MUSIC TECHNOLOGY

AUGUST 1989 USA $2.95 CANADA $3.95

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IMAGINE MY SURPRISE

LIFE IS FULL of surprises. Imagine mine when, after working at Music Maker Publications for only two months as Group Technical Editor of their three magazines in the US, I was asked to be the Editor of Music Technology magazine. "What about Bob O'Donnell?" I asked. "He's leaving to join the competition," was the reply. See what I mean about surprises? Even though he's a dirty rotten low-down scoundrel for doing it (just kidding, Bob!), all of us at Music Maker wish him the best of success in his new endeavors.

Now I'm faced with a new challenge, a new frontier if you will, beginning with this editorial. As I thought about what to write, I decided that it might be a good idea to tell you a bit about myself and my background. I'd also like to introduce our new Group Technical Editor and give you some hints about the exciting new directions that we plan to take in this magazine.

I've been involved in electronic music for over fifteen years, working with all types of musical equipment from the original Moog modular systems to the Synclavier and Fairlight Series III. I own and operate a MIDI studio equipped with Macintosh and PC/AT computers. I also serve on the Executive Board of the MIDI Manufacturers Association.

For two years, I worked as a product specialist and writer/editor for Roland-Corp US. After that, I formed my own consulting business and wrote many user manuals for Yamaha, Digidesign, and Hal Leonard Publishing. In addition, I was the managing editor of *fairlightning*, a newsletter for the North American market of Fairlight Instruments. My articles have appeared in such publications as *Roland Users Group*, *db Magazine*, and the *IMA Bulletin*. During this period, I also wrote a book entitled *Tuning In: Microtonality in Electronic Music*, which is published by Hal Leonard Books. This book, the first of its kind, presents the basic principles of tuning systems and temperaments for electronic musicians in clear and simple terms.

As an educator, I've taught music, synthesis, acoustics, physics, mathematics and computer classes at all levels from elementary through university. I've produced seminars in electronic music at the University of Southern California as well as numerous training courses for music educators. In addition, I work as a professional performer, composer and arranger in a variety of electronic, symphonic, jazz, experimental and early music projects throughout California and the United States.

As I move on to sit in the editor's chair, a new face joins the crew as Technical Editor. Lawrence Ullman is also a professional musician who worked at Roland for two years as a product specialist and writer/editor. He then moved to New York, where he helped to develop the Music Technology program at Columbia University's Teacher's College. Upon his return to sunny Southern California, he formed his own consulting business, providing computer training and support to a wide variety of clients. We welcome his experience and ability to communicate complex concepts clearly and effectively.

Practically everyone who follows this industry knows that the music technology market is changing. Gone are the days of equipment-hungry consu-mers devouring anything just because it's new. We recognize this trend and plan to implement some important changes in the content of this magazine to reflect it. You'll start seeing the results of these changes in our special Third Anniversary issue next month (Has it been three years already? Time sure flies when you're having fun!). Until then, keep on making music! ■ *Scott Wilkinson*

VOLUME 3, NUMBER 12
AUGUST 1989

Cover photography *Melodie Gimple*

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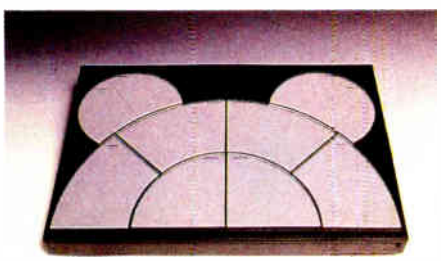

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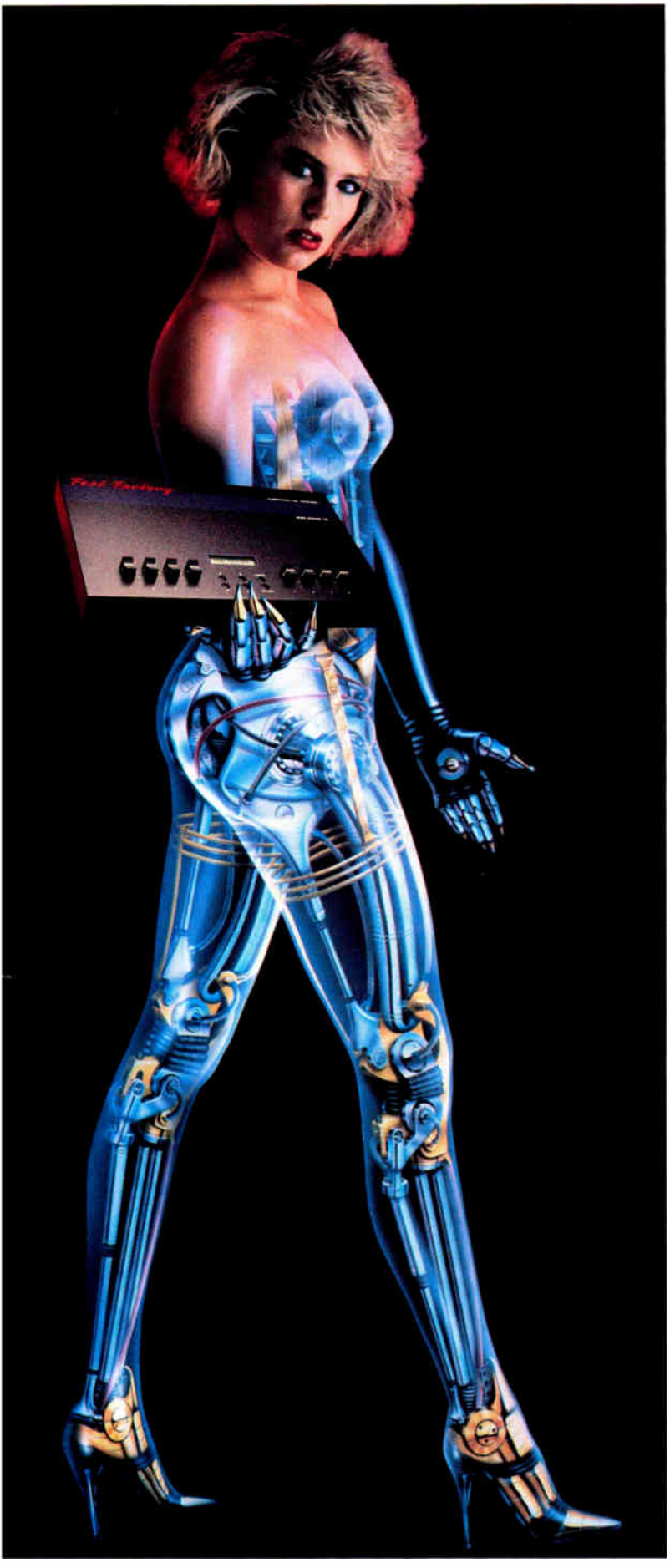

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NEWS DESK

MIDI GURU

Forte Music has revamped the Mentor MIDI Processor. The Mentor now sports a healthy 6 MIDI Ins and 6 MIDI Outs by which to run data through its eight independent programmable MIDI processors. So what does that boil down to? Basically, a lot of control. The Mentor will hold 64 presets in memory, in which to place individual settings for each MIDI device's patch number, volume, transpose, key range, dynamic scaling, controller mapping, and merge assignments. And while we're speaking of merging, any number of Ins can be merged to a single Out, or several groups of Ins may be merged into multiple Outs. Also, any of the eight data processors can be set up to pass data on all 16 MIDI channels. The Mentor comes equipped with a 5"×7"×8" remote controller complete with a 48-character backlit LCD and four programmable control sliders. The Mentor also features inputs for eight control footswitches and pedals ($50 for each dual-control footswitch) and eight control voltages, as well as outputs for eight programmable control bits. An optional memory card ($120) will add 64 more programmable preset locations. The new Mentor, along with one dual control footswitch and remote control w/stand, retails for $995.

MORE FROM: Forte Music, Inc., 1951 Colony St., Suite X, Mountain View, CA 94043. Tel: (415) 965-8880.

VARIABLE CONTROL

JL Cooper Electronics have announced the release of their new FaderMaster MIDI Command Controller ($299), a table-top unit consisting of eight programmable faders designed to control any type of MIDI data. Each of the eight faders can be individually programmed to send MIDI volume, pitch-bend, aftertouch, program change, MIDI note, non-registered controllers, and continuous controller data information in real time. Also, each fader can be programmed for maximum and minimum MIDI channel number, and MIDI data density. In addition, any fader or set of faders can be grouped with any other, allowing for a number of merging capabilities. Finally, SysEx data can be programmed from JL Cooper's Macintosh or Atari "DA" (desk accessory) program ($29.95).

A special "delay mode" can be assigned to any fader, allowing MIDI note and MIDI clock data to be delayed by up to 15 milliseconds in real time.

JL Cooper's FaderMaster.

When using it with synths and effects processors, FaderMaster can be programmed to access up to eight editing parameters at once in real time.

FaderMaster comes pre-programmed with 25 factory "banks," including setups for programming the Korg M1, Oberheim Matrix 1000, Kawai K1 and K4, Roland D50/D10/D20 and MT32, Yamaha DX7 series, E-mu Proteus, Kurzweil K1000 and others, the Alesis QuadraVerb, ART MultiVerb, DigiTech DSP128+, and "mixing" setups for use with MIDI sequencers. In addition, FaderMaster offers nine user-definable banks and two SysEx banks, all stored in ROM.

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

PEAK EXCITEMENT

Aphex' has unveiled their new Aural Exciter Type III ($995), which incorporates a number of features not found in previous Aural Exciter models, including their new Aphex VCA 1001 processor, two modes of noise reduction, and the company's unique "SPR" Spectral Phase Refractor, designed to recreate and restore missing harmonics.

The two modes of noise reduction are: Mode "A," a linear sidechain expander with variable threshold, functions at a 2.5-to-1 expansion ratio, allowing the sidechain "mix" to follow the signal level below the threshold. Therefore, when higher input frequencies drop below threshold, the "mix" falls proportionately at a 2.5-to-1 ratio. Mode "B" is an all-new noise reduction method which actually "erases" source audio noise while the Aural Exciter Type III simultaneously enhances the signal.

Spectral Phase Refraction is a psychoacoustic enhancement designed to correct the phase delay problem that occurs when low frequency sound passes through numerous duplications. This increases the apparent bass energy level without amplitude equalization or "bass boost."

MORE FROM: Aphex Systems, Ltd., 13340 Saticoy Street, North Hollywood, CA 91605. Tel: (818) 765-2212.

Aphex' Aural Exciter Type III.

NEW MAC SEQUENCER

Gateway Software has released Rhapsody, a new sequencer for the Macintosh. Rhapsody ($149) combines a fully graphic click-and-drag user interface with a host of features including a graphic track editor, generic patch/SysEx editor/librarian, an integrated graphic drum programmer, a complete database manager, and graphic event data editing. Rhapsody records up to 64 tracks, with 192 ppqn resolution, and standard MIDI File support.

MORE FROM: Gateway Software, 4446 Salisbury Dr., Carlsbad, CA 92008. Tel: (619) 434-0823.

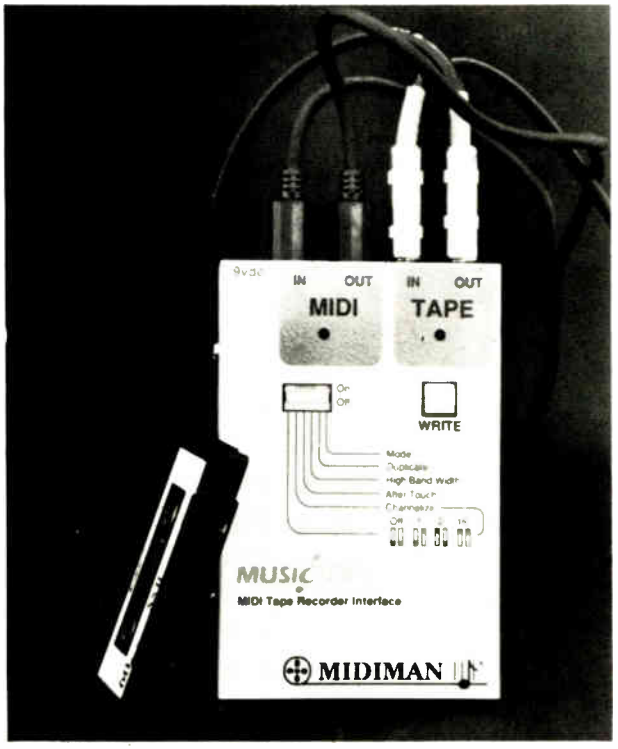
AURICLE ADDRESS

The previously published address for Auricle Control Systems was incorrect. Their correct address is: Auricle Control Systems, 3828 Woodcliff Rd., Sherman Oaks, CA 91403. Tel: (818) 990-8442.

MIDI To Tape

Musicsoft's latest MIDI hardware product is MIDIMan, a MIDI tape recorder interface that will turn your tape deck into a MIDI recorder/player. MIDIMan ($199.95) allows any synth or MIDI-equipped personal computer user to record MIDI information directly to audio tape in real time. MIDIMan stores all MIDI data such as patch change and controller information, eliminating the need to drag around a computer or hardware sequencer. Note storage is limited only by the length of the tape. MIDIMan allows you to store SysEx data dumps of up to 2000 bytes and MIDI timing information directly to tape, thus allowing it to act as a "dumb" sync box for recording and syncing sequencers to tape. Support of both normal and high bandwidth rates for use with DAT recorders and other high bandwidth tape decks, as well as aftertouch on/off modes for filtering extraneous aftertouch information is also featured. Tape Duplicate mode can be selected for making backup tapes, and Channel Select mode can be used for passive channelization (over all MIDI channels) or selective channelization over channels 1, 2 or 10. A special MIDI transmit priority allows selective prioritization of data to channel 10 first and then to channel 1.

MORE FROM: Musicsoft, 1560 Meadowbrook, Altadena, CA 91001. Tel: (818) 794-4098.



Musicsoft's MIDIMan.

Macros for Personal Composer

Personal Copyist version 1.7 is a new macro system designed for and compatible with all versions of Personal Composer. Personal Copyist features "Mr. Copy," a macro file for writing lead sheets and chord charts, with easy-to-remember keystroke commands for quick input of notes, ties, accidentals, beaming notes, chord rhythms, performance directions, and extra-large title fonts. Also included are chord grid tools, a complete library of over 300 labeled guitar chord diagrams, and a choice of different score or staff layouts on which to write your music. The package retails for $69.

MORE FROM: Imagine Marketing Co., P.O. Box 1400, Brea, CA 92622. Tel: (800) 662-6434.

Quest For Compatibility

Music Quest has extended their line of MIDI interfaces for IBM PC/XT/AT and compatibles with their new MQX16 ($199) and MQX16S ($249). Fully compatible with the MPU401/IPC, the MQX16 features Chase Lock tape sync, allowing the user to start syncing at any point on tape, and is compatible with all sequencers that support MIDI Song Position Pointer. The MQX16S also includes SMPTE support for audio-video applications, syncing and striping 30-frame drop and non-drop formats.

MORE FROM: Music Quest, Inc., 2504 Avenue K, Suite 500-492, Plano, TX 75074. Tel: (214) 881-7408.

Human Synthesizer

Stanford University and Center for Electronic Music recently hosted a demonstration of Biomuse, a system developed to create music with the human body's normal bioelectric signals. These signals are detected by small disk electrodes placed on the skin and converted into standard MIDI code. Biomuse, developed by physiologist Hugh S. Lusted and graduate student Benjamin Knapp, converts the electrical activity from the muscles, eyes, and brain to MIDI messages in order to control a sound's spatiality, loudness, pitch and timbre. The current prototype of Biomuse is a stand-alone RS232 device that can be interfaced with any personal computer.

The Center for Electronic Music (CEM) is working closely with the Stanford team in a collaborative fundraising effort to promote further studies of Biomuse's potential in clinical applications, particularly where disabled persons are unable to play conventional musical instruments due to limited range of motion.

MORE FROM: The Center for Electronic Music, 432 Park Avenue South, New York, NY 10016. Tel: (212) 686-1755.

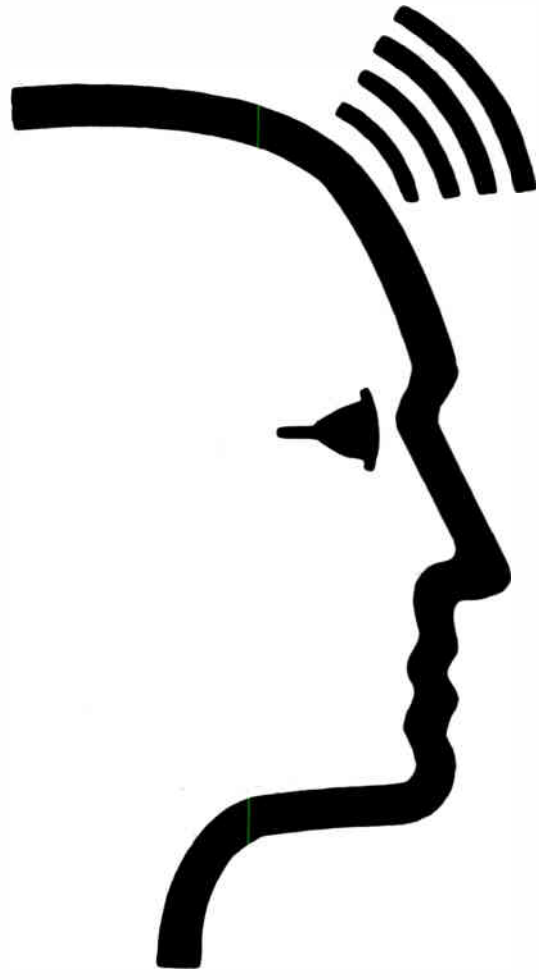
Mac in a Rack

Current Music Technology announces the release of the Mac 'n Rak Plus ($3495) computer system. The system includes an Apple Macintosh Plus computer, 20 megabyte hard disk, MIDI interface with two MIDI Ins and six MIDI Outs, and optional SMPTE-to-MIDI timecode converter, all in a 4-space rackmount package. The Mac 'n Rak Plus has been upgraded and redesigned since its '88 Summer NAMM unveiling, featuring an improved chassis to withstand careless handling and normal vibrations associated with road touring, and a new front panel, featuring a more logical layout.

MORE FROM: Current Music Technology, 146 Paoli Pike, Malvern, PA 19355. Tel: (215) 647-9426.

Current Music's Mac 'n Rak Plus.

WANTED



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READERS' LETTERS

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

Cross-Examination

Did you ever see a movie that you thought was just great, only to later read a critic's scathing review bearing an intangible celluloid virus, attempting to reduce the creator's hard-labored film to plastic goop? Ever wonder about the wide difference of opinion between you and the critic, or even between two critics? Could it be that opinion, like truth, is always relative? Ever wonder how the movie creator feels? No doubt about it – pissed off!

So I find myself in the position of the allegorical movie creator. Only in my case, the disaster is a "home demo . . . LP" for the Korg M1 with "mediocre, obscure-timbre, life-lacking, non-killer" sounds put to songs that makes a person's attention slowly drift to "playing solitaire" with a computer, and at a price you need to "brace yourself" for.

This pretty much sums up Mr. Menotti's opinion of Electron Artistries' M1 Sky Album, reviewed in the June issue of MT. Only three favorable comments were graciously awarded to the first song, two of the sounds, and for a good concept behind the product idea.

In the "do it my way" category, we lost points for not offering our product per the reviewer's "understanding" of appropriate marketing (excuse our ad in MT, and we do sell through local music stores), for not offering the "expected . . . full card" of sounds (we clearly advertise what we sell, price it accordingly, and provide a Program/Combination list, yet the reviewer expected more), and for failing to "do like the factory does" in composing sequences (strong encouragement for compositional exploration?!).

Apparently, the M1 factory music satisfies the reviewer's curiosity about the machine's potential, so – just take what's offered, pal, and don't ask questions like: How well does the Workstation support full-strength songs? How can I automate the effect processor levels within a song, and what advantages are their use in series or parallel mode? Exactly what do you do to switch sounds within a sequence track? How do you incorporate tempo changes and how elaborate can they be? How do you conduct automated fade-outs or fade-ins? How can I get around the one time signature per song restriction? How can track volume edits help in avoiding timbre-upsetting note velocity edits? What about track or individual drum panning? How do you incorporate and chain patterns and how effectively can they be used in situations like switching an instrument pattern to drive a drum kit within the same song?

And what about the sounds themselves? Can I create brass swells to fit the tempo of my song? Nature sounds, like a coyote for a western song, or maybe a gunshot with its associated ricochet? How about a long, sustaining background sound that evolves instead of just idling? I'm a fan of Isao Tomita – how about a realistic human whistle? Maybe a harmonica-type sound with expressive feel? To what extent can the drum sounds be modified? What if I'd like to open my stage act with a police siren sound that rushes the crowd, doppler shifts, then fades into the background? How about a billowing flame sound, thunder, or a lead line instrument that pitch-bends in proportion to the length each note is held? Maybe a mellow steel drum that changes into two other sound textures? Perhaps a flute sound that, when sustained, evolves into a flutter effect? How about the sweet sound of a plucked, sustaining harp? How about an organ-guitar sound created with a harmony interval to fit a particular musical scale? When I put these sound ideas with the sequencer ideas, how much does it tax the processing ability of the M1?

All these questions and more are addressed in the M1 Sky Album. This audio reference's user requirements are to listen to the music and to know how to view settings in the Sequencer and Program Edit mode – not too difficult. Each of the six songs demonstrates different programming and sound aspects. Twelve pages of information are included with a listing of all Programs and Combinations, data loading instructions and precautions, general tips, and details of each song's setup and activity – all provided to, but never mentioned by, the reviewer.

The press release and phone calls to MT describing the purpose of the Sky Album were somehow misinterpreted (or disregarded) to put emphasis on the "LP" marketing aspect of the project. Music marketing via file data distribution (mail or phone line) is going to happen, but for now it's only in its formative stage. The sounds, the songs, and their symbiosis (mixture) form three equal points in the triangle of this product – no one point being dominant! You know – kind of ah . . . ah . . . workstation concept! Yeah! ►

Jazz at its finest. The Blue Note, New York.

PLAN ON SPONTANEITY.

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► That's the ticket!

Regarding the "full card of killer sounds" issue, our definition of a "killer" sound is one that fits its intended purpose. If you need an unspectacular bug fart sound to enhance a wildlife documentary, then that fabulous sound bank of six-layer, ultra-flanged, time-warped, super-wide bandwidth, bottom-slapping, high - end sparkle keyboard sounds ain't gonna cut it. Furthermore, a bunch of intricate "killer" sounds in a mix will simply stomp all over each other, and lose their individual distinctions. Similarly, and contrary to the reviewer's inference, M1 Combinations need Program "brick" sounds as well as Program "wall" sounds (the "killers") for best construction. Unfortunately, space limitations won't allow my elaboration of these points.

The "fairly comprehensive sort of 'track sheet'" for the M1 referred to in the review (a separate product item), provides a legible, logical record for your Song Number, Title, and Library; Time Signature; Tempo; Date; Total Time; Programs, Librarians, and Patterns used; Effect Processor Placement, Type, and Settings; P3/P4 Output Panning; Next Song in Chain; and 10 separate columns for measure numbers, song sections, and the 8 separate individual tracks. Each track column has two sub-columns for initial Program and Volume and their linear changes; a main column for all other data (Pattern numbers, CNTL events, notes, etc.); and a header block to record Transposition, Detune, Pan, Status, and MIDI channel. They're user-friendly and definitely make it more than "a little easier" for you to keep track of the details of the music you'll compose. Reference literature and example sheets are included (yes, in the reviewer's package, too!).

We kind of favor the reviewer's "obscure timbre" comment for its implication that we might be different from the norm. That's fine with us!

As to the M1 Sky Album music, we never intended to make the Grammys, but we feel good about the sounds and songs created and mixed on this versatile $2000, 16-voice workstation, and so do music stores, customers, and the people at Korg (no affiliation). We've had numerous compliments on the drum programming alone. The sounds could be used in many other situations - as is or modified.

Now "brace yourself" for the price: 99 sounds at $.18 each, 6 songs (26+ minutes of music) at $1.67 each, documentation, a data disk at typically $3, and an average or below s/h fee of $3. Typical total cost=$34.

MT is generally a fine professional publication, yet we feel the review given was arbitrary, shallow, included some inappropriate cheap shots, and did not well represent MT's higher merits. I conclude my review with a thumbs down, in view of the doodoo, and we thank MT for printing this rebuttal.

Ron Crosby
Electron Artistries

Mail-Order Fraud

I would like to bring your attention to an advertisement in your November '88 issue, pp. 46-7. It is an ad for a huge equipment giveaway from a Minnesota company called Odyssey Promotions.

After my letters to them were returned, I became suspicious, and did some research. There is no such company listed with the phone company in Bemidji, Minnesota, and my letters were returned undeliverable as the P.O. Box had been closed.

I then called the Rodger Dodger Music Company who supplied the equipment for the giveaway. They informed me that the company never bought the equipment. They rented it for a day for the photo and made a verbal agreement to buy the package in the future.

It seems evident to me that this was just a ploy to make money for someone or some company. Of course the disclaimer that "prizes may be subject to availability" probably exonerates them from any blame, but is there something that can be done about this kind of shady business practice? I don't know what they paid for their two-page ad, but judging from the amount of "techno-lust" prevalent in the industry, I am sure they made out well at $3 a pop.

I just thought you should be made aware of this situation, and although you cannot be expected to stand up for the integrity of all who advertise in your journal, there should be a way to substantiate the validity of "companies" who might be crossing over the boundaries into mail-order fraud.

Love your magazine - keep up the good work.

Ray Dretske
St. Paul, MN

We certainly understand and share your concern. We, too, were intrigued by this ad, but everything seemed okay to us when we ran it. Since then, we've received several complaints about the ad, as you can well imagine. While we do try to verify the legitimacy of the ads placed in our magazine, we can never be 100% sure. In this case, we also talked with the music store from which the equipment was supposed to come. They told us exactly what they told you - that Odyssey Productions had rented the equipment to photograph with the understanding that they would purchase it at a later date.

Although we don't know everything about this situation, it is our opinion that this was not a scam. We believe that it was an attempt to start a legitimate business venture that somehow went wrong. In fact, we have learned that Odyssey Productions has been granted bankruptcy under Chapter 7. If any of our readers have a problem regarding this ad, please contact the ad manager for MT. We will try to help you in any way that we can. - SW

DX/D50 Dilemma

Allow me to offer another view on Mr. Felgner's "DX/D50 Dilemma." My perspective is economic. You astutely observe that trade publications run articles on both instruments, and that instruments should be judged on their sonic quality, but you gloss over Mr. Felgner's principal question, "Did I buy an out-of-date keyboard?" My answer to that question is *yes*!

Don't get me wrong. I own, program, and use both the D50 and DX7II, but when Yamaha announced the termination of their DX line, the market value of these instruments plummeted. Did Yamaha sell their DX customers down the river? Personally, I feel that way, but I must concede that when sales shrink to a trickle, strategic business decisions are appropriate from a manufacturer's point of view.

The principal import of my letter is then, "caveat emptor." We must include financial considerations together with musical considerations when making purchase decisions.

Finally, Mr. Felgner has two options. He could sell his DX7II and buy a more "fashionable" instrument (which won't remain fashionable very long), or use and enjoy it. Even though DX7IIs are being heaped upon a proliferating grave of "dinosaurs," they still sound terrific!

Mark Nadlin
Nashville, TN

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MediaLink

Integrating Media Systems With the Touch of a Button

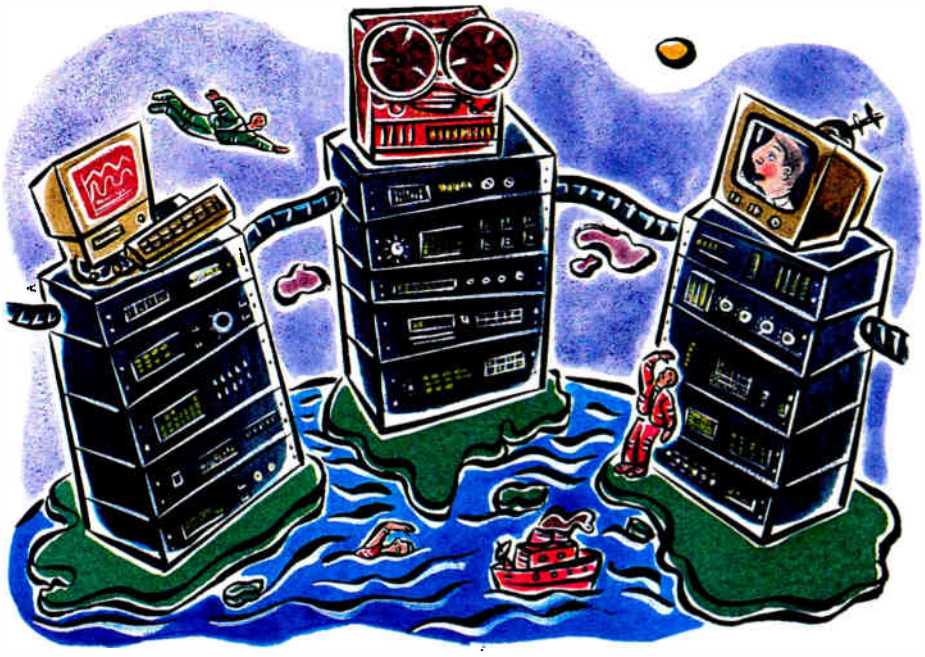

Illustration *Andrew Kingham*

MediaLink could do for MIDI, SMPTE, video, and audio systems what MIDI did for musical instruments. Here's a peek at what may well be the future of media system integration.

Text by Scott Wilkinson.

WHEN YOU STOP and think about it, the very existence of MIDI is astonishing. With unprecedented cooperation between competitors, synthesizers from different manufacturers could be connected together at last. Although the first use of MIDI was merely playing one synthesizer from another keyboard, creative minds everywhere soon expanded its application and large, integrated music systems began to appear.

As musicians were incorporating MIDI into their activities, other media systems were also being developed. The world of film and video had been using SMPTE for synchronizing dialog and sound effects to picture for some time. Digital audio was born with the promise of superior fidelity, microscopic editing and no generational loss. However, although these systems have been integrated to a certain degree (particularly SMPTE and MIDI), they have remained essentially separate entities with little that they can actually say to each other.

All of these developments have one thing in common: they all require a relatively high degree of technical sophistication of their users. This requirement leads many musicians into a quandary. They find that complex technology, which was developed to help them be more productive, actually ends up inhibiting their creativity. It's hard to be spontaneous when you have to look for the cause of a stuck note or the reason why a synth isn't responding. Of course, this is not true of all musicians, and many use MIDI to great benefit. But for others, technology throws cold water on the creative spark.

Enter MediaLink. Like MIDI, MediaLink defines hardware and software protocols that third party manufacturers can implement in their products. While MIDI was developed to provide a connectivity solution specifically for electronic musical instruments, MediaLink is designed to carry simultaneous signals from any digital media system, including MIDI, digital audio, and SMPTE with equal ease.

The brainchild of Mark Lacas and David Warman, both avid musicians who have been working in the computer network and data communications industries for the last ten years, MediaLink was inspired by a desire to simplify their life in the MIDI studio. As Lacas admits, "We were having trouble making an album over the last couple of years because of all the technology getting in the way. The technology was necessary because of the complexity of the musical arrangements, but was too distracting to deal with when I was in creative mode." They formed their own company, Lone Wolf Inc., in order to develop their dream of an entirely integrated, transparent system with which musicians, filmmakers and other media artists can concentrate on their craft without worrying about the supporting

technology. While this is a worthy goal sought by many in the past, it has rarely if ever been fully achieved.

The MediaLink Vision

The development of MediaLink is driven by a simple vision: "One button, one cable." Of course, the simpler the vision, the more complex the underlying processes that support it (just ask a Macintosh programmer about this). MediaLink is no exception. Even so, Lacas guarantees that "the end user will be entirely shielded from everything that we do."

Of course, no technology yet developed can read minds. So part of the Lone Wolf philosophy became "Everything that can be configured, must be – no more than once." Lacas continues this train of thought, "Rembrandt didn't mind painting a picture once, but he'd never go back and do it again. In fact, electronics have allowed us to approach music more like an artist approaches a canvas. We can go back and paint over sections that we don't like. But we want to do the whole thing only once. Then we want to capture the essence of what it took to get there, all of the aspects involved in making it what it is. To get there a second time should involve pushing one button at most."

Lacas and Warman have spent a lot of time considering the way in which musicians and other artists operate. One conclusion that they have come to is that creative people tend to prefer names over numbers. So songs, equipment configurations, and individual devices will be addressable by user-defined names in Lone Wolf MediaLink devices. As an alternative, they can also be numbered by the user and addressed in that way if so desired.

MediaLink Awareness

For Lone Wolf, the goal is to run a single cable that will connect all parts of a system. All of the information handled by the system will be directed along this cable in any direction (this is called *bidirectionality* because a signal can flow in either one of two directions within a single cable). A MediaLink compatible device will require only a single connector and cable to tap into the network – no MediaLink In and Out. Lone Wolf devices will include two functionally identical connectors to facilitate buss and ring topologies, but it won't matter which one you use.

For a device to be "MediaLink aware," it must contain a piece of software code called an *agent*. The agent stores a template of configurable data for a device – how many voices are available, their MIDI channel and patch assignments, how to set all user-definable parameters, and any other data that a developer wants to include. When connected to a MediaLink network, the agent makes this information available to any device on the network that requests it. With the touch of a single button, the complete settings (not just the patch data) for every device in even the most complicated MIDI system become available and can be recorded into a sequencer or printed out to provide a hard copy record of a session. For the artist, pushing a single button will configure the entire system, including patches, signal routings, sequence selection, and every other aspect of the project at hand.

LAN Basics

To understand the potential of MediaLink, it helps to know a little bit about computer networks. But don't worry, this is not as formidable as it may sound. You may even have heard the term "LAN" bandied about. LAN stands for Local Area Network, the most common means of connecting several personal computers together into a larger system. This allows users to share information and resources.

One of the most basic aspects of any LAN is its physical configuration (how the individual members of the network are physically connected). This is called the *topology* of the network. There are four basic configurations: *ring*, *star*, *buss* and *tree* (see **Figure 1** for a diagram of each type of topology).

In a ring topology, the members are connected to a closed loop of cable. A star network consists of a central hub (usually a governing computer) to which all of the other members are attached. In a buss topology, each member taps into a cable that doesn't close on itself as a ring does. A tree network is an expanded version of the buss topology in which several buss networks are connected to a central "trunk" (called the *backbone* in LAN nomenclature), forming the "branches" of the tree. This topology is used in large buildings in which the backbone runs up and down between floors with connected branches on each floor.

Another important aspect of LANs is their *protocol*. This is the way in which the network manages the flow of information from the "talkers" (members that send information into the ▶

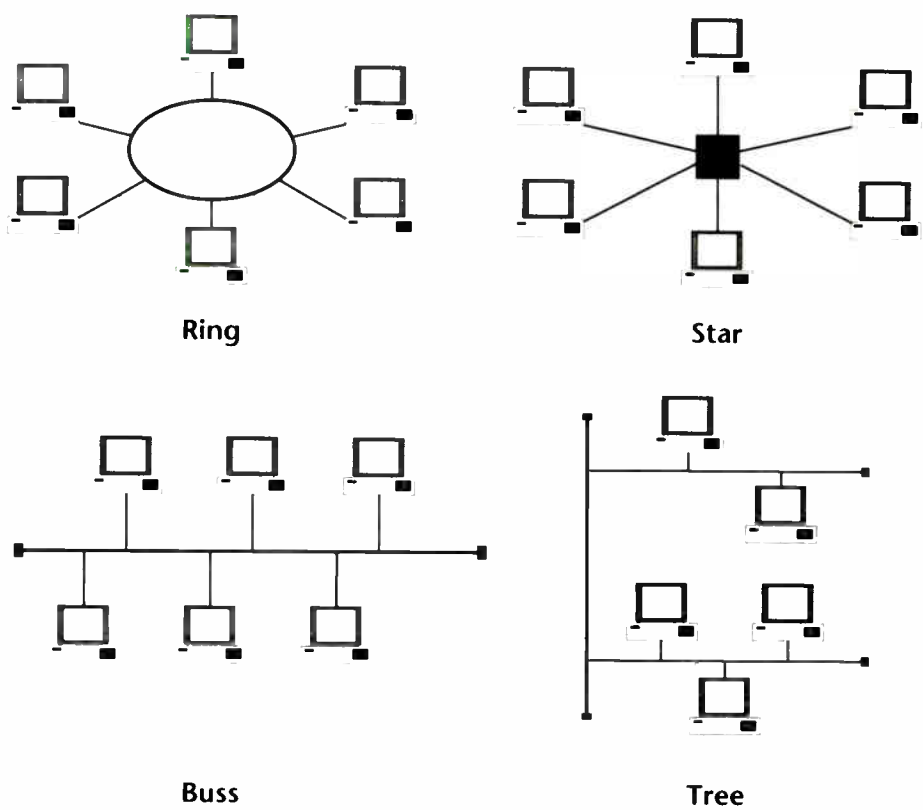

Figure 1. The four basic network topologies: ring, star, buss, and tree.

► network) to the "listeners" (members that receive information from the network). Again, there are four basic types of protocol: *simplex, token, polling* and *CSMA* (Carrier Sense Multiple Access). These protocols are often likened to human conversations as you'll see.

As the name implies, a simplex system is the simplest protocol. (As you'll see, MIDI is an example of a simplex system.) Information flows in only one direction along a given cable and there is generally only one talker at a time. This is somewhat like a dictator who talks while his subjects listen without the ability to respond. In the token protocol, a specific message (called the token, for obvious reasons) is passed from one member of the network to the next, typically in a ring topology. If a member has the token, it is allowed to talk, sending information into the network. When it's finished talking, it passes the token to the next member. If that member has something to say, it grabs the token, says its piece, and passes the token on.

The Carrier Sense Multiple Access (CSMA) protocol is like using a party line or having an undirected conversation within a small group. When you hear a gap in the conversation, you can jump in and talk. If two people jump in at the same time, they will butt heads, back off, and whoever's idea is more important will probably be interjected first because their back-off will generally be shorter. That's how CSMA works. Each member of the network senses when another member is talking and jumps in if they have something to say when there is a lull in network activity. The AppleTalk protocol built into the Macintosh is an example of this scheme.

A polling protocol is generally implemented in a star network. In this protocol, a central computer directs the "conversation" on the network, telling the members when they can talk. If the central computer goes down, the network grinds to a halt. This system works like a large meeting directed by a chairperson following Robert's Rules of Order.

The MIDI LAN

In fact, if you have two MIDI devices connected together, you have established a simplex LAN. MIDI systems use the simplex protocol in which information flows along a given cable in only one direction. This is why a separate cable is required for MIDI In and Out. There is generally one talker (typically the mother keyboard or sequencer) and several listeners. You can manually specify which component is the talker by switching cables or changing the connections in a MIDI patchbay. Of course, a MIDI merger allows more than one device to talk at the same time, but this is quite limited, typically allowing no more than two instruments to talk simultaneously. Daisy-chaining MIDI devices together with their Thru ports forms a buss topology. Using a MIDI patchbay or "Thru" box forms a star topology.

Even with its inherent benefits, the MIDI LAN has become the subject of some controversy in the world of music. As MIDI systems grew larger and more complicated, many people began to complain about the speed of MIDI, delayed signals and the limitations of 16 channels. In addition, MIDI began to be used in applications never envisioned or intended by its creators. Its envelope is still being pushed to the limit, even though there is plenty of room in the MIDI spec for expansion and definition of new messages.

"MediaLink is designed to carry simultaneous signals from any digital media system, including MIDI, digital audio, and SMPTE with equal ease."

It must be said that many of these complaints are not based in reality. For example, there is little truth in the statement that MIDI causes perceptible delays. These delays are usually a result of the time it takes for an instrument's microprocessor to deal with incoming MIDI data. Not only that, many instruments exhibit the same delay when you play on their *own* keyboard!

Of course, like all systems, there is a limit to the amount of information that MIDI can handle. At a data transmission rate (or *bandwidth* as it's called in technical terms) of 31,250 bits per second, no more than about 500 note on/off events per second can be sent down a MIDI cable. However, the practical note limit is much smaller than this due to the presence of other performance data such as pitch-bend or aftertouch. This can lead to delays in massive synthesizer orchestrations with loads of notes and other continuous controllers, particularly when multitimbral sound modules are used as "bands in a box."

In the beginning, 16 MIDI channels seemed like plenty. But MIDI systems grew to be quite large and the capabilities of instruments improved. These days, just two multitimbral synths can use up all 16 channels. This limitation can be overcome by using several independent MIDI systems being controlled by a computer with multiple MIDI Ins and Outs. A MIDI interface with four sets of MIDI ports can control a system of up to 64 separate channels. But this doesn't provide a true 64-channel system; it's four 16-channel systems tied to a common computer in a sort of "star/tree" topology.

Don't get me wrong. MIDI does what it's supposed to do quite nicely and I expect it to remain viable for a long time to come. However, in order for MIDI to expand far beyond its current boundaries and interface seamlessly with other media systems, a protocol like MediaLink is required.

The MediaLink LAN

It was out of frustration with the simplex protocol, lack of transparency, and limitations of MIDI systems that MediaLink was born. Its purpose is *not* to replace MIDI, SMPTE or any other media system. Rather, it was conceived to connect these systems together and provide a level of integration and transparency that has up until now been unavailable.

One of the hallmarks of MediaLink is its flexibility. It can be run on a ring, star, buss or tree topology. It uses a hybrid protocol that combines the best aspects of token, polling and CSMA. While virtually all other networks use copper wires in their cables, MediaLink uses fiber optic cabling. Aside from allowing a much higher bandwidth than copper wire, fiber optic cabling has the added advantage of being impervious to stray electromagnetic fields and other noise. The cost of this cabling has started to drop dramatically as well.

The MediaLink bandwidth can vary from 1 Megabit per second (Mb/s) to 100 Mb/s. Even at its lowest bandwidth, MediaLink can accommodate 30 times the amount of data that MIDI can (with its bandwidth of 0.03125 Mb/s). At its highest bandwidth, this factor jumps to 3000 times the amount of information that MIDI can handle. The bandwidth also depends on the devices in the system.

No device yet devised can run at 100 Mb/s. However, MediaLink is capable of running at this bandwidth in order to accommodate such devices as they become available in the future.

The MediaLink specification defines over 65,000 "groups" that are analogous to MIDI channels, although each one can carry a fully loaded MIDI data stream on all 16 channels simultaneously. Each group can include any number of devices and media systems that will respond to messages intended for that group. In addition, each group can include any number of talkers, unlike MIDI. Of these groups, half are user-definable. The other half are manufacturer specific and addressed with a manufacturer ID number.

MediaLink messages are called "datagrams." These are packets of information much like MIDI messages. In fact, MIDIgrams are a specific example of MediaLink datagrams. These messages can include any valid MIDI message. Other datagrams include SMPTEgrams, videograms, audiograms, and so on.

Enough about MediaLink itself, what about its applications? As I mentioned in the introduction of this article, one of the primary applications of MediaLink is the integration of various media systems. For example, a MIDI system, video system, digital audio system, and lighting system could be connected together and send each of their respective types of data along a single cable. In live performance, this would mean a single slender cable running from the stage to the mix island, from which the sound, visuals and lights are all controlled in an integrated fashion. In a professional studio environment, a single cable could connect the control room with systems located throughout an entire complex. Any device in the facility, regardless of which system it's physically connected to, can be accessed from any other system in the studio. Instant reconfiguration is possible without moving or repatching a thing. With network management software already under development for Macintosh and PC compatible computers, the possibilities seem virtually endless.

The MIDITap

The first device to embody these concepts is the MIDITap from Lone Wolf. This unit, which can run at bandwidths up to 2 Mb/s, forms the interface between a MIDI system and MediaLink. With it, you can connect several separate MIDI systems and integrate them into one large but entirely manageable system.

The MIDITap includes four MIDI Ins, four MIDI Outs, an RS422/232 serial port for connection to a computer, and two MediaLink fiber optic connectors. Each MIDI port includes its own MediaLink agent which can be programmed with configuration data for any MIDI instrument. One can envision a new market for "plug-in software modules" preset with configuration data that can be downloaded to an agent, providing MediaLink compatibility for existing synths, which, of course, are non-MediaLink aware devices.

The MIDI ports are entirely independent and can be mapped in any way you wish, including full merging capabilities on all four inputs. They can also filter MIDI data in any way and send various MIDI messages in response to an incoming message. For example, if you select a program change on your master keyboard, the MIDITap can configure itself and any other device in the system in response to the program change. The serial port can be used to control the MIDITap with a computer or can be connected directly to a modem for communication with a remote system without using a computer at all.

The front panel of the MIDITap illustrates the user interface that will be common to all Lone Wolf devices. There are four buttons labeled Exit, Edit, Enter, and Command, a two-line LCD display, and a parameter knob. The buttons provide access to any function in a series of menus. At the topmost level, the parameter knob scrolls through the menu choices. Pressing Enter takes you down into the selected menu. Whenever you reach a parameter that you wish to edit, press Edit and use the parameter knob to change the value. This knob is velocity sensitive, so that the faster you turn it, the faster the value changes. After changing a parameter, pressing Enter accepts the new value, while pressing Exit ignores the changed value. The Command button brings up context-sensitive commands at any menu level. Of course, the use of these buttons will be optional if you are using a computer to control the box.

The LCD display serves several functions. It displays the parameters and their values as well as the names of the devices and configurations that the user has defined. It can also indicate the level of MediaLink activity on the network and in the box itself with bar graph VU-style meters.

One of the nicest things about this device is the ability to control any MIDITap from any other MIDITap in the system. The front panel is actually independent of the box to which it is attached. You can dial up the name of any device in the system on the front panel with the parameter knob, press Enter, and be in full control of that device. In addition, there are provisions for future hardware modules that can be added to the MIDITap.

Other than completely configuring a system with the touch of one button, the most evident application of the MIDITap is the expansion of MIDI systems into much larger entities. With full group and channel mapping, any MIDI message on any channel in any MediaLink group can be converted into any other message and sent to any other channel(s) in any other group(s). This eliminates the limitations of 16 channels and parallel MIDI systems. Merging and stacking are rendered almost trivial. To merge, simply send data to the same group. To stack sounds, configure a port on the MIDITap to listen to the same group. Each MIDI port is fully independent and communicates with the other ports internally via the MediaLink protocol.

Another interesting possibility is system reconfiguration. If you have created a piece of music in one MediaLink-equipped studio, you could take a disk with your musical data and system configuration to another MediaLink-equipped studio. The computer would then modify your configuration to match the new studio or modify the studio's configuration to match your music.

The Future

Lone Wolf plans to develop additional products in the future that include taps into other media systems such as SMPTETaps, VideoTaps, AudioTaps, and even SCSITaps. With them, media systems will be integrated and controllable like never before. The Lone Wolf vision could well represent a bold step towards a future in which technology will no longer inhibit musicians and other media artists, but rather help them achieve their dreams as it has promised for so long. ■

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

P·O·R·T·R·A·I·T

SOUND POET

One of the most widely recognized champions of new music, Charles Amirkhanian is trying to free sound from pitch with the aid of a sampler. *Interview by Chris Meyer.*

MENTION THE NAME "Charles Amirkhanian" to a modern composition buff, and you'll probably be told about the numerous interviews of modern composers he's done around the world, his progressive radio programming at KPFA in Berkeley, his role in co-creating and co-directing the inaugural *Composer-to-Composer* new music summit in Telluride, Colorado last year, or maybe even about his landmark (and rather playful) text poem 'Dutiful Ducks.' But unless you're deeply plugged into new music circles or prowl around on his home turf of San Francisco, you may not be familiar with his multimedia performances with visual artist Carol Law, or his Synclavier explorations with popular crazed guitarist/composer Henry Kaiser. Charles has some interesting ideas on how much the "sound of music" is really the music of sound.

Chris Meyer (MT): *On your recent works such as 'Pas de Voix (Portrait of Samuel Beckett),' you've seemed to move beyond 'Dutiful Ducks' in that you now use text* plus *sound.*

Charles Amirkhanian (CA): "The last four years, I've been working with Henry Kaiser in his Synclavier studio, and all of the ambient sound recordings that I've been making for ten years are recycled in his instrument and being collaged into pieces that I do now."

MT: *Why did you get into sampling instead of synthesis?*
CA: "Electronic sounds really bothered me. The ones that mean to imitate the orchestra are just an attempt to do something you can't really do, and the glassy and pure sine wave-based ones just didn't speak to me at all. Being able to use a sampler is a way to retain a kind of grittiness in sound, which I think is the essence of what I like in musical expression. And so, as a former percussionist who spent many years trying to replace all of these objects that I collected as percussion instruments with words – making words into percussion points – I've now been able to do something equally expressive, I think, with sampling, and with ambient sounds. And this has given me a whole new way to direct my energies – to make pieces longer, to stretch things over time by slowing sounds down and examining them close-up.

"One of the things I found that helped me in developing longer structures in music was to juxtapose repeated samples with real-time recordings, so that the sample was moving against something real time – with evolution – so that you don't hear the same thing over and over again, but you hear a complex texture that develops. I discovered this, a little bit by accident, while working with Henry Kaiser one day. We were getting bored with a sequence that we had of Chinese television commercials during my piece 'Metropolis – San Francisco.' Henry and I were working with these Chinese television commercials, and we had them assigned to different keys on the Synclavier. We were punching them in and out, and these little fragments were very aggressive, and nasty. In the background, I was playing an organ chorale that was very soft, and sort of New-Agey. The tension between these harping voices, urging you to buy something, but in Chinese, which has a more nasal character, against this beautiful rich organ created a fantastic sound.

"At some point I said 'Gee, Henry, we need something else . . . ' I turned on a cassette tape of a walk that I took late at night through some hot springs. It was a real-time walk through showers, past a swimming pool filter, etc., and the mic was following all these aural contours. Suddenly, a wooden *clack* comes in, and you hear water going onto the pavement where people cleanse themselves after they come out of the sulphur pool. That sound happened to hit at a very tense moment in the commercials. And a couple of people, immediately upon hearing the final mix, said 'It sounds like you're stir-frying these Chinese voices!' [Laughing] It wasn't a reference I intended, but you do get a sense of excitement, because instead of just having the voices repeat over and over again, you have another base (not 'bass') line running against this walk

"What I'm doing is taking music out of the hashed-over, over-intellectualized arena of pitch structure, and into another area that's not dependent on pitch."

through time which maintains interest and tension.

"It's like old radio theater. In fact, these pieces that I do with ambient sounds are often commissioned by what are called the 'Radio Drama' divisions of institutes like West German radio and the Australian Broadcasting Corporation."
MT: *Is it music, or is it drama?*
CA: "A lot of musicians don't consider what I'm doing 'music.' Which is a problem a lot of percussionists have, I suppose. [Laughter] But I think what I'm doing is taking music out of the hashed-over, over-intellectualized arena of pitch structure, and into another area that's not dependent on pitch – that's more dependent on referential sound." (*For another opinion about pitch structure and music without them, see the Perspectives elsewhere in this issue – Ed.*)

"If you take a note on a piano, and plunk it once – say you play an E flat – it doesn't have a reference in and of itself. It's really an abstract sound. But, if you give two seconds of the sound of Dan Rather on a newscast, or the sound of a door closing, that has a very strong reference. So, the pieces that I'm doing are almost like the 19th century tone poems that composers such as Dvorak did. The difference is, they did them with instruments, and the orchestra imitated waterfalls and dancing crowds of people. What I'm able to do now with samplers is actually the reverse process. Instead of music imitating nature, you've got real, natural sounds that are turned into musical structures. It's really a lot of fun." ■

PERSPECTIVES

Pitch Structures and the MIDI Conspiracy

Opinions by Jeffrey Stolet.

IT DRIVES ME nuts when I have to perform some of the most obscene technical contortions imaginable to produce the results I want when using a MIDI-based composition system. As a composer teaching at a university, I'm very often looking for ways outside of the ordinary to express my musical thoughts. And while some things are quite easy to accomplish using a MIDI-based system, it gripes me to no end that other things, often the things I want most to do, are extremely difficult to accomplish. It then dawned on me that MIDI, its related synthesis hardware and software, its related sequencing software, and even the manufacturers themselves, had conspired against me. "Paranoid," you say? Well listen to this . . .

We generally agree that MIDI, with its synthesizers and software, is an incredibly useful and powerful tool for making music. Given the sheer music-making horsepower of these new tools, we often see them as agents that will blaze the trail to new types of music in the future. But despite the recent tremendous advances in synthesizer technology and applications of the MIDI protocol, composers using these tools employ primarily traditional methods of assembling musical compositions. Of course, this is not necessarily a good or bad thing in itself. In fact, there is certainly a great deal that can be learned by studying the compositional techniques of past composers. Very often, however, composers at colleges and universities are interested in pursuing new or unexplored avenues of musical expression, rather than travelling well-worn compositional paths.

Surprisingly enough, one of the primary influences directing compositional style toward well – established methods (particularly musical compositions that are heavily dependent on pitch structure), rather than toward future-looking methods of composition (perhaps being more dependent on the timbral characteristics of the sounds themselves) is the MIDI technology itself. (*For a profile of another composer who creates music witho t depending on pitch structures, see the interview with Charles Amirkhanian elsewhere in this issue – Ed.*)

There are at least a few specific areas which contribute to this situation:

1) As in past styles, an extraordinary emphasis is placed on pitch and pitch-related structures in music composed using a MIDI-based system, despite the great potential contained in synthesizers to create breathtaking non-pitched sonorities. The first of several culprits that directs a composition toward a pitch orientation comes from the early days of synthesizer development, and which MIDI has accepted because of its convenience: the keyboard controller. Because the keyboard controller is so closely modelled after keyboard instruments that were designed to produce discrete pitches, a composer using a keyboard controller would naturally compose pieces that are highly dependent on pitch structure. The more recent introduction of other types of controllers (i.e. wind controllers) doesn't improve the situation much because they too are based on acoustic instruments that are pitch-oriented. Hopefully, some developer will devise an instrument that will be an instrument that musicians will want to use as well as a tool that will avoid this kind of bias.

2) Another influence that directs MIDI-based compositions toward a pitch orientation is the method that MIDI uses for numbering notes. When we wish to play a sound from a synthesizer or digital sampler, we must specify a MIDI note number (0-127). We can't, for instance, access a variety of notes between, say, note #62 and #63.

"One of the primary influences directing compositional style toward well-established methods of composition . . . is MIDI technology itself."

But wait! You say that some synthesizers can contain alternate tunings. You're right, but often those tunings are only traditional variants of equal-tempered tuning with twelve notes to the octave (i.e. "just" or "mean" tuning). And even when a tuning with 19 notes to the octave is used on a particular instrument, these possibilities are often not explicitly stated, or are hidden deep in the operator's manual, or are so difficult to implement that it substantially inhibits a composer from spending the necessary time to learn, experiment and master these potentials.

The use of continuous controllers, while offering the capability to obtain "in-between pitches," is a relatively crude method that on many sequencing programs is not adequately editable. (As a note on this subject, I have heard that efforts are currently underway to alleviate this problem, so that composers can access and edit the MIDI notes between the present MIDI note values.)

3) In many synthesizers, the variety of waveforms produced by its sound gener-ators are derived from conventional instruments. One manufacturer even provides names for its waveforms like "voice1," "piano," or "organ." Other manufacturers have developed methods of synthesis in which sampled attacks of traditional instruments are pasted on to synthesized sonorities. Again, the technology is directing us toward a former, rather than future, style of composition.

4) Finally, hardware and software MIDI sequencers are constructed such that traditional imitative counterpoint or strict canon can be composed, edited, and/or manipulated extremely easily. This is because many sequencers include some sort of function that allows any segment of music to be replicated and then placed in counterpoint with the original. After being placed in canon with the original phrase, this replica can (depending on the sequencer) be transposed, inverted or treated in augmentation or diminution and many alternative versions can be tried. This type of enormous flexibility and power can exert a definite influence on a musical composition that will direct it in a traditional way. (While I applaud the work of software developers who have devised algorithmic composition programs like M by Intelligent Music or TrackGenie by LTA Productions, I wish these programs would go even farther in creating an environment that stimulates non-traditional results.)

Why am I going to all the trouble to make this list of complaints and at the same time, I'm sure, make a few enemies? Because I am positive that others, especially many composers at colleges and universities, feel as I do, and perhaps a hardware manufacturer or software developer will read this article and say, "Yeah, maybe we can expand the potential of MIDI into these other areas," and "Yeah, we can make MIDI and all of its instruments better fill the needs of colleges and universities." I hope so. ■

With a Ph.D. in Music Theory, Jeffrey Stolet holds a Dual Professorship as the Director of Music in the Dance Department and Director of Electronic Music in the Music Department at the University of Oregon. He performs on keyboards in an extensive MIDI system and has toured throughout the US and Canada.

If there's something in the electronic music industry you'd like to comment on, get cranking on your typewriter, computer, or other appropriate writing utensil, and send your thoughts to: *Perspectives, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311*. Please include a daytime telephone number with your submission. If you're working on a word processor, we accept submissions on Macintosh, Atari ST, or IBM PC-compatible disks in text-only/ASCII format; or via GEnie (our address is Musicmkr.LA). We pay $100 for every *Perspectives* article published.

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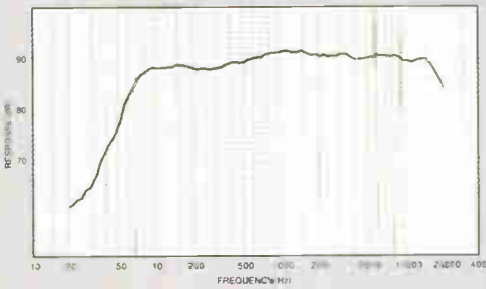

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THE EMPIRE STRIKES BACK

THE NEW SYNCLAVIERS EXPLAINED

part three: synthesis & direct-to-disk

In this month's final installment, we investigate the depths of Direct-to-Disk recording and synthesis in the new Synclaviers.

Text by Scott Wilkinson.

DURING THE PAST two months, we have been taking you on an extended tour through the Death Star of hi-tech music systems. The newest generation of Synclaviers offers unprecedented fidelity and control over sound with high sampling rates, long sampling times and a host of editing features. Likewise, the sequencer is very powerful and the music notation package produces exquisite output. The addition of a Macintosh II to provide a front end for the system was a stroke of genius, although its horsepower is highly underutilized at the present stage of software development. The user interface itself also suffers from a command driven orientation that seems antithetical to the Mac's usual user-friendliness.

In this, the last installment of the series, I'll be showing you the ins and outs of the direct-to-disk recording and synthesis capabilities of the musicians' ultimate toy. You'll see how the Empire maintains its hold on the extreme high end of the hi-tech music industry.

Synthesis with the Synclavier

As you may recall from the first installment of this series, the Synclavier actually started life as a synthesizer. As a matter of fact, I remember working with the first prototype of the Synclavier that was developed at Dartmouth College back in the mid-'70s. At that time, it was a 16-voice additive synthesizer controlled by a Data General minicomputer. The system also had two enormous hard disks that held a whopping 1.5 (that's 1 point 5, all right) Mb each.

While the computing power and hard disk capacity have certainly improved greatly in the intervening

years, the basic synthesis capabilities have not. Of course, the Synclavier is not primarily a synthesizer anymore, and the timbre frames and resynthesis capabilities (explained below) were not present in those early days. Now the system can accommodate up to 96 voices of synthesized sound, but the basic means of creating a sound from scratch have remained essentially the same.

Synthesis on the Synclavier, which is available only on the 9600 system, is basically an additive process. You can construct waveforms by specifying the relative strength or volume of up to 24 sine wave harmonics. These harmonics are fixed in the harmonic series, which means that their frequencies are whole number multiples of the fundamental frequency. For example, the frequency of the first overtone above the fundamental is exactly twice the fundamental frequency. The next overtone is three times the fundamental frequency, and so on. This is fine for sounds with timbres that fall into this pattern, but there are plenty of sounds for which this is not true, such as bells and drums. Of course, you can always use sampling to reproduce these sounds.

Synthesized waveforms can be assigned to the partial timbres that were discussed in the first installment of this series. As you may recall, up to four partial timbres can be assigned to each user-defined keyboard zone, and these zones can be as small as a single key (but watch out, each partial timbre uses up one synthesizer voice). These waveforms can also be combined with samples in different partial timbre locations and mixed, balanced, detuned, etc. Various modifiers can be applied to each partial, including a volume envelope and several real-time effects such as vibrato, panning and chorus. This allows you to combine different groups of harmonics at different pitch levels to achieve those non-harmonic sounds.

The synthesis process is controlled from the FM Timbre Page (more about FM in a moment). This page has several modes for displaying the sound data for each partial timbre. The Graphic Display shows you a bar graph that indicates the level of each harmonic and the shape of the volume envelope controlling each partial timbre. As you change a parameter on the keyboard, these displays change in real time. The Numeric Display includes the same information in the form of numbers with the addition of partial tuning, volume, and the real-time effects. The Partial Timbre Display shows more detailed information about each partial timbre individually.

The FM (Frequency Modulation) capabilities of the Synclavier are fairly limited. A single sine wave modulator can be applied to each partial timbre. It has its own volume envelope, which is displayed as a dotted line superimposed on the graph of the partial timbre envelope. The frequency of the modulator can be specified only in a ratio with the frequency of the partial timbre. For example, if the ratio is set to 1.000, the frequencies of the modulator and the partial timbre will be the same no matter which key is played.

As you know if you've looked into FM programming, you can achieve non-harmonic timbres like those of bells by setting the modulator frequency ratio to something other than a whole number. This is also possible with the Synclavier. With four independent partial timbres per key available, this just about makes up for the limitation of exclusively harmonic overtones. However, the lack of pitch envelopes (or even volume envelopes for each overtone) seems quite limiting in the Synclavier after working with a product like SoftSynth from Digidesign.

Resynthesis

This is one area in which the Synclavier really shines. Resynthesis is the process whereby a sampled sound is analyzed and recreated using synthesis of one form or another. The Synclavier achieves this by dividing a sample into many small time segments called "timbre frames." It then analyzes the harmonic content of each timbre frame and automatically reconstructs the waveform additively, using as many as 128 harmonics. Upon playback, the Synclavier plays the timbre frames back, each crossfading into the next.

The more timbre frames into which you divide a sample, the more accurate the reproduction. Within the current memory limitations of the system (although it's hard to imagine, there *is* a limit to the memory in a Synclavier), a sound can be divided into as many as 300 timbre frames. Typically, however, most sounds can be resynthesized quite accurately with only 20 or 30 timbre frames. For example, I heard a speaking voice resynthesized with remarkable accuracy using 25 or so timbre frames.

At the moment, you must manually mark the timbre frames into which you wish to divide the sound. This is a personal process unique to each resynthesist, but generally, the beginning and end of clearly repetitive waveforms within the sound are the best candidates for marking. Once you have done this, the system automatically calculates all of the parameter values necessary to reproduce the sound as accurately as possible.

After that, you can edit the sound in a number of ways. The available parameters include crossfade, or "splice" time, delay, shape (linear or logarithmic), peak level (volume of the frame), pitch offset (up or down as many as 48 semitones from the previous frame), and harmonic coefficients (volume levels of all harmonics). You can also copy one timbre frame to other frames within a sound and modify them in any way. Each frame can be looped for evaluation as long as you hold down a key. Timbre frames typically follow each other, but they can be made to occur at the same time. This can be used to achieve non-harmonic tones by applying different pitch offsets to simultaneous frames.

An entire resynthesized sound can be assigned to a partial timbre and treated in the same manner as sampled and additive/FM waveforms. With this capability, you can do some amazing things. For example, the non-harmonic possibilities are greatly enhanced. You could also create the sound of an oboe that ends up as a trumpet, or a plucked marimba.

"What about crossfading samples?" you might ask. Of course, this is also possible, but timbre frame resynthesis provides more opportunity for creativity. You can perform infinitesimal modifications on individual harmonics and frames, and each frame can be at a different pitch (this provides the only "pitch envelope" in the system). You can also apply a randomizer to the pitch of each frame and adjust the pitch range in which it will be active. This adds the human touch of imperfection to resynthesized sounds. An additional advantage over sampling is that the sound does not distort or exhibit aliasing anywhere on the keyboard.

Direct-To-Disk

I must say that I was quite impressed with the direct-to-disk system (or D-to- ►

►D as New England Digital calls it). As you would expect, the D-to-D software is standard on the Synclavier PostPro model, but can also be used with the 3200 and 9600 systems. The standard configuration includes eight tracks that can each record up to 25 minutes of sound at a sampling rate of 50kHz. This rate can actually be set to any value from 1kHz to 100kHz, which will also determine the maximum recording time per track.

Four 320 Mb hard disk drives are required to support this configuration, each recording two tracks of digital audio. You can use fewer hard disks to record fewer tracks if your budget is tight. Standard configurations also include streaming tape drives for backing up that all-important data. Because each tape cartridge backs up about 18 minutes per track from each hard disk, you need eight tape cartridges to completely back up an eight-track system. A parallel interface between the hard disks and tape drives means that backing up takes less than real time.

By installing a software and hardware upgrade called MaxTrax™, the system can record 12.5 minutes on each of 16 tracks at 50kHz. You could also add four more hard disks and record 25 minutes on 16 tracks. Other expansion options include additional hard disk drives that can boost the maximum recording time to 100 minutes on each of eight tracks at 50kHz. Keep in mind that each track is played by a Synclavier voice, so you must have as many voices installed as you have tracks.

The D-to-D system supports all of the standard digital I/O (input/output) formats including PRODIGI, AES/EBU and SDIF (Sony Digital Interface Format) at 44.1kHz, 48kHz and 96kHz. If you intend to use these formats to transfer the digital information directly to or from the Synclavier, you must set your sample rate accordingly. It can also run concurrently with the 200-track sequencer described in last month's installment.

Software Pages

The D-to-D system is organized into three software pages: the Project Directory, Track Display, and Audio Event Editor. Typically, you start a new project from the Project Directory. This is where you can specify the start and end times for all tracks, set the sampling rate, and view various status parameters and recording time for each track in a project. You can manage up to 50 projects from this page, depending on their size. In a standard configuration, fifty 30-second commercial spots are equivalent to 25 total minutes. The Project Directory also provides the means of retrieving and backing up projects to tape cartridge.

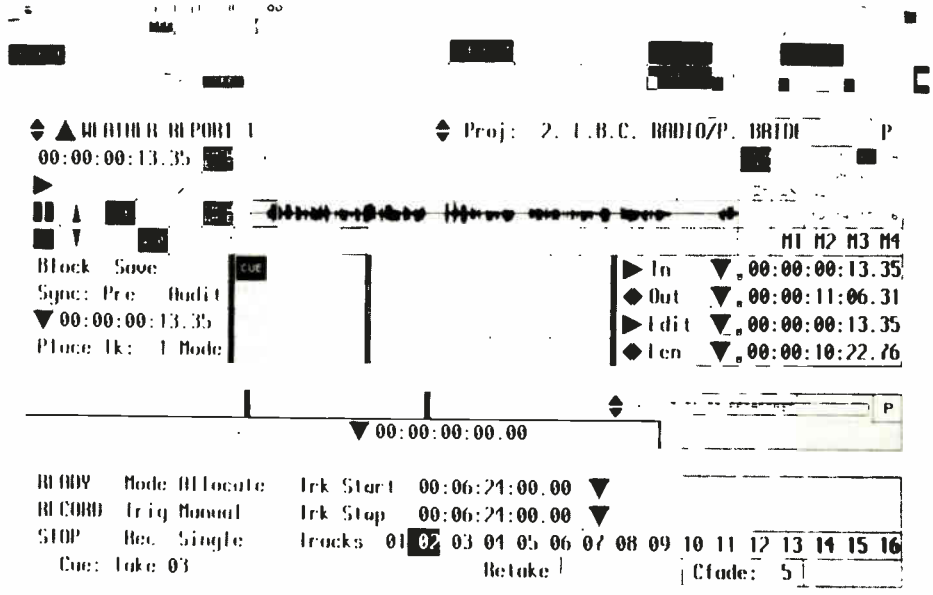

Figure 1. The Audio Event Editor displaying the Cue Editor, Sequencer Motion Control, and Record Control panels.

The Track Display simulates a normal eight-track tape deck, providing linear recording. There are several "Track" parameters including Title, Status, and Record Mode. With these modes, you can monitor the playback from the disk or the signal coming into the system. You can also record several versions of a cue and play them in any order. This is used for sound effects, flying in vocals, etc.

The majority of the D-to-D system can be controlled from the Audio Event Editor. In fact, you can do everything of which the system is capable except tape backup. Unlike the rest of the current Synclavier software, this page is completely mouse-driven.

When you first enter this page, most of the screen is blank. But not for long. At the top of the page are several "buttons." When you click on one of these buttons, a "panel" appears on the screen that provides a specific set of controls. For example, the Project Manager panel provides many of the same controls that are found on the other two software pages. In fact, you can display several panels at once, all of which are active simultaneously. There are also four user-definable buttons that can each be used to call up a series of panels that you use most often.

Recording

There are three basic steps in producing a finished project: recording, editing, and assembling. Each panel addresses one of these steps. For example, the Sync panel provides time controls for the D-to-D system. With it, you can specify the time reference in minutes and seconds, measures and beats, feet and frames, or SMPTE time. You can also set the SMPTE format and offset as well as compute event times, generate SMPTE, and display the offset.

The Record Control panel allows you to record cues directly. There are three record modes that allow you to record on the next available free disk space, punch in to a selected cue without affecting adjacent cues on the disk, or take full manual control of a recording. This panel also allows you to start and stop recording on a disk track at a specified times, compress or expand the time of a cue without affecting its pitch, and transfer a Synclavier sample directly to a disk track.

A list of the cues in a project can be displayed in the Cue Directory panel. Not only that, each cue can be heard by simply clicking on it. This is particularly useful for recording and auditioning several versions of a voice over. For example, suppose that you're given a radio commercial for a car company that is to play in several markets around the country. While most of the spot will be identical for all areas, you must insert a different regional tag indicating the specific car dealer that local listeners should see to buy that

new car. By recording the tags and listing them in the Cue Directory panel, you can play the spot over and over, each time triggering a different tag.

Another application of the Audio Event Editor panels is automatic dialog replacement (ADR). As you may already know, much of the dialog you hear in a movie or television show was not recorded during the filming of the scene. It is dubbed in after the scene has been shot in order to have greater control over the acoustics and ambience of the dialog in the soundtrack (for more info on ADR and other audio post production activities, see 'A Guide to Post Production', MT November '88). As you watch the film or video, you find the moment at which you wish to begin recording. You can then trigger the system to record the dialog onto a disk track at a specific start time. After recording several versions, you can trigger each one to play at the appropriate moment and then select the best one.

Editing

One of the primary advantages of disk-based editing is that it is non-destructive. Unlike tape, the raw material is never destroyed. If you don't like what you've done, you can always go back and start from scratch. Also, the quality of the recorded sound doesn't degrade as you manipulate it, and it's also much faster than tape editing.

In the D-to-D system, most of the editing is done from the Cue Editor panel in the Audio Event Editor. This panel includes a standard Macintosh horizontal scroll bar that provides "rock 'n roll jogging" through the contents of a disk track. The recorded material can also be displayed as a waveform. You select edit points by positioning the scroll box and clicking on the Edit button. This places a scissors icon in the edit window at the selected point. These edit points can be dragged to new positions with the mouse as well. After selecting a section of the material, you can perform all of the expected edits including (but not limited to) cut, copy, paste, delete, fill, and slide, which allows you to move parts of the cue around. And all of this is accomplished without losing the synchronization or length of the cue.

The Cue Editor panel also provides the ability to make microscopic edits, such as removing lip smacks or shortening pauses that are too long. ▶

► You can even use it to transfer a portion of a disk track to the Synclavier sample memory. This is extremely useful for correcting the pitch of an out-of-tune solo or vocal line. The corrected portion can then be transferred back into the disk track.

Assembly

Once the cues have been recorded and edited, they must be assembled into a finished spot. This is done in the Event List panel, which gives you access to the Synclavier sequencer tracks. The cues can be mixed with sequenced parts and are triggered to play at a specified SMPTE time directly from the disk.

Cues can be placed in a sequencer track any number of times in one of several ways. You can manually select a cue from the Cue Directory in real time as you watch the picture. You can also trigger a cue automatically by specifying its start time, end time, or any marked time within the cue. For example, if you need to place the sound of a plane that appears on the screen after its engine sound is to be heard, you can trigger it to play at the correct moment by marking and referring to the time at which it appears on the screen, rather than guessing at its position. Cues that are already synchronized can be placed automatically with their sync time as well.

Once a cue is placed in a sequencer track, you can individually slide their position by specifying a new SMPTE time and globally move groups of events. Once you're happy with the spot, you save it to a separate system disk with other sequences and system software. That way, you don't have to take up space on the D-to-D disks.

The DESC™

NED has developed an alternate hardware controller for the D-to-D system called the DESC™ (you might expect a cute acronym, but NED informs me that there is none – it's just a distinctive way of spelling the name of the furniture at which you work). This device, pictured in the photo at the top of this article, provides a user-interface that's already familiar to audio professionals. Included on the DESC are "transport" and other dedicated buttons as well as a jogger wheel. This provides complete control over the Post Pro system, including track assignments, muting, soloing, and full editing. Actions on the DESC are reflected on the Mac screen in real time.

The End . . . For Now

As we arrive at the end of our tour, it seems clear that the Synclavier is well ensconced in the stratosphere of computer music systems. However, there are rebel fighters on the horizon, taking pot shots at the preeminent position held by the Death Star for so long. As technology continues to increase its capabilities and decrease its cost, other systems will begin to rival the Synclavier in one way or another.

Of course, it will be a while before other systems provide the same level of integration between so many varied functions. And the quality of the product produced on the Synclavier is undeniably excellent. With improvements to the user interface and more reliance on the Macintosh itself, the Death Star will maintain its place in the heavens as the ultimate musical tool for some time to come. ■

The author wishes to extend his heartiest thanks to Sean Callery and Ted Pine of New England Digital for their help and patience during the research for this series of articles.

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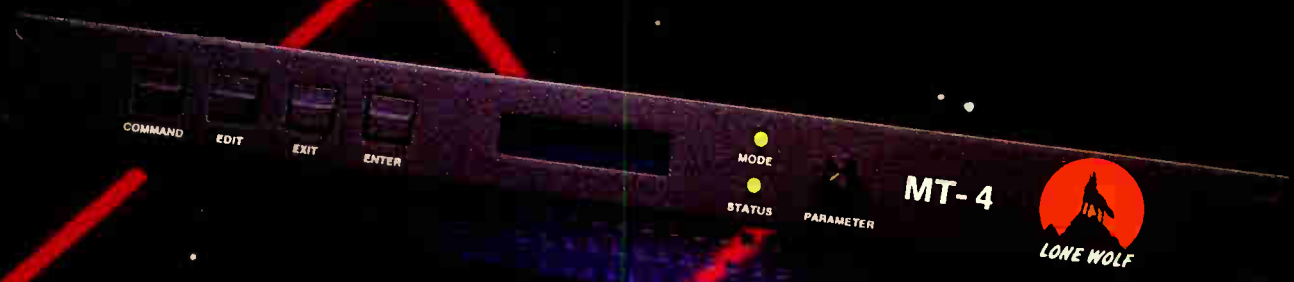

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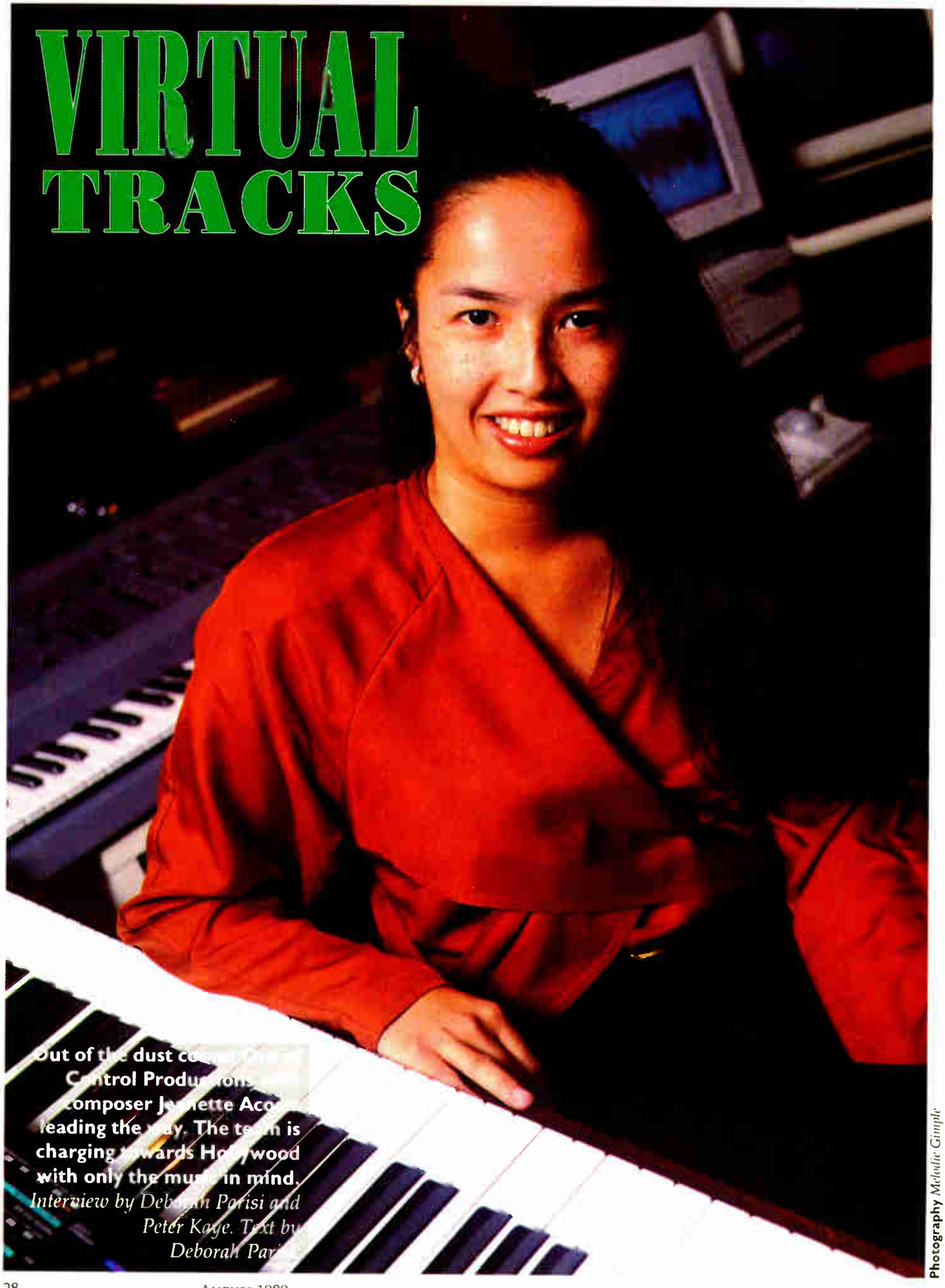


Out of the dust co... Control Produ... composer Jeanette Aco... leading the way. The team is charging towards Hollywood with only the music in mind.

Interview by Deborah Parisi and Peter Kaye. Text by Deborah Pari...

Photography *Melodie Gimple*

THERE'S A STRETCH of beach along California's coast which is notoriously dangerous. Houses and apartments are smashed together along the curving shore, with driveways intersecting bustling Highway 1 at a 180° angle, making it nearly impossible for residents to park their cars without killing themselves in the bargain. To top off the traffic scene, beachgoers crowd every inch of parking space, often dashing across the four-lane highway in search of the perfect tan.

The site in question is none other than world-famous Malibu, home to the stars of stage, screen and, of course, the music business. Lee Ritenour has a cozy little place near the shore, Alan Silvestri's palatial abode overlooks the Pacific through monstrous plate glass windows, and 'The Colony,' as many of the celebrity inhabitants call an older section of the town, has assumed a life of its own – mostly through photographs on the front page of *The Enquirer*.

Jeanette Acosta isn't much interested in the landscape, however; she rarely gets to see it. On workdays, she leaves her own home in Hollywood and heads for the beach – just so that she can lock herself in a darkened, insulated garage with as much hi-tech gear as possible. When I went to visit Studio Malibu, she was working on one of the final episodes of *Murphy's Law*, a series (starring George Segal) which had just been cancelled.

Acosta has reason to be depressed – just a month earlier she was being touted as "the only woman currently scoring for a prime-time network television show," and now that's gone. Even though her company, Out of Control Productions, came from nowhere in 1987, first scoring episodes of *Falcon Crest* and moving directly into doing an entire series, that now seems like ancient history.

Yet Acosta and her team, husband Gary Hunziker and friend Joseph Lisuzzo, are not exactly depressed. They've got too many irons in the fire – Gary has a dance-type act that he's producing, Jeanette's been asked to do a New Age album, and the group is up for several possible film projects. In fact, it looks like Out of Control is just taking off.

So how did the 25-year old Philippine-born Acosta end up with her own production company, her own recording deals, and her own TV show? She did it the old fashioned way . . . she studied.

"I started when I was 13," she says in a characteristically quiet voice. "I was classically trained by Dr. Leonid Hambro, who was the Dean of Piano Students at the time at CalArts. But he was really opposed to electronic music – a be-true-to-your-art type of guy – and I had always been interested in it. So I met a man by the name of Clark Spangler, and he trained me on the (Arp) 2600. I'd go to a lesson and he'd say, 'Your assignment this week is to make this machine sound like women screaming,' or, 'This week is animal week, so bring me back canaries and pigs and dogs – and if your dog barks back then you got it right.'

"At the same time I was being trained in composition, and it just seemed to all come together. From the classical end, I was trained for major competitions but I stopped that because I was tired of touring – I did that from the time I was 13 until I was about 19. So I became a session player, did a lot of commercial work, and played with people like Taj Mahal and Jesse Ed Davis. But then I got to the point where I felt I'd taken that as far as I could, and the question became, 'What can I do to further myself musically again?' So because I'd seen the music for television as a session player, I knew I could do this. I dropped everything again, and I committed myself to being a composer. And that's how it happened – it's just a very strong desire all the way through to make it in music."

Yeah, sure. But I know plenty of people who want to write music for film. How'd you get that first job?

"Well, the first official thing I did was *Falcon Crest*, and that came about from knocking on doors until someone opened up for me. We put a demo tape together showing people what we could do. Then it was just a matter of convincing them that even though we'd never done anything, we were capable, because we had the knowledge to do it. You can do anything in life if you desire it enough, and that's what it came down to.

"Then you meet producers along the way. I was really lucky that the producers of *Murphy's Law* believed in me enough to give me the series. I believe I'm the only woman who has a series on prime time at this moment. And I definitely learned from every show – every one was a challenge. On average, each show had about 13 cues and 15-20 minutes of music. You really have to push yourself . . . often they'd get a tape to me on Friday and the music had to be ready on Monday."

Try doing *that* on your next free weekend. Of course, that's where the company and creative energy of her production team really pay off. "We're all musical, and we're all technical. It's a collaborative effort, really," Jeanette says. "If somebody's busy doing something at one end of the room then there's somebody else doing something else at the other end. We're on a very tight schedule, so it helps to have everybody here. We're a team.

"The term for what we do is called 'virtual tracks' because we don't go to multitrack recording."

"The thing that's important is that this is a labor of love for all of us," says keyboardist and technician Joey Lisuzzo. "We all care about each other and want to do the best we can. We know that there's enough out there for everybody and we do everything for each other. I'm very blessed to have such talented friends."

Gary Hunziker, also a keyboard player and studio wizard, agrees. "We all have different strengths – Jeanette's really good at programming, a lot better than I am. I'm good at sampling, and I'm good at engineering. But not programming – especially on the DX7," he laughs. "I've always loved the drums, so I try to be the drummer. One thing that I've found helps a lot is, before I play a part, I'll listen to a recording of somebody playing a certain style and try to emulate what he's doing – like Jeff Porcaro or someone, a really great drummer – so that my fills can sound pretty convincing. And it's the same thing with duplicating any instrument. Usually you'll want to listen to a master at it. If you want to do a nice sax thing, you could listen to David Sanborn, for instance."

Acosta, who is the primary composer, appreciates her partners' other talents as well. "If they think I'm going in the wrong direction, they don't hesitate to tell me. They're a great help in just making sure that the intuition is correct. And if I am not ►

► creative, then somebody else will be. We end up working very efficiently."

The Out of Control team swings into gear, giving me a chance to watch the process involved in their production sessions. Gary and Joey man the console, the VCR and the synthesizers as Jeanette settles in behind the Mac and master keyboards. "Normally, what they give us is what they call an 'on-line copy,' a finished, edited version of the show without the commercials, but with timecode on it. I view it with the producers and together as a committee we decide where music should go. During the production meeting, we have a music editor that takes down what everybody in the room says, but I also write it down myself. Someone will say, 'OK, during this point in the show, it feels very empty,' or, 'We have a chase scene so we need chase music at this point in time.'

"Then I bring it here to the studio and we view it as a whole again and see whether it's correct, what we decided at the producer's meeting, and we go from there. We plan out how the music should be – if there's a recurring character, for example, then we give the character a theme so that it's consistent throughout the story.

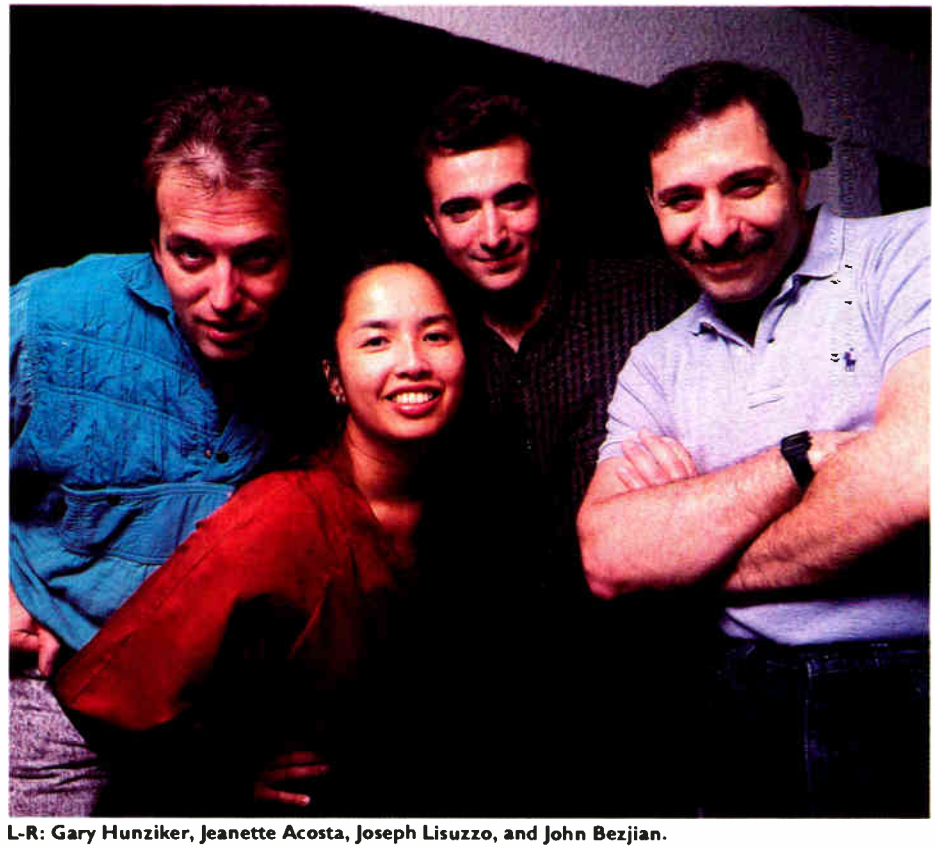
"Then we go to the computer and we record from there. We don't use multitrack recording, we go straight to a four-track ½" master tape." Well, that cuts the time needed for transfers, eh? "The term for what we do is called 'virtual tracks' because we don't go to multitrack recording.

"Usually we start by going to the first start time. On this segment, we were told to start at this point in time, which was at 21 minutes, 40 seconds and 15 frames." The segment we're viewing is one in which Murphy is trying to deliver subpoenas to folks who don't particularly want to receive them, all the while being followed by two FBI agents.

"The FBI people were recurring characters in this show, so I had to give them a theme. And they're kind of bumbling FBI people, so I had to make them more fun than serious. That's what I had to draw from –what will make these guys fun and yet will also make you perceive them as being somewhat serious and haunting Murphy during the show? Let's pull up the (Kurzweil) PX, Preset 13 on MIDI channel 3 . . ." Gary and Joey run around adjusting synths. Once the sequencer is started (Jeanette's using Mark of the Unicorn's Performer, version 2.41, set to external sync so that the Mac follows the timecode on the video), a great jazz riff begins, with plunking bass and hot keys, beautifully orchestrated and accentuated with a wonderful sax sound. We're listening to pure music here – no dialog, no sound effects – and it's pretty good stuff.

Part of the compositional philosophy demands the denial of some of the more sophisticated technologies in order to preserve the musicality of the pieces. They don't see much need for a program like Auricle, for instance. "We have found that we rarely want to make a measure shorter, or put in a measure of 3 when the piece is in 4/4 time," Gary says. "We always try to look at it in terms of musical composition. We feel that, even though it's subliminal sometimes, if you make the music flow nicely with the scene, it'll be more comfortable than if you're changing things around just to make them fit the timecode."

In a sense, all of Acosta's work here is improvisation – she'll cut a drum track, build a bass, choose the lead instrument and let it sing – the same thing everyone does with even the smallest home setup. Part of the genius here lies in the orchestrations. "Studying orchestration was part of the training that I had – it just seems natural to do it," Jeanette smiles. "I play theater pipe organ too, and I think that really gave me an ear for blending music orchestrally in that form. I belong to a theater organ society that has tried to keep up with the silent film things, where they still play music for silent films. I used to do that on Sundays, and you really had to learn a large repertoire and pretend that you're an orchestra. So I think it came from that."



L-R: Gary Hunziker, Jeanette Acosta, Joseph Lisuzzo, and John Bezjian.

In keeping with the improvisational method, Acosta refrains from using score paper if she can help it. "Why do that to yourself?" she laughs. "If I were dealing with an orchestra, then of course, but writing it down takes forever. When you have two days you really don't have time to write it down on paper. So it's essentially improvised, unless the producer asks for a specific song. Then we have to recreate a tune – which is another challenge."

Her teammates continue to jump through patches on the synths. "This is what happens when I'm writing," she explains. "I'll need sounds from different instruments and they'll bring them up for me. It's fun having this much creative talent – all the technical knowledge with all of us put together makes for a lethal combination, and it makes it fun. You can stay in here for 24 hours straight if you want to."

STUDIO MALIBU COMES complete with an old Fairlight CMI, an old Synclavier, several Emulators and Roland and Sequential samplers, a Minimoog, Memorymoog, and two Polyfusion modular synths, as well as an array of 'modern' synths (see sidebar for more). It's got to be a wiring and MIDI nightmare, but Jeanette seems to love it.

"When I did Falcon Crest, I used the Fairlight. It's a wonderful instrument, with a wonderful sonic quality. If a Series III were here, I'd put it to use. You always need one more piece of equipment because each one has a quality you can't get from something else. But since it's not, I use the EIII and everything else in the room. Each instrument has its own wonderful character that you just can't do without."

The owner of Studio Malibu, John Bezjian, takes pride in the way the system interacts. "The studio is set up, in a sense, as a workstation like the Fairlight. All of this – the Mac II, the CD-ROM drive, the EIII, the 300 Meg hard disk drive here on the floor – it's all connected through SCSI [Small Computer System Interface). And yet all of the instruments, even though it is one system, are discrete independent components that I can use separately. So a lot of the things you can do with a Fairlight, as far as waveform editing and all that, can all be done here on the Mac with Alchemy. And because of the SCSI interface, I can actually send sounds from the EIII's RAM into the Macintosh with basically the same speed that I have on the Fairlight editing system." Of course, it also gives him the advantage of purchasing third party software instead of being locked to one supplier.

Jeanette agrees. "It's a much more flexible system. You have more choices in what you want to use as an instrument."

We sit back to take a look at the complete video, this time with dialog and sound effects. I don't want to say anything, but what's happened to the music is pretty disgusting. The dubbing stage has brought up the sound effects way too loud, smashed the music (presumably through cheap reverb and EQ), and totally lost the interesting thematic support that Jeanette had created with her composition. I can't help but think of all the negative comments I've heard on the state of television music . . . maybe it's not so much the talent of the composer but the process in which it's recorded that drives folks up the wall.

I mention the sax sound – it is particularly good. "Yeah, the EIII's really musical," Gary says. "Really good samples. We've pretty much taken the factory samples and tweaked them just a little bit, changed a few parameters just to make them more expressive. But the factory has done a real good job."

"The name of that sound is 'Breathy Sax,' and it was used quite a bit because that was the signature instrument for Murphy," Jeanette adds. "It's not even a Sound Genesis sample – it's an Emulator standard patch run through a little reverb."

As far as drum and percussion sounds, they'll use just about anything. "We use the Studio 440 quite a bit," Gary says.

"The EIII has drums too, and so does the S550, so we have quite a range," Jeanette adds.

True – so how come the Alesis HR16 is in here? "Actually, there's a couple nice things. I like the hi-hats and one of the electronic drums. They're cheap and they've got a couple of good samples. They're easy to use and fun to program. Convenience has a lot to do with some of the decisions we make," Gary laughs. "That's why I still use the 2002. Even though it's an antiquated instrument in many ways, it has some great samples and it's musical. It's the closest I've found in anything we have to a soprano sax."

The one piece of gear that everyone's raving about here comes from Sycologic: the M16 MIDI Matrix patchbay and the M16 MIDI Expander (with 32 MIDI outputs). "The Sycologic has been absolutely problem-free, other than maybe not knowing how to operate it," Gary laughs. "Learning it was the only problem. There have been zero problems with equipment in the room. It's always, always, always, *always* worked."

John smiles. "I chose the Sycologic because it allows me to name every instrument and its own patches. Plus, the remote control unit is separate from the actual thing itself. So if you're adding more instruments to it, all you have to do is select 'Destination,' scroll through, and pick out the number. Literally, every instrument in the room is receiving all of its MIDI from ►

► that box. We're stretching it, too – for instance, with all of that modular gear, there's one huge, long MIDI cable coming here that's been rigged up, which is definitely a no-no, but we've pulled it off. I'm actually amazed we haven't had more problems."

"At times we have maybe 40 tracks of different kinds of MIDI information going on simultaneously. That's a lot of stuff, with pitch-bends and all," Gary says. "Only one time we had some problems with this controller keyboard. It was spitting out All Notes Off messages, so I have this key taped down (the highest on the keyboard), which prevents the All Notes Off message from being sent. Never need this key anyway."

For some unexplainable reason, the best interviews all end the same way, with everyone talking about their favorite instruments.

"The only thing I want is the SDX," Gary says.

"I don't know," Jeanette responds. "What I miss is the Chroma . . ."

"And there's all sorts of new things coming out, too. I want to get one of those Proteus things . . ."

I'm beginning to understand why Jeanette, Gary and Joey are out of control. Neither their dreams nor their techno-lust have yet been contained. If they can muster a bit more luck, hang in there no matter what, and stick to their creative ideals, we'll no doubt be hearing a lot more from Out of Control. Watch out, Hollywood! ■

STUDIO MALIBU

JOHN BEZJIAN'S STUDIO is any musician's wet dream. While it's impossible to run the four-page equipment list here, a few of the highlights include two EIIIs, an EII+HD, two Emax SE/HDs, an SP1200, S550, two MIDI Bass boxes, the Kurzweil 1000 series expanders, D50 and D550 with the PG1000 programmer, Jupiter 6, Prophet T8 with programmer, two Macintosh computers, racks of outboard gear from Aphex, Lexicon, Yamaha, Alesis, Roland and BBE, an Opcode Timecode machine, Tascam 24-track, 4-track and 2-track tape machines along with three Tascam synchronizers, a Tascam M600 mixing board, a Mellotron Mark V, a real grand piano (upstairs in the house), Leslie speakers . . . I suppose you've gotten the point by now. This is a *great* place to play. Or work.

When John realized that he'd have to move his own little MIDI studio out of the house, primarily because of a complete lack of space, the first thoughts of opening a commercial facility emerged. "Since nobody seemed to be beating down my door asking me to do film scores, I thought I could pay some of the bills if I opened it up. My idea is to try to get film composers in the beach area here to use it for composing, allowing them to put their music on 24-track tape while avoiding the drive into Hollywood every day (a two-hour round trip). I figured a guy here could accomplish everything that he could in a major studio.

"The studio has a double insulated wall in the front, so it helps keep out the noise from PCH [Pacific Coast Highway – a nearby coastal road). This is phase one of the room, actually. We've been down here about a year or year and a half. I still need to put in a false floor, and hide all the cables, and insulate against the dog running upstairs. We're primarily set up for what they're doing in television and film, but we've done record projects in here as well – we had an African choir in the room last week, stuck in the middle here with microphones – and we've done other acoustic recording. The room isn't really designed for that, obviously, but we've been able to pull off a variety of different things in a pinch."

A lot of thought has gone into the wiring. "One of the nice things is the way the M600 console is hooked up to everything else in the room," John relates. "Everything that's in here literally comes up on the patchbay, so that you can quite easily walk over to the console, touch a few buttons, and everything's there.

"I've tried to make the room useful in an easy context of sitting here and getting the work done. The Sycologic helps with everything – it literally pulls everything together. You can sit in this one bay area and you can send sounds to any of the samplers or patches to the D550 or whatever, as well as route all the controls up here. You can sit in one place, punch in a patch, assign a MIDI channel number and it's ready to go.

'Another thing that I like about the room is that people can walk in with a Performer disk and just orchestrate with the instruments that I have here. They can come here with the work that they've pre-produced and literally orchestrate the whole thing. And then they can put it on 2" tape, stick it on 'x' number of tracks and they can still add a live guitar player or sax player or whatever if they need to go into a larger acoustically-oriented studio."

But so many instruments. "That's a nice thing, having the plethoritis effect, where there's just tons of everything," John laughs. "We do have two EIII's, so if you want to use a lot of EIII sounds you've got that capability. Basically there's 32 voices of EIII and 16 megabytes of RAM. And when you look at the sheer number of samples . . . I think the only thing we don't have are the Akais. It's easier to say what we don't have here rather than what we have.

"I think it's the environment of the house that really convinces people," John concludes. "A lot of what people like about the studio is that it feels good. You can open the door and look at the beach. We also have shares in the beach club over here, so we actually have a private beach with a key. So if you've been in here for 15 hours and you just have to get out of the box, you can go across the street and hang out."

I suppose you can, if you don't mind taking your life into your hands.

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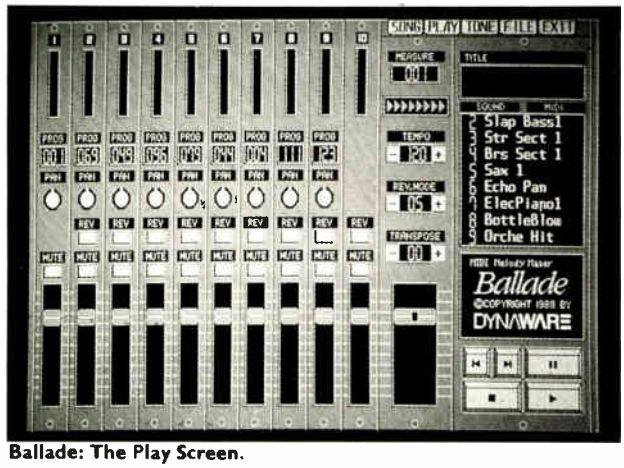
Dynaware
Ballade

An impressive sequencer and editor/librarian for the Roland MT32. *Review by Ernest R. Tello.*

I SUPPOSE IT was bound to happen. Just when you thought you had the different categories of MIDI software clearly mapped out, something shifts in the industry to upset the apple cart. Ballade is one of the new breed of programs that seem to defy classification. If you tag it as simply an editor/librarian for the Roland MT32, you'll be missing quite a bit that this program has to offer, such as scoring, sequencing, and even some powerful automated mixing features.



Ballade: The Play Screen.

If you have an MT32 and MS-DOS compatible computer, it's very likely that you will find this program delightful and quite useful (by the time you read this, Ballade will support several Roland synthesizers, but I've just tested the MT32 version). However, if you want something for entering complex orchestral pieces in standard music notation for MIDI playback, you'll have to look elsewhere. You can enter a sequence into Ballade using standard notation, but nothing too large or complex, and for now at least, you can't print scores. It's simply not for anything more ambitious than band or ensemble music. You create arrangements with up to nine parts plus a drum machine (or the MT32's rhythm section). So actually, it's as much a sequencer as it is a patch editor.

Ballade features an excellent user interface design. When the program first comes up, you are presented with the Play screen, an impressive piece of work in itself. It's laid out to look like a ten-track mixing console that also has a tape recorder control panel. Each track has its own digital level indicators like those on a tape deck, and they even move up and down in real time as the music plays. Just about everything on the mixing console – faders, pan pots, mutes, etc. – can be controlled in real time, by the mouse or arrow keys, and can also be fully automated in a sequence.

The other main screens are the Song screen, the Tone screen, and the Tone list. The Song screen displays the music of a sequence as notes on a staff for one track at a time. The Tone screen is where you do patch editing for the MT32 or other Roland L/A synthesizers. The Tone list presents a few screens of sound patches by name and number that can be mouse selected. For programming various options, there are a large variety of option sheets that pop up and disappear one at a time, as needed. The program is surprisingly sophisticated for being so straightforward and easy to use.

For more systematic testing of patches there is a special monitor feature that is a real jewel. If you click in the space labeled "monitor," a window opens with a cross-hair that moves with the mouse cursor much the way it does in the Music Mouse program. Here, though, the vertical axis corresponds to note velocity and the horizontal axis to pitch. The result is that you can very rapidly test any patch over a wide range of notes and velocities. Clicking on the graphic representation of an envelope opens a window that allows the different lines composing it to be rapidly reconfigured by alternately clicking at the different vertices. At any point, selection of the Compare box allows the original version of the patch to be compared with the edited version.

The superior user interface of this program also carries over into the facilities for creating finished pieces of music. One thing that helps to sell you on Ballade is the outstanding quality of the demo arrangements provided. One is a dazzling jazz-rock extravaganza, an arrangement of Chick Corea's 'King Cockroach,' with moving automated faders and all the stops pulled out. Listening to it, you can hardly overlook the program's strong points. The audible results are right before your ears! It's surprising that more developers do not provide demos of this quality to show off their product's best side.

Now down to more specifics. Overall resolution and quantization are completely adequate for the type of music for which the program is suited. Ballade can resolve down to 64th note triplet values. Two unique and highly welcome tools are the "Ride" and "Slur" Pallets. Each in its own way, these facilities allow for some unusual subtleties of expression in articulating notes. The Slur Pallet provides two different methods for precisely controlling the duration of notes. The standard options include three different staccatos, as well as normal, legato, and tied. You can also set the slur duration numerically for still greater precision. The Ride Pallet provides something that many band musicians will applaud: the ability to let any note lag or lead the beat slightly. As good drummers know, this is an excellent way to put extra tension and drive into arrangements.

The strongest features of this program are the Setting Sheets, which are used for refining and automating the final sound and mix of an arrangement. You can call up one of these sheets for the fader or pan pot of your current track at any point in a song. You select the measures during which the operation is to begin and end, the amount of change, and one of three graphic "curves" that define the pace of the onset of the change. The result of the setting is audible in the music and visually animated on the

Play screen as well. This is probably one of the features that most users will like the best.

Despite the many nice features in this program, I do have some gripes. First are some deficiencies in the ability to visualize and access your arrangements. There are no screens on which you can see a representation of the music on all of the tracks at once. Related to this is the fact that it's very hard to spot program changes. As it is, you have to step through a song a measure at a time looking for them, or stop the piece while it's playing and backtrack to where a change occurred. My final gripe is that instead of compensating for one of the weaknesses of the MT32, the program has inherited it. I'm referring to the fact that six MIDI channels (11-16) are completely ignored.

To sum things up, this program scores very high in overall design. There is room for this program to grow beyond its current state, which already makes it attractive to use with any synthesizer because of its visual animation of automated mixing functions. At this point, however, it is with Roland synthesizers that it is most fully operational. ■

PRICE: $195
MORE FROM: Dynaware Corp., 1163 Chess Dr., Ste. J, Foster City, CA 94404. Tel: (415) 349-5700.

Cannon Research Frontal Lobe

This hardware module for the M1 adds more sequencer memory and a disk drive.
Review by Lorenz Rychner.

IT'S HARD TO fault the M1, except possibly for the lack of a disk drive and its modest amount of sequencer memory. The Frontal Lobe takes care of these shortcomings, and it can do a few tricks of its own. It's a squat little box that fits neatly on the M1 on either side of the volume fader, held in place quite firmly by tiny rubber feet. The three round and five long control buttons on the top panel look and feel like those of the M1, and an LCD readout completes the user interface. The Frontal Lobe is available in four different models: the 15K, with a capacity to store 13,000 sequencer data events (each of which includes the note on, off, and velocity numbers); the 64K, with a 62,000 event capacity; and the 15KD and 64KD which add a disk drive to the first two models.

The rear panel has connections for the A/C adaptor, a standard ¼"jack for use with a pedal, an on/off switch, and two additional jacks that look like they belong on your answering machine instead of your MIDI gear. In fact, there's no MIDI port, but a MIDI adaptor comes with the unit that links one of these telephone-style jacks with the MIDI In and Out of the M1, while also letting you connect MIDI cables to the M1. The other telephone-style jack on the Frontal Lobe is an RS232 computer connector similar to those on your computer's modem, and it can serve to connect two or more Frontal Lobes, or a modem or other devices for special networking applications.

The disk drive works with 3.5" HD (High Density) disks. These are great for increased storage (1.44 Mb), but they still cost around eight bucks apiece at some stores, although you can find them for less than four if you shop around. The manual warns against do-it-yourself mods of ordinary cheap disks (a Black and Decker drill or hot soldering iron are favorite techniques, but don't hold me liable . . .). In addition to storing M1 data, the disk drive serves as a generic MIDI dump recorder. Since there's no capture buffer, the only restriction on dump size is disk capacity – the data flows straight onto the disk. The Frontal Lobe can also issue dump requests for instruments that don't let the user initiate a dump from their front panels.

The RAM portion of the Frontal Lobe stores sequencer data just like the sequencer on the M1, and it retains memory even when the power is off. Chaining sections of songs is possible, and the footpedal can be used to loop and change songs on the fly. While the Frontal Lobe is playing a sequence, you can edit the M1 to fine tune the sounds. This is one heck of a smart box, with an excellent manual and detailed MIDI documentation. If you're using your M1 live, this may be just what the doctor ordered. ■

Frontal Lobe from Cannon Research.

PRICES: 15K, $399; 64K, $799; 15KD, $799; 64KD, $1199.
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The VZ-1 uses a whole new technology called iPD (interactive Phase Distortion) instead of sampled wave forms, or PCM partials. An open system of 8 multi-waveform oscillators interact in a variety of ways–mix, ring, phase, and external phase modulation. The result: sounds that are rich, full, and unique.

One of the VZ-1's strongest features is its Combination Mode, which lets you combine up to 4 different sounds in a variety of split and layer configurations, including multiple velocity split and positional cross-fade capability. You'll swear you're playing a MIDI stack instead of a single keyboard. As a MIDI master keyboard, the VZ-1 can be split into 4 "zones," with separate send and receive channels for each note range.

The VZ-10M is a 2 rack-space version of the VZ-1.

The VZ-1 comes complete with 64 sounds and 64 Operation Memories, plus a free ROM card (RC-100) with an additional 128 of each, for a total of 384 timbres out of the box. Optional ROM cards with additional sounds are also available. And with an optional RAM card (RA-500), you can store up to 64 sounds and 64 Operation Memories of your own.

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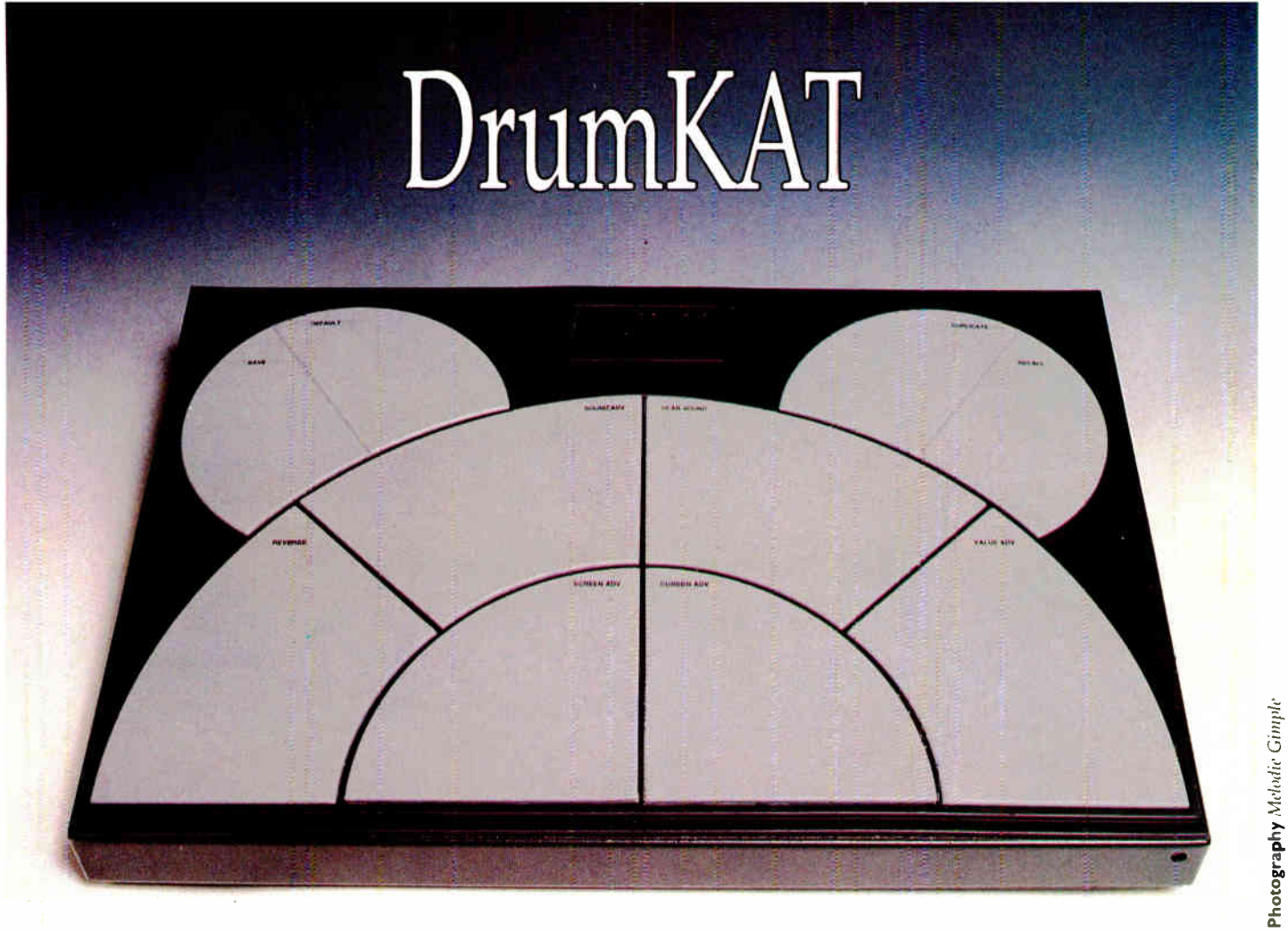
DrumKAT



Photography *Melodic Gimple*

The latest MIDI percussion controller to hit the market sports a very distinctive look, impressive features and a novel editing system. *Review by Matt Isaacson.*

THE ORIGINAL ROLAND Octapad, while slim on features and number of preset memory locations, was a compact, low-cost workhorse that "did the job," opening up the possibilities of MIDI to many percussionists, myself included. Despite its obvious appeal and its shortcomings, it has had little serious competition in the market. With the arrival of the DrumKAT, that could be about to change. But is the DrumKAT worth the extra bucks?

Physical Stuff

The DrumKAT is built into a metal chassis with slender lines and a solid, reassuringly "slab-like" feel. Internal bracing rails stiffen the top panel and keep it flat. This keeps the triggering consistent, and one gets the impression that years of heavy pounding will not affect it. Thick foam rubber lines the insides of the box to deaden it, and the bottom plate screws down over a gasket that prevents rattling under impact (anyone who's played on an E-Drum knows what this means). The unit is consistently dense enough to provide excellent stick rebound on all of its pads. Overall, it's a bit smaller than an Octapad and will integrate easily into most drum sets or percussion setups. An optional mounting plate screws to the bottom panel and provides a ¾" diameter post for universal-clamp stand mounting.

Stick rebound on the DrumKAT – which I consider superior to that of the Octapad, as well as most of the individual pads now available –is enhanced by the pad surface material, which is a gum-rubber type of stuff not unlike what you might find on a stick practice pad. While not completely silent upon impact, the pads are less noisy than those of the Octapad. They thump, but don't click as much. In fact, the entire top panel is covered with this rubber (the pads are gray on a black background). If you miss the pads altogether and hit the dead space instead, it actually makes less noise, as opposed to radically more noise when this is done on the Octapad. Each pad gives an even response to stick strokes at all points on its surface, right up to the very edges, because of the Force-Sensing Resistor (FSR) transducers used to detect pad strokes.

FSR pads such as those used in the DrumKAT respond only to directly-applied pressure. They're more or less oblivious to vibration, so isolation between adjacent pads is virtually total. Not only that, FSR pads are sensitive to changes in pressure, as in keyboard aftertouch. Although it is not mentioned in the manual for some reason, this ability is exploited for performance use on the DrumKAT in a switch-like manner – you can sustain a note by keeping pressure on a pad after you hit it. Admittedly this is tricky at best as a stick technique, but it's a natural for bare-hands playing and opens up interesting possibilities for performing with sustained sounds.

Oddly for a device called the DrumKAT, the pads are laid out in a pattern that looks like – well, a mouse. In fact, the manual more than once refers to specific pads as "ears" – but you get used to this pretty quick. The layout is a bit more like a drum set than the

regular Rectapad (oooops – wait, that didn't come out right), although the similarity would be more significant if the whole thing were four times as big. The "ear" pads – four of the total of ten on-board pads – verge upon being too small. As with the Octapad, so it is with the DrumKAT – the pads are small and very closely-packed and the playing action is all from the elbows down.

A generous 4 line×16 character LCD is nestled between the ears. The large amount of info that it can display keeps programming from becoming a ritual of insanity. The display is recessed below the surface and protected by a clear plastic shield against anything short of a serious premeditated assault. Nevertheless, it is very readable from the playing position and at all levels of ambient light (although I can imagine some performance situations under which one might yearn for the oversized LED patch number display of the O-pad).

The DrumKAT is long on interfacing. Its back panel sports four footswitch inputs, nine (!) trigger inputs, two MIDI inputs with merge capability, two independent MIDI outputs (each with a pair of output jacks), and a metronome click output. These are all discussed below.

A removable power cord plugs into the back. The power supply is internal, which I prefer – nothing to lose, none of those skinny, vulnerable-seeming AC adaptor cables stringing about. No unfortunate mistakes with the wrong adaptor. Another nice touch is the optional carrying case. With the DrumKAT inside it, I felt no qualms about tossing it into the back of a truck from my third-story window (but relax Bill, I didn't really do it). All in all, a very roadworthy system.

Basic Performance Features

Enough nuts 'n' bolts. What can you do with the DrumKAT? For starters, you can set up 32 kits worth of pre-programmed configurations. For each kit, you can specify all controls for each of the ten on-board pads and the nine trigger inputs as well (the DrumKAT tops out at nineteen individual playing surfaces). Performance options for the trigger inputs are the same as for the pads.

In the Simple mode, one pad equals one sound, period. Simple mode lets you set MIDI channel, note number, velocity range, velocity curve and gate time independently for each pad. In this mode, each note message is sent to ▶

both MIDI outputs. The adjustable velocity range lets you use full or compressed dynamics on a pad, while velocity curves let you alter the relationship between your playing dynamics and the MIDI velocities that result. The gate time can be set anywhere from 25 milliseconds to 6.375 seconds (good for playing sustained synth sounds) or to zero (for typical percussion sounds).

For each kit, you can also specify up to six sets of MIDI program change and master volume messages that will be sent automatically on specific MIDI channels over specific MIDI outputs whenever that kit is called up from memory. This gives you an excellent capability for instant, hands-off, "on-the-fly" reconfiguring of patches and mix levels while performing with even a moderately complex MIDI setup.

Footswitch #2 lets you access the various kits while playing. Stomping on it steps you upward through kit numbers one at a time. Hitting designated pads while holding it down lets you step upward or downward once per hit. You can also define eight "songs" of up to 16 steps each, where each song step indicates a kit number of your choosing. If you're in song mode, the footswitch method steps you through the kits in the current song instead of just stepping up or down through consecutive kit numbers. Notably absent is any truly random access to kits – to get from one kit to another, you have to step through any that are in between – but if you're accurate with seven-stroke rolls and such, the DrumKAT will follow you at full speed.

Complex Modes

The simple mode described above is just one of several modes that can be applied to a pad or trigger input. An important point to understand about the DrumKAT is that these modes do not apply to an entire kit at once, but independently to each pad in a kit – and they can be mixed up in any way you choose within each kit. This is one of the keys to the power of the DrumKAT.

Multiple mode is like Simple mode times three. All of the controls provided in Simple mode are offered in three independent sets per pad, allowing you to trigger two or three sounds with a single padstroke. In addition, each of the three sounds can be played on a different MIDI channel via the MIDI output(s) of your choosing, so the sounds can be completely unrelated (and once you get past Simple mode, you can address up to 32 channels of MIDI thanks to the dual outputs).

You can also set a delay time separately for each of the three sounds, which controls how long after the padstroke each sound will occur. The delay time settings are not fine enough to be useful for things like sampler delay compensation, but are intended to let you arrange the sounds as flams, short rolls or simple rhythmic figures. Another important aspect of Multiple mode is the ability to set different velocity curves for each of the sounds. Since some of the curves are reversed – the velocity goes down, not up, when you hit harder – multiple mode allows you to easily set up velocity crossfades between sounds.

Alternate mode is like Multiple mode, but it rotates through the sounds assigned to a pad on consecutive padstrokes instead of playing all of them on each hit. You can rotate among three sounds or alternate between two. Used unimaginatively, this can get annoying very quickly, especially if you hammer away on just the one pad. Making Alternate mode work for you means doing things like riffing around on three or four pads set up with alternating sounds, or playing syncopated grooves using one pad that alternates between three slightly different snare drums.

Velocity Shift mode is another three-way deal. Again, it's a lot like Multiple mode, but the delay parameter is gone, and in its place there is a second velocity range setting for each of the three sounds. In contrast to the first velocity range setting, which sets the minimum and maximum velocities sent over MIDI for a sound, this second control sets the range of pad dynamics that will cause the sound to be triggered. A typical use for this feature is to set up a pad so that soft strokes will trigger one sound, medium strokes another, and hard strokes a third, giving a more complex response to playing dynamics than simple volume change on a single sound.

Note Shift and Gate Shift modes apply dynamics to the appropriate parameter of a single sound. In the first case, changing velocity can change the MIDI note number transmitted, while in the second case, velocity is used to change the gate time of a note. Note Shift works well with samplers, giving you velocity-controlled tuning, or any

pitched sound source for random melodic runs. You can even use it with a drum machine to play a mind-boggling solo all over the set from just one pad (but please, keep it brief).

Last but not least, and a very good friend of mine, is Hi-Hat mode. This is great for drummers who want to play hi-hat sounds in a natural manner. In this mode, you designate an "open" sound, a "closed" sound, and a "foot" sound for one pad. The "foot" sound is triggered by hitting footswitch #3 (although the sound is at a fixed velocity). It is typically the "chick" sound of hi-hats being clamped down or the same as the "closed" sound. Playing on the pad itself will trigger the "closed" sound if the footswitch is being held down at the time, or the "open" sound if the footswitch is not being depressed. The main requirement for this to work correctly is that the "foot" sound must cut off the "open" sound when triggered, just as closing down a real hi-hat will stop its ringing. This can be done on most samplers, and I don't know of any drum machine that doesn't handle its hi-hat sounds in this way.

Just to recap: You can use any or all of the above modes in a single kit, and they can be applied to on-board pads and trigger inputs alike.

Other Performance Controls

The DrumKAT can deliver 64 discrete velocity levels from each pad (which is more than most drum machines and some samplers can distinguish, despite the 127 velocity levels allowed by MIDI). These are processed through one of 16 available velocity curves before being passed on to the velocity-sensitive parameters (which, as discussed above, include MIDI note velocity, note number and gate time), allowing you to further customize the dynamic response of each pad. Smooth, stepped, abrupt and reverse curves are built-in, and two of the 16 curves are user-programmable at each of their 64 points.

The DrumKAT is also capable of controlling a MIDI sequencer. To do this, a pad is placed in tap-tempo mode. Holding down footswitch #4 lets you preview the tempo: the internal beeper sounds at the quarter-note rate. At this point you can tap out the desired tempo on the designated tap-tempo pad. Once you release the footswitch, the next stroke on this pad will send a MIDI Continue message ▶

► and begin a stream of MIDI clocks at the new tempo. Hitting the footswitch again stops the sequence. (If you repeat the procedure, the sequencer will pick up where it left off, because the DrumKAT doesn't send MIDI Start messages). A metronome click output covers situations where the internal beeper is unwanted or not loud enough.

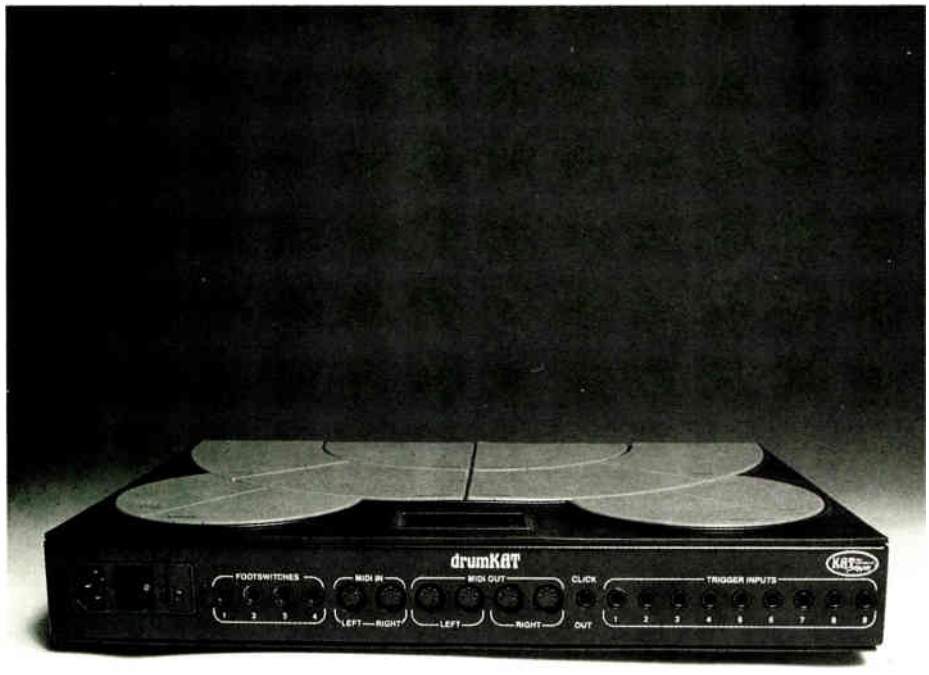
The MIDI inputs on the DrumKAT allow you to merge messages from a sequencer or another controller (such as a master keyboard or a second DrumKAT) into the message streams being sent from the DrumKAT. They also allow you to use these devices to control the DrumKAT, which can recall kits in response to MIDI program change messages – essential if you want to cascade two DrumKATs, and useful if you want to drive kit changes from a sequence or from another player's program changes. Some simple routing and filtering options are provided – clock, note and "other" messages from each input can be sent to either, both or neither MIDI output. Two inputs means that the DrumKAT can serve as a generic MIDI merger for any two external devices, completely apart from its own percussion functions.

The trigger inputs deserve special praise, and not just because there are nine of them. They work with just about anything. The DrumKAT stores settings for each input (such as threshold, dynamics and mask time) that adjust it to the characteristics of the trigger source, be it a piezo pad, an acoustic drum trigger, or a recorded drum track. While you can adjust these settings directly, the DrumKAT offers a much easier method: set the gain (using the bargraph input level display), then hit the trigger once softly and once hard. The DrumKAT figures out the rest on its own. A similar method is used to adjust the sensitivity of the on-board pads.

The Editing Interface

Editing is done in an unusual way – the on-board pads themselves are the editing controls. You hit footswitch #1 to get into Edit mode, then hit one of the pads to select a particular category for editing (e.g., kits, trigger adjust, global) – and then hit it again to confirm your choice. Once in a category, a specific pad steps you through the associated screens. For example, in Kit Edit mode, where most of the action is, each pad performs a specific function such as moving the edit cursor around in the screen, adjusting the setting at the cursor position, reversing the direction of cursor movement, getting you into the copy functions, and saving the edit. One pad is dedicated to monitoring your edits. You beat on this pad to hear what your current edit sounds like – since you probably can't use its "native" pad to play while in Edit mode. This last point is perhaps the most unfortunate aspect of this approach, likely to cause some confusion when you forget about it.

On the whole, although this editing system is a bit off-putting at first, it turns out to be fairly easy to work with once you get familiar with it. This is due in no small part to the effort of the designer to remedy its possible pitfalls. For example, if you really get confused, you can always exit from Edit mode by simply hitting the footswitch again. Once you regain your confidence, you can easily reenter Edit mode and recall the edit you bailed out of – nothing's been lost. You can move from kit to kit without leaving Edit mode, and a full assortment of copy functions prevents the tedium of copying a large set of parameters from one place to another, or a single parameter to a large number of places. The manual, although a bit wordy at times, is nicely done for the first-time user. The large display is put to good use when necessary to help you stumble through without referring back to the manual at every step. All programmable settings can be sent out from the DrumKAT in MIDI System Exclusive dumps for safekeeping in a sequencer or computer.



Conclusion

In my opinion, the DrumKAT is well worth the asking price. It's solidly built, well thought-out, feature-laden and seemingly glitch-free. Whether it's worth the extra difference over an Octapad II is really a personal call based on individual taste and preferences. One factor in its favor is the near-certainty of software updates that will add interesting new features. I'm told that one such update is just around the corner, and will add things like MIDI controller transmission from pads, conversion / remapping of received MIDI messages, and the ability to record drum licks so that they can be played back via single padstrokes.

In total, a truly impressive and expressive controller. ■

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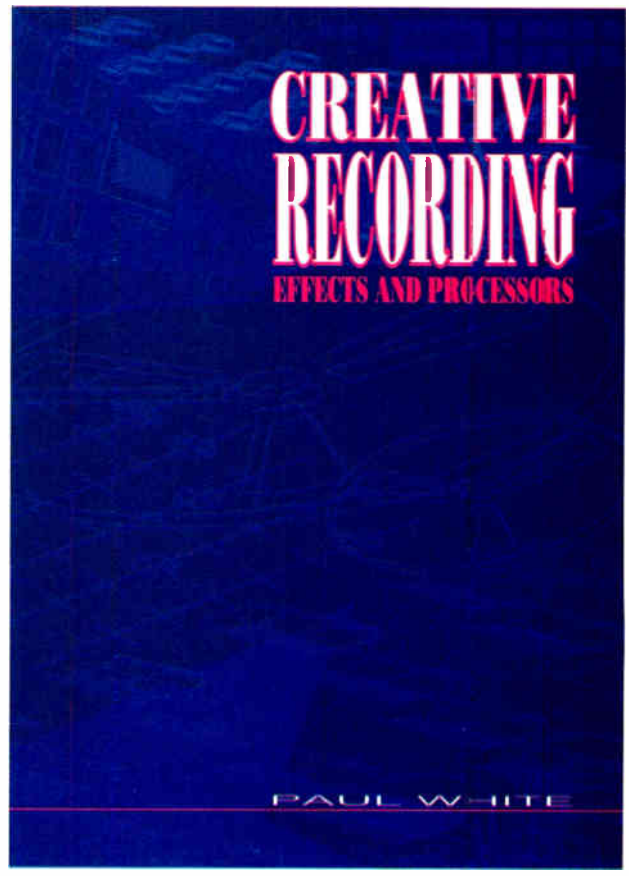

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LISTENING LAB

Who's using technology in the most creative, cutting-edge way these days? Here are some of the artists we've run across this month . . .

LAIBACH

Sympathy for the Devil

Restless/Mute

Pick of the Month

"Wicked" is the key word here. Yes, it *is* the Rolling Stones' classic tune, but this time it's turned upside-down and inside-out. In a sense, they've capitalized on "Satan's" point of view in the lyrics. The effect works, even to the point where I had to dig up the Stones' original version of the song just to remind myself where this all came from. Laibach, a young band from Yugoslavia, call themselves "retrogradists." They see present history melding and melting with the past.

In the instance of *Sympathy for the Devil*, they see a setting for that relatively recent bit of musical history somewhere around the 13th Century. My initial reaction to the record was to burst out laughing at the absurdity of it all. Heavy use of sampling, drums that could have been ripped off from Depeche Mode (but with a lot more emphasis on the "evil" quality that Depeche dabbles in), little splices of speech, symphonic arrangements, and vocals pitch-shifted down into the Third Circle of Dante's Hell, all contribute to the down-right powerfully Gothic feel.

Upon further listenings, I began to understand where these guys get off calling the music "retrogradist" – they're not merely trying to redo what the Stones have done (not even close!). Rather, they are transplanting that work into another time frame in order to show how easily the past and present *do* melt together. I should mention that this is a full-length album, consisting of no less than *six* versions of the song (maybe more). Amazingly, the versions don't all sound the same, and some aren't even similar. However, all carry a definite time-warp characteristic. Very interesting stuff, to say the least.

Also worth a listen is Laibach's *Let It Be* album. You guessed it – they covered the Beatles' entire last album (with the exception of the title track), once again in their own twisted way. Fascinating, really. ■ *Dan Rue*

COLDCUT

Out to Lunch with Ahead of Our Time

The Cartel/A HOT1 4U (import)

One of the hotter production teams in the land of modern dance compile eight cuts representative of their work. Each side (four in all) shows off a different style – acid house (some of the best I've heard, by the way), house (fair to good), hip hop (no new tricks, but very hard-edged and solid), and cut-up (yet another James Brown assemblage, plus the enjoyable 'Not Paid Enough'). The pace of the edits is a lot more relaxed than the frenzied pace of most gotta-show-em-all-I-got 12" 45s, making the overall album sound a bit more mature. The fidelity is low, but we're all decaying anyway, right? Once you're past the flash of getting into New Dance, you might wanna snag this for some stability. ■ *Chris Meyer*

MICHAEL SHRIEVE & DAVID BEAL

Big Picture

Fortuna Records

This picks up where *The Leaving Time* (by Shrieve, Steve Roach, and David Torn) left off. The anguished guitar antics of Torn and algorithmically composed Xpanders of Roach get replaced by a much heavier "orchestral" feel and tons of rhythmic interplay (no surprise, considering Shrieve and Beal are both drummers). As opposed to making you jump out of your chair exclaiming, "now *there's* a new sound," the wonderfully produced sampled and synthesized timbres tend to make you settle back a few more inches and say, "now there's a *tasteful* sound." I really hope that what Shrieve, Roach, and Patrick O'Hearn are doing these days indeed becomes our "Future Age" music. ■ *Chris Meyer*

PETER TOSH

No Nuclear War

EMI America

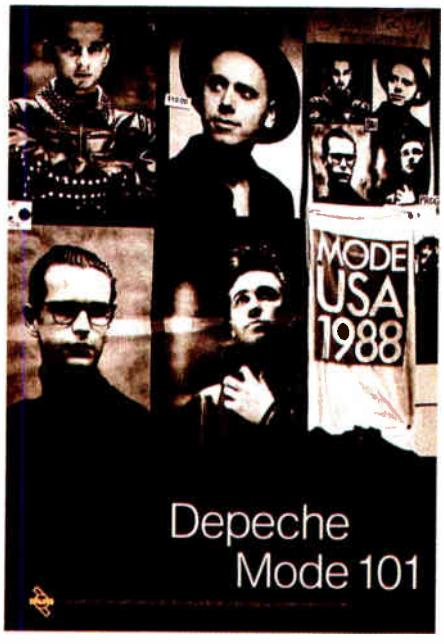
The Man's untimely murder puts this into an additional historical perspective as Mr. Legalize-It's (unfortunately) last album. Every cut is fairly

dense sonically, and virtually none have the instant gratification quotient of some of his earlier work (although the lyrics are some of his best). Repeated listenings and meditations, however, show some real staying power in this document – both lyrically *and* musically. The horn hooks are to die for, and there are a fair number of fun little squeaky noises along with a lot of the more typical analog synth comping. The bass and chunk-a-chunk guitar is mixed much lower than normal for him (making it easier for Pop Radio People to get into, I guess). Most surprisingly, most of the drumming is either a machine or Simmons (initially a disappointment), but it's fascinating to study how he moves the off beats around (like shifting the placement of the snare against the hi-hat in the chorus). Hope you're at peace with Jah, Peter; you've left us a fine Last Testament. ■ *Yung Dragen*

DEPECHE MODE

Depeche Mode 101

Mute



Yes, it's Depeche Mode's first live album, recorded at the Rose Bowl in Pasadena last Fall. Kind of a ridiculous concept, you say? Before I heard *101*, I would have whole-heartedly agreed. After all, these guys are famous for their heavily sequenced arrangements, and the music is all keyboards – just how much juice can you squeeze out of *that* turnip?

Remarkably, this outing rates as one of the better live albums I've heard in a while. The boys took quite a bit of time putting the show together, complete with alternate song arrangements, relatively minimal sequencing (the arpeggiating parts and drums are still on tape), and yes, even a good deal of audience participation. Dave Gahan's vocals sound surprisingly energetic, and quite dry, in fact –a nice contrast to his trademarked generic super-processed tracks on the band's studio albums. Those of you who've seen the band perform in the past will notice a dramatic improvement in Martin Gore's vocals – it seems he's finally overcome his stage fright, giving us a strong performance comparable to his studio work.

The double-length album features just about all of their hits, certainly a nice treat for die-hard fans. Those of you who aren't very familiar with their music will find a superb sampling of their work here. The engineering and production are generally excellent, with a good balance between the music and audience noise. All in all, Depeche has finally established that they are, in fact, a *band* in the traditional sense, and after a decade of music they can rock an audience right up there with more conventional acts. *Depeche Mode 101* offers an excellent example of how to correctly use MIDI (and tape) in live situations. Good work, guys. ■ *Dan Rue*

BOMB THE BASS

Into the Dragon

Rhythm King (import)

If you thought Tim Simenon of Bomb the Bass was just a cutup artist who made occasional forays into straight house music (well, I did), this album will open your ears a bit. Tim moves around between cutup, house, hip hop, rap, rare grooves, and acid with relative ease, often mixing them together. Although it sounds a bit disjointed as a whole at first (and the album, as opposed to remix versions, has less instant-gratification flash), on repeated listenings you'll realize that Simenon is simply more complex than many of his modern dance brethren. Snippets of tuning across a radio dial between cuts helps hold it all together, and a couple of light-weight percussion-heavy rhythm tracks are laid at the end of side one for breaks and looping. If you're only interested in his cutup and house exploits along with production tricks (and want to save some money – this LP is difficult to find, and cost me $15.99 when I finally tracked it down), just go buy the 12" remixes of 'Beat Dis,' 'Don't Make Me Wait,' and possibly 'Megablast.' If you want a more thorough grounding in dance music without the remix flash, Get *Dis*. ■ *Chris Meyer*

GREATER THAN ONE

London

Wax Trax/K=K

This one sounds like an industrial noise band (such as Test Department) decided to make a dance record, hired Art of Noise as producers, and – after the first couple of tracks – edged them out of the studio because they were just . . . too . . . *nice*. It comes off as a late-'80s alliance between some young, socially conscious punks and a few computer nerds with a large record collection for the purpose of changing the world. Great sounds (synth, sampled, and effected), including some of the most inventively snatched samples I've heard this year. Many styles (classical, cut-up, African, Nihilist) get properly mutilated. A few tracks have a great beat (one even clipped out my wagon's subwoofers), and many are really darker than your worst dreams – without resorting to screaming at you (á la Ministry). Please note: this is not just another cut-up record. This one's required. ■ *The Cyberpunk*

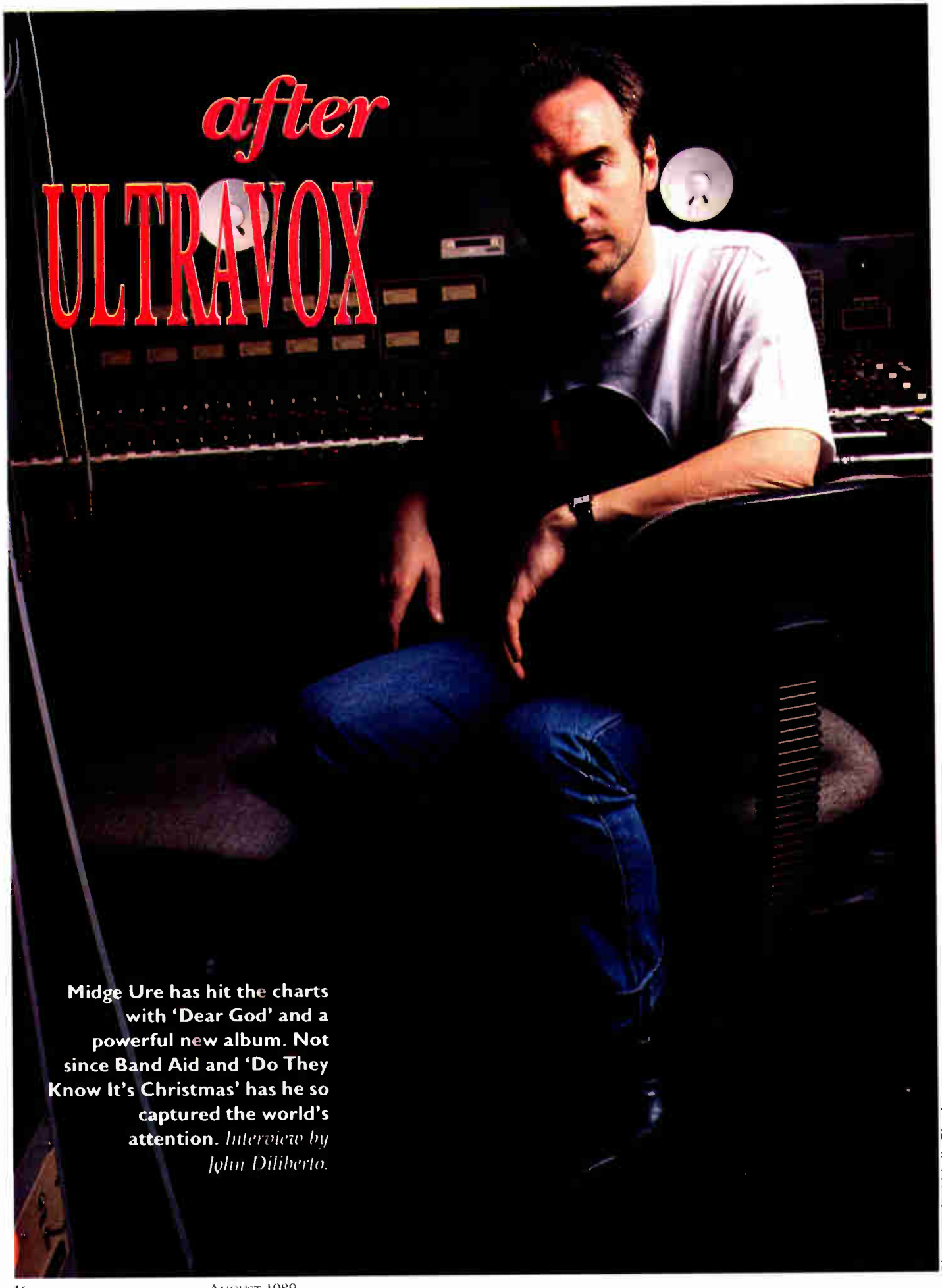
MARK ISHAM

Tibet

Windham Hill

A complex, sprawling CD intended as a soundtrack to a New Age wallpaper video. Containing many of his old and recent cohorts (Bill Douglass, Kurt Wortman, Peter Maunu, David Torn, etc.), *Tibet* includes all the sounds of Mark's film music efforts (closest reference sonically being *The Beast*). These include textured, muted synths; woodwinds and trumpets; ethnic percussion (including much of the gamelan/bell/gong variety); as well as straight and weird guitar – while stylistically managing not to sound like any of Mark's other works (particularly his more dynamic/melodic jazz craftings). Still, much better crafted than the vast majority of New Age. It didn't change my life, but I'm yet to tire of it. A great album to explore. ■ *Yung Dragen*

after ULTRAVOX



Midge Ure has hit the charts with 'Dear God' and a powerful new album. Not since Band Aid and 'Do They Know It's Christmas' has he so captured the world's attention. *Interview by John Diliberto.*

Photography *Melodie Gimple*

FOR MOST MUSICIANS, the tour bus is the dead zone, a moving void where time is slowly worn away watching TV, playing Nintendo, listening to music, and shredding frayed nerves. But not for Midge Ure. Sitting in the back of the bus, he looks into the monitor of his Atari computer, and he's not playing video games. "I bought one over here (in the US) and I've put it in the back of the bus. I'm going to be writing on the bus," he exudes. "Great, great tool!"

Technology and Midge Ure have been traveling companions for well over a decade, powering the Kraftwerk-inspired disco of Visage and the hi-tech art-rock of Ultravox. Even before that, playing in the Rich Kids with ex-Sex Pistols Glen Matlock, Ure was tweaking synthesizer knobs at a time when punks viewed guitar tone-control knobs as unduly hi-tech. As the frontman with Ultravox, though, he rode the first wave of techno-pop along with Gary Numan, Depeche Mode, The Human League and Heaven 17.

But now that the fashionable flush of techno-pop has faded with last night's makeup, Ure is left having to make music without trendy labels like "New Romantics" to lean on, and he does it on his second solo album, *Answers to Nothing*.

Offstage, Ure has always been more down-to-earth, eschewing the haute couture, gigolo look of Ultravox publicity stills. When I interviewed Warren Cann and Billy Currie of Ultravox in 1982, I thought Ure was a roadie when he offered to make us tea, wearing bib-overalls and a plaid shirt. Interestingly enough, that's exactly what he's wearing as he arrives at his Philadelphia hotel room, before his concert. Gone is the thin, pencil mustache he sported, but Ure's distinctive, impassioned vocals and his melodic hooks are enough to place his new music in the lineage of Ultravox.

Answers To Nothing has an airiness in the percussive arrangements that lets some light and breath come through. "Yeah, I suppose in my way it was a backlash against Ultravox – the massiveness, the orchestrations that Ultravox did," admits Ure, with a clipped Scottish lilt. "If there was a space, we filled it. I wanted to get away from that particular sound initially. So I concentrated on the rhythmic side of things, and therefore left a lot of holes. I didn't want to use big pad chords everywhere. All of the songs are built up of small melodies and counter melodies all played very rhythmically. It gives a totally different feel from what I've done before."

Many of the songs on *Answers To Nothing* are based around percussion instruments and rhythms. "Most of them originated from the drum patterns actually," says Ure. "It was my ground base, my starting area. I had a melody in mind and whatever, but the feel that I was trying to get was in the drums. I was trying to get the rhythm happening first, and then it was easy enough to slot in all the percussive melodies."

He generated these melodies using an Atari computer with Steinberg software. "When the Atari came out and this German Steinberg software thing (Pro24) came out, people just went bananas and fell in love with it," gushes Ure, almost embarrassed by his own exuberance. "It's quite a cheap package. An entire system – the computer, the monitor and the software – will cost around $1200, or $1000. Not a vast outlay for what's basically a 24-track recording studio. I love it."

The title track 'Answers To Nothing,' 'Remembrance Day' and 'Take Me Home' bristle with polyrhythmic percussion grooves that sound African influenced, especially with the sampled percussion. "Well, I used a lot of sampled percussion instruments which gave it that feel," he agrees. "And when I started, I also programmed the drum machines with the intention of taking them off and replacing them with acoustic drums. When (Mark) Brzezicki came in to replace those things, he freaked and thought that the drum patterns I had written were exactly what he would have done, so we didn't take them off. We kept them on and he played with them. I used a lot of samples and I suppose I sort of stole the feel of Phil Collins or Mark Brzezicki."

In the past, Ure has shown a fondness for Asian tonalities on 'Edo,' from his first album, *The Gift*. The last Ultravox album featured his Celtic derived 'All Fall Down,' complete with Irish frame drums called *bodhráns*. On the new album, 'The Leaving' manages to sound both Celtic and Asian at the same time, although Ure initially denies the Asian characterization. "I don't think it's particularly Asian," he differs. "It's quite Celtic in a way, 'The Leaving.'

"I know what you are saying," he reconsiders. "I can see the plunky synth things. I thought the basic feel of that was like Fleetwood Mac's *Albatross* from a long time ago [1968]. It had a really nice, slow, lazy, you know *dum, dum, ca dunka, dum*. A sort of slow three, almost. And when I was messing about the machine, that's the feel that started. I started messing with my computer and I really liked the feel of it so I tried to enhance that a bit. I think of it as Celtic, probably because it was written about Glasgow life, northern life in Britain. There are definite Celtic melodies and Celtic influences on the record."

His computers also led to the snakey Arabic bassline of 'Hell to Heaven' that sounds suspiciously like Mick Karn. "Well, I'm a big Mick Karn fan," he confesses, laughing. "I think it was perfectly justified because I know Mick and I admire his work very much. At the beginning of this album I discovered the computer and had great fun playing with the thing. And I realized that, not being a good keyboard player, I could write things in very small sections, give them a certain feel and mess about with bends on the keyboard. When I started doing bass parts, I had a lovely bass sound on the Roland D50. I started messing around with it and doing bends and slides that are very Mick Karn-like, and it was fantastic. I really enjoyed doing it. So I started doing all the bends and slides that he normally does. It sounds Mick Karn-ish until you hear Mick play again. And then it doesn't sound anything like Mick Karn, 'cause Mick does strange harmonies on the guitar, which I couldn't possibly do. It's great fun 'cause a lot of people actually think it's a bass guitar."

ANSWERS TO NOTHING is a personal album, with the simple love song 'Just for You,' childhood memories on 'Take Me Home,' and childhood hopes on 'The Leaving (So Long).' Although the music originates in percussion, the songs originate in his subjects. "I start with the subject matter I want to write about," he says. "Then I make a musical base for that and create an atmosphere with the music. Once I've done that, the lyrics come last." ►

►While these songs are rendered with heartfelt, haunting melodies, the album is also rife with Ure's socio-religious polemic on 'Answers To Nothing,' 'Remembrance Day' and 'Dear God.' He often works within the contradictions of religious symbolism. "There is a slight cynicism there, a slight cynicism on a lot of levels," he admits. "I'm slightly cynical about religion, which has cropped up a few times in the past."

"Several times," I offer.

"Several times," he confesses.

The single, 'Dear God,' might be taken as a prayer with its acoustic guitar strumming urgently behind Ure's plaintive voice. His seemingly naive call for "love for the lonely," "food for the hungry," and "peace in our restless world" might be interpreted as a "We Are The World" song of facile hope. And remember that Ure co-composed 'Do They Know It's Christmas' and was one of the architects, along with Bob Geldof, of Band Aid.

"I think people interpret it in different ways," says Ure. "I mean some people see that it's slightly cynical, but still hopeful at the same time. Other people see it as an out and out religious song, which it's not. It's not a prayer, you know. It's a plea, really. It's me questioning what I was taught about religion when I was a kid, that you pray every night and you go to church or chapel or synagogue, whatever. You do it and say everything will be all right. You think that religion is a thing that is there to help you and to see you through life, and then you wake up one morning and find the entire Irish situation, the civil war that's based on religion. You know, most wars are based on religion. Religions fight each other because they are trying to out-do each other. Everyone's got it right, but they can't all have it right because they are all so radically different. You know, one religion can't be any better than the other religion. I'm just disappointed that we were taught these things as kids, but you haven't really got a choice about it, no one chooses the religion they are born in."

Ure reinforces his sometimes acrimonious lyrics with subtle production techniques. On the fatalistic 'Answers to Nothing,' he speak-sings the lyrics of empty panaceas with his voice mixed almost completely dry. "I wanted that effect," he explains. "I wanted that sort of incredible closeness so that when you listen, it's almost like someone singing inside your head. I wanted to try and get that closeness that's really intense. The only way to do that is to make it incredibly dry and very wispy and very, very closely miked. Very compressed as well. And it worked very well. That was originally a guide vocal. I did it in the studio when I was trying out the lyrics and the engineer had miked it and compressed it for the really quiet part. After the drum break, I decided to go for the whole thing an octave higher. So I just rocketed it and of course the compressors screeched into the red. I mean it was a good performance so we didn't change it. Technically it could have been recorded a million times better, but I could have lost the feel. It was one of those magic moments."

"I suppose in my way the new record was a backlash against Ultravox –the massiveness, the orchestrations that Ultravox did . . . I wanted to initially get away from that particular sound. So I concentrated on the rhythmic side of things."

Another magic moment was the duet with Kate Bush, 'Sister and Brother.' Ure paints this song of sexual equality with overly broad rhetorical strokes, but Bush's impassioned pleas almost pull it off. "In the music industry, you meet some not very nice people, some very strange characters," says Ure disgustedly. "They seem to be these sexist assholes. They will listen to a girl's tape and think it's fantastic and really love it and say 'What's she look like?' Who cares what she looks like! You know, 'Is the tape good, are the songs good, is there talent there?'"

The fact that they never sang together, or for that matter, were never in the studio together except to hear a rough mix, strikes Ure as another metaphor for the equality message of the song. "Well, I don't think you have to be together," he says defensively. "I mean it also shows that you can be incredibly equal. She's sitting in her little technical world and I'm sitting in my little technical world. And I have the utmost respect for everything she does. I think she is brilliant on all

levels and she's touching genius, absolutely brilliant. I consider her to be equal to any musician, any producer, any writer that I've admired. So that strengthens the idea of the song to me."

Ure credits Bob Clearmountain, who mixed the album, with much of the sonic landscaping of *Answers to Nothing*. "He sort of paints the pictures, the atmospheric pictures with his echoes and his panning," he says admiringly. "He listens to depth as well as left and right. I found it quite interesting because he'd spend hours working on stuff. I didn't sit over his shoulder. I said, 'Once you've got it down to something you think is close, we'll sit and refine it and change bits and pieces and whatever.' I'd be sitting about around the studio working on something and I'd say, 'I really like the way the toned echo in the voice moves and then gets slightly below the bend and then sort of disappears off.' He would say, 'Can you hear that? Nobody ever hears these things. I've spent hours doing them and nobody hears these things.' But when you listen to it on headphones, it's got real depth and you can hear all the movement and things that are happening in there."

Ure tuned his ears working with some influential and innovative producers in the past, especially George Martin and, perhaps lesser known but no less influential, the late German producer, Conny Plank, who died early last year. Ultravox recorded their comeback triumph, *Vienna*, as well as *Rage In Eden* and *U-Vox* in Plank's Cologne studios.

"Conny Plank was probably not known at all over here. In fact, he was not very well known in Europe for someone who contributed so much to music," Ure fondly recalls. "He was a real radical producer. He was more an engineer than a producer. He never got involved in musical arrangements on any level. He created atmospheres that were brilliant."

He learned how brilliant after working with George Martin, who produced the lush and soft-edged album, *Quartet*. "George Martin is obviously a brilliant man," says Ure. "He was great to work with as well but in a very different way. He made a much more polished record, at times maybe too polished. Ultravox had a bit of an edge to it and I think that the *Quartet* album was a very sort of chic record, designer music, you know. I don't know if it was quite the right thing to do."

The next Ultravox album, *Lament*, was recorded mostly in Ure's own home studio and marked a re-trenching and simplification of the recording process in reaction to the over-production of Quartet. "Yes, it was a fairly rough record," agrees Ure. "It was almost getting back to the basics again. We didn't get overly complicated on that record, I don't think, whereas in the *Quartet* album, we just went bananas. You know we were even slaving up multitracks. On one song there was something like seven multitracks. And it was just hideous. I mean it was like four multitracks of keyboards alone. It just got so out of hand."

URE SPEAKS FONDLY, although not nostalgically of Ultravox days, the band he helped revitalize in 1980 after lead singer John Foxx left. With Ure, Ultravox forged a sweeping orchestral sound driven by powerhouse dance rhythms and topped by Ure's soaring, emotional vocals. Ultravox brought an emotional maturity and complexity to their music that makes *Vienna*, *Rage in Eden* and *Lament* stand as the cutting edge of synth-pop. A decade later, their records still retain a sense of urgency and conviction, despite recent PR attempts to paint *Answers To Nothing* as the "new Midge Ure," for whom "The days of Ultravox pomp with little circumstance are over."

"I think it's a terrible statement, actually," he sighs indignantly when I read back his press release quote. "Ultravox had a lot of pomp and that's what Ultravox was, we were vast and we were big and we were grandiose, *grandiose* more than pomp. But there was a reason for it, there was a quality there. There was an ideal. You know we were doing something that not a lot of people were doing. Ultravox was one of the very few bands on the radio that you would know who it was."

Of course, part of the problem was that Ultravox was rarely heard on American radio, despite such driving anthems as 'Sleepwalk,' 'Desire' and 'Hymn.' The end of the band was as much a result of public inertia as artistic temperament. "I'm very proud of what Ultravox did and I'm just as ▶

► proud of the fact that we pulled the plug on it, we stopped the band. It wasn't forced upon us," he claims. "And we did it amicably, we decided that it was time to finish it and did. We didn't have a big song and dance about it, we didn't do a farewell tour or try and cash in as much as we possibly could. We just decided that it wasn't working musically and left it to that."

Except for drummer Warren Cann, who was booted from the band before the last album. "Except for Warren," echoes Ure sadly. "Well, that was just one of those unfortunate things. On the last album, the *U-Vox* album, when it came to recording that album, we all wanted to get together as a band and really get back to the original idea of Ultravox. Forget the drum machines. They were a small part of it and had taken over. You know, forget the 22 keyboards of the last two tours, get the guitar on, get into a room and start playing. Hit your drums, hit your guitar, hit your keyboard, hit your bass. That's how we started, and we wanted to see what we could do with that again.

"I guess Warren didn't want to hit his drums," he laments. "He was not interested. He hadn't played his kit for like a year when we went to rehearsals. He turned up with his drum machines and his Simmons pads and there just was an attitude thing, that's all. I still really like Warren, but I haven't seen him since then."

The no frills attitude goes a long way towards explaining Ure's touring setup, which is considerably stripped down from his Ultravox days. Ure fronts the group, playing only electric and acoustic guitars and the *bodhrán*, wearing a plain shirt and suspenders, in a performance refreshingly devoid of rock histrionics and posturing. While *Answers to Nothing* is computer programmed, in concert the glow of the CRT is conspicuous in its absence All the synthesizer parts are handled by Rupert Black and Carol Issacs, playing identical setups with the Korg M1 and the ubiquitous Roland D50, and Kate Stephenson triggering an Akai S900 with Octapads. Steve Williams and Jeremy Black trigger nothing but their drums and bass, respectively. There's not a drum machine or sequencer to be heard.

"I didn't want to limit myself again." says Ure. "I didn't want to be stuck to rigid tempos. I mean, a band should speed up and slow down. They shouldn't do it too much, but they do. You know the natural adrenaline during a song can speed it up just with the excitement element You can't do that with a drum machine. That used to drive me mad at times with Ultravox. I would walk on stage and for whatever reason that night, you know, my adrenaline was pumping and I felt like going a bit faster and I couldn't. We'd have already gone to the next song and the rhythm would start and it felt a bit on the draggy side. But there's nothing like that up there, now. There is still technical stuff up there. You know there's a few keyboards and there's a rack full of bits and pieces or whatever, but it's all played manually."

Which doesn't mean that Ure is pulling the plug on electronics. He composes and records in his own Music Fest Studio where he works with an Emulator II+, Technics Digital Piano, Roland D50, Korg M1, a few Yamaha TX81Zs and a Roland D110. He still has his old PPG around, but he doesn't use it much anymore. "They were very much Ultravox sounds," he laughs fondly, recalling his PPG sounds. "But they are old flames and I can't part with them, you know."

Although technology is a major part of Ure's music, and in many ways has defined and shaped it aesthetically and philosophically, he still considers himself to be primarily a guitarist. "Well, this instrument is what I play," he confirms. "I got my first keyboard only 10 years ago or so, and I'm still far from being able to understand what I'm doing on it. I'm still very, very basic with synthesizers and things. I can make them do what I want them to do, but a guitar is how I express myself I suppose. I like thrash chords, I like power chords, I like the sound that it makes. I like the grittiness that it makes. You can express yourself on the E-stringed instrument, something that you are touching with your fingers, much more than a keyboard. There's no matter of touch sensitivity, especially when you've got big clumpy, non-feeling fingers like I have on a keyboard. You are talking to a man who can only play a plastic keyboard. Give me anything weighted and I've had it. I haven't got the strength in my fingers to push them down. So I don't get a lot of expression on the keyboard. On this album it's not too bad because I've discovered music computers and things that give me a chance to sort of express the drum patterns a little bit more than I would with just a normal drum machine. But the guitar is my favorite, first and foremost instrument." ■

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PART 7

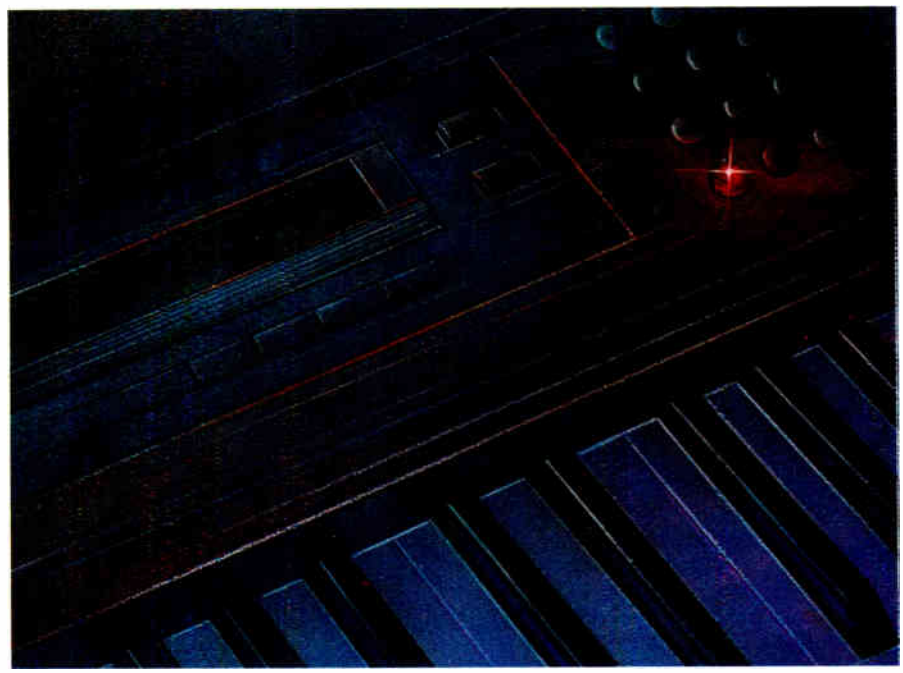


Illustration *Rick Lohnes*

In this month's installment, we begin to explore the inner workings of the Korg M1 Program Edit Mode by solving a mystery . . . *Text by Lorenz Rychner.*

LAST MONTH, WE looked at the "Combi" modes on the Korg M1, in which eight complete Programs are called up to play simultaneously in various configurations. While this is an exciting way of coming up with new sounds, the nitty-gritty synth programming itself is done in Program Edit mode. The word "program" means many things to many people. On the M1, it's the name Korg gave to a memorized set of parameter values, what you'd probably call (depending on what other synths you own) a "sound," or a "patch," or a "tone," or a "preset," or a "voice" . . .

The interesting thing about Programs is that they can consist of a layer of two programmable sounds, just as a Combi can be a layer of two Programs. The two sound generators available for each Program are the *oscillators*. If you give only one of them something to do, then you are using the "Single" mode. When both oscillators are busy, then the Program is in "Double" mode. Here's a tip that you'll appreciate once you've gotten the hang of editing your own Programs: *Make sure that the name of the Program tells you whether it's in Single or Double mode.* You could use capital letters for Double and small letters for Single Program names, or any such device, as long as you're consistent. You'll often save time by knowing which mode a Program uses when you see its name appear in the readout.

Instant Re-Programming

Select any Program. On the lower line of the readout you'll see eight capital letters, each with a corresponding value of zero. These are the most frequently needed parameters, immediately available for changing without entering the Edit mode. This is handy for quick adjustments on the fly. What you change here does not get memorized –the next time you call up the same Program, all the values will be back to zero. Why always zero? In this context, "zero" does not mean that the parameter is actually set and memorized with a value of zero, it simply means that you have not changed its memorized value yet. Zero represents the memorized value, and your adjustments are shown on a scale from −10 to +10. You simply adjust by ear.

Here are the instant changes available from the Program screens.

Press tab A if you want to change the balance between the two oscillators. On Single mode Programs, reducing the value lowers the overall volume level. When tab A and tab C (Level) both show a value of −10, you lose all volume from single-oscillator Programs.

Tab B lets you change the filter cutoff, for both oscillators simultaneously if the Program is in Double mode. The net effect is a change in the sound's brightness. Tab C affects the loudness of the oscillator(s) via the VDA (Variable Digital Amplifier) Levels. Tab D lets you change the Keyboard Tracking of the VDA if there was any tracking specified in the first place.

Tab E adjusts the velocity sensitivity – raising the value increases the effect that your hard/soft playing style will have, and lowering the value makes the sound less sensitive to velocity. Tab F lets you adjust the time it takes for the sound to reach its full volume after you play a key, and tab G does the same to the rate at which the sound fades out after you release the keys. Tab H adjusts the balance between the oscillators and the effects.

The precise effect of an adjustment depends on the memorized settings of the Program's parameters. Experiment using your ears, you don't have to worry about making unwanted permanent changes from this screen since your edits are only valid until you switch to another Program.

Deciphering a Program

Detailed editing is done from within the Program Edit mode. As far as editing methods go, the M1 is smack dab in the middle of the traditional ballpark: Oscillators produce complete waveforms, filters can reduce the number and strength of the overtones (brightness), and amplifiers control the volume from the beginning to the end of every note. You have plenty of help for the finer points of timing, with separate envelope generators for the pitch, filters, and amplifiers. And special effects like vibrato, trills, and tremolo can be programmed separately for each oscillator in each Program. This method of sound programming goes back to the dark ages of analog synthesis, although some of the names have changed, mostly to reflect the changes from voltage control to digital operations. Let's look at a particularly interesting Program from the original factory banks. I'll walk you through all the Program Edit screens while trying to solve a programming riddle.

"As far as editing methods go, the M1 is smack dab in the middle of the traditional ballpark: Oscillators produce complete waveforms, filters can reduce the overtones, and amplifiers control the volume from the beginning to the end of every note."

Select Program 'I80 Good & Bad' and play some long notes. You may recognize this sound as the opening notes of the theme from the classic movie *The Good, The Bad, and The Ugly*. How is the pitch trill at the beginning of the sound achieved? We'll be exploring the Program Edit Mode to find out.

Press Program Edit. The first screen tells you that this Program was created in Double mode, therefore both oscillators 1 and 2 are active. It also shows that the playing mode is polyphonic (chords are possible), and that the Hold feature is off. Hold does the same thing as keeping a foot on the sustain pedal – you'll rarely use it except for sound checks of your playback system or similar chores. Press the Page Up tab and you get the screen that tells you what "multisound" is currently being played by Osc. 1.

So what's a "multisound?" It's the basic building block of all M1 sounds, stored in PCM (Pulse Code Modulated) digital format. Check the owner's manual for a list of the available multisounds. Many of these multisounds are actual recordings of real sounds, laid across the keyboard side by side (hence the prefix "multi"), as in the different strings of a guitar. Each of these recordings, or samples, is then mapped to a group of notes on the keyboard.

The M1 transposes the recorded pitches within each group of keys to give the illusion that each key has its own recording, when in fact you may have only three or four widely spaced recordings. Don't feel cheated; as long as you can play the sound across the octaves, and as long as you don't hear too much difference from one key to the next, you needn't care. Given present technology and the high cost of memory chips, it would be extremely expensive to record a different sound for each key. Some of the multisounds consist of single cycles of digital waveforms, sort of frozen snippets of sound that the M1 can play back. They are even more memory efficient than the PCM multisounds that started out as real sounds.

Back to editing. In this case the multisound played by Osc.1 is '#27:Pan Flute,' with a (loudness) level of 64 and a tuning of 8', which reproduces the true pitch of the keys you play (16' would sound an octave lower, and 4' an octave higher than any key you play). Press Page Up and check out oscillator 2. It plays the same multisound, '#27:Panflute,' at a lower level of 41 and at the same 8' pitch.

Why would the programmer use the same sound twice? Obviously not just to get a louder sound, since neither oscillator is anywhere near the maximum level of 99. Another reason could be the wide spread of a layered sound if the two layers are an octave apart, but that's not happening here. Both oscillators are at the 8' pitch level. What other reasons for doubling the same sound do you know? If you're familiar with the old trick of using the same sound layered on itself with a touch of detune to get a fatter sound, then listen closely to the sound of this program. Do you hear the typical fat quality of a detuned sound? I don't. But when you look at the value above tab G, Detune, it is set to −17 ("I," for "Interval," is at zero). So there is some detuning going on, but I still can't hear it.

Above tab H is the DL (Delay Start) parameter, with a value of 27. Since this whole screen deals with Osc. 2, the delayed start must refer to Osc. 2. It should be easy to hear because the Pan Flute has a breathy attack that highlights the delayed start. Play long notes and listen carefully. There's a second attack near the end of the pitch trill, an explosive, breathy sound. This must be Osc. 2. If you're not convinced, press tab A and then up-tab to change the Osc. 2 multisound to '#46:Pole.' This multisound shows off the delayed start of Osc. 2 even more because of its ▶

"Each multisound, just like any sound in real life, contains certain overtones that affect the sound's brightness and color."

► percussive nature.

Now reset Osc. 2 to '#27:Pan Flute.' Experiment with the delay by changing the DL value to 99. Play and hold a key – and be patient. It takes almost seven seconds until Osc. 2 springs to life. During that time you will hear Osc. 1 die out soon after the pitch trill stops. Now you know why the detune effect couldn't be heard – the two oscillators don't sound at the same time, but rather one after the other. This tells you that there must be a way of regulating the loudness contour (when an oscillator is loud or soft and how fast the change occurs) separately for each oscillator. Listen to the sound again. When Osc. 2 comes in, there's no pitch trill. This tells you something else of importance. Pitch changes can be programmed separately for the two oscillators in Double mode Programs. But how is this trill generated? So far, all we know is that only Osc. 1 is doing it.

Press Page Up to get to the Pitch Envelope for Osc. 1. Think of the Pitch Envelope as an automated pitch-bend sequence in which you can pre-program pitch changes that will happen automatically every time you play a key. Look at Osc. 1 and press tabs A through H in sequence. Here's what the numbers mean: "S+00" (Start Level) means that Osc. 1 starts playing the Pan Flute sound from the true pitch of whatever key you're hitting.

The next value, "AT14" on tab B, looks really important, but actually does nothing in this context. "AT" stands for Attack Time – its job is to control the speed with which the pitch changes between the Starting Level and the Attack Level. Because the value for tab C, Attack Level, is A+00, the setting of AT is irrelevant. By the way, don't assume that zero would be a better value for AT – a time value of zero sets the fastest possible speed.

The next value, "DT" above tab D, is also meaningless in this example, because it controls the speed (Decay Time) with which the pitch returns to the Start Level from the Attack Level. Well, since we never left the true pitch level in the first place, who cares how long it takes to return? Once you release a key, the value for RT (Release Time) controls the speed with which the pitch changes to the value of R (Release Level). With the Release Level set to zero (true, unchanged pitch), RT also has no effect. Since there's no change in pitch programmed for this oscillator, the last two parameters aren't needed,

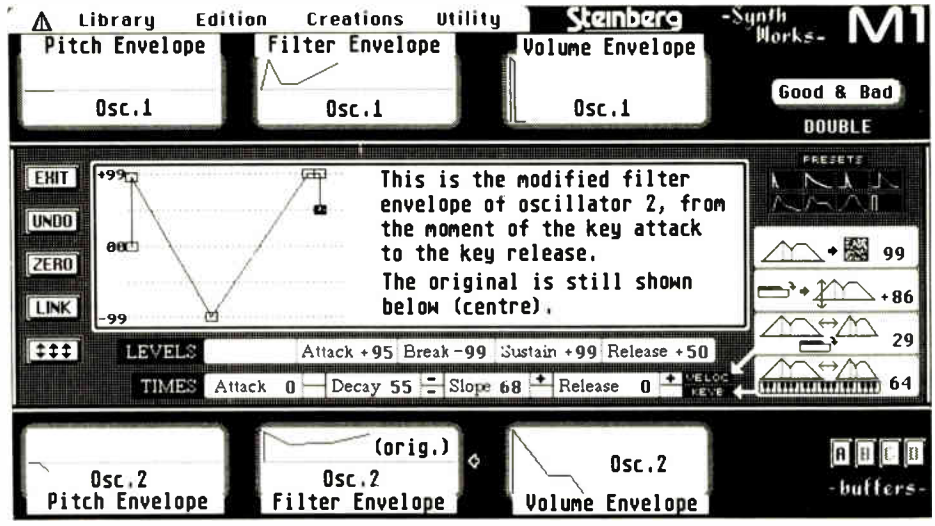


Figure 1. The drastically changed filter envelope of Osc. 2.

either. Their job would be to control pitch level and speed changes according to your velocity (hard/soft playing style).

So the conclusion of all this is that Osc. 1 does not undergo any pitch changes, at least not as a result of its pitch envelope. The pitch trill that you hear must be caused by other parameters. And what about Osc. 2? It can't give us the pitch trill, since it only comes to life once the first oscillator has trilled and died out. But there may be something of interest in Osc. 2 anyway.

Press Page Up, and you see what your ears have already noticed: a slight pitch movement downwards in Osc. 2 at the end of long, held notes. "R−26" is the lower (flat) pitch level, and "RT22" is the speed of the pitch movement. To hear the effect of velocity on the sound, set "L" (Level) and "T" (Time) on tabs G and H to 99 and vary the strength of your playing style. The fast time value of 99 resets the pitch rapidly at the end of held notes that you struck firmly in the first place. The high number for L (Level) makes for a wider pitch change at the end of those firmly played notes. If you choose negative numbers for the velocity parameters, then similar changes will occur on softly played notes instead of those that are firmly struck.

Fooling with the Filter

We'll have to suspend our search for the cause of the trill for the moment, because the next few screens deal with parameters affecting the Variable Digital Filter (VDF) and Variable Digital Amplifier (VDA), not pitch. Pressing Page Up four times gets you to the filter settings for Osc. 1, and the following four screens provide the same parameters for Osc. 2.

If you're familiar with traditional synth filtering, think Low Pass Filter with envelope control and you're in business. What happens is this. Each multisound, just like any sound in real life, contains certain overtones that affect the sound's brightness and color. When the filter is wide open (high cutoff and level values), all the overtones are "passed through" intact, and the multisound is heard at its original brightness. When the filter is partially closed, the higher overtones are removed, and the multisound appears more muted or muffled than in its original version. With the filter fully closed, the sound can virtually disappear. What remains of the multisound, after it has passed through the filter, goes to the VDA where the loudness is regulated.

In the Program under scrutiny here, Osc. 1 shows a VDF cutoff of 99 with an EG (Envelope Generator) intensity of 00. Try this with a cutoff of 50 and notice how the trill is now more muted than the sound produced by Osc. 2. At cutoff=00, the trill from Osc. 1 is just about inaudible. Leave it at zero for now. On the next screen you'll find the envelope parameters which control how the brightness changes over time.

"During its brief life, the pitch that Osc. 1 produces is modulated by a square wave, creating a trill of a certain speed and pitch interval."

And the following screen allows you to control these brightness changes using keyboard velocity. The final screen for VDF1 is keyboard tracking, where you can specify how the filter cutoff changes according to the range on the keyboard in which you happen to be playing.

Press Page Up until you see the VDF2 cutoff/intensity screen. Notice that Osc. 2 has a filter cutoff of zero, which is the same value you just gave to Osc. 1. On Osc. 1, setting the cutoff value to zero made its output nearly inaudible, but Osc. 2 is sounding loud and clear. This is because its EG is working hard at a value of 99. To discover just what that intensity of 99 really does, let's look at the next screen.

There are four levels from left to right: Attack Level (+95), Break Point (+55), Sustain (+60), and Release Level (+84). Ahead of each of these level values is a time value that determines how fast the level is reached. The time values are: "AT" (Attack Time), "DT" (Decay Time), "ST" (Sustain Time), and "RT" (Release Time). Change the envelope shape as follows: Reduce the Breakpoint to −99, increase the Sustain Level to 99, and hold a long note. The sound appears as bright as it did before (Attack Level=+95), fades out (to Breakpoint=−99), fades back in to a brighter, breathier color than before (Sustain=+99), and finally holds steady (sustains).

The VDF2 Release value of +84 can't be heard because the overall volume of the sound dies out before the cutoff change occurs. Change RT to 0 and R to +50 and you will hear a quick decrease in brightness along with the fade in volume. See **Figure 1** to get a better idea of these changes. There are some important points to remember when editing changes that occur over time: lower values in Time parameters mean faster changes, and higher numbers mean slower changes. A Time value of zero is just about instant. The EG Intensity value controls the overall depth of effect that the EG will have. The Level values (from −99 to +99) then dictate the degree of effect within the window set by EG Intensity. And remember that the filter, although basically a modifier of the sound's brightness, can act as a volume control if you set very low values for Cutoff and Intensity, or negative values for some of the Levels (like you did with Break Point in the above example).

Controlling Loudness

The next screens control the output of the VDA. The output of each oscillator is controlled by an Envelope Generator similar to the VDF filter EG. One major difference is that there is no Release Level for the VDA, because the volume always goes to silence after you release a key. You do have control over the speed at which this happens, however. Otherwise, you can see the now familiar levels: A (Attack), B (Break Point), and S (Sustain) along with their speeds: AT (Attack Time), DT (Decay Time), ST (Sustain Time), and RT (Release Time) as mentioned above.

Look at **Figure 2** where the volume EG of Osc. 1 is shown graphically. Now you see why it stops sounding so abruptly. The volume of Osc. 1 starts instantly (AT=0) and goes to the highest possible level (A=+99). (EG Level values of +99 produce an output equivalent to the Oscillator Level of 64 that was programmed on an earlier screen.) As soon as the Attack Level has reached +99, it moves to the next level, Break Point, which is set a little lower at +92. It changes to this lower level at a speed of DT=10, which happens to be quite fast. Once the volume has reached the Break Point, it then moves to the Sustain Level of S+00 (silence) at the fastest possible speed (ST+00). The programmer of 'Good & Bad' timed the Delay Start of Osc. 2 by ear to coincide with the abrupt ending of the sound from Osc. 1.

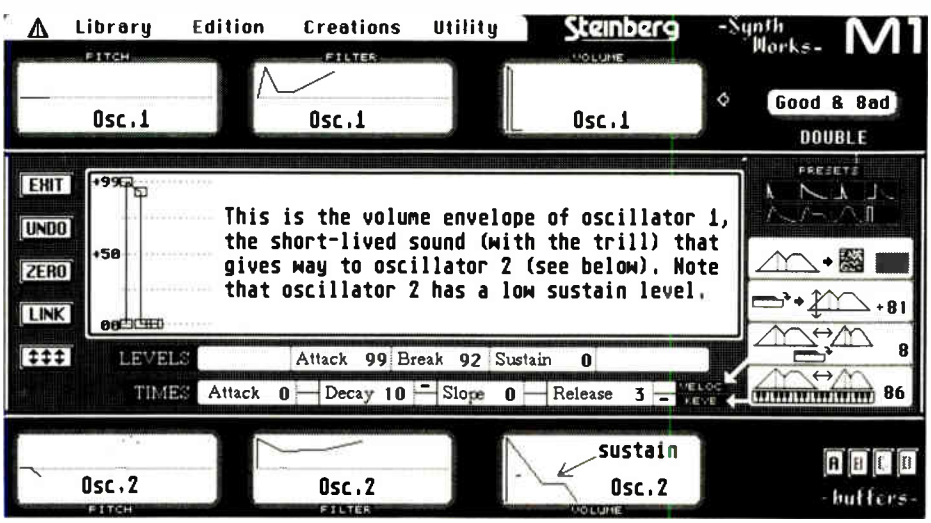


Figure 2. The original amplitude envelope of Osc. 1.

What Creates the Trill?

Now that we know why these two sounds follow each other, all that remains to be figured out is this: what creates the trill? Keep pressing the Page Up tab, past the screens that let you adjust the volume changes with velocity and with keyboard tracking, until you see "Pitch MG" (Pitch Modulation Generator). The Pitch MG uses the characteristic up and down motion of a square wave to influence the pitch; thus producing a trill. The other Pitch MG parameters active on Osc. 1 include the trill speed (F70), a delay after you strike a key (D00 – not active here), and the pitch shift interval (I67 – in this case a perfect fourth).

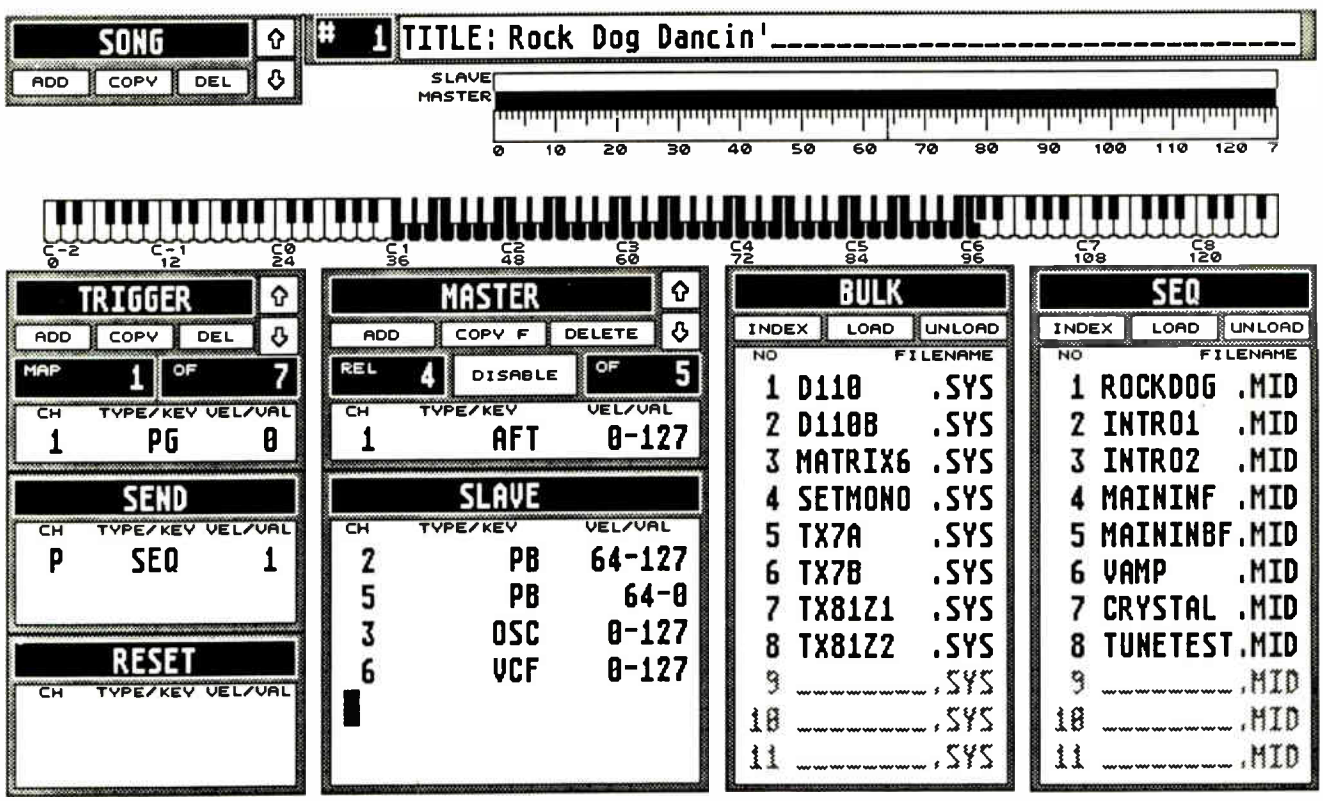
So here's the solution to our mystery: Osc. 1 speaks only briefly, due to the zero sustain level and fast decay and sustain times of its VDA EG. During its brief life, the pitch that Osc. 1 produces is modulated by a square wave, creating a trill of a certain speed and pitch interval. Feel free to change this from Osc. 1 to Osc. 2 (in which case the pitch of Osc. 1 will be steady for as long as it lasts), and then to Both. Try changing the waveform, speed and delay to get a feel for these parameters. On the next screen you can assign similar parameters to the filter cutoff, producing subtle tremolo or drastic wah-wah effects.

Space doesn't permit me to get into the details of the remaining screens where you edit the parameters for aftertouch, joystick and the onboard digital signal processing. But I hope that this month's excursion has given you an insight into the basic setup of the Program Edit mode. Trust your ears at all times, and don't be afraid to change things. Remember that you can't accidentally do permanent damage to your sounds as long as you keep the memory protect in Global Mode. ■

Note: The author thanks Steinberg/Jones for the loan of their excellent program SynthWorks M1 for the Atari ST computer.

MIDImouse Music

UltraMIDI



MIDI mapper extraordinaire, playback sequencer and SysEx librarian for the performing musician and Atari ST. *Review by Jim Pierson-Perry.*

IN A MARKET dominated by swarms of "me too" sequencer and patch editor software, UltraMIDI from MIDImouse Music comes as a breath of fresh air. It integrates the ST as a data processing device within your MIDI network to remap controller messages, trigger sequence file playback, send SysEx information and more – all in real time and controlled by you from a master keyboard.

At the simplest level UltraMIDI acts as a MIDI mapper, converting and redirecting messages between instruments. This concept is taken much further by treating commands to load and play sequence or SysEx files just like regular MIDI messages. For example, sequences can be mapped to individual note-on events. Pressing a key starts up the corresponding sequence. Press a different key to jump to another sequence instantly – all the while playing live along with your prerecorded parts. At the end of the song, stomp on a footswitch to send SysEx patch data files to your instruments, load a new set of sequences and change the controller mappings.

System Setup

UltraMIDI runs on any Atari ST/Mega computer with a monochrome or color monitor. It uses key-disk copy protection and allows the program to run from a hard drive. Desk accessories and RAM disks are both supported. The manual is enough to get you started, but needs much more coverage of program operations and could also use some in-depth tutorials.

The program operates in two modes: edit and playback, each with its own workscreen. You begin in edit mode, defining map relationships, creating SysEx files and loading sequence/SysEx file names into memory to use while playing. Selecting the playback mode activates the real-time data processing. You can jump back and forth between modes with ease to test and fine tune your setups.

A playback-only version of UltraMIDI, minus the editing and librarian

features, is included on the program disk. This maximizes available memory for loading setups and sequence/SysEx files. A third version, coming this summer to registered owners, will let UltraMIDI run without an ST monitor by directing playback screen information to keyboards whose LCD displays can be controlled by MIDI (e.g., Yamaha, Oberheim, Roland, etc.).

There are a number of ways in which to configure your MIDI system to work with UltraMIDI. You can use two keyboards, merged into a single MIDI data stream – one to send just control messages and the other to play live. The Yamaha MCS2 MIDI control unit works particularly well in this application. It provides 2 foot controllers, 2 footswitches, breath control, 2 continuous controllers, 3 on/off buttons – all user-definable and merged with two MIDI Inputs.

A Meaningful Relationship

The heart of the program is real-time mapping: recognizing predefined MIDI messages and processing them to trigger sequencer operations or to generate new messages. The new messages are then routed downstream to receiver instruments or devices. Each specific mapping operation is defined by a master/slave "relationship." A single master message can cause UltraMIDI to generate up to 255 different slave messages.

All messages, master or slave, have three parts: MIDI channel, event type and a value parameter. UltraMIDI supports all standard MIDI commands as event types except for polyphonic aftertouch and tune request. Events for sequence and SysEx file manipulations include load, erase, play once, loop continuously, stop and various combinations of these. Note-on/off commands contain a note range field, spanning anything from a single MIDI note to the entire keyboard. This lets you easily define multiple keyboard splits from a single master keyboard. The value parameter refers to velocity ranges for note-on/off events, level ranges for controller events and file index numbers for sequencer operations.

In MIDImouse terminology, a specific mapping operation is called a "relationship." To establish a basic relationship that allows a master keyboard to directly play a slave synth, simply define a one-to-one correspondence for both key and velocity ranges. Scaling or inverting the note ranges or velocity values can create many interesting effects such as transposing notes (a fifth or other interval between master and slave), inverse velocity (quiet master/loud slave), velocity threshold (slave doubles only on accented notes) and reverse keyboard (high notes on master play low notes on slave). Slave messages of any event type can be created, regardless of the master message. Within one relationship, a single note-on event from a master can generate slave messages that trigger sequence playback, turn on local control and engage sustain. Each of these slave messages can be transmitted on an individual or common MIDI channel.

"The heart of the program is real-time mapping: recognizing predefined MIDI messages and processing them to trigger sequencer operations or create new messages and route them downstream to receiver instruments or devices."

Controller relationships add a rich source of musical expression to your playing. Some simple examples include routing breath controller to MIDI volume, pitch-bend control to panning, or redirecting a foot controller to set portamento time. Making use of multiple slave messages from a single master provides complex effects such as aftertouch simultaneously triggering positive pitch-bend on one synth and negative pitch-bend on another while kicking in the mod wheel on a third. Remapping is also useful when you have slave synths that respond to controllers that your master cannot directly send (e.g., use program changes from a CZ101 to move between pan positions on a D110).

Establishing Control

UltraMIDI utilizes a hierarchical management system to define sets of mapping relationships and change from one set to another as you play. Individual master/slave relationships are at the lowest control level. The next stage is a *map*, a collection of master/slave relationships that define the MIDI processing that UltraMIDI is to perform. Changing from one map to another alters the processing environment by activating a new set of master/slave relationships (new split points, play a different group of sequences, etc.).

Maps are activated in playback mode through a unique pre-defined trigger event (typically a program change) or from the ST numeric keypad. Only one map can be active at a time. When activated, a map can be configured to send messages to prepare the MIDI environment (e.g., load sequences, set MIDI volume). Another set of messages (reset) can be used to "clean up" after the map before activating another (e.g., center pitch-bend, erase sequences from memory).

The next control level is called a *song*, and holds all of the maps (up to 255) used while playing a particular piece. The top level is a *set*, which contains all the songs in memory (a maximum of 20). You can save individual song files or entire sets to disk. Each song, map and relationship draws from a common pool of up to 99 sequence and SysEx files that are loaded, played and erased from active memory as dictated by the maps. Sequence files must come from an external sequencer program in standard MIDI file format. UltraMIDI is a playback program only; it does not record sequence data. Playback tempo is taken directly from the sequence file (the default is 120 bpm) and cannot be changed within UltraMIDI. I tested multitrack sequences from Hybrid Arts EditTrack and Dr. T's KCS (converted to MIDI File Format) and all played flawlessly.

Map Making

The editing screen (**Figure 1**) is well designed to work at all control levels. Numerous defaults and shortcuts make editing a snap. Maps are defined through the two blocks shown at the bottom left of the screen. The one on the left holds the trigger event and send/reset message fields while the one on the right is used to define master/slave relationships. Each map within a song, as well as the first map of all songs in memory, must be assigned a unique trigger event. UltraMIDI automatically validates new trigger events against those currently in memory to prevent multiple assignments.

Clicking on the up/down arrows on the screen cycles through all maps in the current song. The "add" button jumps to the next undefined map slot while the "delete" button erases the

current map. All delete actions require confirmation before being executed. The copy button copies all master/slave relationships along with the send/reset fields from the current map to a destination map. This facilitates creating clone maps in which only a few relationships out of many are to be changed.

Message data is entered using one of three methods: directly typing values, via MIDI, or through the keyboard and controller screen icons. The MIDI option requires you to hold down some ST keys while reading the MIDI data, a problem if your gear is more than an arm's length from the computer.

The keyboard and controller icons provide a fast and intuitive way to enter key and value ranges. To set up a split, first position the entry cursor in the master message key field, then click and drag the mouse over the desired note range on the keyboard icon. The range is automatically entered in the message field and shown graphically above the icon. Reposition the entry cursor in a slave field and click on the master range shown on the icon to copy the same setting. Alternatively, the master range can be dragged along the icon to transpose the slave field or use the click and drag method to define a new slave range. The same techniques work with the controller icon to set master and slave value ranges.

The arrows and add/delete buttons in the master/slave block work as in the map block. The "copy F" button automatically creates a matching note-off relationship from a defined note-on relationship across all specified slave units. The disable button turns off UltraMIDI processing when you go to playback mode.

The bottom right portion of the screen holds blocks for the sequence and SysEx file reservoirs. Files must be assigned an index number to be used within a map. They can be loaded into memory before entering performance mode or automatically loaded under map control. The unload function (and erase event type) takes a file out of active memory while preserving its index number for later use. Keeping only file pointers in memory, rather than all file data, maximizes available memory. Inserting a new file between existing entries prompts UltraMIDI to reassign appropriate index numbers to all affected maps in memory.

The top of the screen shows the

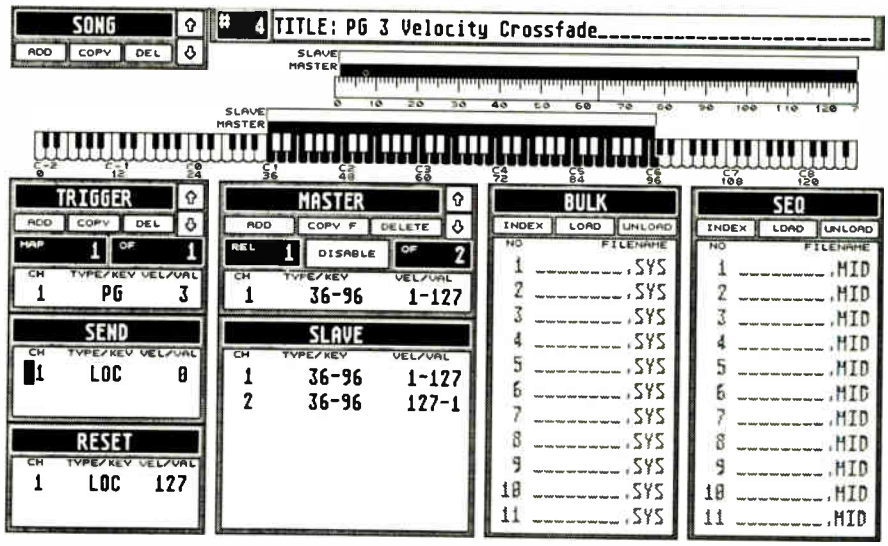


Figure 1. The Editing Screen.

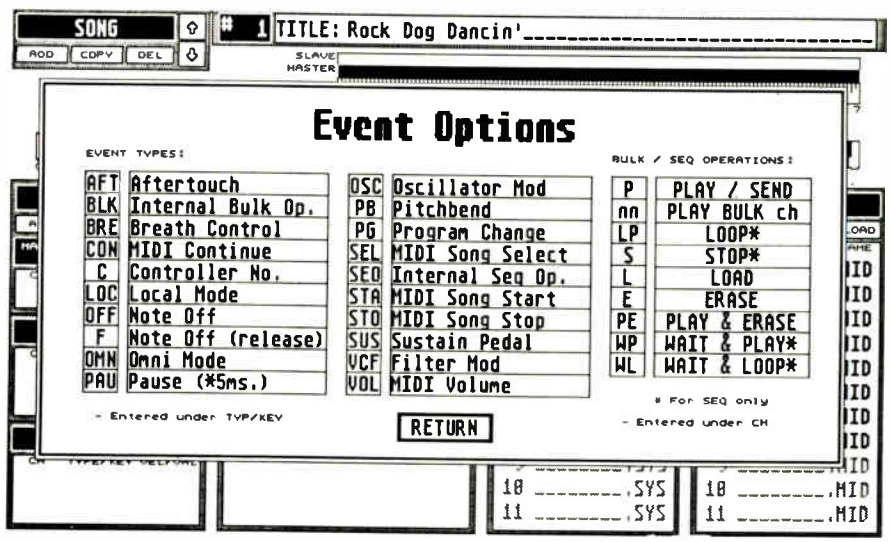


Figure 2. Reference chart of all message event types recognized by UltraMIDI.

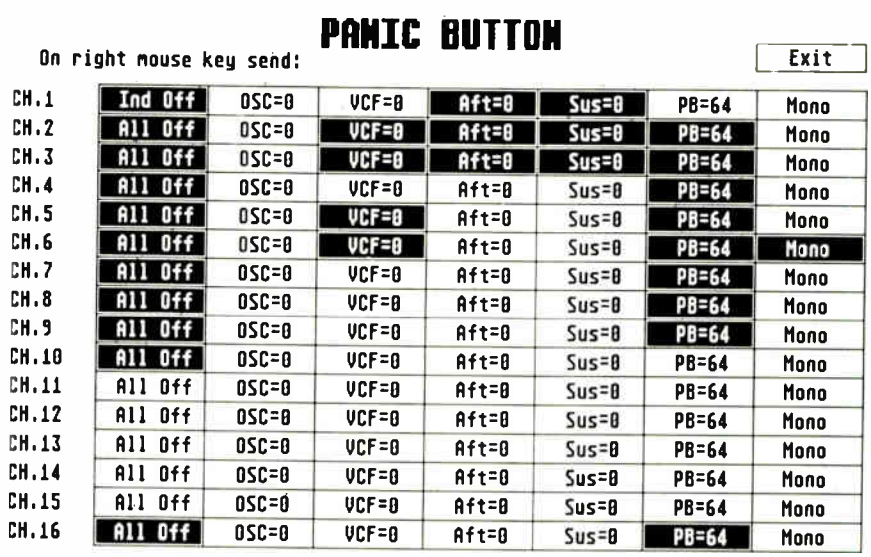


Figure 3. The right mouse button sends a series of reset messages, individually defined for each MIDI channel.

current song title with controls for cycling through all songs in memory. Entire songs can be copied, except for trigger events. Pressing the ST Help key brings up a reference chart of all message event types recognized by UltraMIDI (**Figure 2**).

Bulking Up

SysEx files are created within UltraMIDI through the Bulk In/Out command under the Tools menu. This calls the librarian dialog box from which you can transmit an existing SysEx file or record a bulk dump sent from a MIDI device. Some SysEx files contain embedded channel information (e.g., Yamaha and Akai instruments). If you change the MIDI channel for one of these devices after recording a SysEx file, you will be unable to successfully retransmit the file without first changing the channel information bytes in the file.

UltraMIDI provides a way around this problem with a utility program that associates a data mask with each type of SysEx file. When the file is sent, the stored channel number is replaced by a new value you set in the librarian dialog box. While useful, this requires you to know the SysEx file structures (get those manuals out!) and may be hard for novices to follow. In addition, the utility program runs only with a monochrome monitor and has a nonfatal bug that causes repetitive operating system errors.

For devices that cannot self-trigger a SysEx dump, you must define prefixes (SysEx dump requests) in the librarian. You will need to consult your equipment manuals to write the appropriate request messages. Once defined, prefixes can be saved to disk and recalled whenever needed.

Show Time

Pressing the F10 key on the ST sends UltraMIDI into Playback mode with the current song and map activated. All songs in memory are listed in the center of the screen with the current one highlighted. Jump from one to another by using the ST function keys, mouse, or by sending the MIDI trigger for the first map in a song. MIDI Thru is supported (activated from the edit screen) along with an optional clock output to drive a drum machine or secondary sequencer.

A status box in the upper left corner of the screen shows the active map number within the current song and any sequence/SysEx files (referenced by index number) being played or on deck waiting to start. In addition to their MIDI triggers, you can jump between the first 10 maps using the ST numeric keypad. Additional keyboard commands let you stop a sequence in mid-play, end a sequence loop or cancel the sequence scheduled to start next. All UltraMIDI processing is toggled on/off by pressing the spacebar, equivalent to the disable button from the edit workscreen.

For more drastic occasions, clicking the right mouse button acts as a panic button. This sends a series of reset messages, individually defined for each MIDI channel (**Figure 3**) to re-initialize your system. You need to set up the panic button definition table to reflect your MIDI system and update it whenever you make changes in your system. This design handles stuck notes and most of the common controllers, but it cannot be augmented to include controllers or messages particular to your setup (e.g., tune request, pan, volume).

Conclusion

I tested UltraMIDI by running two master keyboards with a Yamaha MCS2 MIDI control module into a stack of six different slave units. I didn't notice any MIDI delay even while processing heavy pitch-bend, aftertouch and foot controller data over a looping multitrack sequence. To operate, the program checks each incoming MIDI command to see if it has been defined as a trigger event. Each byte must first be checked against the map triggers for all songs in memory, then against the triggers for all maps in the current song, before it is finally passed along to be processed using the active map relationships. Theoretically, if you had a lot of maps with large numbers of relationships, you might run into timing delays.

I am impressed with the novelty and power of UltraMIDI. It is easy to use and incredibly addictive. This is an excellent program for any performing MIDI musician. An upgraded version is in preparation that will add support for polyphonic aftertouch and tune request events, provide variable sequence tempo, correct the SysEx utility program GEM errors and extend it to color monitor systems – along with a rewritten manual. ■

PRICE: $229.95

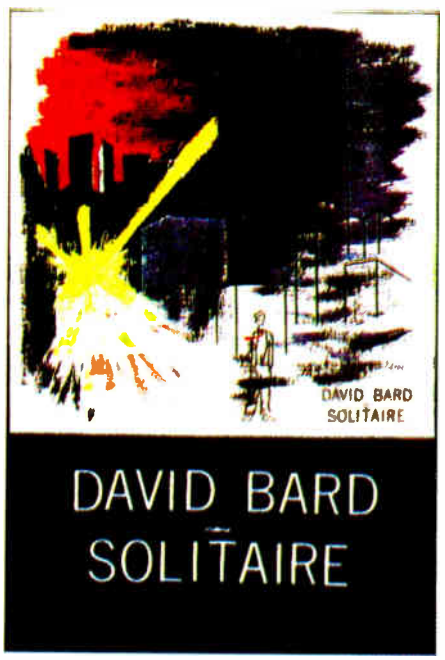
MORE FROM: MIDImouse Music, Box 877, Welches, OR 97067. Tel: (503) 622-4034.

READERS TAPES

"What would rock and roll be without feedback?" – David Gilmour in the movie *Pink Floyd: Live at Pompeii*. *Reviews by Yung Dragen.*

THIS MONTH, A lot of guitar-based tapes streamed out of the queue. And I don't mean guitar-oriented rock 'n' roll (GRR? GORR? GORnR?), but some unique approaches to the instrument – two that were pretty much produced with a processed or MIDI'd guitar alone, and one by somebody who used to take that route and turned back.

Most intriguing was *Solitaire* by **David Bard**. The only pieces of



David Bard.

equipment used were an Ibanez Roadstar II guitar, a Yamaha SPX90 multi-effects processor, and an eight-track deck. With this combination, David recreates an entire band, including some of the hugest snares, handclaps, and kicks I've heard (along with some good bass and slinky guitar lines). The style is somewhere between instrumental rock and slightly dark metal-age (one piece is even called 'Welcome to the Industrial Age'). Everyone I've played this for (and it's been quite a few) have been astounded. Certainly worth getting. A sequencer and sampler would be the next logical steps, so that the timing could be tightened up and the range of instrument simulations extended even more.

A different tact was taken by **Chris Chen** on *Pixx*. Essentially, Chris explored what he could do inside the boundaries of playing guitar. The guitar-synth works like 'Velocity Mayhem' are the strongest, showing a wide range of dynamics and some interesting orchestrations. His '12 String Odyssey,' on the other hand, comes off as just noodling and riffing

with nowhere in particular to go. The "normal" guitar songs also seem to be workouts for how far he can extend his technique, more than playing for the song itself. All of this comes off as too negative. There's some very good, original potential in there; he just needs a strong-handed producer (either an alter-ego or another person) to corral all that energy into a tighter bundle.

On that very topic, Guitarist #3, **Carl Weingarten** self-confesses in the letter prefacing his multi-instrumental (and multi-musician) work *Laughing at Paradise*: "Of course, there is nothing wrong with composing for guitar. However, I feel that sometimes guitarists – myself included – are not always the best listeners. We're so used to the guitar-as-the-star, that is, sailing out in front of the piece, and forgetting to participate within the composition itself. I think too, that some synthesists have been suffering from the same oversight. Technology has opened up so many doors, but many people use it as an excuse to avoid really composing. Technology can indeed only open doors, it's up to us to step through them."

Mature musings? The music is even better. The title cut puts Fripp to shame

Carl Weingarten.

when it comes to interlocking lines, because not even Fripp used violin, cello, and a number of other textures to weave in with his guitar. The synth-heavy works (major contributor: Walt Whitney) are some of the best trance music I've heard. And the acoustic works are folksy and relaxing. *Another* choice pick.

Now, on to some other instruments and styles:

– **Tim Boone**/*No Resistance*: The trick to listening to this first solo effort by Jaxon Crow collaborator Boone is to get past the title track – a lightweight,

high-speed exercise in high-pitched arpeggiations and drum machine machinations. The rest is a very successful cross between '60s psychedelic/acid rock and New Age: great sounds and a good bit of drive on several of the numbers. A mixture of analog and FM synths along with SK5 samplers and judicious reverb. If you liked Crow and Scubatronics (in which Boone was also a member) but wanted more propulsion at times, you'll find it here.

– **Marcus Hicks**/*Midiology*: Laid-back, slightly funky, slightly jazzy instrumentals (and a couple of vocals) by this essentially self-taught musician. The drum machine programming (HR16 & RX17) is a cut above the average, the TX81Z FM synth, Juno 1 analog synth, and S10 sampler are balanced nicely against each other. The only criticisms are a slight over-reliance on the FM piano sound, and slightly distorted recording levels.

– **Kid Bacchus**/*three-song demo*: Most of the better-produced pop tapes I receive (including this one) suffer from processing that's too deep and levels that are too low in the vocals. Otherwise, this is rather well-done upbeat modern-sounding pop/rock performed mostly by duo Doug Nally (drums) and David Thomas Peacock (the kitchen sink) with some nice ornaments – the mix could just use more space.

– **Ken Cheetham**/*Beside Cabbage*: "Happy" is the word that comes to mind, between listening to the upbeat instrumentals, looking at the cute, child-like cassette artwork, and reading the irreverent bio ("Ken Cheetham is a member of the Homo Sapiens species, and has existed for the last 30 of the universe's several trillion years . . . He does lots of important things each day, such as sitting in an office making marks on paper . . . Ken's future plans include working to increase corporate profits for a few more decades, and then being dead for ever and ever . . . He hopes to make meaningful statements to fellow Homo Sapiens, such as 'Seen any good movies lately?'"). The songs have a jaunty, occasionally jazzy/funky (white variety) feel, hornish lines, and fun with the bass. Worthwhile listening.

– **Eugene Marquis**/*Eclectic Clarinets*: Mostly classical numbers multitracked by Eugene of up to 23 clarinets(!). Not since the early days of Carlos and Tomita have I bent my head around the concentration and singleness of purpose required to build a fully

orchestrated work out of monophonic instruments a line at a time. The recording, timing, intonation, etc. are almost *too* perfect. If you like woodwinds and easily-listening classics (Bach, Mozart, Debussy, etc.) at all, write him.

– **Andrew Hosch**/*In the Dreamtime*: The title refers to the creation myth of Australia's aborigines. In Hosch's own words, the music is "Composed with traditional instrumentation in mind, but realized with electronic keyboards, electric guitars, alto saxophone, and kalimba." The music consists mainly of tightly coiled, inner-driven sequenced lines with rock and Latin drum machine backing. Not a lot of melodic development ('Buzzard Dance' borders on atonal jazz), but hypnotic in alternately soothing and frenzied ways (depending on the tempo of the song). The listed influences include Reich and Glass, so this comes as no surprise. Outstanding to me was 'Suite Java,' which really lifted above the rest by invoking the majesty of a gamelan orchestra.

– **Jumbalaya**/*Ruff, Tuff, and Hard on Ya!/Walking on Sunshine/Keidi Finally Scores*: Keidi Howard is a reggae musician (with an impressive list of credits), producer, and the visionary behind Elf King Lore Records (which released well over a dozen albums in '88 alone). His voice is a lot closer to white pop (reminding me strangely enough of Jerry Harrison at times) than stereotype Rastafarian. The feel of the tunes also leans a bit towards pop (probably making it more accessible to crossover listeners).

Ruff sounds like an essentially solo effort (Keidi is *very* well-versed in MIDI), and sounds a little more barebones than the group effort on *Sunshine* (the title track of which has a great "islands" feel thrown in). "Scores" is a set of three demos reflecting Keidi's desire to start scoring for picture, and are considerably more complex than the standard reggae formula. Unfortunately, the slightly murky recording hinders hearing some of the details on *Scores* (the other tapes feature average to good quality), but

it's nice to hear the formula getting stretched a bit. *Ruff* contains the weird/silly safe-sex song 'Don't Forget Your Boots!' Not exactly in the same groove as us Marley/Tosh fans have come to appreciate, but a nice way to ease in.

One final note – Darrel Katz, send your address!!! I want to be able to print it when I review your tape! ■

Contact addresses:
David Bard, 150 Massachusetts Avenue, Box 925, Boston, MA 02115. Tape costs $5.
Chris Chen, 395 31st Avenue, #301, San Francisco, CA 94121.
Carl Weingarten c/o Multiphase Records and Tapes, POB 15176, St. Louis, MO 63110. Tel: (314) 773-0938.
Tim Boone c/o Podium Productions, 8636 Forest Hills, Dallas, TX 75218. Tape costs $6.
Marcus Hicks, 764 Maple Street, Rochester, NY 14611.
Kid Bacchus c/o Cutting Edge Productions, 3225 Netherland Avenue, Riverdale, NY 10463. Tel: (212) 543-8198. Tape costs $5; order "KB 701."
Ken Cheetham, POB 11232, Berkeley, CA 94701. Tape costs $5 ppd.
Eugene Marquis c/o Grenadilla Records, POB 19864, Cincinnati, OH 45219. Tape or album, $9; CD, $14 (plus $2 p/h).
Andrew Hosch, POB 712, Portland, OR 97207. Tel: (503) 222-0192.
Jumbalaya c/o Keidi Oh Be Music Company, POB 40222, Long Beach, CA 90804. Tel: (213) 433-6195. Tapes are $5 each plus $1.50 p/h.

Tapes are reviewed in the order received. Send your contributions toward musickind along with name, address (please put on tape, if possible – Yung's filing system is not all it could be), equipment list, photo, and price to: *Readers' Tapes, Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.*

Mick Micro, MIDI Detective in Search of...

"THE SECRETS OF SYSTEM EXCLUSIVE"

Part 2

Illustration *Ernie Rideout*

We now return to the adventures of Mick Micro, MIDI Detective, as he and the fat man learn the secrets of System Exclusive from Melodia the MIDI Mystic. *Story by Scott Wilkinson.*

I WAS BEGINNING to wonder if Melodia was ever coming back. Had she abandoned us to languish forever in the electronic ether? The fat man and I had looked high and low for a cheeseburger to no avail, although it was odd that I wasn't particularly hungry, even after all the time we had spent waiting for Melodia's return.

We had just started to talk about the practical applications of SysEx when Melodia started to fade away. She said that her Ni-Cads were running down and she had to go recharge them, leaving us to wait in fear that the low batteries wouldn't maintain the data in RAM, including us. If the power went – so would we!

Melodia's Return

Suddenly, Melodia's face reappeared in the matrix. What a relief! She had recharged the batteries and we were still here! "Boy, am I glad to see you!" I said with enthusiasm. "What kept ya?"

Melodia smiled and said, "Those Ni-Cads will take a charge only so quickly. If you push 'em too hard, they might blow on you." I was glad that she hadn't taken any chances. She continued, "Now, where was I?"

The fat man jumped in. "You were about to get into the practical applications of SysEx. I *do* hope that my client will understand if I'm late for our appointment. This is exactly the information I need to fulfill our contract."

"Oh yeah, now I remember," she said. The fat man and I settled down for another data dump from Melodia's memory into ours.

Editor/Librarians

"Do you remember me telling you about editor/librarian computer programs?" she asked. We nodded our

heads. "As you'll recall, these programs take SysEx data from an instrument and allow you to edit it and organize it into banks and libraries of new sounds. These sounds can then be sent back to the instrument and played. Not only that, you can usually adjust a single parameter from the computer and it will affect the instrument as you do.

"In order for editor/librarians to work, though, it is sometimes necessary to connect the MIDI Out of the instrument to the MIDI In of the computer and vice versa, forming a loop. That way, the computer can send a request for SysEx data to the instrument and the instrument can send the requested data back to the computer. This configuration is also important for instruments that require 'handshaking' while transferring SysEx data. In these cases, the instrument and computer send 'acknowledge' messages back and forth to verify that the requested data is sent without problems."

That puzzled me. "What if the instrument is a sound module with no controller like a keyboard?" I asked. "How can you play it to hear the effect of your noodling with the parameters?"

"Excellent question, Mick. But then, that's what I've come to expect from you. The simplest solution to this problem is to use a MIDI patchbay with which you can change the MIDI connections in your studio with the push of a button. This allows you to connect the MIDI Out from the sound module to the MIDI In of the computer when requesting SysEx data from the module, or the MIDI Out from the controller to the MIDI In of the computer when playing the module while adjusting parameters on the computer. In both cases, the MIDI Out from the computer is connected to the MIDI In of the module. Here's a diagram to show you what I mean." With that, two simple system diagrams appeared. See **Figures 1a** and **1b** for a reproduction.

"When using a MIDI patchbay in this way, make sure that the 'MIDI Thru' function of the editor/librarian is turned off when the module's Out is connected to the computer's In. Otherwise, the SysEx data coming from the module will be echoed through the computer and sent right back to the module, setting up a MIDI feedback loop – a nasty business at best. On the other hand, the MIDI Thru function must be turned on when the

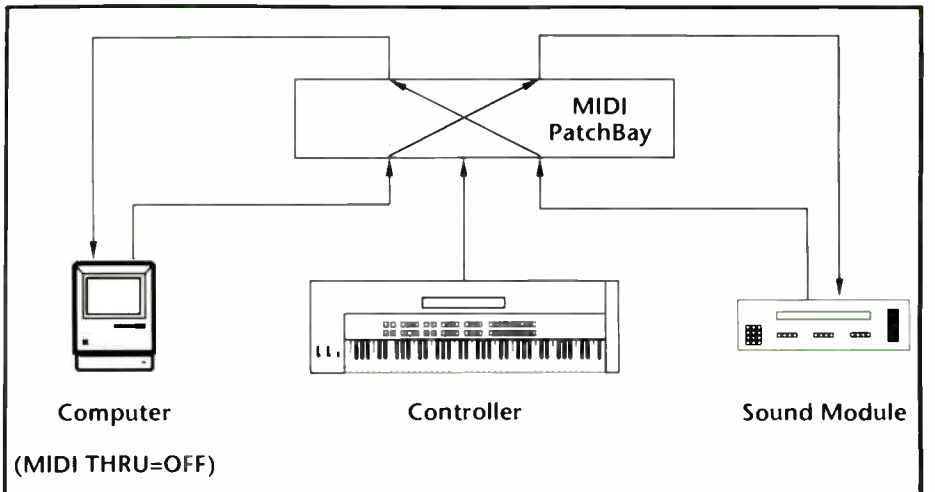


Figure 1a. System configuration for requesting SysEx from a sound module to an editor/librarian.

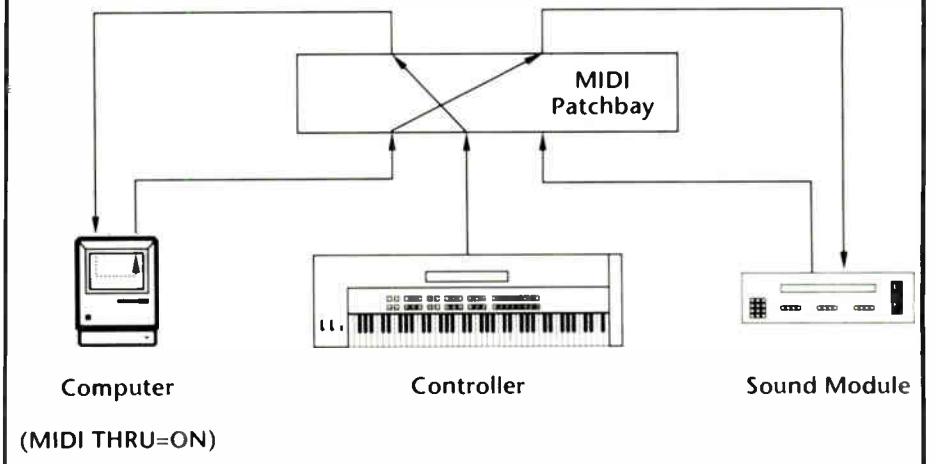


Figure 1b. System configuration for sending SysEx from an editor/librarian to a sound module.

Out from the controller is connected to the In of the computer. This allows the performance messages from the controller to pass through the computer, getting merged with the SysEx data as it's sent to the module. This lets you play the module while you alter any parameter you wish."

This all seemed quite reasonable to me, but the fat man was getting nervous again. "I'm glad to know all of this, but my client gave me a sequence file with SysEx data in it. How do I deal with that?"

Sequencing SysEx

I could tell that Melodia was getting a little fed up with the fat man, but she continued just the same. "Recording SysEx data in a sequence has several important applications. However, not all sequencers can record SysEx. And those that can may have a limit on the amount of SysEx data they can handle. For example, Dr. T's sequencer for the Atari ST computer, called Keyboard Controlled Sequencer (KCS) Level II, can record up to 5K of SysEx data in a sequence. This is fine unless you want to record an entire bulk dump from an instrument. These bulk dumps can be as much as 30K or larger."

"Why would you want to record SysEx data in a sequence?" I asked.

"There are several reasons," Melodia replied. "One of the main reasons is to ensure that the various instruments in your system are loaded with the correct sounds for the tune your sequencer is about to play."

"Isn't that done with recorded program change messages?" the fat man asked.

"Program changes are used to call up different sounds in an instrument's memory during a sequence," she said, rolling her eyes in impatience. "But what if some of the instruments were loaded with a different set of sounds since you recorded the program changes? The sounds that are called up ▶

► by those program changes will most likely be entirely different than those you intended. What if the instruments you're using are also used by others? For instance, how can you be sure that the instruments at the studio in which you're going to record are loaded with the same sounds that you used at home while sequencing?"

This barrage of questions left the fat man looking bewildered. "Uh, I don't know," he said dejectedly.

"Well then, I'll tell you. If you had recorded the bulk dump of each instrument's memory into the sequence, that data would be sent to the instruments in the system when you played it, loading their memory with the sounds you were using. Then, your program change messages throughout the sequence would call up the right sounds."

Pretty clever, I thought, but it was my turn to ask a question. "How do you record a bulk dump into a sequencer?"

"The exact procedure varies from one sequencer to another," she replied. "However, I'll give you a general idea of how it's done. Basically, you want to record the SysEx bulk dump from each instrument capable of such a dump at the very beginning of the sequence in a section before the music starts. Because you may well have spent a good deal of time deciding on the final sounds for your sequence, you will probably want to do this after the song has been recorded. This means that you'll have to insert some blank measures at the beginning of the sequence."

"How will I know how many measures to insert?" I asked.

"Bulk dumps typically take a few seconds to complete. If an instrument takes six seconds to dump its entire memory, that's equal to about three bars of 4/4 time at 120 beats per minute. If there were five such instruments in a sequence of that time signature and tempo, I would insert at least 15 bars at the beginning. If this turns out to be too little or too much, you can always adjust the length of this section as you go along.

"The next step is to record the bulk dump from each instrument. If possible, set your sequencer to start recording 'on cue' as soon as it receives the first MIDI message. Then, tell the instrument to send its bulk dump. If your sequencer doesn't have the ability to wait for an incoming MIDI message, you'll have to start recording manually by pressing the record button *just* before you initiate the bulk dump. Obviously in this case, the sequencer and the instrument must be physically close together. If you have to do this, I hope you have good eye-hand coordination." Maybe all those quarters in the video arcade weren't spent in vain after all.

"After the bulk dump has finished, stop the recording. The sequencer should have an editing mode that lets you edit individual bytes. In the Roland MC500 sequencer, this is called icroscope Mode." Ah, this was the meat of the matter for the fat man. Our quest was not for naught.

"Make sure that the first byte is F0H. You could also check the manufacturers ID for a chuckle. Find the last byte in the dump and verify that it's F7H. Also, notice the bar and beat number on which that last byte occurs. This will tell you where to start recording the next instrument's bulk dump. Actually, start the next recording a few beats after the last F7H to make sure there's no confusion. Repeat the process for each instrument. When you're done, trim the section containing the bulk dumps so that the first patch changes follow closely after them and the music starts shortly after that.

"Of course, you may not want to record the entire SysEx bulk dump of all your instruments at the beginning of every sequence. It may be that you have several sequences that use the same sounds. In the interests of efficiency, you could record the bulk dumps from your instruments into a separate sequence with no music and play it at the beginning of a session. That way, you wouldn't have to wait for the bulk dumps before every song. You can also record only the SysEx for the specific patches that you're using in each song."

"One of the main reasons to record SysEx bulk dumps into a sequencer is to ensure that the various instruments in your system are loaded with the correct sounds for the tune your sequencer is about to play."

This seemed almost *too* easy, and yet I knew that we were talking about some of the most complicated aspects of MIDI. Still, I had a feeling there was more. I asked, "Is there more that can be done with sequenced SysEx?"

Real-Time Control

Melodia smiled slyly. "As a matter of fact, there is," she said. "You can do some pretty amazing things if you have an editor/librarian and a separate sequencer running simultaneously. When you alter an individual parameter on many editors, the SysEx that represents that change is sent out via MIDI. This SysEx can be recorded in a sequence and played back to the instrument, causing the parameter to be changed every time you play the sequence just as if you had done it from the editor.

"However, you should be aware that you may run into a bit of trouble with some instruments. Sending the SysEx to change certain parameters on certain instruments might cause them to choke on their own buffers. Whether or not this is true for a particular instrument is best determined by experimentation.

"How about an example?" Sounded good to me. "Let's suppose that you're using a TX81Z, an editor such as TX81Z Pro for the Macintosh that sends SysEx as you change individual parameters, and a sequencer capable of recording and editing SysEx such as the MC500." The fat man's eyes lit up. "Let's further suppose that you've already recorded the note data for the TX to play into the sequencer. As the sequencer is playing notes on the TX from one track, you can alter a parameter with the editor in real time and record the resulting SysEx on another track. In this case, you must connect the editor's MIDI Out to the sequencer's MIDI In and the sequencer's MIDI Out to the TX's MIDI In, making sure that the Thru function in the sequencer is turned on.

"Using this procedure, you could, say, change the frequency of a modulator in a voice as it plays. If you've studied FM programming, you know that this would drastically alter the timbre of the sound. By recording the SysEx that changes the parameter, this change in timbre will now occur every time you play the sequence." Be sure to check out the series of articles on FM programming (Programming Compleat, Parts 1–5) in the January '89 through June '89 issues of MT for more info on this. "You can also edit the SysEx data in the sequencer as long as it provides individual byte editing capabilities like the MC500."

Figure 2 illustrates the type of

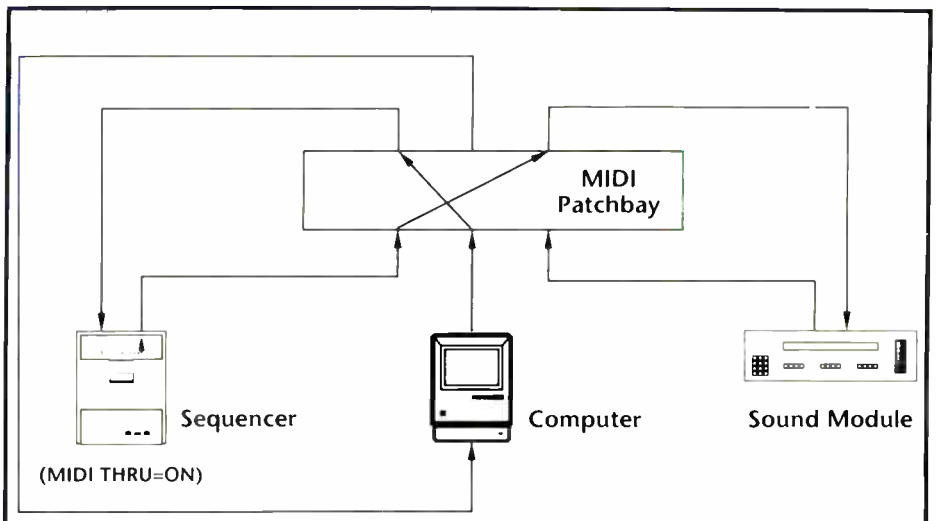


Figure 2. System configuration for recording SysEx in real time from an editor/librarian into a sequencer.

system that Melodia described to us. The computer is running a TX81Z editor that is used to change the TX's parameter values in real time as the sequence plays. These parameter changes are recorded into the sequencer on an empty track for later playback.

Despite Melodia's excellent explanation, I was still a bit puzzled. This was a very useful technique, but it didn't seem to cover all the bases. "What if someone doesn't have a computer *and* a separate sequencer?" I asked.

"Always trying to save a buck, eh Mick?" Melodia sneered. "Actually, there are several ways around this problem. If you use a Macintosh for sequencing, Apple is working on something that will let you transmit, or 'pipe' the output of one program directly into another program *entirely* within the computer.

"This new system tool, called the MIDI Manager, is designed specifically for MIDI applications. For example, it will allow you to 'connect' the output of an editor/librarian to the input of a sequencer program, both of which are running under MultiFinder. In this way, the SysEx from the editor can be recorded directly into the sequencer without going outside of the computer at all. Of course, it requires a Macintosh

"This data piping is possible on an Atari ST computer as well. Dr. T's has a catalog of some 25 editors for the Atari in addition to their KCS Level II sequencer. They've also developed a multitasking system called Multi Program Environment (MPE) under which several programs can be running simultaneously and sharing information. They are currently implementing the ability to record SysEx in real time from any of their editors into KCS while both programs are running under MPE. And they aren't the only software developers working on this technique for the Atari either.

"The Commodore Amiga can also be used to sequence SysEx in real time. The Amiga was designed from its inception as a truly multitasking computer, meaning that *any* program can be running at the same time as any other program. However, a problem appears when you try to edit a patch in an editor program while a sequencer is playing or recording at the same time. Both programs must compete for access to the MIDI ports, and this competition is very difficult to arbitrate.

"Dr. T's is one company that has solved this problem. Using one of their editor/librarians and KCS on the Amiga with a MIDI patchbay, you can edit a patch while the sequencer is recording. You must set KCS to record SysEx and ignore all other incoming MIDI data except note on and off messages – KCS can't be set to ignore them. The notes already in the sequence will be re-recorded in this procedure, but you can remove them later.

"Route the signal from the Amiga's MIDI Out through the patchbay to your instruments and also back to the Amiga's MIDI In. Make sure that the 'Thru' functions in the editor/librarian and sequencer are turned off to avoid MIDI feedback. In this way, the SysEx from the editor will be sent out of the computer and sent right back from the patchbay to be recorded into the sequencer, along with the notes that were already in the sequence. You can then easily remove the note data that was recorded with the SysEx using the appropriate procedure in KCS."

That gave me an idea. "How about inserting an external MIDI data filter between the patchbay and the Amiga's MIDI In to avoid re-recording the note data from the sequence?" I asked.

"Another superb idea, Mick," she replied. "Some patchbays, such as the JL Cooper MSB+, include such a filter internally. You could also use a MIDI processor like the Yamaha MEP4 to filter out all MIDI data going back to the Amiga except SysEx." Check out **Figure 3** for a diagram of such a system.

"Remote controllers provide another way to record real-time SysEx. For example, most of the Roland synth programmers use SysEx to control the parameters on their current line of instruments. If you use a PG1000 or PG10 to program your L/A synth, you can record the SysEx from these units ▶

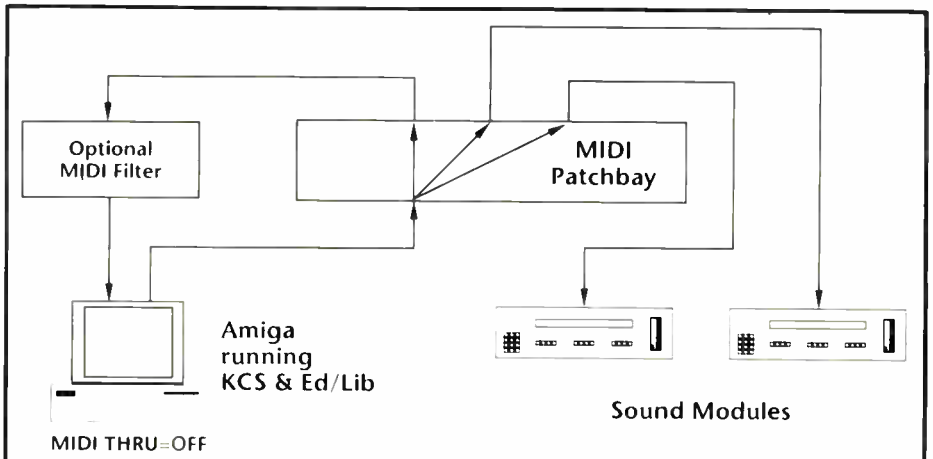


Figure 3. System configuration for recording SysEx in real time from an editor/librarian into KCS, both running on an Amiga computer.

► into your sequencer. The SysEx changes the appropriate parameter value and also passes through the synth to the MIDI Out, so you can record it without having to repatch at all. This scheme also works with the programmers for the Juno 1, Juno 2, MKS50, JX8P, MKS70 and MKS80.

"The Lexicon MRC MIDI Remote Controller can be used to control the parameters of several Lexicon signal processors in real time with SysEx. Not only that, its sliders can be programmed to transmit any MIDI messages. The same is true of the Forte MIDI Mentor's remote controller and JL Cooper's newly announced product, the Fader Master MIDI Command Center. This unit includes eight faders that can be assigned to send any MIDI message, including SysEx. These devices can be used to send SysEx to a sequencer in order to affect real-time parameter changes in sound generators, signal processors and other MIDI gear."

Don't get me wrong, I was awfully glad to understand System Exclusive at last. But I was about to suffer another case of information overload. (I was also wondering how Melodia's Ni-Cads were holding out.) I happened to look over towards a nearby disk drive as my attention was beginning to wander when I saw some movement. As I walked over, I saw a woman at a large control console behind the drive.

Behind The Disk Drive

"Pay no attention to that woman behind the disk drive!" Melodia's huge floating face cried. As I got closer, I realized that it was *Melodia* back there, frantically working the console. Suddenly, she stopped and looked sheepishly at me. "So, you've discovered my little secret," she said in a much quieter voice (and no reverb, either). "You might as well know that you're trapped here," she continued. "I have not yet discovered any way out."

"Have you tried a SysEx bulk dump to the DAC?" I asked.

Melodia looked astonished. "Why didn't I think of that?" she gasped. She turned to the console and made some adjustments. Suddenly we were speeding towards the digital-to-analog converter in the distance. It loomed as we accelerated towards it faster and faster until I was certain we would crash headlong into . . .

The Analog Domain

Suddenly, we found ourselves standing in the deserted house surrounded by audio gear and computers. The Granny Smith appeared to be off. Apparently, we made our escape just as the Ni-Cads were giving out.

"Oh Mick, we made it!" Melodia put her arms around me in a great big hug. "How can I ever thank you?"

I could think of a number of ways. "Ya know, we make a pretty good team, you and me. How would you like to merge our data? 'Mick and Melodia Micro, MIDI Detectives!'"

"Why Mick, I didn't think you cared! Together we'll knock the world of MIDI on its back panel!" With that, she took my arm as the fat man hurried off to meet his client. Melodia and I walked into the dawn of a new day for midiots everywhere. We would spread the word about System Exclusive. We would put its power in the hands of the people!

But first, we would find the nearest cheeseburger. ■

The author would like to thank Al Hospers of Dr. T's Music Software for his invaluable assistance.

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

Alchemy: 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.

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

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

Auricle: Auricle Control Systems, 3828 Woodcliff Rd., Sherman Oaks, CA 91403. Tel: (818) 990-8442.

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

DrumKAT: KAT, 43 Meadow Rd., Longmeadow, MA 01106. Tel: (413) 567-1395.

DX1, DX5, DX7, DX7IIFD, DX9, DX11, DX21, DX27, DX100: Yamaha Music Corp. USA, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9011.

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

Emulator II/+: E-mu, see *Emax.*

Emulator III: E-mu, see *Emax.*

Fairlight Series III: formerly made by Fairlight Instruments, Inc.; Electric Sound and Picture, 30 Bay St., Broadway, NSW Australia, 2007. Tel: 011-61-2-212-6111

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

Juno 1, Juno 2, Juno 60, Juno 106: Roland, see *D10.*

Jupiter 6, Jupiter 8: Roland, see *D10.*

JX3P, JX8P, JX10: Roland, see *D10.*

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

LA2A, LA3A: JBL/UREI, 8500 Balboa Blvd., Northridge, CA 91329. Tel: (818) 893-8411.

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

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

M16 Matrix Sycologic Ltd., 20 Conduit Place, London, UK, W2 1HS. Tel: UK 01-724 2451.

M600: Tascam/TEAC Corp. of America, 7733 Telegraph Rd., Montebello, CA 90640. Tel: (213) 726-0303.

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

MC500, MC300: Roland, see *D10.*

Mentor: Forte Music, P.O. Box 6322, San Jose, CA 95150. Tel: (415) 965-8880.

MEP4: Yamaha, see *DX1.*

MIDI Bass: 360 Systems, 18740 Oxnard, Tarzana, CA 91356. Tel: (818) 342-3127.

MKS20, MKS50, MKS70, MKS80, MKS100: Roland, see *D10.*

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

MSB 16/20: JL Cooper Electronics, 13478 Beach Ave., Marina del Rey, CA 90292 Tel: (213) 306-4131.

MSB+/Plus: JL Cooper, see *MSB 16/20.*

MT32: Roland, see *D10.*

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

Music Mouse: Aesthetic Engineering, 175 Duane St., New York, NY 10013. Tel: (212) 925-7049.

Octapad/II: Roland, see *D10.*

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

PG10/PG1000: Roland, see *D10.*

PPG Wave 2.3: formerly made by PPG GmbH.

PPS1: JL Cooper, see *MSB 16/20.*

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

Prophet 2000/2002: formerly made by Sequential Inc.

Prophet T8: formerly made by Sequential Inc.

Proteus: E-mu, see *Emax.*

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

Roadstar II: Ibanez, Chesbro Music Co., P.O. Box 2009, Idaho Falls, ID 83403-2009. Tel: (208) 522-8691.

RX5, RX11, RX15, RX21: Yamaha, see *DX1.*

S10, S220, S330, S50, S550: Roland, see *D10.*

S612, S700, S900, S950, S1000: Akai Professional, 1316 E. Lancaster, Fort Worth, TX 76113. Tel: (817) 336-5114.

SDX/SDX Real Time Recorder: Simmons Electronics USA Inc., 23917 Craftsman Rd., Calabasas, CA 91302. Tel: (818) 884-2653.

SK5: Casio, Inc., 570 Mt. Pleasant Ave., Dover, NJ 07801. Tel: (201) 361-5400.

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

SP12/SP1200: E-mu, see *Emax.*

SPX90/II: Yamaha, see *DX1.*

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

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

SynthWorks DX/TX/Synthworks M1: Steinberg, see *Pro24.*

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

TrackGenie: LTA Productions, P.O. Box 6623, Hamden, CT 06517. Tel: (203) 787-9857.

TX7, TX216, TX802, TX816, TX81Z, TX16W: Yamaha, see *DX1.* ■

SYNCHRONIZING BASICS

part one

Illustration *Clive Goodyer*

Synchronization may be one area of music technology you'd rather not deal with, but if you're working with multitrack recorders, video, or sequencers, you'll probably have to. Here is an introduction to the world of sync. *Text by Chris Many.*

IN THIS ELECTRONIC, MIDI era we live in, one (more) subject that we're all called on to understand is synchronization. It's not enough that a musician or composer knows how to create a haunting phrase, or how to write the next top ten hit. It's not enough for one to learn the ins and outs of synthesizers, from FM (Frequency Modulation) to analog, from VCOs (Voltage .Controlled Oscillators) to low pass filters; or how to get a good, clean sample, much less the real difference between 12-bit and 16-bit samplers (besides the price tag, that is). We all know the length of the list of subjects a musician of this and future decades is and will be required to know. Synchronization usually tends to be low on the list, and rightly so. After all, it's just a matter of turning on the tape and locking up a sequencer, isn't it? Ah, if only that were true . . .

Clearly Defined

Let's get a couple definitions out of the way first. What do we mean by "synchronization?" My handy dictionary defines "synchronize" as *1. Occurat the same time; agree in time. 2. Move or take place at the same rate and exactly together.* Orchestras normally require a conductor to "synchronize" their performances, getting all of the musicians to play together and agree on the tempo among other factors (interpretation, dynamics, etc.). A computer or dedicated sequencer actually takes on the conductor's role when used to perform music, causing different tracks to start at the same time and perform exactly together at the same tempo.

But what would happen if our conductor was unable to communicate his intentions – if his or her baton waved not in rhythm, but to some unknown beat? Or if raising one's hands high above one's head meant

decrescendo? If we were unable to communicate by using some common language agreed upon by all concerned, then we have the opposite of synchronization: anarchy. Fortunately, musicians have a common language: music. Whether or not indi-vidual performers within an orchestra speak French, Italian or English, the language of a conductor setting the pace and dynamics of a piece is understood the world over. This concept of language is what establishes the fundamentals of synchronization.

This analogy holds up well when we apply it to the field of mechanical-synchronization. In this case we have a 24-track recorder, a ¾"videodeck and a sequencer all made by different manufacturers, all "speaking" different languages. By imposing a senior communication protocol on all of these machines, one in which there is a common understanding, we can get them all working in sync with one another.

FSK and Clicks

There are two main categories into which these synchronizing languages fall: click or pulse types, and time reference types. Click types are basically electronic pulses occurring at a regular rate that can be read by two machines so that they can run at the same speed. In other words, if two machines start at the same time and run at the same speed, then they'll stay in sync. The problem with this type of sync is that there's only one reference point to work with, namely the starting point.

Many sequencers use this kind of sync signal, known as FSK (Frequency Shift Keying). It's an audio signal in which the frequency of one sine wave tone is modulated between two distinct values by a square wave (sounds kind of like simple FM, yes?). For example, in Roland FSK on the MC500 MkII, the frequency of the primary tone is modulated between 1.3kHz and 2.1 kHz. These modulations, or shifts between frequencies, are performed a certain number of times per quarter note– 24, 48 or 96 are the standard amounts – and so drum machines and sequencers are ideally suited for this type of sync. Of course, each modulation, or pulse, is identical to every other pulse, so there's no way to identify any given part of one's music, strictly speaking.

FSK is one familiar example of a click-type sync. There are several others, such as DIN sync (Roland), Oberheim's "O" sync, and a few other proprietary sync codes from various manufacturers. There's also another type of pulse or click sync called Control Track that is used extensively in video applications. Control Track is a series of electronic pulses that are recorded on the bottom part of a video tape, separate from the two audio tracks. These pulses are used for editing purposes in conjunction with a Control Track Editor, allowing clean edits using video tape. By finding a blank space between selected video frames (called the vertical interval), a Control Track Editor lets you make electronic splices without causing visible jumps. Again, the pulses used with Control Track are all identical, so such editing is not 100% accurate because there is no differentiation between individual pulses. The machines being used have to count the pulses, so they are only accurate to within two or three frames.

Another example of a click-type sync signal is the Click track used by musicians when multitracking. Although the tempo can change and a different audio pitch could be used to delineate the start of a new series of clicks (*click*, click, click, click . . . etc.) the clicks are essentially identical. Once again, there's no location reference using a click track (the music might give you a reference as to where you are in a song, but the click itself doesn't).

However, the click type of synchronization does provide an agreed - upon method for locking the performance of two machines together, as long as they both start from the beginning of the music each time you run them. By counting and comparing the electronic pulses, both machines can synchronize to each other every time.

"If you didn't know that there was a blank space between videoframes, you're not alone. VITC, although used daily in a wide variety of video applications, is largely unknown in the music field."

SMPTE Timecode

It's cumbersome to have to rewind to the beginning every time you want to slave one machine to another, espec- ▶

► ially if you're working with a long piece of music or video. Enter SMPTE timecode, an audio signal developed by the Society of Motion Picture and Television Engineers. It's based on the internationally accepted concept of time (i.e., Hours: Minutes: Seconds), providing a great number of pointers or location references. SMPTE is not based on counting pulses per quarter note, but instead it sets the tempo against areal time standard. So when you record SMPTE timecode onto video tape, eachframe is stamped with its own individual reference point in time. This is true for audio tape as well – every point on the tape is uniquely marked with a precise moment (Hours, Minutes, Seconds, Frames and Sub Frames). This means that moving to any location is simply a matter of requesting the machine to move there.

There are two kinds of SMPTE code: Longitudinal Time Code (LTC) and Vertical Interval Time Code (VITC, pronounced "vit-see"). LTC, commonly used by most musicians for sync purposes, is the audio signal recorded on audio or video tape. VITC is recorded in the vertical interval between video frames on video tape. One of the big advantages of VITC is that, when using the appropriate hardware, you can read code while in very slow motion or in pause mode. For the most part, LTC cannnot be read at very low or high speeds because there are frequency changes due to playback speed.

Now, if you didn't know that there was a blank space between video frames, you're not alone. VITC, although used daily in a wide variety of video applications, is largely unknown in the music field. Why? Because VITC cannot be recorded on audio tracks. Therefore LTC must be used when running audio hardware, such as a multitrack tape machine and a sequencer. In order to synchronize these different types of machines (video and audio) we must find the common ground between them, and LTC is it.

Just to make things a little more complicated, there are four different types of LTC: Non-drop frame (30 frames per second, or fps), Drop frame (29.97fps, it requires the code to "drop" or skip a frame number once in a while to stay in sync), and 25 and 24-frame SMPTE. Simple, huh? 25-frame is the standard used by the European video community and 24-frame just happens to coincide with the standard film (as opposed to video) frame rate. American video uses the drop frame-rate of 29.97 fps. The 30-frame rate is used for pure audio applications, such as synchronizing sequencers to multitrack recorders. In order to synchronize things using LTC then, you must make sure that the type of code used is the same for all machines, otherwise you'll wind up with some very confused machines.

Other Formats

Another time-based synchronizing code can be found in the MIDI-specification. Song Position Pointer (SPP) is one method used by sequencers, drum machines and assorted MIDI machines to locate a particular point in a song. Using a code based on numbered beats in a song to identify specific points, SPP is useful in providing a simple cueing system for MIDI instruments.

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MIDI Time Code (MTC) was recently adopted for use in similar applications, and uses the same method as SMPTE timecode (i.e., Hours, Minutes, Seconds, etc.) for location reference. The drawbacks of MTC are the additional information it adds to an already full MIDI data stream, the need for special conversion boxes to change true SMPTE code to MTC, and less accuracy than SMPTE-itself. However, it does provide the best method of time-based synchronization available for MIDI users without SMPTE. However, MTC by itself cannot be used for synchronizing MIDI gear with multitrack tape machines or VCRs since it cannot be recorded onto tape. *(For more information on SMPTE-to-MIDI converters, see "Surviving a SYNCing Ship," in MT October '88.)*

Recently, yet another form of synchronizing code has been developed, a kind of bridge between the pulse and time methods: so called "Smart FSK." Essentially, it's an FSK-type clock with Midi Song Pointer imbedded within the signal. This allows devices designed to read and write this kind of code to use an inexpensive but reliable type of pulse code (FSK) that incorporates one of the main strengths of time-based code (locatability). JL Cooper's PPS1 and Synhance's MTS1 (reviewed in MT July '87) are the only two machines that offer this kind of code, so it's quite a ways from becoming an industry standard. Consequently, it precludes itself from being widely used to lock up VTRs and MTRs (Video or Multitrack Tape Recorders). However, it is an alternative synchronizing method worth considering if you're on a budget.

MIDI itself is a communication protocol, designed to work with the microprocessors in synths, signal processors, sequencers, etc. but not meant to be recorded on audio tracks. As a result, additional conversions to other communication languages (i.e., FSK or SMPTE) are required in order to use MIDI with other non-MIDI machines such as VTRs or MTRs. Even with the latest advances (like Fostex's R8, a multitrack machine that syncs to MIDI clock), there are still hardware and software requirements to "translate" the different languages into one common communication protocol.

Summary

To summarize then, there are two categories of synchronizing languages: click or pulse types, and time formats. The click/pulse type of sync code is characterized by the fact that each pulse is identical to every other pulse, requiring you to start from the beginning of the recorded data every time to get an accurate coordination between machines. All that's being communicated by electronic (e.g., frequency modulation) or audible (click track) means is a continuous stream of countable pulses, each one following the previous in a predictable, timed fashion.

Time reference code such as SMPTE allows for electronic information to berecorded on audio or video tape that uniquely identifies each point on the tape. These signals represent the passage of time in Hours, Minutes, Seconds, Frames and Sub Frames. This allows machines to locate to any given point on a piece of tape and is used to instruct the machine to move to a specified time stamp.

In our next installment of synchronizing basics we'll look into just how two or more machines of different manufacture, with different functions and purpose, can be made to work in exact coordination with each other. ■

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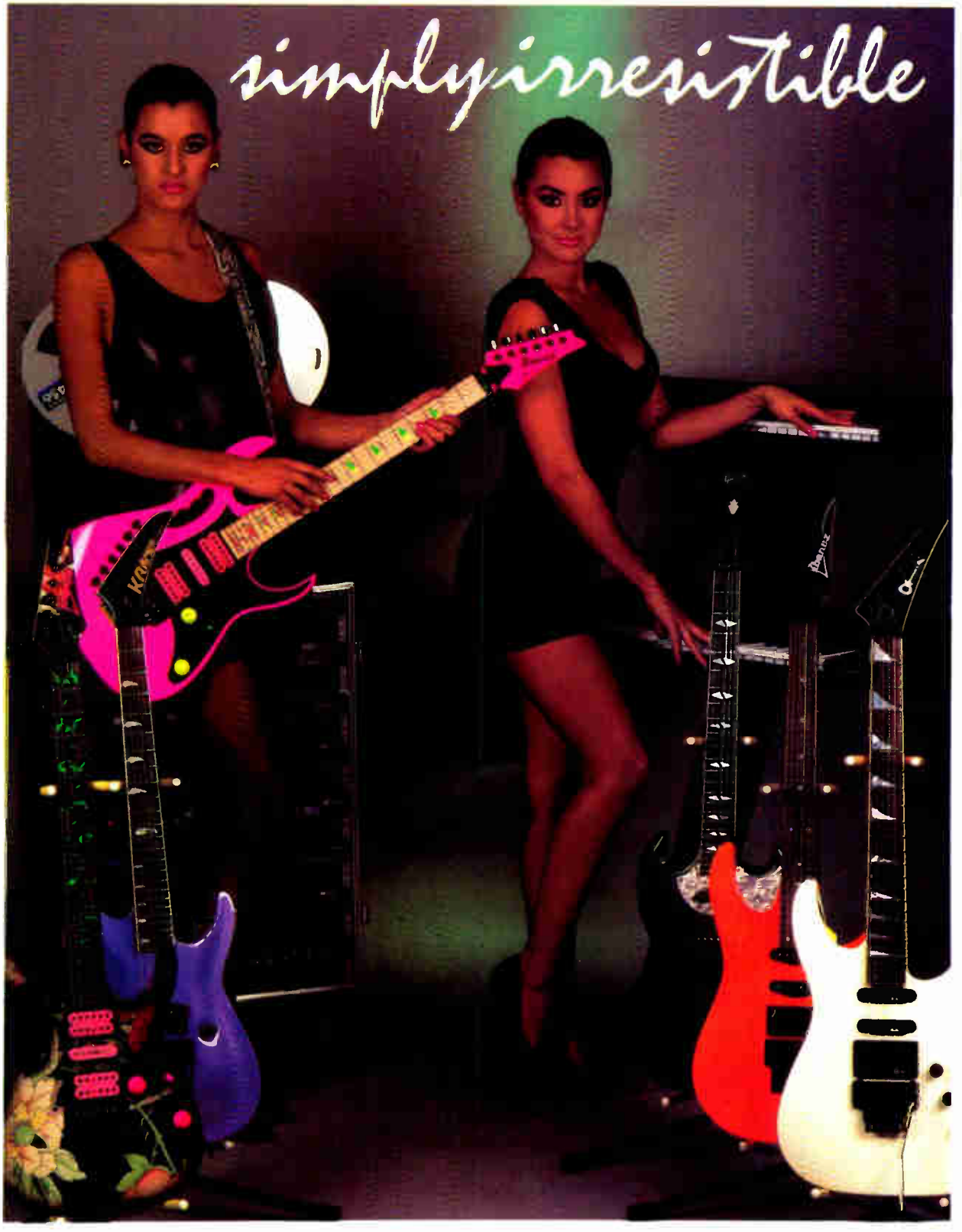

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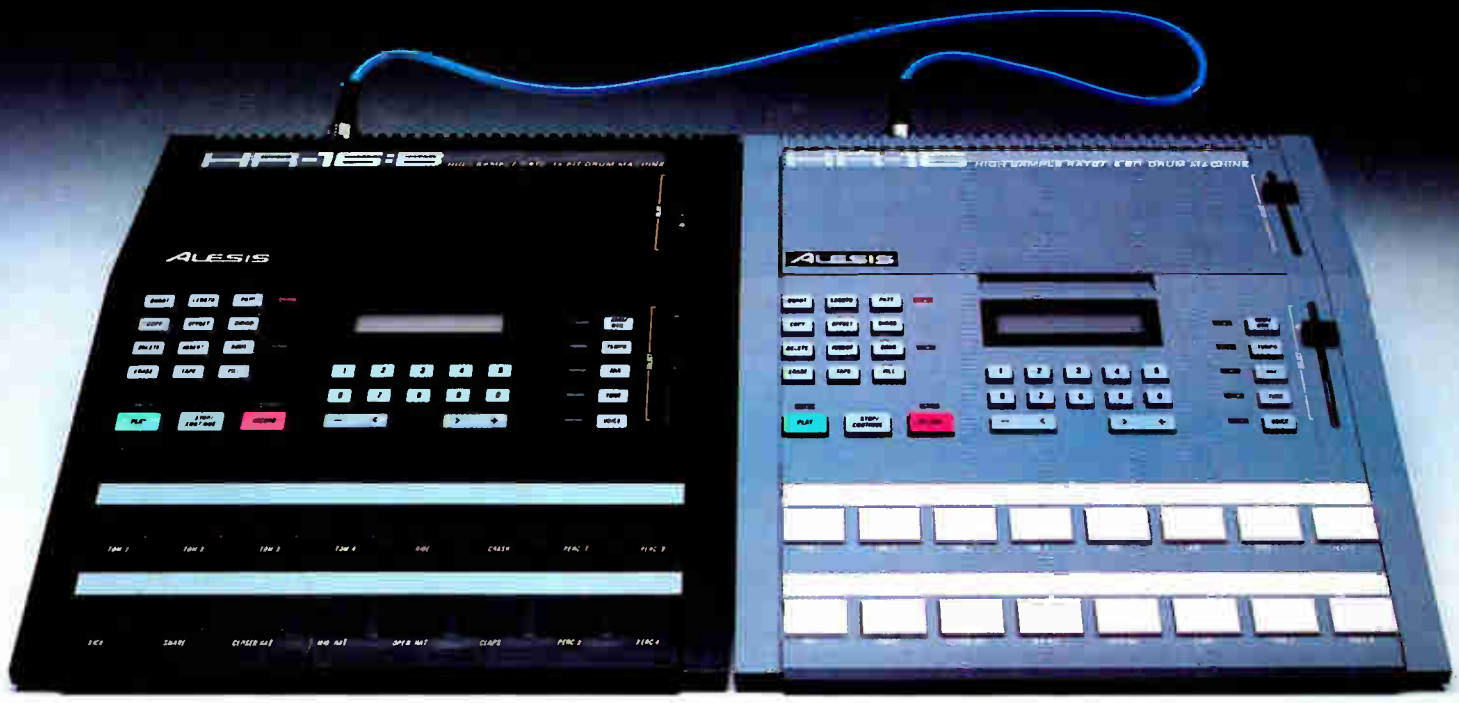

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