders, and color support. **Galaxy** ($249) is a universal librarian that includes all of

the features found in Opcode's individual Librarians. It supports over 70 instruments and includes "PatchTalk," a language you can use to create your own file types for future instruments. Banks can be "Published" for use in Vision, and MIDI Manager is supported. Also announced was a new 3.0 version of **Cue**.

Passport also celebrated their birthday with 10 candles on their cake, and they marked the occasion with several new products. **Sound Exciter** ($79.95) is an 8-voice software synthesizer for the Macintosh. Running under Apple's MIDI Manager, the program emulates a multitimbral synth with dynamic voice allocation. You can even create splits for multisampled patches. It's compatible with MacRecorder and Studio/Jam Session sounds and instruments, making it perfect for use in a multimedia presentation.

A new division of Passport called **Music Data** will be shipping a wide range of pre-recorded MIDI sequences in Standard MIDI File format, configured for the MT-32. More than 800 titles have already been acquired, with styles ranging from pop to classical. Each package will retail for $39.95. ▶

▶ Also announced were Atari and IBM versions of **Encore** ($595). Passport will be adding MIDI Manager support to Encore, Master Tracks Pro 4, and Alchemy 2.0 (which they have acquired and will now be distributing). As a present to their users, they will be dropping copy protection on nearly all products – huzzah!

sYbil 2.0 ($299), the real-time performance software from **Scorpion Systems Group**, now supports all types of MIDI controllers from a single program and has been re-written from the ground up (it's no longer based on HyperCard). Scorpion claims that the new version is *much* faster and easier to use.

Steinberg/Jones demonstrated a Macintosh version of their highly acclaimed **Cubase** sequencer ($495). Containing all the features of the Atari version (see *MT* February '90 for a review), it looks to be another major player in the increasingly crowded high-end sequencer arena. And speaking of Cubase Atari, a new version (available now) features the "Dynamic MIDI Manager." Sort of a do-it-yourself graphic editor, you use it to define up to 128 faders, knobs, buttons, etc. that can be assigned to *any* MIDI messages, including SysEx. It will even "learn" SysEx commands from any device capable of sending them in real time. Templates are included for the M1/3R, Proteus, MT-32, DMP-7, and JX-8P, and Steinberg expects third party templates as well. Also announced was a Proteus version of their **Synthworks** editor librarian ($199). Excellent graphics are used throughout the program. Of special note are the "graphic patch cords" in the modulation matrix window.

Live Control ($299) is a software mapper for IBM-PC and compatibles from **Toucan Software**. Features include real-time re-mapping of continuous controllers, harmonization and transposition, velocity mapping, virtual controllers (the mouse becomes a MIDI controller), filtering and viewing of data.

From **Zero One Research** comes the **MIDI MIX 3D** desk accessory ($149) for the Mac. It provides 16 fully assignable real-time sliders that can be muted, solo'd, crossfaded, grouped, and assigned to any of four subgroups. The program can be used to process any Standard MIDI File or with MIDI Manager for real-time manipulation and overdubbing of MIDI data. The Super FX Section gives real-time access to many popular effects devices and synths, and new templates can be created.

Alternate Controllers

What's big, blue, completely programmable, and really fun to play? No, it's not IBM's latest product. It's the **Atari Hotz MIDI Translator** (approx. $7000). This large, Atari ST-driven MIDI controller is covered with touch sensitive pads of varying sizes, each of which can be independently programmed to send any MIDI message(s) you desire. For example, a row of small pads running vertically along the left side of

The new Hotz controller co-developed by Atari and Jimmy Hotz.

the playing surface can each be set to transmit a different amount of pitch-bend data, allowing for very expressive real-time performance. Other pads can send chords, notes, you name it.

Since all settings are controllable in real time via MIDI, a sequencer can configure the unit on the fly, allowing for some amazing possibilities. For example, by sending the unit pre-programmed chord changes and scales, you can solo to your heart's content and, no matter what you do, you'll never play a wrong note! As CDs with MIDI become available, Atari is hoping that they will be able to use that data to control the Translator. Imagine playing along with your favorite artist, making up perfect new solos and riffs without years of practice. This might be it folks – the dream of music performance for the masses fulfilled at last.

More down to earth, but still fascinating, is **Buchla and Associates' Thunder** ($1990), a MIDI controller created by synthesizer veteran Don Buchla. About the size and shape of an electronic bass drum pad, Thunder has 26 keys (pads) arrayed in an unusual (and beautiful) pattern that is claimed to "complement the shape and reach of the human hand." All of the keys are pressure sensitive, and 14 can sense position as well. More than just a controller, Thunder can also process and transmit MIDI data in a number of interesting ways. In addition to pitch bend, portamento, polyphonic aftertouch and release velocity, it can store instrument setups, capture and send SysEx, and offers

some unusual note filtering and microtonal capabilities. If that's not enough, the unit will even record and playback riffs (with real-time alterations), and can generate echoes, transpositions, etc. from a single gesture.

Percussion Sound Sources

Another mystery product from **Kawai** was the **XD-5 Percussion Synthesizer** ($TBA). A 2U rack mount device, it has 16-voices, six individual outputs (plus stereo), and 48kHz samples.

The **S3 Rhythm Workstation** ($1199) from **Korg** has some very cool new features including separate (and fully editable) attack and sustain samples that can be mixed or matched at will to create new sounds, four pattern tracks and four linear tracks that can be used to overdub data in real time, built-in digital effects, and complete SMPTE functions.

I didn't actually count, but **Roland** seems to have released more new products than anybody else. In the area of drum and percussion devices, their **R-8M Total Percussion Sound Module** ($995) is a 1U rack-mount version of the R8 Rhythm Composer. The **SPD-8 Total Percussion Pad** ($695) is a slightly smaller, self-contained version of Roland's Octapad with forty 16-bit drum sounds built in. Just plug it in and and whack away!

Roland's **Boss** division had to get in on the act too. The **DR-550 Dr. Rhythm** turned quite a few heads. For $295 list, you get forty-eight 16-bit sounds including (house and rap fans, listen up!) a complete complement of TR-808 sounds. The battery or A/C powered unit has a large LCD, 12-voice polyphony, 64 preset and 64 user programmable patterns, and 8 Songs – you can even program patterns via MIDI.

Be sure to check out the NAMM report in our sister publication *Rhythm* for the complete low down on drum and percussion products.

MIDI Peripherals

The **MIDIBuddy Multi MIDI Processor** ($1495) from **Acme Digital** is a 2U rack-mount sequencer/data filer and 10×10 MIDI patchbay/processor rolled into one. The Processor/Router section, available separately as the **MIDIBuddy Programmable Processor Router** ($1046), provides many mapping, filtering, zoning, transposition, and MIDI delay functions. The

Sequencer/Data Filer is also available separately for $1046, and multiple units may be linked with an optional Optical Network Expansion Port.

New Pocket Products from **Anatek** include **Pocket Sync** ($129.99), an intelligent FSK-to-MIDI Clock interface; **Pocket Plus** ($129.99), a 2 In/1 Out Macintosh MIDI interface with built-in merger; **Pocket Split** ($109.99), an eight-zone keyboard splitter with fixed and floating modes; and **Pocket Sequencer** ($199.99 with RAM card) a 15,000 event, 16-track sequencer with a 256K RAM card for storage.

Anatek also announced three non-pocket products. **Studio Merge** ($399.99) is a 8-into-1 MIDI merger in a 1U rack mount chassis, while **Anatek UPS** ($389.99) is a 120-volt uninterruptible power supply and line conditioner for studio or live applications. **Anatek PC Computer Interface** ($TBA) combines many of the most popular Pocket Products with a MIDI Interface. Features include four merging inputs, two assignable pedal inputs, and FSK tape sync.

JL Cooper Electronics announced a new line of MIDI products. The **Synapse MIDI Patchbay/Processor** ($1195) is a fully programmable 16 In/20 Out MIDI Patchbay/Processor. The **NEXUS** ($99.95) is a 3 Input/8 Output MIDI patchbay in a half-rack package at a very attractive price, while **NEXUS Plus** ($159.95) is a 2 In/8 Out MIDI Merger/Mapper. **MacNEXUS** ($69.95) is a low-cost, 1 In/3 Out Macintosh MIDI interface in a quarter-width rack/table-top package. **SynchMaster** ($349.95) is a Macintosh MIDI Interface/SMPTE Synchronizer with two MIDI Ins and six MIDI Outs. It generates and reads all SMPTE formats and Smart FSK.

The new **MS-114** ($229.95) version of the **Key Electronics MIDIATOR** universal MIDI interface can be used with an optional RS-422 interface to bring MIDI compatibility to any computer or workstation with a serial port. Custom applications can be created (software drivers are available) for use in many industrial and commercial applications such as flight simulators, automation, animation and production processes.

A MIDI-to-fiber optic cabling system was demonstrated by **Lone Wolf**. The **MidiLink** system ($600) consists of two interface boxes connected by a single duplex fiber optic cable which can be up to 2.5 kilometers in length. Lone Wolf demonstrated the system by

sending MIDI data from a sequencer in their booth to devices in Opcode's booth and back again – a round trip of over 1000 feet!

Lone Wolf also announced three important collaborations. They are working with Opcode Systems on creating "**The Virtual Studio**." Enhanced versions of Opcode's Vision and Galaxy programs are being designed to take advantage of Lone Wolf's MediaLink protocol and MidiTap (see *MT* August '89). Software vendor **Sound Source Unlimited** has teamed with Lone Wolf to produce preset LanScapes for the MidiTap. The **PAN Network** now offers three Lone Wolf-related services: the Lone Wolf Forum, a Client Support area, and a Developers area.

The **MIDI Time Piece** ($495) is **Mark of the Unicorn's** single rack space, dual-cable MIDI/SMPTE interface for the Macintosh with eight fully merging inputs and eight outputs. Each of the eight outputs can be addressed separately, providing 128 MIDI "channels." Up to four Time Pieces can be networked for up to 512-channel operation. A special "Fast mode" (currently only supported by Performer 3.4) is used to provide the high throughput necessary to handle all of those channels without "log jamming." A desk accessory (provided) gives complete

> "Seeming to take a cue from world events, joint ventures and cooperation between manufacturers was evident everywhere."

control over all settings and allows saving/loading of configurations.

Steinberg/Jones announced the **Niche ACM Audio Control Module** ($479), a single rack space device that allows MIDI control over eight channels of audio. The unit uses a non-VCA design and Steinberg/Jones claims a signal-to-noise ratio better than 95dB and frequency response ±0.1dB from 30Hz to 30kHz.

Peavey Electronics Corporation's **MIDI Master** ($399.99) is an 8 In/8 Out MIDI patchbay/processor with two independent processors for mapping and transposition, a merge function, multiple data filters, four assignable continuous controllers (three pedal inputs and a front panel rotary knob), velocity switching and scaling, and channel bumping.

Uptown Technologies, Inc. introduced **Flash**, a highly flexible MIDI-controlled audio switcher designed for studio or live performance applications. The unit can be used in a variety of configurations: as a 4 Stereo In/1 Stereo Out switcher, as a selector between four mono effects loops, as a MIDI Controlled Trigger Switcher (controlling footswitch functions from MIDI), and many more. Flash can even provide MIDI control (on/off) over any A/C powered device, like lights or a toaster! Uptown claims that switching is totally silent, and other specs include a noise floor of –108dB and total harmonic distortion of 0. The unit can be controlled by an optional Silent Footpedal ($120).

The **APB-16** ($495) is a 16×16 MIDI-controlled analog signal router (audio patchbay) from **VOCE, Inc.** that can store 128 patches. RCA jacks are used throughout. The unit can be programmed via SysEx or computer. IBM-PC software is included, but owners of other computers are on their own.

From the company that brought you the Micro-Wave, **Waldorf Electronics'** **MIDI BAY MB-15** ($595) is a 15-In/15-Out programmable MIDI patchbay with two merging inputs. Independent filters are provided for each of the two merged inputs. A panic button can send All Notes Off messages to all connected devices. In addition, a "Hyper-PANIC" function can send individual Note Off messages for each note on all channels. For situations where the Panic Button and other controls need to be near to hand, the optional MBR-1 Remote control ($ N/A) should come in handy.

That's All Folks

Well there it is, another NAMM show report come and gone. Think they introduced enough new stuff to keep you occupied for six months until the next show? The success of this show was very important to the general health and welfare of the music industry, and all indications are that it exceeded expectations. Manufacturers continue to grow and innovate (or at least refine), and a new spirit of cooperation has already begun to produce some great products. But is there any room left in your rack? How about on your hard disk? Do you have enough inputs left in the patchbay? I don't know about you, but I'm going to *make* room.   ◆

MUSIC TECHNOLOGY

For more info on products mentioned in the NAMM report or anywhere else in this issue of *MT*, check out the following listings…

56K, 56K-A, 56K-D, 56K-PC: Turtle Beach Softworks, P.O. Box 5074, York, PA 17405. Tel: (717) 757-2348.

414B-TL, 460: AKG Acoustics, Inc., 77 Selleck Street, Stamford, CT 06902. Tel: (203) 348-2121.

1000 DAT Machine: Nakamichi America Corporation, 19701 South Vermont Ave., Torrance, CA 90502. Tel: (213) 538-8150.

1200 Pro I, 1200 Pro II, 1200 Pro III: Kurzweil Music Systems, Inc., 411 Waverley Oaks Rd., Waltham, MA 02154. Tel: (617) 893-5900.

3324: Sony Corp. of America, 9 West 57th St., New York, NY 10019. Tel: (212) 418-9427.

A-50, A-80: RolandCorp, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

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

Alchemy 2.0: Blank Software, 1477 Folsom St., San Francisco, CA 94103. Tel: (415) 863-9224.

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

Anatek PC Computer Interface: Anatek Microcircuits, Inc., 400 Brooksbank Ave., N. Vancouver BC V7J1G9 CN. Tel: (604) 980-6850.

Anatek UPS: Anatek, see *Anatek PC Computer Interface*.

APB-16: VOCE, Inc., 111 Tenth St., Wood-Ridge, NJ 07075. Tel: (201) 939-0052.

ARP 2500/2600: formerly made by ARP, Inc.

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

B3: Hammond Organ Company, 1060 Thorndale Ave., Bensenville, IL 60106. Tel: (312) 595-6900.

Beyond: Dr. T's Music Software, Inc., 220 Boylston St. #206, Chestnut Hill, MA 02161. Tel: (617) 244-6954.

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

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

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

Cue 3.0: Opcode Systems, 1024 Hamilton Court, Menlo Park, CA 94025. Tel: (415) 321-8977.

CZ-1, CZ-101, CZ-1000: Casio, Inc., 570 Mt. Pleasant Ave., Dover, NJ 07801. Tel: (201) 361-5400.

D-10, D-110, D-20, D-50, D-70, D-550: Roland, see *A-50*.

Digital Audio Vision: Opcode, see *Cue*, and Digidesign, see *Creator*.

DM-80: Roland, see *A-50*.

DMI-64 Mark II: VOCE, Inc., see *APB-16*.

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

DR-550 Dr. Rhythm: Boss, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141.

DSP128+: DigiTech (DOD Electronics), 5639 South Riley Lane, Salt Lake City, UT 84107. Tel: (801) 268-8400.

DVP 1: Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

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

EditTrack: Hybrid Arts, see *ADAP II*.

Eltekon 386: Eltekon Technologies, Inc., 37491 Schoolcraft Rd., Livonia, MI 48150. Tel: (313) 462-3155.

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

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

Erasable Optical Disk: Hybrid Arts, see *ADAP II*.

EZ Vision: Opcode Systems, see *Cue*.

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

Flash: Uptown Technologies, Inc., P.O. Box 3111, Madison, WI 53704. Tel: (414) 473-1088.

FX500: Yamaha, see *C1*.

Galaxy: Opcode Systems, see *Cue*.

GenEdit: Hybrid Arts, see *ADAP II*.

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

GX1000: Kurzweil, see *1200 Pro I*.

HookUp!: Hip Software Corporation, 117 Harvard St., Suite 3, Cambridge, MA 02139. Tel: (617) 661-2447.

Hotz MIDI Translator: Atari, see *Atari ST*.

HR16, HR16B: Alesis Corporation, 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: (213) 467-8000.

HX1000: Kurzweil, see *1200 Pro I*.

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

JX-8P: Roland, see *A-50*.

K1/m/r, K3, K4, K5: Kawai America Corp., 2055 E. University Dr., Compton, CA 90224. Tel: (213) 631-1771.

K1200: Kurzweil, see *1200 Pro I*.

K-4000: Kawai, see *K1/m/r*.

KCS Level II: Dr. T's, see *Beyond*.

KL-1, KL-1m: Kawai, see *K1/m/r*.

Kurzweil 150FS, 250: Kurzweil, see *1200 Pro I*.

KX8, KX76, KX88: Yamaha, see *C1*.

Live Control: Toucan Software, 3307 South Garnsey St., Santa Ana, CA 92707. Tel: (714) 241-9177.

Live List: Digidesign, see *Creator*.

LXP1, LXP5: Lexicon Inc., 100 Beaver St., Waltham, MA 02154. Tel: (617) 891-6790.

M: Intelligent Music, see *Jam Factory*.

M1, M1R, M3R: Korg, see *DVP 1*.

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

MacNEXUS: JL Cooper, see *FaderMaster*.

MacRecorder: Farallon, 2150 Kittredge St., Berkeley, CA 94704. Tel: (415) 849-2331.

Master List: Digidesign, see *Creator*.

Master Tracks Pro/PC: Passport Designs, see *Encore*.

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

Max: Intelligent Music, see *Jam Factory*.

Microsound AT-2, AT-2+2, AT-4: Eltekon, see *Eltekon 386*.

Micro-Wave: Steinberg/Jones, see *Cubase*.

MIDIATOR: Key Electronics, Inc., 9112 Highway 80 West, #221, Fort Worth, TX 76116. Tel: (817) 560-1912.

MIDI BAY MB-15: Waldorf Electronics. Distributed by Steinberg/Jones, see *Cubase*.

MIDIBuddy: Acme Digital, P.O. Box 3798, Ann Arbor, MI 48106. Tel: (313) 668-0375.

MIDI Grand: Yamaha, see *C1*.

MidiLink, MidiTap: Lone Wolf, Inc., 1505 Aviation Blvd., Redondo Beach, CA 90278. Tel: (213) 379-2036.

MIDI Manager: Apple, see *Macintosh*.

MIDI Master: Peavey Electronics Corp., 711 A St., Meridian, MS 39301. Tel: (601) 483-5365.

MIDI MIX 3D: Zero One Research, P.O. Box 301, Brisbane, CA 94005. Tel: (415) 467-5007.

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

Minimoog: formerly made by Moog Instruments.

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

MK76: Akai Professional, 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114.

MKB-1000: Roland, see *A-50*.

MKS-20, MKS-50, MKS-70, MKS-80, MKS-100: Roland, see *A-50*.

Model 760: Rhodes (Roland), see *A-50*.

MPU-101, MPU-401: Roland, see *A-50*.

MS6: Cheetah (Jessico), P.O. Box 2034, Wheaton, MD 20902. Tel: (800) 458-5515.

MT-32: Roland, see *A-50*.

Multimix: Hill Audio, 5002B North Royal Atlanta Dr., Tucker, GA 30084. Tel: (404) 934-1851.

Multiverb: ART (Applied Research & Technology, Inc.), 215 Tremont St., Rochester, NY 14608. Tel: (716) 436-2720.

NEXUS, NEXUS Plus: JL Cooper, see *FaderMaster*.

Niche ACM: Steinberg/Jones, see *Cubase*.

Notator: Digidesign, see *Creator*.

Octapad: Roland, see *A-50*.

OvalTune: Intelligent Music, see *Jam Factory*.

PCM-F1: Sony, see *3324*.

Performer 3.4: Mark of the Unicorn, see *MIDI Time Piece*.

Pocket Pedal, Pocket Plus, Pocket Sequencer, Pocket Split, Pocket Sync: Anatek, see *Anatek PC Computer Interface*.

PPG Wave 2.2, 2.3: formerly made by PPG GmbH.

Prophet 5, 2000, 2002, 3000: formerly made by Sequential, Inc. Contact: Wine Country, 1572 Park Crest Ct. #505, San Jose, CA 95118. Tel: (408) 265-2008.

Proteus, Proteus II, Proteus XR, Proteus IIXR: E-mu Systems, see *Emulator III*.

PX1000: Kurzweil, see *1200 Pro I*.

Quadraverb: Alesis, see *HR16*.

R-8 Human Rhythm Composer, R-8M: Roland, see *A-50*.

RealTime: Intelligent Music, see *Jam Factory*.

REV7: Yamaha, see *C1*.

S3: Korg, see *DVP 1*.

S612, S700, S900, S950, S1000: Akai, see *MK76*.

SDE-1000, SDE-2500: Roland, see *A-50*.

SDS5: Simmons Electronics USA Inc., 23917 Craftsman Rd., Calabasas, CA 91302. Tel: (818) 884-2653.

SEM1: Oberheim-E.C.C., see *Matrix 1000*.

Sequencer/Data Filer: Acme Digital, see *MIDIBuddy*.

SMPTETrack II: Hybrid Arts, see *ADAP II*.

SoftSynth: Digidesign, see *Creator*.

Sound Exciter: Passport, see *Encore*.

SoundStage: Turtle Beach, see *56K-A*.

Sound Tools: Digidesign, see *Creator*.

SPD-8: Roland, see *A-50*.

SRM-10B: Tannoy, 300 Gage Ave., Unit 1, Kitchener, Ont., Canada N2M 2C8. Tel: (519) 745-1158.

SRV2000: Roland, see *A-50*.

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

Studio Merge: Anatek, see *Anatek PC Computer Interface*.

Super Jupiter: Roland, see *A-50*.

SX-16: Cheetah, see *MS6*.

SX1000: Kurzweil, see *1200 Pro I*.

SY55, SY77: Yamaha, see *C1*.

sYbil 2.0: Scorpion Systems Group, 175 Fifth Ave., #2624 New York, NY 10010. Tel: (415) 864-2956.

Synapse: JL Cooper, see *FaderMaster*.

SynchMaster: JL Cooper, see *FaderMaster*.

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

SynthEngine/386R: Spectral Synthesis, Inc., 18568 142nd Avenue, Northeast Woodinville, WA 98072. Tel: (206) 487-2931.

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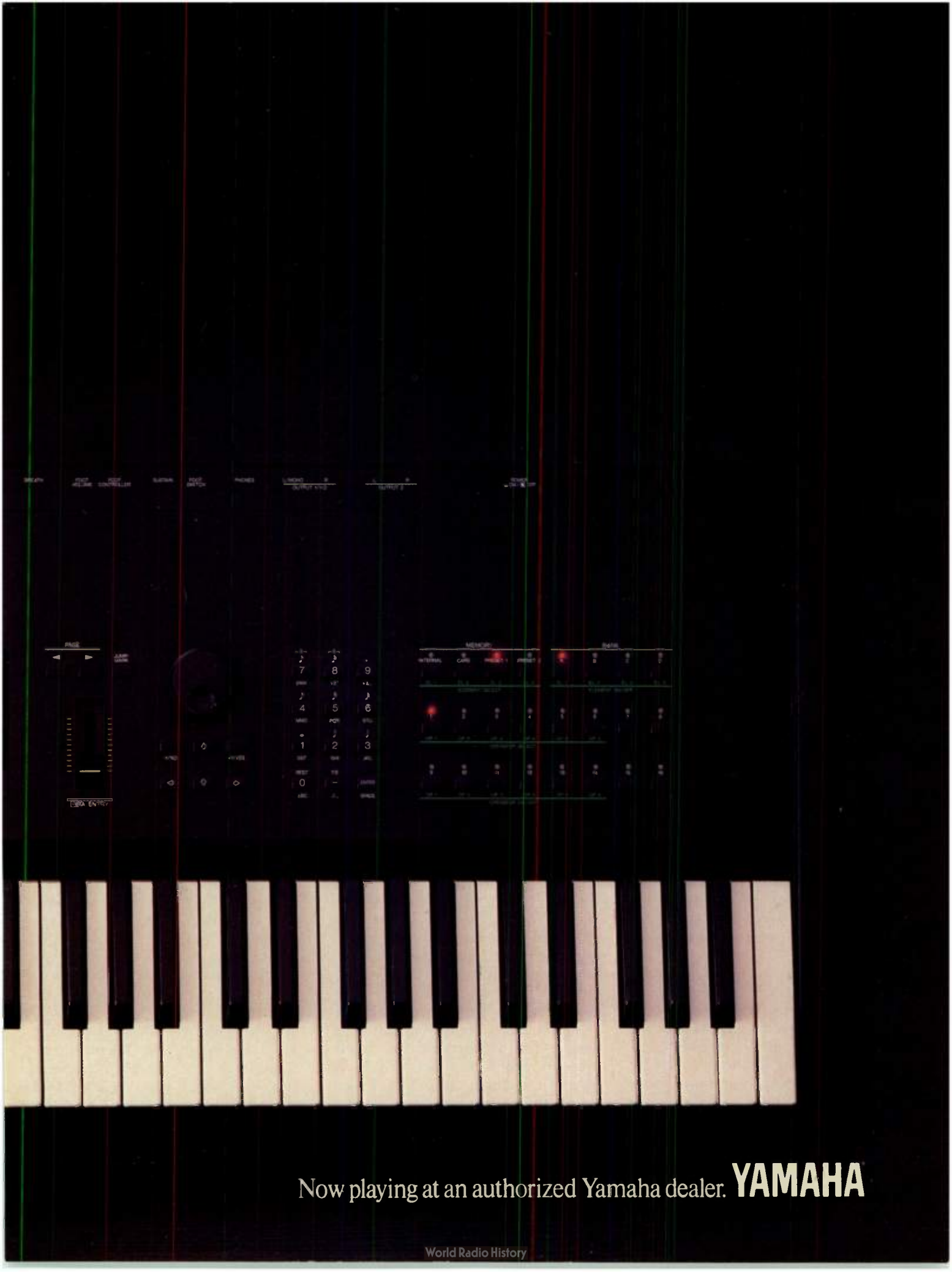
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Waldorf MicroWave
Synthesizer Module

With its origins in the classic PPG Wave synth, the MicroWave brings wavetable synthesis to the masses. But can it roast the competition? *Review by Simon Trask.*

AS RECENT EVENTS in the eastern bloc have demonstrated, the tide of change drowns those who can't ride the waves. Whether you're running a country or a company, you'll be left behind if you don't respond to the prevailing trends. Sometimes that means overthrowing the very system by which you function.

In Eastern Europe, we're witnessing the breakdown of a closed system in favor of an open system. On a more humble level, developments in musical technology during the latter half of the decade have followed a similar path. The open-system approach made possible by MIDI and computer-based sequencing has virtually atomized expensive, single-manufacturer computer music systems.

A good example of this trend is the PPG Wave system. By the mid-'80s, this now-defunct German company had created a sophisticated computer music system consisting of the eight-voice Wave 2.3 Synthesizer, Waveterm B computer unit, EVU Expander (2.3 in a rack) and PRK/PRK FD Master Keyboard. Up to eight system components could be linked together in a closed system using PPG's own digital communication buss. The Waveterm was at the heart of the system, providing 16-bit sampling, additive synthesis and (non-MIDI) multitrack sequencing.

At the time, the system offered a degree of sophistication that simply wasn't available on a cheaper scale. If you could afford the outlay, it was worth buying into that sophistication. After all, compared to other computer music systems like the Fairlight and Synclavier, the PPG Wave was a bargain.

Unfortunately for PPG, it was the Wave system that came to be regarded as expensive (not to mention restricted) with the appearance of relatively cheap yet increasingly sophisticated digital technology in the ensuing years. Who wants to be locked into one system when the MIDI modular approach offers so much more variety, flexibility and power? Bowing to the inevitable, production of the Wave system ceased around '85 or '86.

Which brings us to Waldorf Electronics and the MicroWave (distributed in this country by Steinberg/Jones). The company is largely owned by Wolfgang Duren, who was responsible for the business side of PPG, while the MicroWave itself was designed by Wolfgang Palm, the man who designed the PPG Wave system. Not surprisingly, the MicroWave is based on the same wavetable approach to synthesis that helped give the PPG Wave its highly distinctive and much-loved hybrid digital/analog sound.

Layout and Operation

The MicroWave is a 2U rack-mount unit

with a charcoal gray exterior and a bright red rotary dial on the front panel.

A 2×16 backlit LCD window displays the current parameter(s) and their values, while a red Param/Value button below the window allows you to switch the display cursor between parameter name and value. The aforementioned dial selects a new parameter or changes a parameter value accordingly. A card slot below the window takes ROM and RAM cards from Waldorf (actually, from Korg – Waldorf wisely chose to use the ubiquitous M1 RAM cards for the MicroWave).

Finding your way around the MicroWave's large number of parameters isn't too difficult thanks to the 4×4 matrix display of parameter groups screened on the right side of the front panel. This is a useful setup, but the frequent need to switch between parameter name and value in the LCD does become tiresome. Two red dials, one for parameter and one for value, would've been much nicer. Apparently Steinberg is in the process of developing MicroWave editor/librarian software, which is certainly good news.

The MicroWave's polyphony is the same as that on the Wave 2.3 – eight voices. Not overly generous, perhaps, but it's worth bearing in mind that you get two oscillators per voice – many sixteen voice synths provide only one oscillator per voice. Individual patches are known as Sound-programs, while multitimbral organizations of up to eight Sound-programs are called Multi-programs. There are 64 Sound-programs and 64 Multi-programs in internal battery-backed RAM, an arrangement which is duplicated in the ROM or RAM cards.

Doubtless to the delight of programmers, Waldorf has provided the MicroWave with no less than *eight* buffers (in sharp contrast to the more common "compare" toggle button). When you have completed your multiple tweak session, you can save all eight buffers at once.

The unit's rear panel provides MIDI In, Out and Thru jacks, four individual mono audio outputs, and a stereo output pair. A mono mix is possible if you use either of the stereo outputs and set the MicroWave's global Stereowidth parameter to Mono.

Wavetables

The MicroWave employs what Waldorf calls "Dynamic Spectral Wavetable Synthesis." At the heart of the unit, stored permanently in onboard ROM, are 32 Wavetables (the same 30 as were found on the Wave 2.3 plus a couple of new ones). The internal RAM provides the capacity for 12 more Wavetables, which can be loaded into the Micro-Wave via MIDI SysEx data dumps. An additional 12 Wavetables can also be accessed from ROM cards.

Each Wavetable consists of 64 Waves. Each of these Waves is made up of 128 waveforms derived from eight-bit samples or created by additive synthesis. Some quick arithmetic reveals a total of 2048 waveforms, but statistics don't tell the whole story (do they ever?).

The MicroWave's oscillators can play any individual waveform as in traditional synthesis, but it isn't limited to playing single waveforms at a time, sweeping through any number of them within a single Wavetable. It's also able to interpolate changes in harmonic spectra from one Wave to another (a feature which comes into its own with the Wave envelope, which we'll come to later).

Architecture

Despite uncomfortably modern terms like "Dynamic Spectral Wavetable Synthesis," the MicroWave's architec- ▶

ture is actually fairly traditional. Two oscillators per voice use two Wave modules to define the sound source. The audio output of each module and a third output from a noise source are combined at the Mixer stage, where you can set the level of each source. The summed output of the Mixer is then routed through a (4-pole) 24dB/octave low-pass VCF and a VCA, after which it is passed through a Pan/Glide module before being routed to the outside world via 12-bit DACs and the audio outputs. In addition, there are two digital LFOs and three envelopes (Wave, Filter and Volume), which have "hardwired" and assignable modulation inputs at the various audio stages. In fact, the MicroWave's many and varied modulation possibilities are among the most sophisticated to be found on any synth.

With patch names like 'Wave Kills You,' 'Cut Me Leave Me,' and, above all, 'Leone's Wet Dream,' whoever's responsible for the programming on

our review unit deserves a medal for inventiveness. Unfortunately, the same thing can't be said about the sounds themselves, many of which only succeed in showing what the MicroWave is *not* good at.

I won't dwell on the sounds, as many may well be replaced before the first shipment of MicroWaves hits the streets. So what can be said about the MicroWave's place in the synth universe? Leave most of the "realistic" instrumental sounds to the new generation of sample-based instruments. The MicroWave's forte is synthesis in the traditional experimental sense, which isn't to say that is has an altogether analog sound. It's actually more digitally metallic with a strong analog edge. Harsh, dirty, aggressive, menacing, spiky, eerie, even soothing are words that come to mind. Oh, and you need to watch out for your speakers, as it outputs at a very high level.

The temperament feature allows you to select one of four preset tunings

(reversed keyboard and two random tunings in addition to standard 12-tone equal temperament) or a tuning that you've programmed yourself. User tuning tables allow you to edit the coarse (semitone) and fine (+63 to –64) pitch of every note in the entire MIDI pitch range to create non-standard tunings and scales.

Modulation

The MicroWave allows you to choose from a large number of internal modifiers: LFO1, LFO2, Volume Envelope, Filter Envelope, Wave Envelope and LFO Envelope (LFO1 attack/decay). In addition, MIDI modulation sources include key tracking, attack velocity, channel and polyphonic aftertouch, pitch bend, mod wheel, sustain pedal, volume pedal, pan controller, breath controller and four controllers labelled W, X, Y, and Z, each of which can be assigned any MIDI controller code.

The two Wave modules and the Volume and Filter modules each have "hardwired" envelope inputs (Wave, Volume, and Filter envelopes respectively) whose effects are governed by envelope amount, envelope velocity and MIDI key-track amount settings for each module. The Volume and Filter envelopes control amplitude amount and filter cutoff point, as you might expect, but the effect of the Wave envelope on the Wave modules is far from traditional, as is the wave envelope itself – more on this later.

These modules (and the two oscillators) also have two modulation inputs to which any of the internal or MIDI modifiers listed above can be assigned. Mod2 has source and amount parameters, while Mod1 has source, control, and amount parameters. In addition, the oscillators each have a Mod2 quantize parameter, which allows stepped pitch changes to be produced from a continuous modulator input such as an envelope.

Resonance has its own mod source and amount parameters, which also means that you can modulate filter cutoff and resonance at the same time, from the same or different modulators. If you're of an inventive disposition, things can get really interesting here. Also, the Pan/Glide module has its own mod source and amount parameters for auto- or dynamically-controlled panning effects.

Modulation amounts are assigned per module rather than per modifier,

so the same modifier can have a different degree of effect on different modulator inputs (the amount range is +63 to –64, so the effect can be positive or negative). The parameter being controlled in each module is predetermined: the oscillator's pitch, the wave's wavetable, the filter's cutoff point, and the volume's amplitude amount.

Mod1 is more sophisticated than Mod2 in that while the source modifier directly controls the relevant module parameter within a limit set by the amount parameter, its actual degree of control is "scaled" by the control modulator. So whereas you could assign MIDI velocity to directly open and close the filter using Mod2, you could assign the Filter envelope as source modifier to control filter cutoff and use velocity as the control modifier to scale the envelope's effect with Mod1. In this way, you can put complex modulations under dynamic MIDI control with a

"The MicroWave is based on the same wavetable approach to synthesis that helped give the PPG Wave its highly distinctive hybrid digital/analog sound."

complex modifier, or scale the effect of one MIDI command with another. And of course you also have the option of using Mod2 to bring in another modulation source. On top of this, most of the onboard modifiers have parameters which can themselves be modulated by any of the other onboard modifiers (including themselves) or the MIDI modifiers. Conveniently, the modifiers for oscillator 2 can be "linked" to oscillator 1, in an effort to avoid repetitive programming.

The Volume and Filter envelopes are of the familiar ADSR type, although the latter adds an initial delay stage. However, each stage of each envelope has its own modulation source and amount parameters. Each stage's timing is set on a scale of 0-127, with maximum values generating truly lengthy times: just under nine minutes for the attack stage and just under six minutes each for the decay and release stages. A maximum value for the sustain stage means that it sits at the attack level (ignoring the decay stage) until the key is released. The onset of the Filter envelope can be delayed for up to 36 seconds. The depth of effect that the envelopes have (including their polarity) is determined at the modulation ▶

input stages of the individual modules.

Far less traditional is the Wave envelope, which has eight segments or stages, each with its own time and level parameters. What's more, you can specify any one segment as the Key Off point, causing the segments after this point to be activated only *after* you release a note. Additionally, you can select Loop on/off and a loop start segment. This segment can come before or after the Key Off point, which determines whether the envelope will loop before or after you release a key.

As with the other envelopes, the Wave envelope isn't confined to the Wave modules but can be used wherever there's a modulation input – the results can be particularly spectacular when it's applied to filter cutoff and resonance. However, applying it to a Wavetable is one of its most sonically intriguing uses. The level parameters of each segment, in conjunction with the modulation amount parameters, determine to which Wave within the Wavetable each segment moves, passing through the Waves between those at the ends of the segment. The segment times determine how long it takes to get from one level to another. The MicroWave interpolates gradual shifts in harmonic content while moving from one Wave to another. This achieves particularly effective results when using looped segments and slow segment times on held notes to create some eerie metallic drone effects.

Now it may seem churlish to raise a complaint about such a sophisticated modulation source, but all the same I found myself wishing that the segments could be looped before *and* after the key release, instead of either/or. Because you can create rhythmic effects with this envelope, combining sustained notes with staccato notes having a long release stage could have generated some interesting results. I guess some people are never satisfied.

Multi-Programs

When you select Multi-program mode on the MicroWave, the expander becomes eight virtual Instruments, sharing its eight voices between them dynamically. You can set a global volume level and assign MIDI controllers to Controls W, X, Y, and Z for each Multi-program. You can also program a 16-character name and decide whether the MicroWave will respond only to patch changes received on the

base MIDI channel (these select Multiprograms), only to patch changes received on the Instrument MIDI channels (these select Sound-programs for each Instrument), or to both.

Parameters per Instrument are as follows: Instrument on/off, MIDI receive channel, Sound-program, Key Limits Low and High, Velocity Limits Low and High, velocity curve (selected from six preset or four user programmable curves), transpose, detune (±semitone), temperament, volume, panning, panning mod on/off, and output routing (L+R/Outs 1–4). In addition, you can

> "Because of its wealth of modulation possibilities, it's a synth for anyone who delights in getting creative and experimental with sound."

enable or disable reception of each of the following types of MIDI data for each Instrument: patch changes, pitchbend, mod wheel, channel aftertouch, poly aftertouch, volume, pan, controller, and sustain pedal.

A pretty thorough implementation then – which makes the inevitable limitations of having only eight-note polyphony all the more frustrating. Still, combining two or more MicroWaves for greater polyphony is possible (if a little expensive), as the expander implements MIDI overflow.

Quick Edit

In an attempt to provide shortcuts for the programmer, Waldorf has come up what they call "Quick Edit" facilities. These are divided into two categories: Fast Access and Macros. Fast Access (FA), as its name suggests, makes access to and editing of related parameters much easier by grouping them on a series of LCD pages. For instance, you can edit the preconfigured envelope amounts of the Volume, Filter, and both Wave modules from the 'Env Amount FA page,' while the 'Envelope FA page' allows you to edit the four parameters (ADSR) of any one of the envelopes from a single page.

Macros allow you to call up factory-defined Wave, Filter, and Volume envelope shapes as a quick alternative to editing segment and ADSR parameters individually. Handy in some circumstances, maybe, but no real substitute for a nimble-fingered editing technique and thorough knowledge of the param-

eters – although such Wave envelope shapes as 'Slap Back,' 'Wah Wah,' 'Repeat Echo,' and 'Long Loop' make intriguing starting points. If the Macro shapes aren't exactly what you want, you can always go into Fast Access and fine-tune them. If you *still* can't get what you want, then it's back to the individual parameters – and the feeling that you might have been better off starting with them in the first place.

Waldorf has also provided a range of modulation Macros, some using LFO1 and LFO2 – allowing you to use two modulation effects at the same time. A variety of vibrato effects are complemented by the likes of 'Pseudo Leslie,' 'Auto Wah Wah,' 'Auto Panning,' 'Vel-Auto Pan,' and 'Stereo Echo.' To me, this is the most successful aspect of the Quick Edit system, but more for its creative possibilities that for any "quick-fix" philosophy.

The Envelope Please

The MicroWave excels in sonic areas where many of today's digital synths are weak, and falls short where they succeed, making it in many ways a perfect foil for those instruments. It has a very characteristic sound that can loosely be described as "metallic analog," but it can range in quality from pure, clean, and crystalline to heavy, dirty, and industrial. It's a synth for anyone who thinks that current instruments are too polite, and because of its wealth of modulation possibilities, it's a synth for anyone who delights in getting creative and experimental with sound.

I hesitate to label it a "programmer's instrument," because the concepts of programmer and musician have become somewhat separated these days. Let's just say that it's a creative musician's instrument. Eerie, bewitching metallic drones, extremely rude and dirty organ sounds, clanking industrial noises, biting percussive sounds, punchy (but not fat) bass sounds complete with spiky resonance effects if required, piercing lead sounds, complex self-modulating sounds which play themselves forever, menacing atmospherics... The MicroWave positively encourages you along wilder shores rather than well-worn paths. ◆

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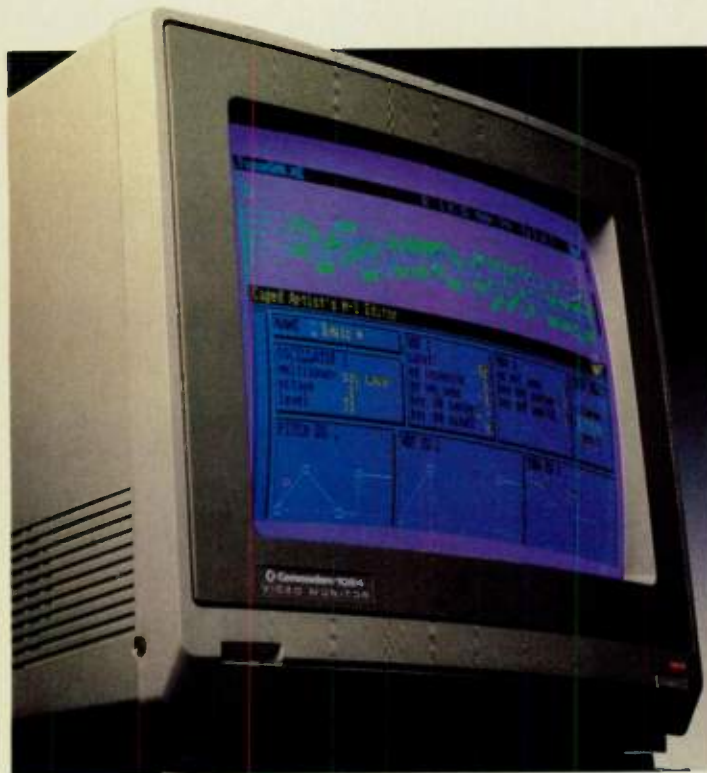
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World Radio History

Electric Eclectic

From Frank Zappa to Missing Persons, from television composing to his solo work, Patrick O'Hearn has been making steady progress towards becoming one of the great hi-tech musicians of our time.

Interview by Gene Ferriter.

PATRICK O'HEARN HAS emerged as nothing less than a musical Renaissance Man, wielding synthesizers, electronic and acoustic percussion devices and his primary instrument, the bass, with equal fluidity. He has composed, arranged, performed, produced and mixed four distinctive solo albums for Private Music, and in the process, built a remarkable digital studio in his home. O'Hearn could easily become a self-sufficient recluse, but has chosen instead to collaborate with gifted musicians like Terry Bozzio, Mark Isham, Peter Maunu, and Alex Acuña, who are among the guest artists that have graced his discography.

Working with such luminous talent is nothing new to O'Hearn. His diverse career has landed him gigs with jazzmen Tony Williams, Joe Pass, Dexter Gordon, Joe Henderson and Charles Lloyd on the one hand, and stints with Frank Zappa, Missing Persons and Group 87 on the other – a somewhat panoptic view of modern music. It's no surprise that his own material synthesizes this spectrum of influences, combining the best elements of rock, jazz, new age and world music, including a distinctly Middle Eastern element in his latest release, *Eldorado*.

O'Hearn recently moved from Los Angeles to the small town of Hubbard, Oregon with his wife and children. A few months prior to the move, his career took an unexpected twist. In August of '89, he received a call from his agent, which led to a job composing the background music for the nighttime television series, *Falcon Crest*. "Originally, the arrangement was to do three shows, kind of like a trial, because the people at the show were not unanimously convinced that I was the appropriate choice. I had my own reservations as well, because the old style nighttime soaps like *Dallas*, *Dynasty*, and *Falcon Crest* have seen

their heyday by most accounts. It was certainly not an area that I felt I could possibly contribute anything to, other than non-constructive criticism," says O'Hearn, laughing at the thought.

"My whole preconception was turned around when I met Joel Surnow, however," he continues. "Joel was given the task of trying to save a sinking ship and turn the show around. He, as a maverick, came into the show having worked with Michael Mann on devising, producing and writing the first couple of seasons of *Miami Vice*. Joel was also the producer for two seasons of *The Equalizer*, so he said to me, 'I don't know what your preconceptions are here, but I'm used to working with Jan Hammer and Stewart Copeland. That's where I'm coming from. Not this kind of milk-toasty, generic, bleeding heart violin and harp glissando nonsense.' Relieved, if not elated, I replied, 'Hell, if you're going to have me rubbing shoulders with the likes of those chaps, then by all means, deal me in.'" He laughs again.

Many composers, including Copeland, have described the process of resorting to a past inventory of musical progressions and motifs when having to score for a television series. The sheer quantity of material that the composer must generate in such a short time frame makes original ideas a valuable commodity. But O'Hearn doesn't seem to need this technique. "I didn't go through the process of trying to use any closet material that I had. That's never worked for me. I've tried that on each one of the four records that I've done for Private Music, because I'm always coming up with ideas and motifs. I have stacks of ideas

"It's like action art. You keep the teapot or coffeepot percolating and just go hell-for-leather once you get the tape."

on four-track cassettes that could be articulated and arranged, but I never seem to be able to pull it off. Some of the ideas are quite structured, while others are nothing more than a four-bar jungle rhythm or something, but they never seem to work. I always end up making up new stuff entirely on the spot, both for my records and for *Falcon Crest*."

The dream of scoring a series is shared by many composers, but the actual demands can take a tremendous toll. Jan Hammer has described the

madness of working eighty-hour weeks during his *Miami Vice* tenure. "The whole process is very intense," O'Hearn agrees, "because you get the tape and you only have a couple of days to compose and produce a master of anywhere from 12 to 24 minutes of finished music. It's like action art. You keep the teapot or coffeepot percolating and just go hell-for-leather once you get the tape. It zaps all of your focus and time.

THE MUSIC THAT O'Hearn composes for the series, as well as his most recent solo projects, was recorded entirely in his remarkable home studio. Visualization, patience, determination and serendipity have all played a major role in building his sanctuary, previously referred to as 'Now You See Me, Now You Don't' (since his move to Oregon, he's searching for a new name).

"I started in the most humble fashion, recording with a four-track Fostex. I was quite happy with the results, though. I was able to produce a demo that helped me to land the deal with Private Music," he explains. "When I went to make my first record for Private [*Ancient Dreams*] with Peter Baumann, one of the stipulations of the contract was that it had to be done digitally. That was back in about March of '84, and at that time, CDs were something that you really only found in a specialty boutique. We rented a machine and recorded in a couple of different studios around LA, but in the process, we accumulated quite a hefty little bill for a relatively obscure record.

"So when it came time to do the second record, *Between Two Worlds*, Peter suggested that we rent the equipment and do it in my home. Those were my sentiments exactly. We found a company out of New York called Audioforce. One of their owners, Sid Simmons, flew out to Simi Valley [*an outlying suburb of LA*] from New York and fully set up a Mitsubishi 800 Series 32-track machine and one of their home-designed monitoring boards right in my bedroom. When it came time to mix the record, I still had to go into a commercial studio, which just shot the whole thing. It cost as much to mix the record for seven days in New York [*about $20,000*] as it did to rent the 32-track machine, the console and all of the connectors and interfacing from Audioforce for that ▶

two-and-a-half month period.

"By the third album, *Rivers Gonna Rise*, I was already completely sold on home recording," O'Hearn continues. "I had Audioforce come in again with their machine and their board to do most of the basic tracking, but I was able to persuade the label to come up with a plan which we mutually agreed upon. They took the money that would ordinarily have been invested in the commercial studio and advanced that to me against the purchase of a console, allowing me to mix the record myself. Private was willing to include it in the recording fund, because as far as they were concerned it wasn't going to cost any more than what they were used to shelling out for me to make a record. It was going to be infinitely beneficial for me and ultimately, if amortized over a few records, was going to bring their costs down considerably."

Owning your own board and an arsenal of equipment is a big head start, but perhaps the biggest financial hurdle for any fully digital studio is the tape recorder itself. "Fortuitously, Peter Baumann had bought a Sony 3324 about two-and-a-half years earlier, but had barely used the machine. He

approached me about buying it, but I clearly didn't have $125,000 dollars to spend on a tape recorder. Peter made an extremely magnanimous offer, however, cross-collateralizing it against my recording budget. What this means, though, is that I really don't make any profit on the records I make for Private Music other than writer's royalties. But I have gained a remark-able home studio, with a Sony 3324 and a Harrison MR2, and I'm just as happy as a clam, ready to carve, any time day or night. I've certainly achieved the best possible situation."

A S A MUSICIAN, O'Hearn grew up playing a variety of instruments, including the violin, cello, trumpet, percus-sion, and flute. But he was most organically drawn to the bass. "When I was about nine or so, my Dad brought home a bass guitar that he had picked up just for the hell of it. My folks were both musicians and they were al-ways bringing home instruments. I started playing bass at that point, and it's always been my primary instrument.

My mother played piano, so I always played around on that as well, but just couldn't apply myself to formal lessons. By the time I was ten, I was playing bass in some local rock bands.

"I got into music professionally at quite a young age. I actually became a part of my parents nightclub act as well, playing regular weekend union cocktail lounge gigs by the time I was 13 or 14. In high school I started playing the double bass in the orchestra and became fascinated with the upright bass as well, which sort of took precedence for me at the time."

What O'Hearn does not reveal with his matter-of-fact delivery is that he was no ordinary high school band member. For most students, music becomes a hobby or a memory after graduation; some may go on to seek out a living playing weddings or sessions. Rarely is an artist able to hold his own with living legends. "When I got out of high school, I started playing bass with a lot of really great jazz players that I had always listened to in San Francisco: Dexter Gordon, Joe Pass, Charles Lloyd and Tony Williams," says O'Hearn of four of the most revered jazz leaders in the world. From there he hooked ▶

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▶ up with his more electronic (if not eclectic) mentor, Frank Zappa, in 1976.

"Frank was looking to put together a new band. He asked Terry Bozzio, who he wanted to get for the other part of the anchor system. Terry suggested me, so I stopped by the Record Plant to say hello on the way home from a gig with Joe Henderson. I had my upright bass, and after a hasty introduction, Frank looked at the bass, then looked at me and said, 'You actually play that thing? Care to do some carving, sailor?' I agreed, so an engineer quickly strung up a microphone and a set of headphones and within 15 minutes I was putting a bass part on one the tracks he was working on.

"When I came in from the control room, he seemed to be genuinely pleased with the performance and asked if I played the electric bass. Since I did he said, 'This is your assignment. Take this cassette home, and tomorrow come in and put a bass guitar part down on this tune.' The tune was so incredibly abstract because it was all segments from different songs edited together. There were wild tempo changes and meter changes, but there was continuity. It was an extraordinary piece of music, but it was so complex. There would be a bar of 11, followed by a bar of 5, followed by a bar of 7/8, followed by three bars of 5, with kind of an 11/4 triplet over it. It was really wild.

"I stayed up all night listening to the cassette and wrote out what I felt would be interesting bass notes over the harmonic changes. I came back in

"I started in the most humble fashion, recording with a four-track Fostex. I was quite happy with the results, though. I was able to produce a demo which helped me to land the deal with Private Music."

the next day and performed it and he was suitably impressed. 'What are you doing starting tomorrow?' he responded. 'Do you want a job?' I said 'Damn right,' so he stuck his hand out and told me I was hired."

Zappa is hailed not only as a prolific musical genius, but also as quite an innovator in music technology. "He had a tremendous collection of contemporary electronic instruments for that time period," O'Hearn recalls. "He had a huge, fantastic modular E-mu system, an analog system with kind of a digital

keyboard controller. That thing was just remarkable. He had sort of the Noah's Ark of electronic collections – just about two of everything with the exception of the E-mu system. He only had one of those. He had two Polymoogs, two Minimoogs, and two ARP 2600s, among other things."

Zappa's foray into electronic music had a major impact on O'Hearn's direction, as did the influence of his good friend, Mark Isham. "Mark also owned an ARP 2600 and had managed to get one of the original Oberheim four-voice SEM modular units as well. That may actually have been the first commercially available polyphonic synthesizer, a wonderful instrument. Mark was getting some of the finest tones out of it.

"Between hearing what he was doing and Frank's tremendous collection, I decided that synthesizers were something that I wanted to dive into. I picked myself up a Moog, which led to an ARP 2600 – things that are still an integral part of my collection. The ARP is great because it's patchable and somewhat modular in its design, but it's also integrated in that it's all hard-wired internally. Therefore, if you don't want to get involved in re-routing the signal path, you can play the thing without a lot of complicated patching – without any patching whatsoever, as a matter of fact – and still make use of some of the elements that can be introduced by sliders, such as ring modulation and external hard-patched oscillator control for primitive FM synthesis."

Developing synth/keyboard literacy is no small task, requiring a musician's undivided attention, at least for a spell. "Well, as I got more into the synthesizers, I kind of gave up the bass guitar and bass fiddle and started playing keyboard bass with Terry Bozzio and Missing Persons. I became more interested in the electronic sounds, which led directly to my involvement with Private Music.

"On the second Missing Persons album, I brought in a track called 'If Only For The Moment,' and Capitol Records decided to do a 12-inch version of the tune. Peter Baumann was in New York working as an independent producer at the time and was hired to produce the remix of the song in January of '84. He told me about these lofty plans for a record company that would cater to what at that time was the completely ignored area of electronic, ambient music. There was EG Records

and the things that Eno was doing, but nobody really had a label that they were pushing in that direction. So Peter started Private Music and I was kind of a charter member, recording my first album, *Ancient Dreams*, about six to nine months later."

It was the first of four solo albums for O'Hearn, each with its own characteristic flavor. *Eldorado* is the most recent effort, named after the mythical land of riches, El Dorado, sought in vain by early Spanish explorers in the Americas. "The first piece to be conceived was the title track, and that set a tone for the rest of the record. I really wanted to work with some Middle Eastern musicians and had the good fortune

"I decided that synthesizers were something that I wanted to dive into. I picked myself up a Moog, which led to an ARP 2600 – things that are still an integral part of my collection."

of crossing paths with Shahla [Sarshar, vocals] and Farid [Farjad, violin]," O'Hearn explains.

Not everything went so smoothly, however. "There's a division of direction in a certain sense between tracks like 'Eldorado,' 'Black Dilihla' and 'Hear Our Prayer' and some of the more light-hearted pieces. The president of Private Records heard the record early on and he was a bit dubious about its commercial potential. As much as I hate to say it, I started to question my own beliefs. Not that I turned around and tried to figure out how to make some New Age toe-tapper to fit their bill, but the reactions that I received from a couple of people caused me to second guess what my direction and ultimate goal was for the album. It's something that I've dealt with and won't let happen again."

Many musicians never find that resolve, especially with the alluring carrot of commercial success. "What my heart tells me to do when I sit down and start humming melodies, tapping out rhythms, or playing harmonies, is correct. For any individual artist there's a line that you walk in terms of what you want to express, how you want to express it and how you wish it to be received, if at all. I don't need any outside influence trying to massage my direction one way or the other. That's something I learned while making this last record. I'll never stray from ▶

that again, because it's very painful when you do.

"When all is said and done, when a record goes out there with your name on it, whether you've pressed only 100 copies and distributed them yourself or Warner Bros. has manufactured a million of them, you're responsible for it. You're held accountable for it, regardless of the outside influences. You have to know that it's the best that you could do and it's true to yourself. In ten years things change a lot, and you want to be able to look back and be proud of these things."

Patrick O'Hearn already has a lot to be proud of. One of the most gracious, eloquent and congenial musicians you're likely to meet, O'Hearn's horizons seem endless. "I want to get back together again with Tony Williams at some point, and Terry Bozzio and I have talked about starting a band ever since Missing Persons broke up. I'm also thinking about my next record. I'm curious as to where that's going to go. I want to get the whole cast from *Eldorado* together at some point: Mark Isham, Alex Acuña, Peter Maunu, Farid Farjad, and Shahla Sarshar, because I know it would be an absolutely barn-burning show." We'll be there. ◆

Patrick's Toy Box

Apple Macintosh SE
ARP 2600
Akai S900 with retrofit
Akai S1000
Alesis HR16 & HR16B
Digidesign Softsynth & Turbosynth
Kawai K5
Korg DVP 1 Vocoder
Mark of the Unicorn Performer
MXR Analog Delay
MXR Pitch Transformer
Oberheim Expander
Oberheim SEM Modules
Opcode Librarians
PPG Wave 2.2 with MIDI retrofit
Roland D50
Roland MKS70
Roland SDE 2500 & SDE 1000
Roland SRV 2000
Sequential Circuits
    Prophet 5 with retrofit
Sony PCMs (2)
Strate Gates (2)
Yamaha REV7
Yuri 1178 Stereo
    Compressor/Limiter

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- ▲ 1 MIDI Thru
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- ▲ SMPTE In/Out
- ▲ Musical Fonts in ROM
- ▲ MS DOS 3.3
- ▲ MIDI Monitor Software
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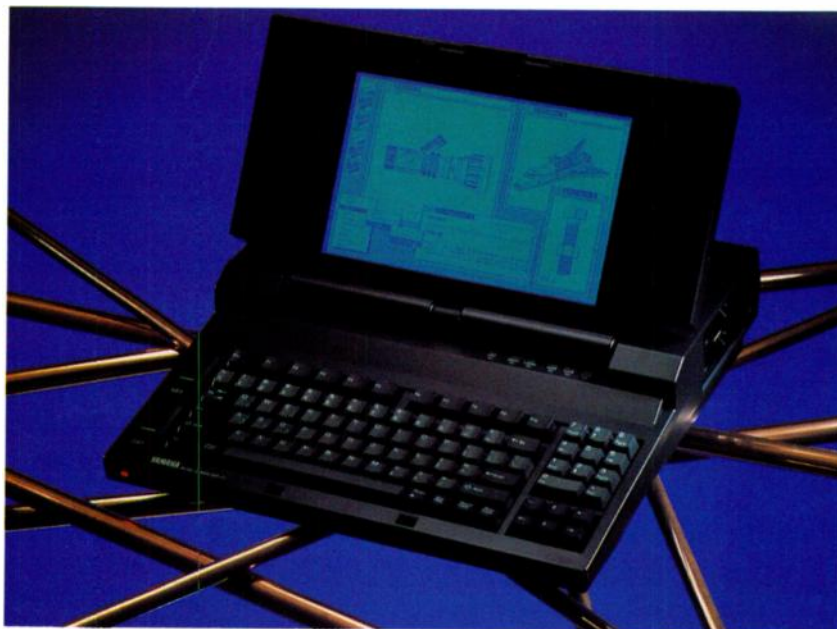
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- ▲ Multi-tasking Operating System
- ▲ Workbench System Software
- ▲ Amiga-BASIC
- ▲ Amiga Bridgeboard for IBM-PC Compatibility
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- ▲ 4 Voice 2 Channel Sound Output
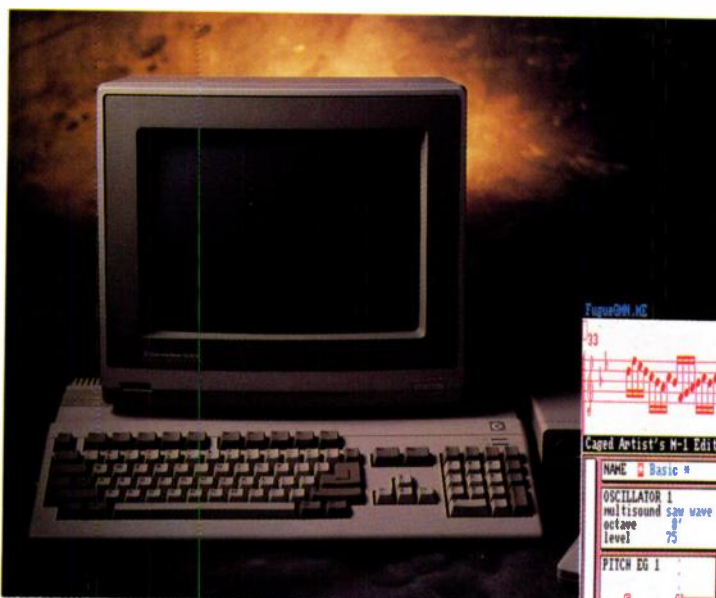
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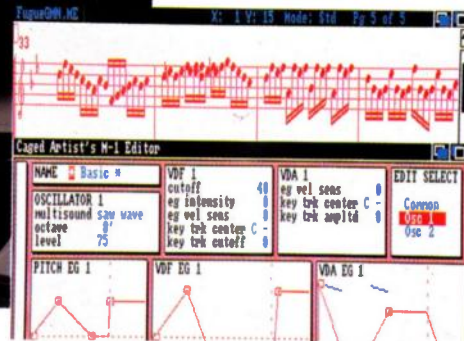
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JL Cooper
FaderMaster
MIDI Control Device

In these days of unfriendly synth panels and software sound editors, there has been an increasing need for a hardware unit that can be adapted for use in a variety of situations. *Review by Vic Lennard.*

THE CRITICISM HAS often been made that modern-day synthesizers lack buttons, sliders and knobs for individual parameters, making computer editors almost a necessity for most users. However, while these programs are fine for creating and editing sounds, they're certainly a bit clumsy if all a sound needs is a slight "tweak." Add to this the inability to program some synths (Yamaha TX7, Roland MT-32, Oberheim Matrix 1000 and so on) from the front panel, and the problem is considerably compounded.

Lately, certain software sequencers have started to include graphic sliders to permit the editing of various parameters in real time while the sequencer records such changes. These too suffer from a common problem – only one parameter can be changed at a time due to the fact that they are mouse-driven.

Someone had to come out with an undedicated bank of hardware sliders – like those found on the JL Cooper FaderMaster. This device looks just like a small lighting mixer, being a black box with eight faders. A two-digit display and six function buttons complete the top of the unit while the rear simply has MIDI In, Out and a socket for the external power supply.

Moving a slider sends out MIDI bytes pertaining to a particular parameter, such as MIDI controller messages for volume, modulation and so on. Parameter type, MIDI channel and various other aspects of transmission can be altered to suit the situation in which FaderMaster is being used.

Basic Functions

For the purpose of illustration, let's say that we want to set one of the sliders to send out MIDI Volume on channel 5. FaderMaster can send out Note On/Off, Program Changes, Channel Aftertouch, Pitch Bend, and Continuous Controller information. MIDI volume is a member of the latter category, which is selected by pressing the "Parm" button and holding it down while moving the chosen slider through the various two-letter keys for the above categories – No, PG, AF, Pb and Co. The unit has an internal battery that saves any changes once power is turned off.

MIDI Volume is controller #7, which is specified by holding "Parm#" and moving the slider by the same method as above. The MIDI channel is specified by holding the "Chan" button and again moving the slider until the number 5 is selected.

Now any movement of this slider will send out MIDI Volume data on channel 5. Let's take this example a couple of steps further. Many MIDI devices show little response to volume values of less than 30 or so, while others can exhibit distortion if the highest possible value of 127 is sent. FaderMaster allows you to set minimum and maximum values so that the entire travel of the slider can still be used, which increases the sensitivity. These limits are set using the "Min" and "Max" buttons in exactly the same way as those already described.

Banks

One thing I haven't mentioned yet is the number of presets – each set of eight faders constitutes a Bank. There are 30 Bank memory locations, pre-programmed for a variety of applications, from basic MIDI volume and pan on each of the 16 MIDI channels to more specialized uses such as editing the E-mu Proteus, Ensoniq VFX, Korg M1, Roland D-50 and Yamaha DX/TX series. [*A firmware update called "FaderMaster 2.0" was announced at NAMM and adds many new preset banks including LXP-1, LXP-5, and a variety of synths and samplers. – Tech. Ed.*]

In addition, there are nine User Banks in which you can tailor the data sent out by the fader precisely to your own criteria. Finally, there is one SysEx Bank. Bearing in mind that most of the presets transmit System Exclusive, this bank is invaluable for conversation with new synths or those not part of the preset package (more about this later).

Unfortunately, there is no facility to copy from one bank to another – this is one area in which FaderMaster falls down a bit. This means that banks have to be set up from scratch. The SysEx bank can only be programmed using an extra piece of software (for ▶

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⌘                                  FaderMaster
              Music Technology D-50 Volume                      Program
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  Parm#   7     1     2     3     4     5     6     7           Upload
  Min     0     0     0     0     0     0     0     0
  Max    100   127   127   127   127   127   127   127         Download
  Speed   1     1     1     1     1     1     1     1

      Header: F0 41 pn 14 12 00 03 20 vv rs rs          F7     File/Edit
          rs = Roland checksum         cs = Normal checksum
          pn = Insert parm # here      vv = Insert value here

  17: LNFlight+Tough    ⇧        01%
  18: We are Family     ⇧        01%
  19: Rock the Boat     ⇧        01%      Memory used ▓▓▓              9%
  20: Winner            ⇧        01% ⇩
                                          MidiTrack ST ©1986 Hybrid Arts Inc
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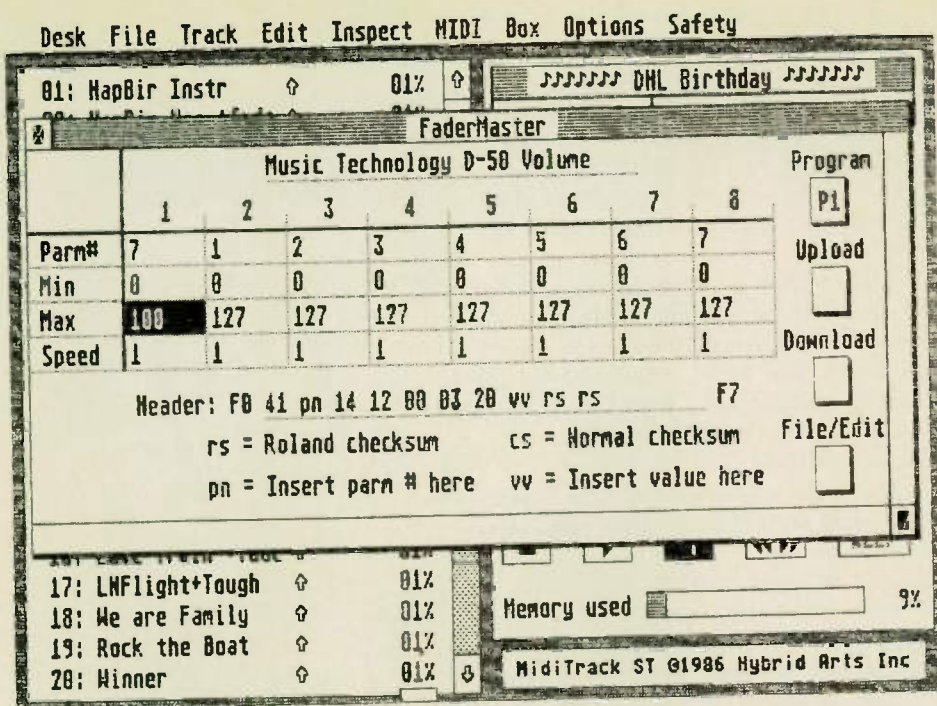
Figure 1. Roland D-50 editing.

▶ Atari ST or Macintosh), although it comes pre-programmed for the ART MultiVerb.

Advanced Features

Continuing with the previous example, it's quite possible that you'll want to control the volume of more than one device simultaneously, for instance in a fade. This would require you to set up a slider for each MIDI channel, and then you'd need very steady hands

"Modern day synthesizers lack buttons, sliders and knobs – someone had to come out with an undedicated bank of hardware sliders."

(or a long pencil) to achieve an even fade effect.

The grouping facility on FaderMaster gets around this problem. Any fader can be placed in a group and put under the control of another single fader. You can assign all eight faders to the movement of just one, which is similar to the function of subgroup output sliders on mixing boards.

Since it's the *position* of the slider that determines the value sent out, it's important to consider the rate at which the slider's position is scanned by FaderMaster. If it's too slow, then any subtle movement may be missed. If it's too fast, too much MIDI data will be

generated, which could lead to timing glitches when used with a sequencer – especially if SysEx is involved. The Speed function allows you to set a value between 1 and 16 subject to the formula:

Scanning rate per second=100/v, where v is the number selected.

So a Speed of 1 gives a scan rate of 100 times per second, while 16 gives 6.25 times per second. Allowing for the fact that MIDI is serial (sending data one bit at a time), the lowest scan rate for any particular situation should be used so that the amount of MIDI information generated is as low as possible (although this cannot be changed on the presets).

One of FaderMaster's most important functions is that of merging incoming data with the data being generated by the faders. There are three modes for doing this, selected with the Group button. The first of these is "Unconditionally On," and is used to merge all incoming data with that generated by the faders. For example, this mode would be used when the master keyboard has no MIDI Volume slider and volume changes are required. If Volume data has already been recorded and you then decide that it should be replaced, the "Unconditionally Off" mode would be used. If the incoming data is of the same type as that assigned to the fader, then it is ignored and may be replaced.

However, the situation may arise in which only a small portion of the volume data needs to be replaced and a facility like punching in and out is needed. This is the "conditional" mode, in which information is passed through the unit until the fader is moved, at which point it is replaced by the fader values.

To make this method easier, there is also a "Null" feature that shows the numerical difference between the current fader position and the data coming in. While the Null button is being pressed, no data is actually transmitted. This last facility allows you to check the incoming values and prepare the position of the slider – a useful feature. The only problem is that while it can be used for Note On/Off data or Continuous Controllers, it cannot be used with Aftertouch, Program Change or Pitch Bend, each of which can cause more than its fair share of headaches, and whose replacement can often be awkward.

There is little doubt that the blame for the mechanistic feel of much of today's music has been laid fairly and squarely at the feet of the drum machine. Even using "humanize" functions on a sequencer doesn't seem to resolve the problem. With FaderMaster, a note and MIDI channel can be assigned to each slider and the position of the slider can be made to delay that note by up to 15 milliseconds. So if the sequencer is playing a drum module and you want to give the choruses more urgency, assign the note number for the snare drum to one of the sliders and advance it against the hi-hat. The effect will be that of "pushing" the music, and the depth of the effect is completely in your hands – literally.

Alternatively, slider eight can be used to delay MIDI clocks, allowing you to loosen up the timing of all instruments on a drum machine simultaneously. In fact, it would be possible to record an FSK tape sync code with subtle tempo changes using FaderMaster and a MIDI/FSK box by moving the faders as the code is going down. The result would be a looser feel with all synchronized instruments following in time.

Hands-On

I've had FaderMaster for a couple o months now, and during the course o my tests, one particular song required most of the instruments to change vol

ume each time the chorus came along. Typically, I'd have experimented with the volume for each MIDI device and then written it into the sequencer, but FaderMaster made the job quite a bit easier. Once the relevant faders had been placed into the correct positions, hitting the Min, Group and Value buttons sent out a "snapshot" of the entire bank, which was then recorded. This got me out of always relying on numerical values, rather than my ears. Now if it sounds right, I can go for it.

Another common problem occurs when you need to fade one function up while fading another function down. Fortunately, grouping two faders together, one of which has been set to operate in reverse (by simply reversing

> ### "Grouping together two of FaderMaster's faders, one of which has been set to operate in reverse, results in a perfect crossfade effect."

its maximum and minimum values), results in a perfect crossfade effect.

As a long-time user of the Oberheim Matrix 1000, it has always been an annoyance to me that no real-time editing (in fact, very little editing at all) can be performed on it. Little things like setting a high resonance value and sweeping the VCF cutoff frequency to create a growling synth effect are impossible. However, FaderMaster changes all of this by assigning both of these edits to faders in the Matrix 6/1000 bank.

As previously mentioned, the speed of the scanning rate cannot be altered in the preset banks and is fixed at the maximum of 100 times per second. In the context of the song I was working on, this involved over 2000 bytes of SysEx data being sent to the sequencer and transmitted (along with note information) during the course of an eight-bar section, which included 16th-note hi-hats and quite dense chords. All I can say is that if there were any timing glitches, I didn't hear them and neither did the guys for whom the track was intended.

Another point worth mentioning is that many of the current effects units such as Yamaha's new FX500 and Alesis' QuadraVerb are using MIDI Controllers to change parameter values such as reverb depth, pre-delay time and so on. I spent a lot of time controlling the QuadraVerb using FaderMaster. Over 20 of the parameters can be

altered in real time by assigning them to MIDI Controllers, Pitch Bend, Aftertouch, note number or note velocity. The system worked like a dream, although there were certain times when I wished that FaderMaster had foot pedal extension jacks so that my feet could control a couple of the sliders.

Optional Software

While FaderMaster's nine user banks can be edited directly, the SysEx bank cannot. Add to this the fact that visually editing anything is bound to be easier than doing it "conceptually" and the additional software designed to complement FaderMaster has instant appeal.

Extremely simple to use, it can be used as a desk accessory with most programs on the Atari ST (I didn't try the Macintosh version). This means that it can be used with your sequencer without having to quit. Single banks can be downloaded to or uploaded from FaderMaster and can also be saved to disk as single programs, or as all ten editable banks in one file.

Verdict

One of the marvels of FaderMaster is the ability to actively "draw" your own controller curves, especially for volume. I stress curves because volume should not be linear and most computer sequencers offering a draw-your-own facility make it very difficult, if not impossible, to do this. For the volume faders alone, this is a very useful device.

When you start to delve into the possibilities of humanizing drum machines, altering the parameters in effects units, crossfading samples and other ideas that inevitably arise as you use FaderMaster, it begins to look like an invaluable unit. Yes, I have a few gripes, especially regarding the necessity of the optional software for editing the SysEx bank, but quite honestly I cannot think of a way in which this would be possible otherwise. It simply limits the available functions for someone with a small hardware sequencer.

I don't often buy a unit I get to review, but there is absolutely no way that FaderMaster is leaving my studio. If you want real-time control over your MIDI devices, get one of these pups. ◆

PRICE: $299.50

MORE FROM: JL Cooper Electronics, 13478 Beach Ave., Marina del Ray, CA 90292. Tel: (213) 306-4131.

The Communication of ART

With 49 albums to his credit and countless others on which he has appeared, you might think that Chick Corea has said all he can say with his music. But his latest effort proves this to be a fallacy, and once again establishes him as an incredibly innovative and powerful composer and performer.
Interview by Scott Wilkinson.

MAD HATTER STUDIO is nestled in a somewhat secluded corner of Silverlake, a suburb of Hollywood, California. From the outside, you'd easily pass it right by without realizing that much musical history has been made there. On the inside, however, the warm wood-panelled walls are adorned with album covers and artwork representing a remarkable career that spans over two decades.

An entire organization occupies the

building, primarily dedicated to the music of one man – Anthony Armando (Chick) Corea. His prodigious musical output is born of compositional, performance and improvisational skills that seem almost too good to be true (as evidenced by his seven Grammy awards and 26 nominations, including three this year). He has also remained a pioneer in the use of music technology, playing and programming the most sophisticated devices available throughout his long tenure as one of the most celebrated composers and

keyboard players of our time.

His latest album is no exception. *Inside Out* represents a culmination of Corea's artistic vision for his quintet, the Elektric Band. "Each record that I've done with the Elektric Band has gained in group playing richness," he says with understandable satisfaction. "And this one has a particular group playing impact to it. When I wrote the music, I knew that the group was going to gel like this, because it had been feeling really good, even though it had been a year since we played. I knew that the band was going to be ready to cook."

Apparently, Corea was right about that – the playing on the album is *incredible*. Not only is the ensemble tighter than ever (which is hard enough to imagine), each member of the Elektric Band – Corea on keyboards, John Patitucci on bass, Dave Weckl on drums, Frank Gambale on guitar, and

L-R: Chick Corea, Eric Marienthal, John Patitucci, Frank Gambale, Dave Weckl.

Eric Marienthal on sax – is a monster soloist in his own right, with plenty of room to stretch out.

Not that they haven't enjoyed that opportunity on previous outings – in addition to *Inside Out*, the Elektric Band has three studio albums and one live album under its collective belt. The playing and writing on all of these recordings is exceptional, moving from some very inside grooves to some very outside harmonies and melodic ideas. Not only that, a wonderful trio lurks within the band, bringing Corea, Patitucci and Weckl together to perform and record as the Akoustic Band.

One very interesting aspect of *Inside Out* is the manner in which it was conceived and produced – from the inside out. "This one started without any kind of image references for me, no verbal concepts or physical concepts of space and time, no poetic images or whatever. The way I approached the composition was sort of as an improvisation. It took me a few weeks to set my studio up and come around to the beginning of the composition. I composed the whole record in about six days, because it was a flow and I just kept going with it. Then the music flowed as an interaction of the emotions of the musicians.

"After the recording was finished [*all of* one *week later*], we started looking at illustrations and trying to work out a way to ground the music in some kind of concept or imagery, and that's how we developed the list of titles and the cover. For a long time, the pieces were known as 'Comp 1,' 'Comp 2,' 'Comp 3,' 'Comp 4,' 'Comp 5,' and 'Comp 6.' The musicians got to know them by these titles. When we were first listening to the music, some of the thoughts were toward grandiose and classical titles, like 'Fantasy' and 'Symphony,' that kind of thing. But I thought, 'Gee, I don't want to stick it into a formalized classical kind of an atmosphere, because that's not the way we play the music,' even though some it might remind you of classical music. So we came up with these titles that are more in keeping with the spirit of the tracks."

I must admit that many parts of the album reflect an aura of chamber music while others seem symphonic in their scope (although they also cook their *buns* off). His comments led me to think (and ask) about one of my favorite topics – musical categories. If it's not classical, how would Corea categorize his own music? "Well, it depends on with whom I'm commu-nicating. I might use the word 'jazz' with some people, but not with other people because of what they think jazz is. Of course, it degrades a work of art to try to say what it is, because the actuality of it is itself. So, the way to describe music is to put it on and listen to it, and that is the music."

And yet, aren't categories important and useful in some cases? "That's a very interesting question," he ponders. "Life and commerce would tend to lead us to the answer that they're indispensable for problems like which bin to put the record in. But from my viewpoint as an artist, all that categorizing does is label a creation that has already been created and define how it gets associated with other creations. The whole function of art and creation is to make something new, and you have the choice of drawing upon old forms or not. It's possible to make something that doesn't come from an association with something else. But if someone else looks at it, they may say, 'Yeah, well, that looks like a tree to me.' So, for me, the usefulness of categorization is practically nil.

"I like to talk about music in terms of its emotions," he continues. "For instance, I might describe an intense piece of music, or music that moves

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L–R: Frank Gambale, Dave Weckl, Chick Corea, Eric Marienthal, John Patitucci.

slowly, or music that makes me feel incredibly serene, or music that makes me feel like dancing. These are the kind of descriptions and categorizations that mean something to me. Even so, it's such an individual thing that what would make me dance might not make the next guy dance."

THE LEVEL OF technological sophistication on *Inside Out* is no less astounding than on previous Elektric Band albums. This time, however, Corea took a slightly different approach. "I put together a certain number of synth sounds that I played from the Yamaha MIDI Grand during the basic tracks, and I had a pedal that would bring in these sounds. I could have just the acoustic piano when the pedal was off, or I could bring in these additional textures with the pedal. I played on all of the basic tracks in this way.

"I recorded the complete piano performance of each basic track directly into the Synclavier sequencer, which was locked to tape by SMPTE. After the basic tracks were done, I revised all of the synth sounds in the sequences and basically orchestrated my piano part throughout the record. I could take those MIDI performances and then turn them into synth tracks. It turned out to be a very interesting way to get the initial feel of the basic track performance, along with later thoughts of orchestration.

"I often have thoughts about how particular phrases would sound better with this sound or that sound after I hear my basic track performance.

Sometimes I've attempted to replace the original performances with synth overdubs. But this way, I retain the original performance.

"The other thing that was somewhat unusual for me, although I've done it a little bit before, was that I worked with a programmer, Jay Oliver. I think that the way in which we interacted was kind of interesting. I gave him an idea of how I wanted certain patches to feel and respond rather than how I wanted them to sound. I asked him to help me with this because I knew that he had a sensitivity toward this type of thing. So I thought we had a pretty interesting working relationship. We came up with some very interesting programming, especially on the TX816."

Coincident with the release of *Inside Out* is an extended tour schedule throughout the US, Europe and Japan to promote the album (*see the sidebar 'Inside Out Around The World' for the itinerary*). As you might imagine, touring with that much technology poses its own set of problems. "Actually, the better we get at it, the simpler we make things," Corea seems happy to say. "One of the things that makes it difficult to use synthesizers and various sound devices live is the amount of gear that gets put together. It was basically getting so heavy that it was becoming impractical to tour with so much equipment, requiring more set up time, road assistance, technical assistance, and so forth.

"But there is a way to simplify things. What we had to do was rethink our whole touring system. Dave's setup at the drums and my keyboard setup are the most complex. Patitucci doesn't use any synths, and

neither does Eric. Gambale uses some stuff occasionally. So it's really the keyboards and the drums. Dave and I simplified our setups this past year, carved the weight of the whole thing in half while maintaining the level of sound sophistication.

"Unfortunately, one of the things that I had to do was eliminate the Synclavier from my touring outfit. The delicacy and size of the instrument demanded a lot of care and setup. I was mainly using the Synclavier for sequences – it's my master sequencer. So one of the things we did was record our sequences on DAT, although I won't be using many sequences this year. As far as sounds are concerned, I eliminated certain synths and did some sampling on the Kurzweil 250 so that my setup was much more compact."

WISE WORDS FROM a man who's been there and back – many times. But surely technology has made a greater impact on Corea's music than simply giving his roadies hernias. "Synthesizers, sequencers and samplers have been in my area of music for a long time. I enjoy them because there is a bubbling of creation that happens.

"But," warns Corea, "it takes a commitment and an investment of time to learn a new piece of technology. And I've also discovered that the degree to which I understand the workings of a piece of gear is directly proportional to how well I use it. It's possible for me to hire Jay Oliver or some talented programmer, and say, 'I want a blues sound here and I want a trumpet sound here,' select the sounds, and then just overdub them. However, it's another level entirely when I actually go into the instrument myself and learn something about programming it and how I can elicit sounds.

"Whenever I've spent time programming, I've always come up with sounds and ways of music that are an expansion for me. So, that's my key. I mean, I can use sounds built by others and that's totally valid – I do that all the time. But when I get into it myself, my own music definitely expands."

What about the flip side of the coin? How much influence does the musician have on the development of technology? In Corea's position as a Yamaha endorsee, I imagined that

they would ask him what he thinks of a new instrument idea, or what he'd like to see in a new instrument, but this is apparently not the case. "It's more or less after the fact that I'm asked to have a look at an instrument, and those considerations are then used for the next product. I think that's pretty much how it goes. Unfortunately, I've never gotten too close up in the development of an instrument, although I continue to think that it's a really good idea. I guess it's just time consuming and it would cost a lot of money for the companies to really get deeply involved in doing that."

But feedback from musicians is a valuable thing when designing a musical instrument, isn't it? "Yeah, I think so, too," he agrees. "On the other hand, if you put yourself in the instrument builder's place, you'll notice the variety of different ways in which musicians use and approach instruments. I think that the manufacturers basically try to see what would make an instrument with the biggest attraction. I also know that some of the things I like about certain instruments are not necessarily what someone else wants.

"I'll give you an example. I don't particularly like keyboard controllers with weighted keys, with the exception of a real piano like the Yamaha MIDI Grand, because they're kind of a crutch. There's a weight on each key, but the weight is only there to make you feel like it's a piano. But when you play an organ keyboard like the DX7 type of keyboard, it's fulfilling it's purpose, which is that of a trigger.

All it needs is a velocity and points at which it's on and off. That to me is real. I like synth keyboards with a very loose, just on and off action. But that's just personal to me. I think the consensus is that players like to have a weighted keyboard."

YOU MIGHT HAVE noticed that Corea expresses his gratitude to L. Ron Hubbard in the liner notes of many of his albums. "Hubbard's been a big influence on my life since 1968 in a lot of different ways," he says forthrightly. "Aside from developing Dianetics and Scientology, he's also an incredible writer of action, adventure and science fiction. But it's his artistic sense and human sense that are constantly inspiring to me. He found an ability to reach out to so many people with very sophisticated ideas, which set a high standard for me."

Corea illustrates his point, recalling his own background, "My musical background is in jazz and improvisation. When I was in school, most of my schoolmates were going to dances and listening to Elvis Presley, and then later the Beatles and so forth. Meanwhile, I was studying the music of Bud Powell and Charlie Parker, and then later Miles Davis and John Coltrane. When I began to perform in front of audiences, I found that there was a certain way in which I could communicate and reach people based on this style. But it left out, I don't know, 95% of the populace. So, I became quite interested in what

art has to do with communication.

"Hubbard set a fine example for me with his writings, including his writings on art. For instance, he wrote a series of essays called the *Art Series*, which is a magnificent statement of the basics of art. He includes the human factor in his philosophy about what art is. He defines 'art' as a word that summarizes the quality of communication, not so much as some kind of a technical thing. And to me, that's actually what it is. Music is a communication – even if it's only a communication to me or those who like jazz, it's still a communication. It's sharing an idea and a feeling between one person and another. My study of Hubbard's works keeps me learning new ways and paths, and ideas about how to expand myself spiritually as a musician as well.

"If I'm able to come to an understanding of my intentions as a musician and how I want to communicate and how I want to make people feel, I think it puts my attention on what is actually occurring. This makes technique a servant to communication, rather than the other way around. It takes an edge off of me trying to be such a perfectionist as a technician, ▶

INSIDE OUT AROUND THE WORLD

In order to support and promote the new album, the Elektric Band is takin' it on the road throughout the US, Europe, and Japan. Here's their itinerary, so you won't miss the opportunity to hear them when they blow into your town:

APRIL ◆ 5 – San Diego, CA ◆ 9 – Seattle, WA ◆ 10 – Olympia, WA ◆ 11 – Portland, OR ◆ 13 – San Francisco, CA ◆ 14 – UCLA, Los Angeles, CA ◆ 15 – Santa Ana, CA ◆ 19 – Oklahoma City, OK ◆ 20 – Dallas, TX ◆ 21 – Austin, TX ◆ 22 – San Antonio, TX ◆ 23 – Houston, TX ◆ 26 – St. Louis. MO ◆ 28 – Univ. Tenn., Chatanooga, TN ◆ 30 – Louisville, KY

MAY ◆ 1 – Cincinnati, OH ◆ 2 – New Orleans, LA ◆ 4 – Cleveland, OH ◆ 5 – Chicago, IL ◆ 6 – Columbus, OH ◆ 11 – New York, NY ◆ 13–20 – Boston, MA ◆ 28 – Charleston, SC

JUNE ◆ 1–10 – Chicago, IL ◆ 16–17 – Playboy Jazz Festival, Los Angeles ◆ 22 – Philadelphia, PA ◆ 24 – Pittsburgh, PA ◆ 27 – New York, NY ◆ 30 – Rochester, NY

JULY ◆ 1 – Saratoga, NY ◆ 2 – Montreal, Canada ◆ 8 – Oyster Bay, NY ◆ 14 – Baltimore, MD ◆ 15 – Stratton, VT ◆ 17 – Waterford, CT ◆ 27 – Reading, PA ◆ 28 – Oyster Bay, NY

SEPTEMBER 18 through **NOVEMBER** 9 – Europe ◆ **NOVEMBER** 17–23 – Japan

which results in me playing the piano technically better.

"For instance, you can watch any great skilled artist – dancer, pianist, whatever – and you go 'wow!' But now much attention do they have on their bodies? Like none. Look at Baryshnikov throwing his body around the stage like that. Is he thinking about which way his hand moves? God, no. He's communicating this wonderful emotion through the movement of his body, you see. So, that kind of thing is clearer to me thanks to Hubbard. It's basically what I needed to become a more well-rounded musician, because I grew up in the pursuit of technique."

OF COURSE, COREA'S chosen tools with which to communicate his musical ideas, at least in the context of the Elektric Band, are the synths, samplers and sequencers that have become so sophisticated. But what does he see in the future of these instruments? "I like the trend of companies creating new ideas. I think it's great when a guy in a company has a new idea for a piece of software or hardware, or a new instrument or whatever. The world keeps getting filled with these things, which doesn't bother me at all.

"On the other hand, I don't like planned obsolescence – that is not one of the things that I think is great in the game. If I had a company building instruments, I would want to plan an infinite existence into them. For instance, New England Digital has created the Synclavier and they keep on refining it, but the basic instrument is still the same. You can rely on it being there. I like that aspect of it.

"If any electronic guys are listening out there who are developing these ideas, one thing that I would like to see happen is a simplicity of use, fewer wires – fiber optics is a great new direction. And a simplicity in the user interface. You can't expect all users to understand the fine intricacies required to put new devices together. There should be a department in these companies that considers the user *before* a product is designed. The product can then be made comfortable to use. It's a weak area, I feel."

This reminded me of the trend towards controls such as "brightness" that are appearing on some instruments. Such controls actually alter several individual parameters within the instrument simultaneously while allowing the user to manipulate a musically significant aspect of the sound with a single control. This leads to the idea that technology provides greater opportunity to build these simplified instruments as it evolves into greater sophistication.

"Yes, that's right," agrees Corea. "There will always be lots of levels and types of instruments – some that are easier, some that are more difficult. It depends on how deeply someone wants to get into it. For instance, I don't know that I would be completely content with a knob that said 'brightness' without the ability to go in and tweak the six parameters that it controls. It would be nice to have an instrument with both options available.

"There *is* one thing I'd like to see," he continues wishfully. "I recently purchased a Macintosh Portable computer, which has helped me stay productive on planes and in airports where I spend a lot of the year. So, now I've got music notation software and a couple of sequencers. But in order for me to use the laptop as a sequencer, I would have to attach a MIDI interface, an external synthesizer, and so forth and so on. Can you see me in my plane seat trying to get all of this stuff together?" The image *is* amusing, to be sure.

"But it's very possible to put all of that in the computer itself. That's what I'd like to see. I'd like to be able to plug my headphones directly into the laptop, take the alpha-numeric keyboard out, replace it with a little two-octave music keyboard, and sequence with a set of sounds on the hard disk. I could actually do some composing and sequencing while I'm on the plane without having to carry around a bunch of additional gear. Now, I don't know how big a market there is for that kind of a setup, but that's something I would like to see for the musicians on the road."

And what about Corea's own future? "1990 is going to be a year of performance for us with the new *Inside Out* music, and some new Akoustic Band repertoire. In fact, we're going to try to include a few trio pieces in the Elektric Band concert, since the three of us are there anyway.

"Compositionally, I'm working on a piece for Eric Marienthal's new record, on which I'm also going to play. I'm also working on a piece for Dave Weckl's new record. It's a special track that he's invited Steve Gadd to play on. So it will be the two of them, plus Anthony Jackson on bass and Jay Oliver playing synths. I'm going to carve a piece out for that ensemble, which should be a lot of fun."

IN FACT, COREA was eager to get home and work on these projects after our conversation. But before he could do that, he was scheduled to give another interview over the phone to a Japanese magazine. As he was finally leaving (an hour later), he popped his head into the office where I was finishing up my business and said with an impish grin, "Listen to this! The interviewer just said to me, 'We are very concerned. The new album is so perfect, we're afraid that the band will break up.' I told him not to worry, we're not breaking up. I'm sure that the Elektric Band will be around for a while."

I was very glad to hear that, since I really dig the band's sound, and I'm sure that Corea has more to communicate within that particular context. He seems almost compelled to continue creating music that expresses his inner self to the outside world, and I, for one, hope that the channel of communication remains open. ◆

INSIDE OUT OF THE GEAR

Even though Corea has scaled down his equipment setup for the tour, it took a lot of electrons to make Inside Out. Here's a list of the gear used on the album:

CHICK COREA
Yamaha MIDI Grand Piano
Yamaha TX816's (2 racks)
Kurzweil 250
Kurzweil PX-1000, GX-1000,
    SX-1000, HX-1000 Expanders
Synclavier
Korg M1R
Roland D-550
Roland Super Jupiter
Mac SE computer
Studio Master Mixing Console
Tannoy SRM-10B Monitors

DAVE WECKL
Simmons SDS 5 & MX1
Hill Multimix 16 Channel Mixer
Akai S900 Sampler (2)
Barcus Berry 2MC
    Signal Processors (2)

READERS TAPES

"Think of it as a kind of alternate America – a 1980 that never happened. An architecture of broken dreams."

Wisdom by William Gibson; Reviews by Yung Dragen.

ACTUALLY, THIS MONTH it feels like several 1980s happened – some just have a stronger presence here in the '90s than others. This month's tapes include fairly normal pop and jazz, new age, classical performed on synths, a warped cross between pop and strange electronics, and some original works – a pretty good cross-section of Hi-Tech Music.

And then there's the small but undeniable industrial movement. The Bauhaus crowd of the past celebrated technology in their architecture and visual arts. The "Power Electronics" or "Cyberpunk" movement of today acknowledges it (without necessarily glorifying it) in sound. One such industrial soundmaster is **Brian T. Tibbs**. His riveting tape – *Changeling*. To quote Brian's letter:

"In my music I try to address the confrontation of man with his own industrial creations, how this interaction leads either to destruction or assimilation, and how industrial man remembers his natural origins. To do this, I assume the persona of The Changeling. This character is based loosely on the mythological notion of a changeling as a grotesque non-human child left in the place of a human child. The Changeling personifies industrial man in the following ways:

1. As man having assimilated, or been assimilated by, his own machinations;
2. As man having adapted to, or even become dependent upon, his industrial squalor;
3. As man now having the capacity to affect his own evolution and become not what Mother Nature intended."

The resulting tape is full of sampled, mutated voices (many with metallic images riding over top) that piece together more a description of a scene or point in time than a linear story, underscored with strong, hypnotic rhythms. It's one of the best (and most listenable) in the genre I've heard. The concept – this particular "alternate America" – is one of the scariest.

And on that happy note, let's see what the other parallel universes have been up to:

– **Ditto**/*Texas Electric*: "Original" is the first word that comes to mind. "Demented" is the second. In this alternate universe, Texas garage musicians were handed synthesizers and got into avant garde instead of the guitars and rock 'n' roll that confronted them in our particular version of reality. And in such a universe, Ditto would be considered a seminal influence. Big synths with a bit of swamp. The second side, "Parlor," is even soothing in spots (in an unsettling way). Good and fresh – but definitely weird.
– **George Barry**/*Consuming Passions*: A pair of poppish white reggae tunes done quite well. 'Just Lust' is a good crossover tune. The humorous 'On the Island' is slightly marred with random timbale fills. A reasonable ruff-rock posing number, 'Will to Power,' has good guitar, shuffling Simmons fills, and an interesting piano-like "chunk" sound on the turnarounds. The ballad 'Passion' is fairly standard with the exception of the surreal feedback elec-

tric piano. One guy with synths, PCM, drum machine, and guitar – a pretty good effort.
– **Michael Loveless**/*Realm Beneath the Oaks*: An alternate '70s universe. I'm reminded of some of the early French progressive releases on the Egg label, such as OSE or Richard Pinhas (of

Heldon) in his mellower moments. Translated, this means we get spacey, meandering tonal electronics with monophonic Minimoog melodies, plus some nice heavily-reverbed, almost-random wooden percussion. Won't change your life, but it's pleasant and relaxing.
– **Walter Dana**/*Opus 47 & 48*: Mr. Dana is a very special man. A famed composer originally from Poland, he has been spending his *semi*-retirement in Florida with a grand piano, several pieces of MIDI gear and a multitrack, continuing to compose and orchestrate original works. *Opus 48* is entitled 'Melodies,' but shows a concept of melody different than that of the mainstream. Instead of one voice taking the lead and the others supporting, typically three voices (most often piano, string section, and an FM wind instrument) either call and respond, go their own separate ways, or jealously vie for attention. *Opus 47* ('Four Seasons') is not as competitive, but no less multiminded. Interesting is the contrast between playing acoustic piano (which I could listen to Dana do for hours) and sampled piano – it becomes obvious what we're missing in the sampled translation. Advice: Lower the FM wind sounds in volume and/or add a judicious amount of reverb to make

ambient sounds.

– **Kablamachunk!**/*Well...There It Is*: Heavy déjà vu listening to this – I swear I've heard these hooks before in my favorite post-New Wave power-pop records of the late '70s/early '80s. Strong, interesting, and *fun*. Lots of

samples (silly and realistic), good guitar, warm sound (Pultec tube EQ and EMT plate reverb wrap around an Alesis QuadraVerb), excellent production. See? "Pop" doesn't have to be a dirty word...

– **Hank Crimson**/*Evergreen*: Jim Dimino's alter-ego Hank makes his second appearance, this time as a big, happy, sloppy, blues/country guitarist/vocalist (as opposed to the '50s/'60s rocker Hank played in *Back From Eternity*). The recording is a bit distorted and cluttered, but it *is* lotsa fun.

– **Joe Nastasi**/*Closed for the Season*: The vocals are strong, but almost all other

JOE *NASTASI*
CLOSED FOR THE *SEASON*

elements (stiff drum machine, over-reliance on organ and DX Rhodes synth timbres, etc.) sell this light-headed rock effort short. This is the type of material that needs a band of humans to breathe some animation into it (so much for machines *dominating* the '90s...).

– **Continuum**/*You Tell Me*: Okay, I'll tell you – this is some of the best jazz fusion I've heard, bar none. The bass (Steve Billman) and synths (Craig Ochikubo) particularly kill. On the very slight downside, Alfred Garcia's guitar could occasionally use a bit more tail on the notes – he sounds a little tight and choppy at times. Of special note is how relaxed the feel is for a studio recording.

– **Meterpool**/*Time Passed, Time Forward*: I didn't have to read the letter or look at the liner notes to guess that this outfit (Gary R. Weisberg and Tom Valdez) *exist* for multimedia and industrial soundtracks. To quote their

METERPOOL
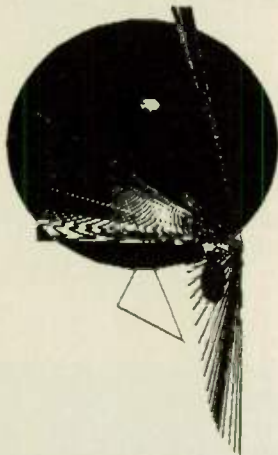
TIME PASSED, *TIME FORWARD*

blurb, they "combine New Age, jazz, and pop sensibilities in this up-tempo and energetic release [that ranges] from the danceable rhythms of 'One Oh One' to the textural introspection of 'After Math' to the mainstream drive of 'Promise.'" Music for yellow-tied MBA types (or IBM PS/2 ads).

– **Paul Adams**/*Various Waves*: Guitars (mostly acoustic), synths and natural sounds mix together to form a lush (albeit sometimes syrupy) aural wall-paper. Wanna do New Age but can't think of anything beyond the appropriate arpeggios and string washes? Check this out.

– **The Shocking Pink Dinosaur**/*Dorfitude*: I honestly try to avoid plugging friends in this column, but it's hard to contain my enthusiasm for this

single. Imagine, if you will, deep solid drum sounds à la heavy metal but played to a hip-hop beat and augmented with algorithmic composition (the bass drum work in particular gets dizzying at times). Intertwined pointillistic melodies that sound like a fusion between Scarlatti (and other Baroque-
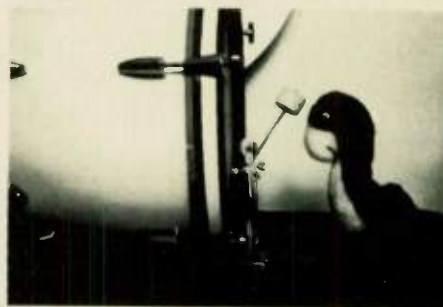
TSPD – The Shocking Pink Dinosaur

era composers) and minimalists like Philip Glass are played mostly with a variety of heavily fuzzed plucked guitar notes (and some samples, for good measure), plus sampled found sounds and voices over the top. The normal bass guitar or synth is replaced with the word 'Dorf' pitch-shifted down an octave or two and time-stretched over the duration of the piece, with the fade-out consisting of a final, furry '...ffffffff.' The video (which will publicly premiere on MTV's *120 Minutes* the first Sunday in April) is even more unique – a "must" experience.

I still don't have a finger on this new decade – send some more tapes and help me figure it out. ◆

Yamaha SY77

Performance Synthesizer

The first in a new generation of Yamaha synths arrives just in time to ring modulate in the new decade. Will the SY77 set the pace for synth development in the '90s?

Review by Simon Trask.

THERE'S NO GETTING around it. The DX7 is the synth for which Yamaha will always be known first and foremost. In a sense, every subsequent FM synth has existed in the DX7's shadow, despite the many improvements made to the original spec along the way.

Both a blessing and a curse for the company, the now venerable DX7 still holds a unique position in the history of the synthesizer. But then, it came at a unique time – the transition from analog to digital synthesis. Clear foresight placed the company at the vanguard of that transition.

Now that everyone's working within the realms of software and digital technology, can anyone get far enough ahead in the game to pull the same stunt that Yamaha did in the early 1980s? Because they achieved so much with the original, people are bound to assess any next-generation synth from Yamaha against the DX7's success.

Nevertheless, the SY77 inarguably embraces the workstation approach that seems to be an essential part of the contemporary synth: 16-track sequencer (16,000 notes), 3.5" DS/DD disk drive, digital multi-fx, 16-part multitimbral capability and a dedicated drumkit.

So the question on everyone's mind is, "Will the SY77 be the DX7 of the '90s?" This could be taken to mean, "Will it leapfrog the competition both sonically and technologically," or "Will it be the hardest synth in the world to program?" Well, let's have a look...

I Hear Voices

Essentially, Yamaha has expanded "traditional" FM synthesis and called it "Advanced Frequency Modulation" (AFM). This is combined with Yamaha's sample playback technology called "Advanced Wave Memory" (AWM2).

The two synthesis methods are interactive, and digital filtering has been added to each section. The interactive bit means that you can use an AWM2 sample to modulate any AFM operator (carrier or modulator), and/or use the AFM output as an AWM2 "sample." Yamaha calls this "Realtime Convolution and Modulation" (RCM) synthesis, but perhaps we can forgive them for that.

Each Voice (Yamahaspeak for "program" or "patch") can consist of up to four Elements (an Element being a complete AFM sound or a complete AWM2 sound). The AFM and AWM2 Elements are paired: 1 & 3 and 2 & 4 (AFM and AWM2 respectively in each case). Each AFM Element uses its paired AWM2 Element as a modulation input, so you can't use more than one AWM2 sound to modulate the operators within an FM algorithm. You *can* use that single AWM2 sound on any or all of the six operators, providing they have a spare modulation input.

You can choose one of 11 possible combinations of Elements: 1, 2 or 4 AFM mono; 1 or 2 AFM poly; 1, 2 or 4 AWM poly; 1 AFM + 1 AWM; 2 AFM + 2 AWM; and Drum Set, which allows you to select and program a keyboard drumkit configuration from the AWM samples. The SY77 divides its polyphony 16:16 between the AFM and AWM2 sections, so with 1 AFM+1 AWM you have 16 notes, while you have eight notes if you double the Elements (2 AFM + 2 AWM).

There's much that will be familiar about the SY77's AFM section to those of you who already know FM through the DX series. The carriers, modulators and algorithms are still present, as are the operator level settings, operator envelopes, LFO, pitch envelope and

> **"With the accessible front end that Yamaha has given AFM and its user-friendly combination with AWM2 samples, there's really no reason to be frightened of (A)FM anymore."**

associated parameters. But programming on the large LCD screen is much easier than it's been in the past.

There's far more to justify the SY77's *Advanced* FM moniker than its ability to use AWM2 sounds as operator modulation sources. For a start, each operator has two modulation inputs. One is taken up when another operator is functioning as a modulator in the algorithm, but that still leaves the other one free for a noise waveform input or the AWM2 input. If no operator is acting as a modulator, you can use both noise *and* AWM2 as modulation inputs.

The SY77 also ups the number of feedback loops from one to three and

makes them configurable, an advance that allows much greater timbral richness. And not only has Yamaha increased the number of algorithms from 32 to 45, but they've revamped the operator configurations, coming up with a good deal more variety, complexity and sophistication in the process.

Other new features that justify the AFM tag include: 4-breakpoint scaling of each operator's output level, allowing more flexible volume and timbre enveloping across the keyboard; six-segment envelope generators with initial delay and selectable loop point; and a sub LFO in addition to the main LFO, used to control pitch modulation only.

The AFM sound can be routed through its own pair of fully-programmable digital filters (0Hz–22.43kHz cutoff). Either or both of the 12dB/octave filters can be used. Filter 2 is always low-pass and filter 1 is switchable between low-pass and high-pass. The AWM2 section has an identical pair of digital filters. In fact, a four Element Voice can make use of up to *eight* filters at once – selecting an AFM Element as an AWM2 "sample" allows you to route its output through that second pair of filters.

The AWM2 section allows you to select one of 112 sixteen-bit linear samples, recorded at 32kHz or 48kHz. AWM is the sound-modeling technology that Yamaha has used with great success as the basis of their Clavinova digital pianos, so it's only natural that FM and AWM should meet at some point. However, in this case the AWM sounds are programmable...

The quality of the AWM2 sounds is very impressive, but this isn't surprising when you consider that AWM technology interpolates between samples to simulate changes in a sound's harmonic content. For instance, you can hear the difference in 'Preset 1 A01: Grand Piano,' where the decay of the notes is quite natural, suffering from none of the thinning of tone that results from sample looping typically used when memory is at a premium.

So what sort of source sounds do you get in the AWM2 section? Well, there are plenty of acoustic instruments: piano, trumpet, muted trumpet, horn, flugelhorn, trombone, flute, clarinet, tenor and alto saxes, violin, pizz, strings... In the bass department there are fretless, wood, thumping and popping, and a punchy synth-bass. Then you have various tuned percussion (vibes, marimba, etc.), several blown bottles and breathy sounds, some spiky ▶
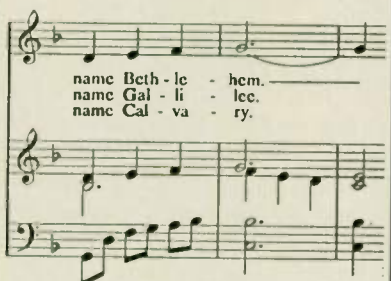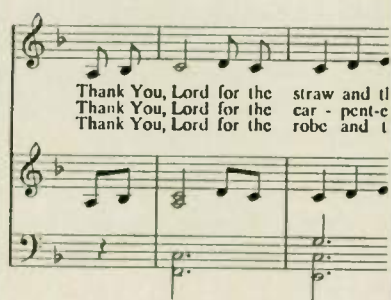
metallic percussive sounds, struck piano strings, sax breath, a booming Japanese temple drum, delicate koto and shamisen, and a selection of triangle, sawtooth, pulse and digital inharmonic waveforms.

Rounding out the samples are 20 drum and percussion sounds, mostly standard kit with a few Latin sounds thrown in. They're punchy, tight and clean, and when tuned around and used with other percussive samples in the Drum Sets (see below), they form a passable collection.

As an alternative to AFM and AWM2 Elements, you can assemble Drum Sets for individual Internal patches by selecting any one of the SY77's 112 AWM samples for each note on the keyboard. Additionally, you can program a complete set of effect parameters specifically for the Drum Set, and designate a controller to control the overall volume level of the Set.

Overall, there's plenty of clarity, detail and vitality in the sounds, and where characteristic attacks are needed (on some of the brass sounds, for example) they are present for the most part. The tenor and alto saxes were the only samples that struck me as a bit lackluster.

In short, the SY77 can produce the full gamut of sampled, synthesized and sampled-plus-synthesized sounds that we've come to expect from today's synths, but it goes beyond the sonic vocabulary of existing synths with the sophistication of its new AFM section. And while programmers will love the SY77, it's not an abstruse instrument in the way that the DX7 was.

Pan Handling and Beyond

The SY77's panning capabilities have to be among the most sophisticated available. As an alternative to static pan positions for each AFM and AWM2 Element within a Voice, you can draw on a range of preset and user-programmable dynamic panning effects, and you can have up to four such effects going at the same time within a Voice. For each programmable effect, you can specify pan source (velocity, note or LFO) and depth together with a six-stage pan envelope and a ten-character name.

Yamaha introduced microtuning on the DX7II, and they're not about to ignore it on the SY77. As well as allowing you to create two tunings of your own, Yamaha's new synth provides you with a choice of pure major, pure

minor, mean tone and Pythagorean (with any pitch in the octave as root note in each case), Werkmeister, Kirnberger, Vallotti, quarter- and eighth-tone and more. You can also specify tuning on/off for each Element.

The last stage in the sound chain is digital effects processing. The SY77's four effects processors are divided into mod1, mod2, reverb1 and reverb2, and can be configured in any one of three ways. Voices are routed through a comprehensive bussing scheme through either, both or neither of two Groups, which are effectively inputs to the digital effects section and "hard-wired" to a pair of stereo audio outputs.

Each of the two mod processors can be set to stereo chorus, stereo flanger, symphonic, tremolo or off. The reverb processors have a much larger number of effects to choose from: in addition to hall, room, plate, church, club, stage, bathroom (honestly), tunnel and metal reverbs, there are various delay and echo effects, distortion, tone control (rough and ready EQ) and combinations of reverb and delay, reverb and distortion, distortion and delay, tone control and delay... Scarcely any of these effects have more than three parameters to their name, and none have more than four. No wonder there are so many different effects and effect combinations. Disappointingly, the mod effects seemed on the weak side, while the reverb and associated effects are usable as far as they go, which isn't as far as you might like.

Front and Rear

Yamaha has given the SY77 a 61-note synth-style keyboard which is sensitive to attack velocity and channel aftertouch and has a pleasantly chunky feel to it.

The front panel has been well thought out, with the different functional areas clearly organized. The centerpiece is a 60×240-dot (8×40-character) backlit LCD screen with easy-on-the-eyes blue shading and adjustable contrast. Related parameters can be grouped in a single display, graphic editing of envelopes is possible, and edit pages within a Mode and Voices within a Bank can be listed. The SY77 adopts a now familiar method of operation, with eight Function soft-buttons below the LCD to activate various functions and parameters. In addition there's just about every edit control possible: date slider, infinite rotary wheel, "±" buttons and numeric key-

pad, together with Page left/right and cursor left/right/up/down buttons.

Also on the front panel are card slots for Voice/Multi RAM and ROM cards and waveform ROM cards (like Korg's M and T series, the SY77 can access a library of samples on card). The SY77 comes with 128 Preset ROM Voices and capacity for 64 Internal RAM Voices, and can access a further 64 Voices from ROM and RAM cards.

Finally, on the rear panel are MIDI In, Out and Thru jacks, knobs for adjusting LCD contrast and the on-board sequencer's metronome click output level, a dedicated breath controller input, dedicated volume footpedal and sustain footswitch inputs, program-mable footpedal and footswitch inputs, headphone output and two pairs of stereo audio outputs plus the power on/off button.

Sequencer

Sixteen-Part multitimbral configura-tions of Voices can be defined for use with the SY77's onboard sixteen-track sequencer or for remote sequencing from an external MIDI sequencer, with dynamic allocation of the synth's polyphony across the Parts. As well as selecting a Voice for each Part, you can set several control parameters, includ-ing pan settings and effects settings as you would for a Voice. The effects apply to all 16 Parts, with effects rout-ing per Part determined by the output buss scheme.

Yamaha has come up with a very workable and practical sixteen-track sequencer for their new synth. You record a single song at a time, up to

"While programmers will love the SY77, it's not an abstruse instrument in the way that the DX7 was."

999 bars in length (memory provid-ing), using the 16 track buttons to select the Record track (its LED turns red) and to mute specific tracks (LEDs flash green-yellow). Active recorded tracks are indicated by continuously lit green-yellow LEDs. The same color coding is used by the SY77 when it comes to sequence editing, with the LEDs of the track(s) to be edited turn-ing red when you select them.

Tracks 1–15 are linear recording tracks, with a two-bar count-in for real-time recording at 96ppqn resolution.

Recording modes available for these tracks are real-time replace or overdub, step-time and punch in/out (with pre-defined punch points). The sequencer can record and playback *any* operation you do on the synth (presumably as SysEx data) in real time, including any voice edits, button pushes, and menu changes. Track 16 is reserved for play-ing patterns recorded in the separate Pattern mode. To play patterns back within a Song, you must chain them together in track 16 within Song Edit mode. Once you've constructed a pat-tern chain, you can copy it to any other track, where it becomes continuous data. You can also copy an individual pattern directly into any of track 1–15 and extract into a pattern any portion of one of these tracks (up to the maxi-mum pattern length of 32 bars). Step-time recording and editing of patterns is also possible.

The step-time recording and editing screens allow you to scroll forwards and backwards to any bar within a track. If you're into odd and constantly-changing time signatures, you'll be glad to know that the SY77 allows you to specify a different time signature for each bar, chosen from the ranges 1/4–8/4, 1/8–16/8 and 1/16–32/16 – ▶

▶ surely enough to please anyone.

In step record, durations can be selected by scrolling through musical notes in an onscreen parameter field, or by selecting a duration more directly by pressing the relevant button in the numeric keypad (each of these buttons has a graphic note value inscribed above it). You can choose whether your notes will be normal, staccato or slurred, and select one of four programmable accent levels for each step. A graphic representation of a keyboard in the lower half of the step-record screen allows you to see what notes you've played when you scroll through a track.

Step-time record is permanently in overdub mode, so whenever you play notes, they're entered at the current step with the currently-selected duration. Step-time edit works a bit differently, allowing you to switch between the graphic keyboard to help you see what the notes are at a particular step and a MIDI event list.

The Song Edit Job page provides access to 16 comprehensive editing functions, a number of which operate on user-definable portions of individual tracks. These functions include crescendo or diminuendo, filtering out specific MIDI data such as aftertouch, and shifting a whole track forward or backward in time by up to ±99 clocks.

Finally, the SY77's sequencer is able to read sequences from disk that are stored in Yamaha's NESQ and ESEQ formats, allowing you to load sequences recorded on other Yamaha devices such as the QX3 and QX5 FD sequencers and the V50 FM synth.

Verdict

When Yamaha unveiled FM synthesis in the first half of the '80s, they effectively issued a challenge to other manufacturers: produce a synthesis system that provides the same degree of sonic detail and clarity. The response to that challenge has been unfolding throughout the rest of the decade, and, as we've reached the close of that decade, it seems like a good time to survey what's been happening to the synthesizer post-DX.

When Roland eventually broke Yamaha's dominance of the synth market, they did it with another instrument that laid the ground rules for other manufacturers to follow. The D-50 combined sampled instrument attacks with traditionally-conceived synthesis transplanted to the digital domain,

which was a logical move on two counts.

First, FM synthesis had imparted a new degree of instrumental realism to synthesis, primarily with the amount of sonic information it was able to convey in the attack segment of the sound. Of course, this is the segment which plays a large role in differentiating one instrument from another – even from staccato notes, you can tell a trumpet from a guitar from an oboe. The D-50's use of samples subsequently brought the attack segment of its sounds that extra degree of realism.

Second, while many musicians liked what they heard from FM, the unfamiliar ins and outs of its programming structure proved much less attractive to them. By transplanting familiar

"AFM is capable of producing full, warm, luscious pad-type sounds and fat, warm, punchy analog-type bass sounds which old-style FM could never produce."

analog-derived concepts to the digital realm, Roland achieved a certain continuity with their past analog synths.

Subsequently Korg came along with the M1, which extended the sample principle to include not just attack segments but complete instrumental samples – at the same time expanding the range of samples available by allowing additional sounds to be read from plug-in PCM ROM cards. Now, the sample input board for Korg's T-series synths represents the latest logical extension of this development, freeing musicians from reliance on sample cards provided by the manufacturer. At this rate, synth and sampler will become one (can the day be far off?).

Like the D-50, Korg's M and T-series synths stick closely to traditionally-conceived synthesis. Meanwhile, confirming the prevailing trend, 1989 saw the emergence of Ensoniq's strongest synth yet, the VFX, which also combines samples with traditionally-conceived synthesis, although it's more akin to a Matrix 12 than a Jupiter 8.

So where do these developments leave Yamaha and the SY77? In a way, the relationship that has developed between samples and synthesis (not to mention the advent of affordable sampling) during the '80s has worked in Yamaha's favor, by removing the onus on synthesis systems to come up with

realistic recreations of "real" instruments. FM synthesis has probably come closer to achieving that aim than any other system, admittedly with varying degrees of success, but programming those sounds was by no means straightforward. How much easier it is to plug in a sample card – which is exactly what you can now do on the SY77.

What about that other "development" – the retention of a traditional model of synthesis? Well, seven years since the introduction of the DX7, it isn't strictly analog-style synthesis that can claim to be traditional any more. Thanks to Yamaha's persistence with it over the years, FM synthesis has passed the "future shock" stage and created its own tradition. Combined with the accessible front end that Yamaha has given AFM and the SY77 (courtesy of the synth's large LCD screen, sensibly-presented programming structure and clearly thought-out front panel) and its user-friendly combination with AWM2 samples, there's really no reason to be frightened of (A)FM anymore.

There are other important points to be made about the SY77. It should be clear that Yamaha has given it all the technological knick-knackery expected of the contemporary "workstation" synth, so you need have no fear of losing out there. But, more importantly, Yamaha has integrated the AWM2 section of the SY77 with a much-enhanced FM synthesis section – which can, in turn, use the output of the AWM2 section as a modulation input to its operators. It's also worth bearing in mind that AWM is more than simple sampling, so the SY77's samples have a greater degree of realism and responsiveness to them than straightforward samples.

Ultimately, it must be the AFM section on which the SY77 stands or falls. It's easy to be cynical and laugh at the fact that Yamaha is *still* using FM after all these years. But the "A" in front of the "FM" is more than wishful thinking. In pure sound terms, AFM is capable of producing full, warm, luscious pad-type sounds and fat, warm, punchy analog-type bass sounds that old-style FM could never produce, introducing a new breadth and richness to FM synthesis. Also included on the sonic menu are metallic sounds that can be warm and rich or cold and harsh, the familiar DX-type bright, tinkly electric pianos but also seductively dark and warm electric pianos, fat and punchy brass sounds, rude and dirty organ sounds, silky smooth strings

and all of the harsh, ugly, cutting FM sounds you could wish for.

There was more than one occasion when I thought I was listening to a sample, only to find out that it was an AFM sound. In fact, many of the SY77's preset sounds use the 1 AFM + 1 AWM combination, but don't construe this as an attempt on Yamaha's part to hide shortcomings in the AFM section. In the light of its new and expanded set of algorithms, 16 operator waveforms, three assignable feedback loops, dual modulation inputs per operator and ability to accept AWM2 sample sounds as modulation sources, *and* the far more user-friendly programming access provided by the SY77, AFM deserves to be considered afresh. Bringing the AWM samples into the picture, the SY77 is also good at the breathy, swirling, ethereal sounds.

I must say that I found the SY77's digital filtering, and in particular the resonance, a little disappointing after the Waldorf MicroWave's rich, powerful analog filtering (see the review of the MicroWave elsewhere in this issue). However, it does add an extra dimension to AFM (well, maybe half a dimension), particularly when it comes to filter sweeps. I'd also say that the digital effects aren't the most exciting aspect of the SY77, but they're adequate. The SY77's ability to layer four sounds and still have eight-note polyphony is a point in its favor, as are the sophisticated panning effects of which it's capable, while the 16-track sequencer is user-friendly and reasonably powerful but still (of course) no substitute for a computer-based option.

The DX7 comparison looms large in the collective psyche of synth players, which is perhaps why I've heard (and heard reports of) lukewarm initial reactions to the SY77. I must admit, my initial reaction was that it sounded good but wasn't about to knock the socks off the competition. It certainly doesn't represent a DX-equivalent quantum leap forward, but it does at least represent a significant step forward. No future shock, but maybe that's a good thing. I grew steadily more impressed with the SY77 as I got to know it, and it's left me with a feeling that I want to *continue* getting to know it. Sometimes those relationships can last the longest. ◆

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LISTENING LAB

In the Lesson of Life, we must all do our homework. For the musician, it's easy. Just listen...

JANE CHILD
Jane Child
Warner Brothers

Pick of the Month

Jane Child's album reminds me of early Prince records, not so much in style or content, but in its directness of perspective and creative vision. As a *wunderkind* who could write, perform, and produce all by himself, Prince was definitely ahead of his time. Jane Child also wrote, performed, and produced her eponymous debut effort – and she seems to be perched at the right place and time for success.

The overall sound on this album is very hard, and demonstrates a pressure-cooked, "ready for the '90s" kind of

electricity. Nothing musically weak or archaic here – the bass and keyboard lines fairly slap the listener as the stifled drums make you want to gasp for air. Child has a gripping style, both musically and vocally. Her voice entertains, shocks, and delights the listener with its acrobatics. The sound is well-crafted, and the music is studied.

Unfortunately, about half of the songs are lacking in commitment. The music is self-assured, but the lyrics need beefing up. Without compelling lyrics, the listener is left physically grooved, but not psychologically moved. When she's not *saying* anything, she works against her potent delivery and divergent vocal style. Juxtaposed against "blah" lyrics, her well-trained but untamed voice sells itself short.

I don't mean to sound disparaging, because there *are* some real gems on this album. I especially liked 'Biology,' 'Hey Mr. Jones,' 'World Lullabye,' and 'Don't Let It Get to You.' I *know* that Child can re-invent herself both stylistically and lyrically. She simply needs more compelling material so that she can grow and change in a more well-rounded, consistent manner. ◆ *Alex 2000*

CARL STONE
Four Pieces
Electro-Acoustic Music

Interviewed in *MT* back in April '88, Stone performs most of his music live with a Macintosh, Prophet 2002 sampler, and Yamaha TX816 FM synth. His com-

positions tend towards simple constructs that explore the dismembering of a theme (in the case of 'Hop Ken,' Moussorgsky's 'Pictures at an Exhibition'), spatial, pointillistic placement of FM percussive sounds ('Wall Me Do'), or simple elongation of simple themes that might even start out as one note ('Shing Kee').

It is very tempting to be bourgeois and dismiss Stone's works as curious, simplistic, almost funny inside jokes (in person, Carl has that sense of a jester lurking beneath his Mr. Rogers surface). Personally, I've gotten tired of the twangy FM overdrive timbres that academics seem drawn to, and 'Hop Ken' is interesting for about a minute before your senses get overwhelmed by the seemingly random chop-chop applied to (as Stone himself refers to it) "this timeworn piece" ('Pictures'). It also makes me wonder why I'm sweating the details so much while these pieces seem so simple.

Ah, but there must be something lurking beneath the surface (along with the jester) – why else would so many of us find ourselves drawn back again and again? A friend of mine who had seen Stone play live recently started off by saying how disappointed he was, but when asked to describe the pieces, he said, "Well, first there was this simple thing with mostly FM timbres (probably 'Wall Me Do')...but that was actually kind of nice...and then there was this piece that started out just as one female note, which slowly grew to, oh, maybe a five-note melody...but you know, I kinda liked that too..."

You get the picture. I guess music (let's call Stone's "modern classical" for lack of a better term) doesn't have

o be complex (or have a driving beat, or have a hairdo or the weight of history attached) to be worthwhile. This stuff is. ◆ *Chris Meyer*

GRACE JONES
Bulletproof Heart
Capitol

Grace Jones is one of the few people I am genuinely scared of, with a persona that defines the word "tough." Yet despite my cowering admiration for her, Grace's records have always seemed to be uneven, mixing cabaret schmaltz with "The Image."

Bulletproof Heart isn't perfect either, but it is a '90s update on The Image. The leadoff track, 'Driving Satisfaction,' currently resides on my answering machine. The car sounds and skids remind me of Roxy Music's 'Love is the Drug' (which Grace weakly covered a while back). But as soon as the super-chromed reverbed snare comes in, you know you're about to be dragged along from the rear bumper on a high-speed drive. Analog wood blocks mix with the chrome-plated drums and excellent hi-hat work. Rhythmic echoes of Grace's voice and a biting Minimoog bass doubling the kick drum lock in the groove. As an added plus, real string stabs contrast nicely with the synthetic washes.

'Kicked Around,' the second cut, reflects the toughness of The Image with a militaristic drum and harsh synth intro. Some good, tight Simmons work mixed with a fat acoustic snare carries the tune from there. The beat and feel get stripped down further with On My Way,' and 'Seduction Surrender' twists the formula into "tribal meets electronics." 'Amado Mio' is still more vicious, but the synthetic organ/accordion patch on top seems out of place. Current musical trends also find their way into a couple of tunes, with Love on Top of Love' mixing Gothic male chants and a jazzy swing beat with analog bass and a slight house/acid feel overall. 'Crack Attack' starts out with a rap and goes into an almost romantic lament for the children being lost to the demon Rock Cocaine.

The rest of the album is fairly disposable (why, Grace, do you lower yourself to numbers like 'Paper Plan?'…well,

at least it too has a sharp Minimoog bass…). Nevertheless, this is still quite a modern-sounding release overall, worth studying for the sounds – while dreaming of grovelling at Grace's feet. ◆ *Yung Dragen*

DANIEL LANOIS/BOB DYLAN
Acadie/Oh Mercy
Opal/Columbia

Daniel Lanois may still be unknown to many people, but a number of the records he has produced have become acknowledged pop masterpieces that reached a huge audience. From the brilliance of Peter Gabriel's *So* to the double spark of *The Unforgettable Fire* and *Joshua Tree* that catapulted U2 to the top, Lanois has continued to expand his musical vision through producing Robbie Robertson, The Neville Brothers, and Bob Dylan's latest effort.

Dylan is back, and he sounds better than ever. The insistent beat of 'Political World' and 'Everything is Broken' is balanced by the atmospheric nuances of 'Ring Them Bells' and 'Man In The Long Black Coat,' making the first side of *Oh Mercy* the best side of Dylan in more than a decade. The wistful 'Most of The Time' and 'Shooting Star' reflect the more subdued tone of side two.

On every track, Dylan's vocals are bolstered by the masterful production of Lanois – his voice is way up front, fully conveying the subtlety and brilliance of his phrasing. The painter of words has found a sublime musical complement that supports him without clutter. 'Man In The Long Black Coat' is a perfect example of simplicity and guitar processing creating the right mood for Dylan's penetrating lyrics. With Lanois' studio savvy, even Dylan's harmonica playing sounds good. Yes, Dylan is back, and he's as distinct and defiant as ever.

On *Acadie*, Lanois' first solo album, he combines simple acoustic songs with others dependent on a much more heavily processed sound. The eclectic mix sounds like the waking life of a cowboy and the dreams of a sound poet. There are delicate, wonderful moments, especially on the tracks influenced by Brian Eno. Evocative textures make 'White Mustang II,' 'Fisherman's Daughter,' 'Ice,' and 'St. Ann's Gold' particularly effective. 'Silium's Hill'

combines a sparse guitar and wispy synth textures with a plaintive vocal and great lyrics. The album opens with 'Still Water,' a strong song that is both accessible and unique. It's not surprising that it is faintly reminiscent of U2, since Adam, Larry, and Eno help out. An unusual version of 'Amazing Grace' closes the album, with Aaron Neville's pure vocals awash on an ocean of space music. ◆ *Mihai Manoliu*

THE PSYCHEDELIC FURS
Book of Days
Columbia Records

You can always tell a Psychedelic Furs song when you hear one. You know – the raspy-voiced Richard Butler, the intriguing noises, the overall brazen feeling – they're all just as obvious on the Furs' latest release, *Book of Days*. This is the seventh album by the British group, which they wrote, arranged, and co-produced with David M. Allen (best known for his work with The Cure).

It was that distinctive Furs' sound that made songs like 'Pretty In Pink,' 'Heaven,' and 'Love My Way' so popular in the mid-80s. It was also at about the same time that the band fired producer Daniel Lanois, one of that decade's most successful producers. However, they recovered from this mistake quite well, recording the hit single 'All That Money Wants' and releasing a compilation album in 1988.

The songs on their latest effort are all too familiar, but quite enjoyable nonetheless. 'House,' the strongest track on the LP, has steadily climbed the Modern Rock charts. Others, such as 'Parade,' 'Shine,' and the title track are creative and reflective. John Ashton's gripping guitar is extremely heavy throughout, radiating a powerful ambience that is not so much uplifting as it is moving. The tone captured by such songs as 'Should God Forget' and 'Torch' is bland yet forceful, remaining faithful to the Furs' intense thrash rock sound.

So, while seeking alternate avenues, the Furs have discovered that it's the old formula which brings new success. *Book of Days*, with its harsh and brash sounds, moody and broody melodies and deep dark essence, is all that the Furs have always been and more. ◆ *Debbie Greenberg*

V_room Electronics

Fuzzy Logic in the MI Market
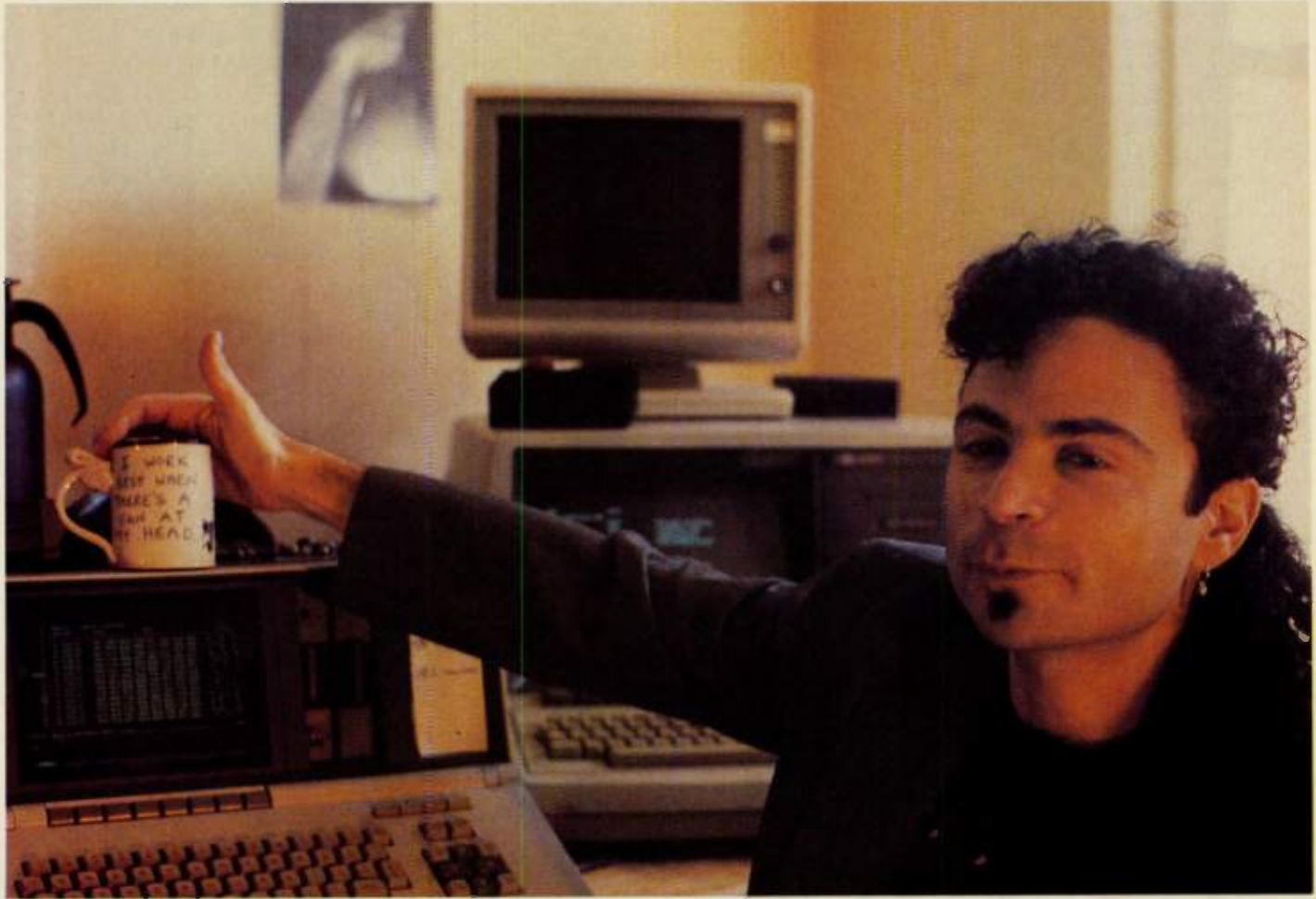
Smythe Davidson satiates his mid-late afternoon coffee fix.

A new company formed by American synthesizer veterans has developed a hybrid sampling instrument that could give the industry quite a scare. *Interview by Chris Meyer.*

THE DEMISE OF American synthesizer manufacturing companies has alarmed many aficionados of electronic music. No one questions the cost effectiveness or reliability of the Japanese products (remember paying over $4000 for a Prophet 5? Remember also the horrors of taking one on the road?). Many Japanese products actually sound quite good now (unlike their initial efforts). However, it could be argued that the American products had a certain warmth to their sound, mixed with occasional out-and-out technological and ideological breakthroughs. Therefore, some feel that the lack of American products has resulted in a certain sterility in new instruments.

Enter V_room Electronics – a new company with a list of personnel that reads like a "Who's Who" (not to mention an occasional "Who's *That*?") of American synthesizer companies. Former employees of Aries, ARP, Blacet, Buchla, Computone, EML,

Moog, Oberheim, Octave, Polyfusion, Serge, Sequential Circuits, Steiner/Parker, and Wavemakers have gathered together in Silicon Valley to relive past glories. Their first product? A revolutionary sampler that mixes analog and digital technologies.

We had a chance to sit down with Smythe Davidson, Chief Engineer of V$_r$oom (which, by the way, was named after the Korg spin-off "Zoom" – with the "V$_r$" coming from the term "reference voltage," indicating their voltage-controlled past). He talked about the mixture of old and new technology behind the sounds coming out of their Infinite Resolution Analog Sound Sampler (ASS∞), not to mention what else V$_r$oom might be up to.

MT (Chris Meyer): *You refer to your ASS as an analog/digital hybrid – what part is analog and what part is digital?*
Smythe Davidson (SD): "The digital part comes from digital microprocessor control, and the fact that the sound is still 'sampled' in the more familiar sense of the term. Once every 20–25 microseconds, the incoming signal is analyzed and its current 'state' – signal level – is stored into memory. The analog part is the memory itself. Instead of digitizing the signal into somewhere between 4000 and 65,000 discrete numbers [*the number of levels into which a signal is broken down in a 12- or 16-bit sampler – Ed.*], we store its *exact* voltage level into a cell of analog RAM. This way, you have none of the level quantization distortion typical of digital samplers, and no arguments over how many bits are enough. The only specs that affect the sound, aside from the sampling rate, are the same ones you'd see on a piece of audiophile stereo equipment – signal-to-noise, dynamic range, and harmonic distortion."

"We're in the '90s now. To assume that we can only achieve what was, for the most part, poorly done almost two decades ago is a disservice."

MT: *Explain "analog RAM." At first, it seems like a contradiction in terms...*
SD: "That's because we always associate the word 'RAM' with 'digital' or 'computers.' What 'RAM' really stands for is 'Random Access Memory.' The term doesn't specify the method used to store information for later recall.

"In our case, one cell of RAM actu-

ally holds a voltage instead of a binary number. We got this RAM from the back-to-analog movement happening in control computers – namely, in the fields of neural networks and Fuzzy Logic. These fields of research are fueled by the fact that the logical, decision-making process – whether we're talking about choosing a color of paint for your living room to match your furniture, or how to tweak the parameters of a nuclear reaction to keep it operating in its optimal zone – does not consist entirely of simple yes/no decisions, but is the result of weighing several factors by varying amounts against each other.

"In your living room, you take into account the different colors of your different pieces of furniture, how big they are, how different colors match them, and which you might sell first and therefore no longer need to worry about matching. In a nuclear reactor, you balance such factors as operating temperature, radiation levels, and water flow against how much active materi-

al to expose to the fission process. You have much finer control over the process if you treat it as a series of continuous variables instead of digitized levels, such as 'Is it safe?' or 'Is it going to blow?'

"Anyway, the Japanese and Chinese are aggressively developing a new set of computers based on Fuzzy Logic [*the original concept was actually developed by an American – Ed.*]. One of the components they need is something that can store a continuous variable. It's quite a step backwards to take a

nice, continuous process, digitize it into normal computer memory, and then convert it into a control voltage again. We looked into their research, and found that they had developed

"Instead of digitizing the signal into somewhere between 4000 and 65,000 discrete numbers, we store its exact voltage level into a cell of analog RAM."

analog RAM of sufficient size and accuracy to store sound."
MT: *So what actually happens during "sampling?" What replaces the usual analog-to-digital and digital-to-analog converters in your ASS?*
SD: "A signal comes in through a mic preamp as normal. Since we're still sampling a signal with respect to time, we still need the traditional anti-aliasing filter up front to knock out any frequencies that are too high. Although we're using a standard solid-state filter in

The innards of the analog hybrid V$_r$oom ASS (Analog Stereo Sampler).

PHOTOGRAPHY BY MELODIE GIMPLE

the prototype unit (see **Figure 1**), we are looking into using a tube-based preamp. Tubes have a natural high-frequency roll-off, and are warmer sounding [*the 2nd harmonic distortion induced by an overloaded tube circuit is actually quite pleasant sounding – Ed.*]. They are also more in keeping with our 'Back to the Future' philosophy than the coldness of a standard transistor-based circuit and its associated odd harmonics.

"After the preamp, the signal is sampled by a standard capacitor-based ▶

sample-and-hold circuit at a user-selectable rate of 25 or 50kHz. In order to save memory, one of the new areas we're looking into is varying the sampling rate during recording, since in most cases only the attack contains the higher harmonics that require a 50kHz sample rate. An analog switch then passes this voltage to the appropriate RAM cell, which works very much like a sample-and-hold itself and copies this voltage.

"On playback, these cells are addressed sequentially at a variable rate to get the proper pitch, briefly mated with a sample-and-hold on the output, fed through a voltage-controlled filter similar to the ones used in the Prophet 3000 and E-III [*a seven-pole lowpass filter with three poles used to block images and the other four to change the tone color of the sound and/or to block images – Ed.*], and a low-noise VCA [*voltage controlled amplifier*]. Sum them together in an internal mixer, and voilà – a clean, natural-sounding, analog output."

MT: *What are the sonic advantages of analog sampling over digital?*
SD: "The biggest advantage is the noise floor. It stays constant, without pumping up and down with the signal level. Perhaps the single most annoying problem inherent with digital audio is that as the signal level goes down, you have fewer precious bits to process the signal, and therefore the distortion and noise floor comes up. Ironically enough, the favorite way to cover this up is to add good ol' analog noise to the signal to mask and bury these artifacts. Why not leave the noise out, leave the signal in analog form, and not introduce all this crap in the first place?"

MT: *The idea of storing and passing along audio in capacitive memory sounds very familiar to the 'bucket-brigade' devices found in old analog delay lines. But they were usually quite noisy and had low fidelity as a rule. How have you overcome that?*
SD: "First off, technology changes. We're in the '90s now. To assume that we can only achieve what was, for the most part, poorly done almost two decades ago is a disservice. We're using higher quality parts. We're using a higher voltage range. Since the noise created by our system stays pretty much at a constant level, the higher the voltage swing we can give the sound to go through, the better the signal-to-noise ratio. And since we're not limited to battery power, we can

get *quite* a voltage swing. We get a 6dB improvement in dynamic range and signal-to-noise every time we double the voltage. That part is actually giving us a problem right now. Whereas analog RAM is typically designed for 5 to 15 volt swings, we've been pushing it to 100 volts in the prototype, and some of our engineers wouldn't mind seeing over 400 or even 1000 volts. Getting UL clearance at those voltage levels is going to be difficult, though. When the sticker on the back says, 'Do not open while plugged in,' it's really going to mean it!

"Second, our technology is different. The bucket brigade devices you mention passed the signal from RAM cell to RAM cell before it reached the output. Long delays meant more passes,

> **"The software is scheduled to be completed April 1 of next year. And our engineers have the utmost confidence that they'll be perfectly on schedule."**

and a slower passing rate. Each pass degraded the signal somewhat and added noise, just like copying a tape over and over would. Our analog RAM only stores the voltage – the ASS only passes data on the way out."

MT: *Since the sound is stored in analog format, how do you perform sample editing, such as mixing and crossfade looping? How do you display samples for visual editing? For that matter, how do you store samples, since all of the storage devices with which we're currently familiar, such as disks and RAM cartridges, are digitally based?*
SD: "The storage issue *is* causing us a minor problem. Obviously, you don't want to resample everything every time you power up, although we expect our device to be so easy to use that it wouldn't really be that much of an inconvenience. We're looking into videotape or recordable videodisks as an answer – many people don't realize that video is actually an analog signal, not a digital one. Our current thoughts are to make them into an optional storage unit, or maybe allow the owner to use their own VCR to save samples. Of course, following this path opens up many possibilities – such as an audio-to-video translator, so people can use their portable video cameras for remote sampling.

"Viewing the samples is also tricky. One suggestion was to shove a CRT

into the ASS. The horizontal and vertical deflection in a CRT is actually voltage-controlled, so we would just have to generate a horizontal voltage from the address in memory and let the samples themselves provide the vertical deflection. A very elegant solution, I think.

"In the prototype, we've also installed a very high-quality 20-bit A/D and D/A for the purpose of sending data to and from our proprietary in-house sample editor. Since we only need one of each for the sake of the computer display, we don't have the expense of building in 16 or 24 DACs to pass along to the user. Marketing wants us to take it out, arguing that having digital components in what is supposed to be an 'analog' sampler is marketing suicide, but we're not quite as pious as pro-analog or pro-digital audio people. After all, we're not religious zealots here – we're perfectly sane, rational, normal engineers. And who listens to marketing anyway?

"As far as sample editing and modification, remember that many functions in current samplers and software packages are actually digital emulations of analog processes – EQ, mixing, fade up, fade down, etc. Each function can be performed by a simple analog circuit – built to high-quality standards, of course. You run the appropriate sample or samples through the appropriate processing function in real time – no need for an expensive math co-processor or DSP chip – and resave it in memory.

"Actually, there is no good reason why the whole range of old analog modular synthesizer modules couldn't be used to process samples. One of the things that we have to do between now and product release is to decide which functions to build into the ASS, and whether or not to allow room for future expansion."

MT: *Speaking of which, when do you think we can see your ASS in public, and how much will it cost?*
SD: "We'll premier it at the Summer NAMM in Chicago. We're actually rather glad that so many manufacturers are planning not to attend that show – it means that there will be fewer companies there to steal our thunder. As far as a ship date goes, the software is scheduled to be completed April 1 of next year. And our engineers have the utmost confidence that they'll be perfectly on schedule. Honestly, we don't like the industry practice of announc-

V_room & BS

THE ASS IS not the only part of the electronic music industry V_room is after. As you might imagine from all of the ex-synthesizer engineers involved, a new form of synthesis is also under development. Or is it really all that new?

"BS" stands for "Brownian Synthesis" (or in V_room's case, "Brownian Synthesizer"). Those who have studied a bit of chemistry or physics know that the random motion of atoms, particles in a solution, or even dust in the air is referred to as "Brownian motion." The people at V_room feel that the main difference between natural and synthesized sounds are the random elements that exist in the real thing, be it strange bumps in the amplitude envelope, a little instability in pitch, the almost-random way in which harmonics jump around, or even the chaotic noise of something like a bow full of rosin grabbing and releasing the string on a violin. By carefully adding random (or "Brownian") elements into the way a sound is produced, they're hoping to get a much warmer, natural, organic sound.

"We all know that compost, rather than a chemical concoction, is ultimately the best fertilizer . We feel it will be the same with music and BS," stated V_room engineer 'MIDI Bob' Breedlove. "All of those 'imperfections' found in older, non-digital synthesizers that the really hip session people in Chicago, New York and LA say are so important

are actually a form of BS. Now that we've got BS down to a formula, our marketing department predicts that everyone who has a chance to hear it will be blown away by our BS."

Further down the road, but also under development by V_room, is an analog delay for digital tape machines. Their prototype consists of a short loop of two-inch recording tape dragged over a pair of analog multitrack recording heads. The unit features digital ins and outs (unlike their ASS, which currently has only an analog output). Parallel digital delay lines time-align the signals that the user wishes to remain unaltered with those processed through the tape.

Another project closer to home for the true MIDI-head is a "feel-factor" type of MIDI delay box, in which the user sets the delays in terms of the distance separating the imaginary performers. This will be used to recreate the appropriate delays for a listener in the audience or a musician on stage in a rock band or an entire symphony orchestra. V_room is working on "closing the loop" to imitate the delays between a bass player and drummer listening to each other and varying the beat to match the other performer, and eventually (in conjunction with algorithmic composition software) two improvising musicians playing off one another.

Well, I bought it all... — *CM*

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ing a product so far in advance, but we think one year – this April to next April – is within reasonable limits.

"As far as price goes, it wholly depends on the price of analog RAM. *That* depends on the success of the current neural network and Fuzzy Logic projects in the Far East. It's ironic that an American company is hoping that an advanced Japanese research effort is successful, so that we may prosper – and possibly broadside the whole market."

MT: *I can't help but to ask – with the current trends towards digital everything, doesn't designing an analog sampler seem like a step sideways, if not ass backwards?*

SD: "The *world* is analog! For crissakes,

our *eardrums* are analog! Chopping everything up quite literally into little bits just to be able to deal with it is an artificial exercise performed only in our attempts to imitate what we perceive to be the perfection of computers, or as a cop-out to be able to communicate with them. Only when our brains have been downloaded into conventional digital ROM, or when we finally cast away our bodies and enclose our brains within the body of a cyborg with digital input and output jacks, will there ever be an honest *need* to go digital with something as ethereal and artistic as music and sound. It is the rest of the music industry – not the ASS – that is backwards, my friend."

◆
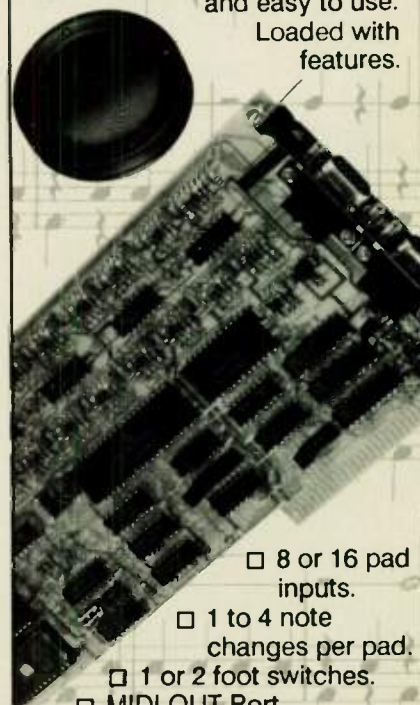
Intelligent Music
Upbeat 2.0

Intelligent Music's new drum machine emulation software gets a major update, and includes some truly exciting innovations. *Review by Lachlan Westfall.*

AS EXPECTED, THE advent of the Standard MIDI File transfer protocol has spawned a number of "niche" software programs that would be rather limited if their data couldn't be transferred to other programs. No company has embraced this esoteric form of music software more wholeheartedly than Intelligent Music. Their programs – M, Jam Factory, OvalTune, RealTime, and the new UpBeat 2.0 for the Apple Macintosh – set the standard for what has come to be known as "intelligent software."

The initial version of UpBeat (as reviewed in the August '87 issue of *MT*) was definitely a specialized product. It allowed you to create drum patterns. These patterns could then be exported as MIDI Files (*sometimes* – MIDI Files were still being worked out at that time) to other programs supporting the "standard." On its own, UpBeat 1.0 was more or less limited to drum patterns, but when combined with a variety of other programs, it was very useful.

UpBeat 2.0 (2.01 actually) walks the same road as the original version in that its primary function allows you to create sequences and songs that are very rhythmically oriented. Now that MIDI Files have settled down into a real standard and the scope of the program has been widened, UpBeat 2.0 has broken out of the drum pattern categorization and can no longer be cubbyholed so easily. While using the new version, I soon found that the point at which I used to think "Time to send this pattern over to a *real* sequencer..." has been pushed way back. I even found myself completing many musi-

cal compositions without ever leaving UpBeat. Finally, like their RealTime sequencing package, all of the features and functions within UpBeat 2.0 can be executed in real time, while the music is playing.

For the Uninitiated

For this review I'll be focusing primarily on the enhancements and additions to UpBeat 2.0, of which there are many, but just for a little refresher...

There are five main working areas in UpBeat: the Control Strip, the Palette, the Counter window, the Pattern window and the Library window. The Control Strip includes the Start, Stop, Continue and Record functions as well as the MIDI Thru selector. The Palette contains the various "tools" that are used to place notes, called "strikes," in the patterns. The Counter window displays the time in Bar, Beat and Tick and also includes a count-in parameter.

The primary working area in UpBeat is the Pattern Window. Rhythmic patterns are created by placing MIDI notes on individual tracks at specific points in a measure. This can be done by selecting a particular tool from the Palette and placing it in the pattern, or by playing notes in from a MIDI keyboard. Strikes appear on individual tracks, which can correspond to drums in your drum machine or to individual MIDI channels. The particular tool chosen from the Palette will determine the velocity of the note played.

All patterns are displayed in the Library window and can be linked in a variety of ways to form complex performances within the Song window. These Songs can then ultimately

be transferred into a sequencer in the form of MIDI Files to become the backbone of a complete composition.

Left To Your Own...

In order to work with the wide variety of MIDI instruments in the world, UpBeat requires that you "teach" it about the particular instruments you will be using. This is accomplished by defining what are known as "Devices."

Devices include all of the information necessary to allow UpBeat to talk to a specific instrument. A typical Device consists of the name of the instrument and the MIDI note numbers that correspond to the sounds in that instrument. These note number definitions, along with their corresponding names, are called "Sounds." For example, two defined Sounds for my TR-505 were the notes C1 as "kick" and D1 as "snare."

When defining a Device for a drum machine, each Sound will typically have a single note number. However, a Sound definition need not consist of only a single note. A single Sound can consist of a number of different MIDI notes, triggering a variety of Sounds on a particular instrument. I typically use multiple notes when defining a hi-hat so that slightly different Sounds can be used to produce a more realistic effect.

UpBeat 2.0 has greatly enhanced the ability to define more than one note for each Sound. Each Sound now has up to 127 "steps," and each step can be a different note or chord. When a strike is painted into the Pattern window, any step can be selected. There is also a random step indicator that selects a step from those available. This is what I used when defining my hi-hat pattern, so that it would sound slightly different each time it played (try doing *that* in a traditional sequencer).

The actual MIDI notes for each step within a Sound can be defined on the screen by clicking on a note grid in the window or with a MIDI keyboard. Once the Devices are defined, the information is transferred to the Pattern window where the actual performance is recorded.

On The Right...

Tracks in the Pattern window can be defined in two ways: by simply clicking on a new track and assigning a MIDI channel, or by using previously defined Devices to set up the tracks in the pattern for you. Since a Sound can

consist of a single note or combination of notes, two types of track definitions are available in UpBeat 2.0 – Rhythm and Normal (corresponding to Drum and Synth in the previous version).

When a Device defines a Pattern's tracks in the Rhythm mode, each Sound in the Device gets an individual track. For example, the tracks for a drum machine Device might consist of kick, snare, hi-hat, lo-tom, hi-tom, etc. The Normal mode is used when you want to record and play back musical information in the form of notes and chords, and the track definition simply corresponds to a MIDI channel number. This mode is oriented toward multiple notes on the same track.

As far as the Device is concerned, there's not much difference between the two modes. It's when you use Devices to create patterns in the Pattern window that the differences become apparent. Simply put, Rhythm Devices create many tracks with one note each and Normal Devices create single tracks with many different notes.

All Devices are stored in the "Device List & Input Setup" window, which consists of 16 lines, one for each MIDI channel. From this window, you can load up to 16 Device definitions into UpBeat from a file stored on disk and assign them to MIDI channels simply by dragging them into the slot corresponding to the desired output channel. An input channel that is different

from the output channel can be defined, if desired. However, while channels can be defined to be sent out over the modem or printer port, only 16 channels are supported.

It seems like it takes a while to get to the point where you're making music, and in truth it does take some time and energy to set up the program the way you want it. Luckily, you really only have to do this once, and from then on it's "grab your Devices and go."

An Entirely New Dimension

Tracks play notes from two different sources – the track itself and the step list. Notes input from a MIDI keyboard or placed with tools from the Palette are stored in the track itself. They are displayed as Note name and octave (e.g., C3). However, notes can also be played from a previously defined "step list" (see **Figure 1**). One of the most significant advancements in version 2.0 is the addition of these 127 steps to each track.

As with defining Devices, these steps are certainly advantageous with rhythm patterns. However, they add an entirely new dimension to the program when used to create a "Normal" Device and a track for recording notes and chords from a synthesizer. These steps can hold a veritable library of notes and chords that can be selected specifically or at random.

Aside from allowing you to creatively decide which notes are played, UpBeat provides a number of intelligent means of controlling *how* recorded notes are played. Both the duration and articulation can be precisely defined or put under the control of the pro-
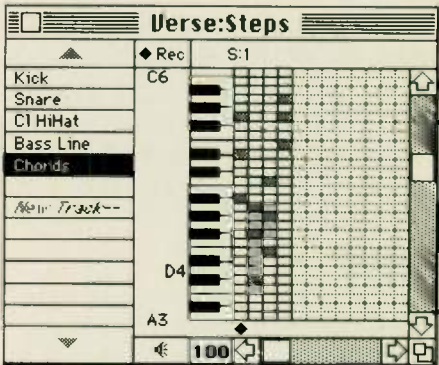
Figure 1. Step List.

gram. By "put under control," I mean that variables set up within the track can be used to determine the velocity or articulation of a particular note or chord. The many variables associated with how a track plays back are best described by examining the eight display modes for each track in a pattern.

1. Main

The Main window displays the notes recorded in the track. Version 2.0 provides a number of new ways of looking at each note (see **Figure 2**): the strike value, strike/note length, strike/ ▶
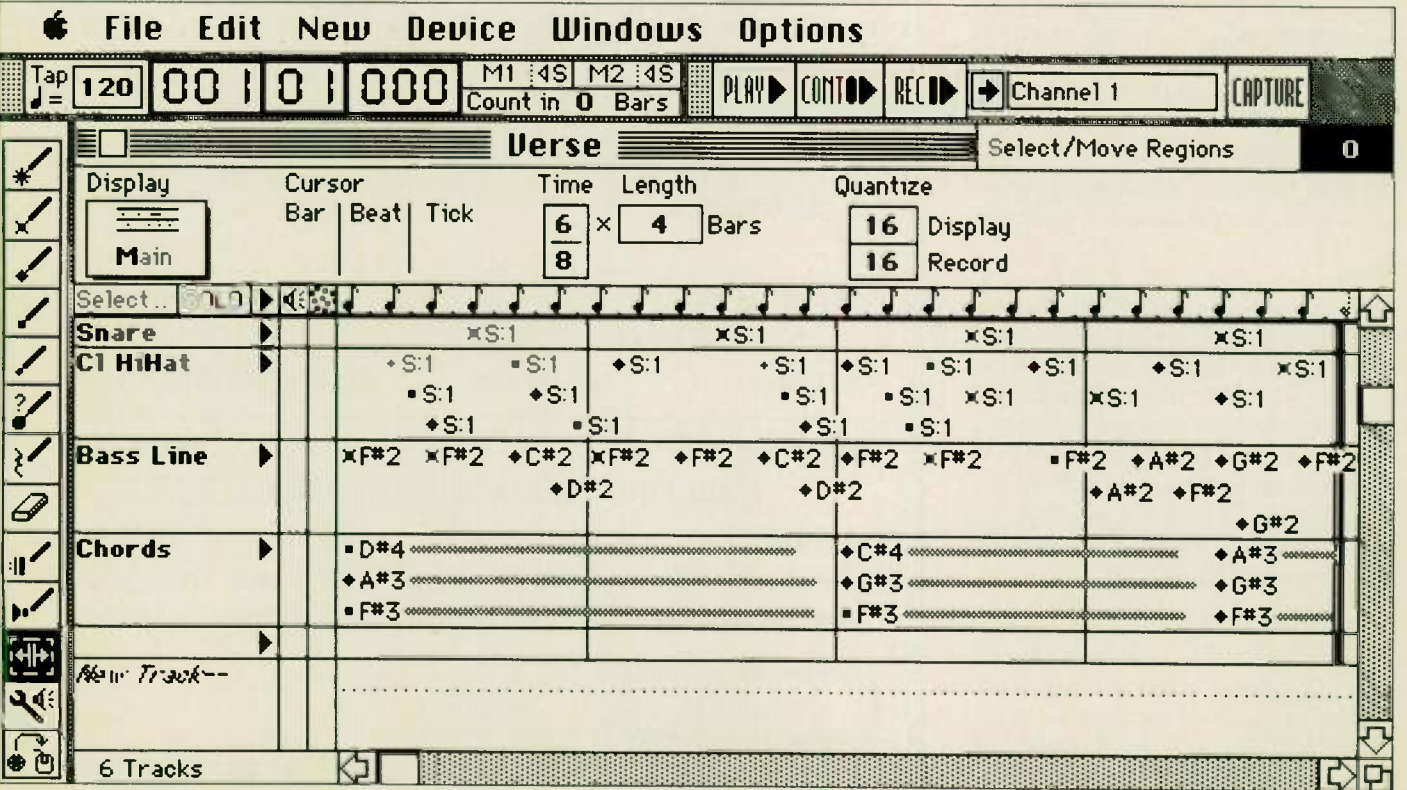
Figure 2. Main Window.

▶ note number, note number/note length, or strike/note number/note length. This is a very helpful improvement – now you can display rhythm tracks as strikes, and melody tracks as note numbers and lengths.

2. Output

The Output window displays the MIDI channel, any Device assigned to the track, transposition, initial program change number, and even a MIDI Volume value. On looped tracks, the program change message is sent out on the first play only.

3. Velocity

The Velocity window shows the specific velocity values assigned to each strike tool in the Palette window. Each tool can be assigned a specific central value and a range around that value. For example, a tool set to 30 with a range of ±10 would produce random velocities ranging from 20 to 40.

4. Random Velocity

In addition to the five specific strike tools, there is a "Random" tool that gets its velocities from the other five. This window allows you to select which strike tools are most likely to be chosen by the random tool.

5. Articulation

Like velocity, the articulation (length) of a note or chord can be controlled by the program. Five articulation strikes are available that can range from 3% to 350% and feature a '±' value similar to the velocity display.

6. Random Articulation

A sixth "random" articulation strike is available. It's parameter is set here.

7. Fills

The fills option directs the program to "fill in" empty spaces with notes from the track. UpBeat provides control over how the fills are produced from this window. You can select the source track for the fills, the rhythmic division of the fills and the percentage of empty space to be filled. The spacing between existing notes and notes in the fill can also be adjusted.

8. Time

The "note density" can be adjusted here, providing control over how many of the notes in the track are actually played. The actual placement of the notes can also be adjusted with a '±' value in ticks.

Even More Control

Another significant improvement over version 1.0 is the addition of a few more tools in the strike Palette. Not only can notes be placed in the Pattern Window, but so can MIDI program change numbers, allowing you to change synthesizer sounds within a track. The selection tool has also been expanded to allow you to copy a section and not only paste it to another location but also to a larger or smaller location with the "fit paste" option. The placement of the notes are appropriately scaled when inserted. This function can also be performed in real time with the Compander function for some interesting interactive "jamming" sessions.

Other paste options include Merge paste, which merges new information with information already on the track; Clipped paste, which lops off any extra information that won't fit into the selected area; Swap paste, which exchanges data on the clipboard with data in the track; and Repeat paste, which duplicates copied information until it fills the selected area. These are just a few of the very powerful editing tools found in version 2.0.

Unlike the previous version, tracks in UpBeat 2.0 can now be looped by inserting a loop point with (appropriately enough) the "loop tool." The loop doesn't have to be at the end of a measure; it can actually be placed at any point in the track. When multiple tracks are looped, some very complex polyrhythmic effects are possible. Further control over looping is provided by the "loop percentage" parameter. Loops in UpBeat are not necessarily absolute – a 50% loop will only repeat half of the time. In addition, more than one loop can be placed in a single track and each loop can have a different percentage.

The MIDI File Connection

Once you've created a performance, it's possible to "record" it for posterity. This is done by means of the Capture function, which takes any information produced while UpBeat is playing (including changes made by the user as it is playing back) and records the performance. This captured performance can then be saved as a Standard MIDI File for use with other programs.

In addition to the Capture function, UpBeat can also export a Pattern as a MIDI File. This option allows you to avoid having to play the whole song in order to create a MIDI File. The data in the pattern is simply and quickly saved in MIDI File format on disk. When exporting the pattern, there are three options for saving: as a Pattern File, Single-track MIDI File (type 0) or Multi-track MIDI File (type 1). In addition, the number of repetitions of the pattern saved in the MIDI File can be specified.

Unlike UpBeat 1.0, the new version can now *import* MIDI Files. This can be accomplished in one of two ways. The MIDI File can be imported into a Pattern where notes and program changes will show up in the tracks corresponding to their MIDI channel – just as if they were recorded directly.

Figure 3. MIDI File import dialog box.
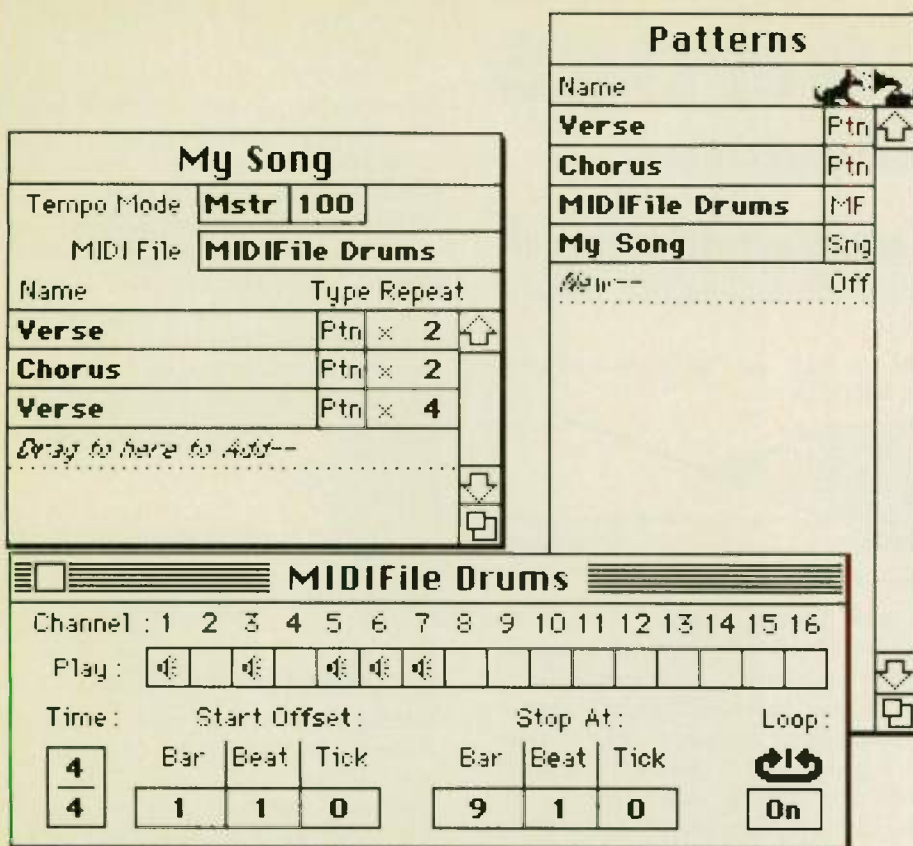
Figure 4. Song Window with imported MIDI File.

When imported into a Pattern, any other MIDI File data (such as pitch-bend) is ignored.

MIDI Files can also be imported and stored in the Pattern/Song list. When importing in this fashion, a dialog box (see **Figure 3**) allows you to select which channels are to be imported, as well as the types of MIDI data desired. The options include: Poly Key Pressure, Mono Key Pressure, Notes, Pitch Bend, Program Change, Tempo Maps, and even System Exclusive.

After a MIDI File is imported into the Pattern/Song list, it can be used with a new Song and can play in the background. The Song can then follow the tempo map of the imported MIDI File and send information such as continuous controllers that could not otherwise be recorded into UpBeat. Those channels that are played, the start and stop time, and looping of the MIDI File can all be adjusted from the Song Window for added control (see **Figure 4**).

Conclusions

This is quite a program – it was a bit overwhelming at first. One of the things I liked best about the original version was that it was a lot easier to grasp than many of the other Intelligent Music Programs (I'm still struggling with M) On the other hand, UpBeat 2.0 approaches other IM products in complexity, but does an admirable job of retaining the straightforward approach of the previous version. With respect to the user interface, the ability to decide how the data in each track is displayed is an excellent improvement, since users will now be more inclined to record musical information as well as rhythmic patterns. However, UpBeat's inability to record pitch-bend or other continuous data will be a hindrance to some.

Unfortunately, I had my share of system crashes and freezes when working with the program. I ran UpBeat 2.01 on an 8Meg Mac II with a color monitor. The crashes only occurred when running in color (which looked really cool, by the way), under MultiFinder, and using the MIDI Manager (see sidebar 'Apple's MIDI Manager'). As soon as I turned off color, stopped using MIDI Manager and removed all unneeded INIT files, there were no more crashes – even under MultiFinder.

In my opinion this program is a must for any Mac/MIDI tweak-head (like myself). However, the increased complexity may be too much for those just looking for a simple drum pattern program. I foolishly pride myself on being able to sort out a program without resorting to the manual. Not this time! You'd better do your homework. Thankfully, the manual was easy to follow and very complete.

With the increased flexibility in recording notes and chords, the extended MIDI File support, and (notably) the real-time capabilities, UpBeat 2.0 has taken a significant step forward. It has advanced to the point of being a MIDI sequencer, albeit unique and specialized, in its own right. If it fits your style and you have the energy to learn it, UpBeat is well worth having. ◆

PRICE: $249

MORE FROM: Intelligent Music, Inc., 116 North Lake Ave., Albany, NY 12206. Tel: (518) 434-4110.

Apple's MIDI Manager

LIKE MANY OTHER new versions of Macintosh MIDI software, UpBeat is now able to communicate MIDI information via Apple's new MIDI Manager system software. Among other things, the MIDI Manager routes MIDI data to the modem and printer ports on the Macintosh. This is done with a desk accessory call Patch Bay. This DA allows you to simply draw connections between the "output" of UpBeat and the Mac port to which you want to send data. To patch incoming MIDI data into UpBeat, you would connect the output of the Mac to the input of UpBeat in the Patch Bay.

The real power of the MIDI Manager becomes evident when running under MultiFinder. In this case, a number of applications can be open and running simultaneously. If you're running UpBeat with a MIDI sequencer they can *both* be patched to the modem port and sending data simultaneously. Furthermore, the output of UpBeat can be directly patched to the input of another program, such as a sequencer, without ever going out over MIDI. Simply patch one program's output to another's input and bypass the modem or printer ports altogether.

MIDI Manager also handles synchronization between programs by separating out Clock or MTC timing messages and providing applications with clock in and clock out ports. The MIDI Manager software is provided on the UpBeat master disk, and will also be available with System 7.0. ◆

SAMPLE EDITORS
The Missing Features

A short diatribe on how sample editing software could still learn a few more basic tricks. *Complaining by Chris Meyer.*

SAMPLE EDITING PACKAGES are the word processors of sound – giving them up would be like going back to a typewriter and paper. But whereas most word processors do a pretty good job of aiding and abetting the writing process, many features in sample editors seem to take an abstract physics approach to editing sound rather than a musical (or even synthesizer-oriented) one. This article is intended as an open letter to the creators of these programs, expounding on features and considerations that us sample-hounds (with ears) need. It may also give *you*, the users, some ideas for work-arounds to cope with what you now have.

Shapes

The amplitude envelopes of natural sounds tend to follow an "exponential" curve – attacks quickly rush up towards full volume and then round off before peaking. Decays drop quickly and then spend the rest of their time gracefully curving towards silence (okay, maybe that's an overly poetic way of stating it, but it's easier to relate to than a mathematical equation).

Conversely, many digital synths and samplers have "linear" envelopes that rise and fall at a perfectly even pace. This is considered by many ears to be inferior to the exponential shape of nature and many older analog synths. **Figure 1** illustrates the difference with a simple attack/decay envelope.

linear   *exponential*
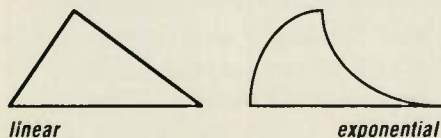
Figure 1. Attack/decay shapes.

Unfortunately, crossfades in sample editors (from one sound to another or during a crossfade loop) tend to use linear or incorrectly-shaped exponential envelopes. **Figure 2** shows such a linear crossfade from one sound to another. This sounds slightly wrong to

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the ear, just like the linear envelopes in digital synths.

old sound   *new sound*
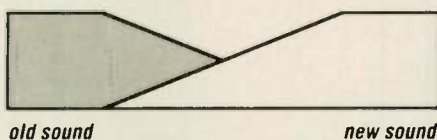
Figure 2. Linear crossfade.

Some sample editors borrow from the well-known equal power panning curve while creating a crossfade (refer to the Advanced Sampling Course in the February '90 issue of *MT* for more on equal power crossfades). **Figure 3** shows the relative volumes of the left and right channels as the user turns the pan control from left to right.

left   *right*
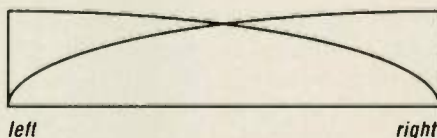
Figure 3. Equal-power panning curves.

This is fine for reconstructing the static *position* of a sound (also for crossfading from one sound to another over the length of a keyboard – again, we're talking position), but it was never intended to be a continuous function *over time* to fade from one sound to another (**Figures 4 and 5** show what many sample editors do in this regard). At least one sample editor also uses this reverse-exponential curve to fade a sample down to silence. The resulting curve is like the attack of a sound

old sound   *new sound*
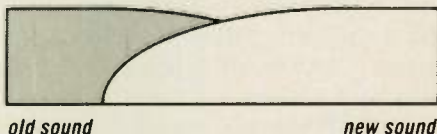
Figure 4. Wrongly applying panning curves to a crossfade.

old sound   *new sound*
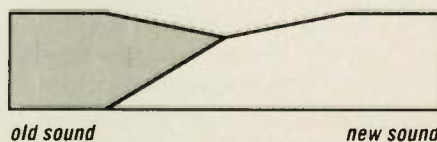
Figure 5. Pseudo-exponential panning curve crossfade.

played backwards, which is even worse than a linear fade.

If you think of a crossfade as one sound decaying while another attacks, the envelopes of these two sounds would look like **Figure 6**. Yes, I have actually heard this curve (along with all of the others above), and it is the smoothest, most natural one I've run across so far. In an odd case of hardware being ahead of software, no sample editing packages that I know of do this, but two samplers do – the E-mu EIII and the Sequential Studio 440.

old sound   *new sound*
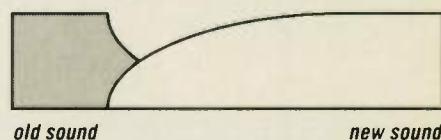
Figure 6. Proper exponential attack/decay crossfade.

Backwards/Forwards Follies

Bidirectional loops are great for making a short loop seem longer (since you're playing the sound between the loop points forwards and then backwards). They also seem to imitate a natural bowing motion more nicely than forwards-only loops. Unfortunately, they also get the short shrift from many sample editors.

The first problem is the "loop window" found in most sample editors. On the left half of the screen, these windows show the sound just before the loop end point. On the right half, you see the sound just after the loop start. The same view is used for forwards-only and backwards/forwards loops. In a unidirectional forwards-only loop, this is the way the sound actually flows, and is therefore correct.

But in bidirectional backwards/forwards loops, once the sound hits the loop end, it reverses and starts playing backwards – so a mirror image of the sound should be shown on the right half of the display (not an unrelated image of the loop start) to get the correct idea of what's actually happening. **Figure 7** shows a loop window and an overview of the sound for a bidirectional loop – it looks horrible, but sounds fine.

In bidirectional loops, the loop start is an entirely different point than the loop end. Each point should get its own loop window, and should also be crossfaded individually – after all, they are two entirely different loop points that don't interchange data. Many times, I've seen the crossfade process ruin one point that was fine while it
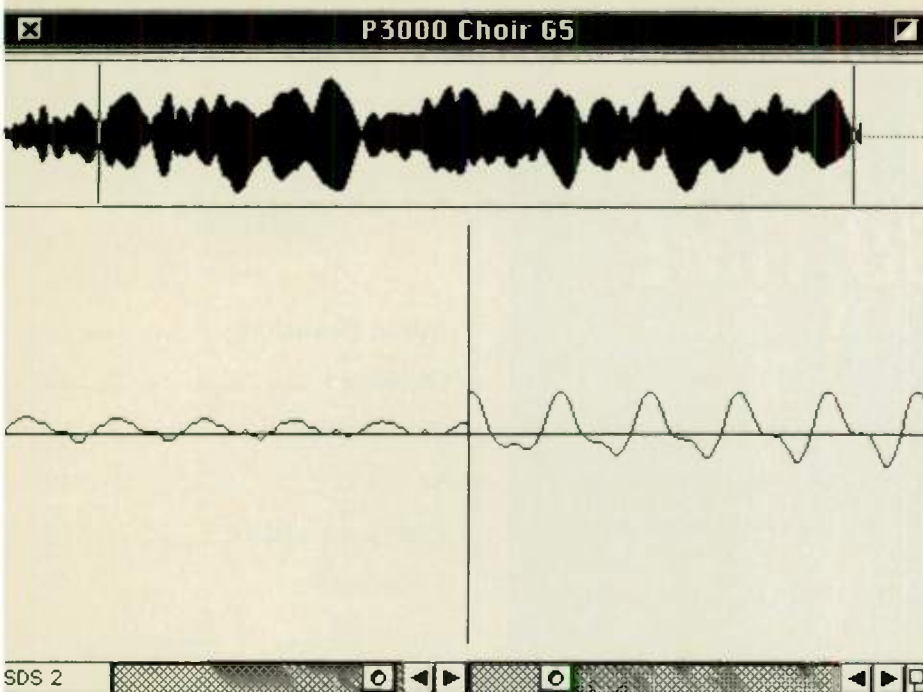
Figure 7. Loop window and overview of entire sound showing a misrepresented bidirectional loop.

corrected the other point that clicked. Again, only one hardware sampler (the Studio 440) and no software package treats crossfades in this way.

Speaking of clicks, correctly performed backwards/forwards crossfades shouldn't click. They don't in the Prophet 2000 or in GenWave (a sample editing package for the Atari ST), but they do in everything else I've tried. I believe it's just a simple math error, the result of offsetting by one sample when performing the crossfade. I personally wrote the crossfade software in the Prophet 2000 back when I worked for Sequential *(RIP)*. It clicked on backwards/forwards loops until I sketched it out on paper and fixed a simple offset-by-one-sample error. But so many sample people don't use bidirectional loops – or assume that they *can't* work by their very nature, that they don't give them a fair shake.

Plus...

I'd like to see some of the mindsets in sample editing packages expanded a little. For starters, there's the assumption that the length of the crossfade at the start and end points must be the same. The only actual *rule* is that the sound must be exactly the same *exactly at the loop points*. How quickly they approach this at either end can, in theory, be as different as the user desires. Treating the two ends differently may allow us to break up some of the overly-cyclic effects crossfading tends to have on loops.

Also of interest would be more available choices for crossfade mixes at the loop points other than the typical "linear" (50/50 mix) and "equal power" (71/71 mix). The idea is to keep the amplitudes at the loop points after the crossfade is performed the same as amplitudes before the crossfade. Giving the user more latitude in selecting this mix would be useful. Even better would be a program that could auto-detect the amplitude at the loop point before and after a trial linear crossfade, and then decide what strength of non-linear crossfade to perform on the sound to make it come out right.

I also think that it would be nice for sample editors to behave more like paint programs – samples should be treated as general "shapes" to replicate, twist, and overlap with other shapes. Current sample editors tend to treat samples on a point-by-point basis, or as blocks to cut and paste like paper. Anything that might make it easier to merge and recombine several samples into one new sample might go a long ways towards overcoming the "factory disk" or "just another piano" syndrome.

In general, I get the impression that the marketplace feels that samplers – and sample editors – have pretty much reached the end of their evolutionary lines. Well, I don't. I hope that some bright engineers at the software houses and sampler manufacturers also think that the Art of Sampling has a long, long way to go before it gets frozen, framed, and hung out to dry.   ◆

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