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MUSIC TECHNOLOGY

JAN HAMMER
Escaping the Deadly Vic

PATRICK O'HEARN
Reaching Forward

DIGITAL PIANOS
A Survey

COMPUTER NOTES

Music Quest
Hard Disk Recording
Blank Software Alchemy
MIDI Concepts Concepts:One

REVIEWS

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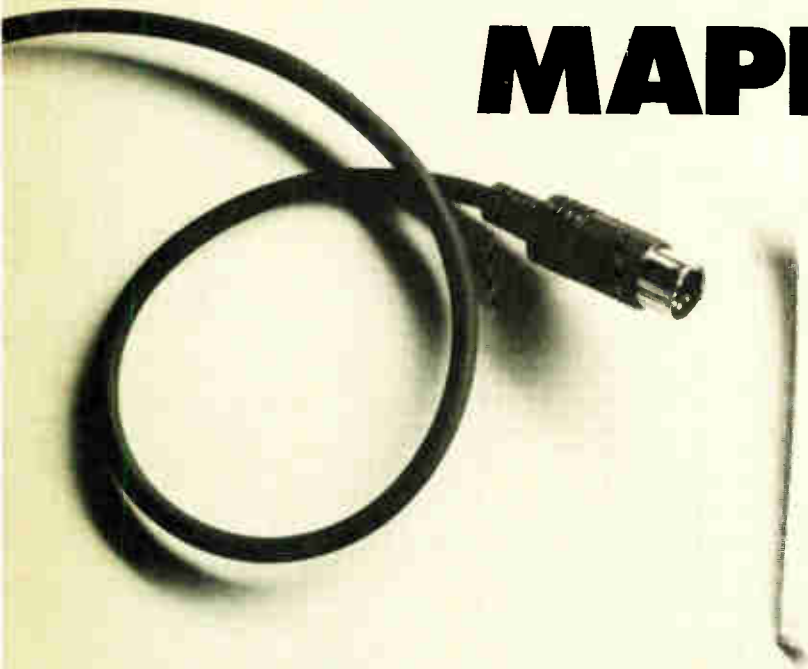

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VOLUME 2, NUMBER 11
JUNE 1988

EDITORIAL

Copy Protection Wars

Note: This month I'm lending this space to our Technical Editor, Chris Meyer, whose personal experience with regard to this hot topic makes him an ideal choice to speak out on it. **BO'D**

THE ELECTRONIC MUSIC industry is a good deal smaller than you probably think. A software company may take in less than a busy gas station during a year (no joke). When I worked in software, we considered selling 500 copies of a program as "going gold," and 1000 as platinum (only one program made it that far). Those selling sounds have an even smaller market – I developed a pair of percussion disks that were sold through a major sampler manufacturer as part of their factory sounds, and saw money back for less than 200 each.

Enter into this the idea of copy protection. Users hate it – period. Sometimes software companies try cumbersome ways of protecting software such as hardware keys, only one hard disk install (hard disks *do* crash), or demons that flip out your computer (to the point of destroying data) if they think they've been copied. But let's all take an honesty pill for just one second and admit it – we don't want copy protection because we want the software for free.

Now, in some cases, users want to legitimately try out a piece of software before committing to it. Some companies have placated this desire by offering demo disks (with some minor cripple, like the inability to save your work, or shutting off randomly after five minutes). Others don't protect their software, and in essence charge for the manual and customer support. But for those who want no protection whatsoever, remember that hard economics paint this picture: if nobody pays for the software, nobody's going to bother to create it. Some companies charge large sums of money for their programs to compensate for the small market or potential copying, but a higher price only further encourages someone to try and break the protection. And then manufacturers have to spend more time and money coming up with a more bulletproof scheme – round and round.

The problem is even more acute on the synth patch and sample library side of things. Whereas computer operating systems are built to allow copy protection, no sampler or synthesizer does. That means that anyone trying to sell sounds can expect to sell just one copy of each into each store – from there on, they'll be freely copied and distributed to the world. And there's no manual or hardware key to prevent it. And here, the same rules of economics apply – if money can't be made selling the product, eventually nobody's going to bother to make it. And the loser is the user, who wanted it free in the first place.

We're starting to see more and more sample libraries appear on CD and cassette tapes – we review quite a few in our Patchware section. The cassettes tend to be cheap enough that nobody bothers copying them (although they still get loaned around), and CD's can't be copied economically (without some loss of sound quality). This is good, and a healthy source of new sounds, but still means that half the work – sampling and setting the sounds up – isn't done, and must be finished by the user.

I sample my own sounds (and have a group of people that I trade regularly with), but I'm willing to pay for the time and work involved in getting, say, a good Bösendorfer grand piano. I feel deprived of this ability, because people who might want to prepare and sell me that sound can't make any money off it due to rampant copying. That's why I think it's not out of line for sampler (and synth) manufacturers to build in some provision for copy protection into their instruments, and allow their factory samples and outside third-party sounds to be protected (while the user's sounds can be saved normally, for backups). I know many users will scream for my head, but I really think this "something for nothing" mentality is going to end up *leaving* us with nothing, and smother an industry before it has a chance to get started.

Rock throwing from both sides of the fence is welcome. ■ *Chris Meyer*

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Alesis didn't invent the drum machine and MIDI sequencer/recorder. We *reinvented* them. We think a drum machine should sound *exactly* like real drums. And a MIDI sequencer should be a powerful, flexible computer, yet work as simply as a multi track recorder.

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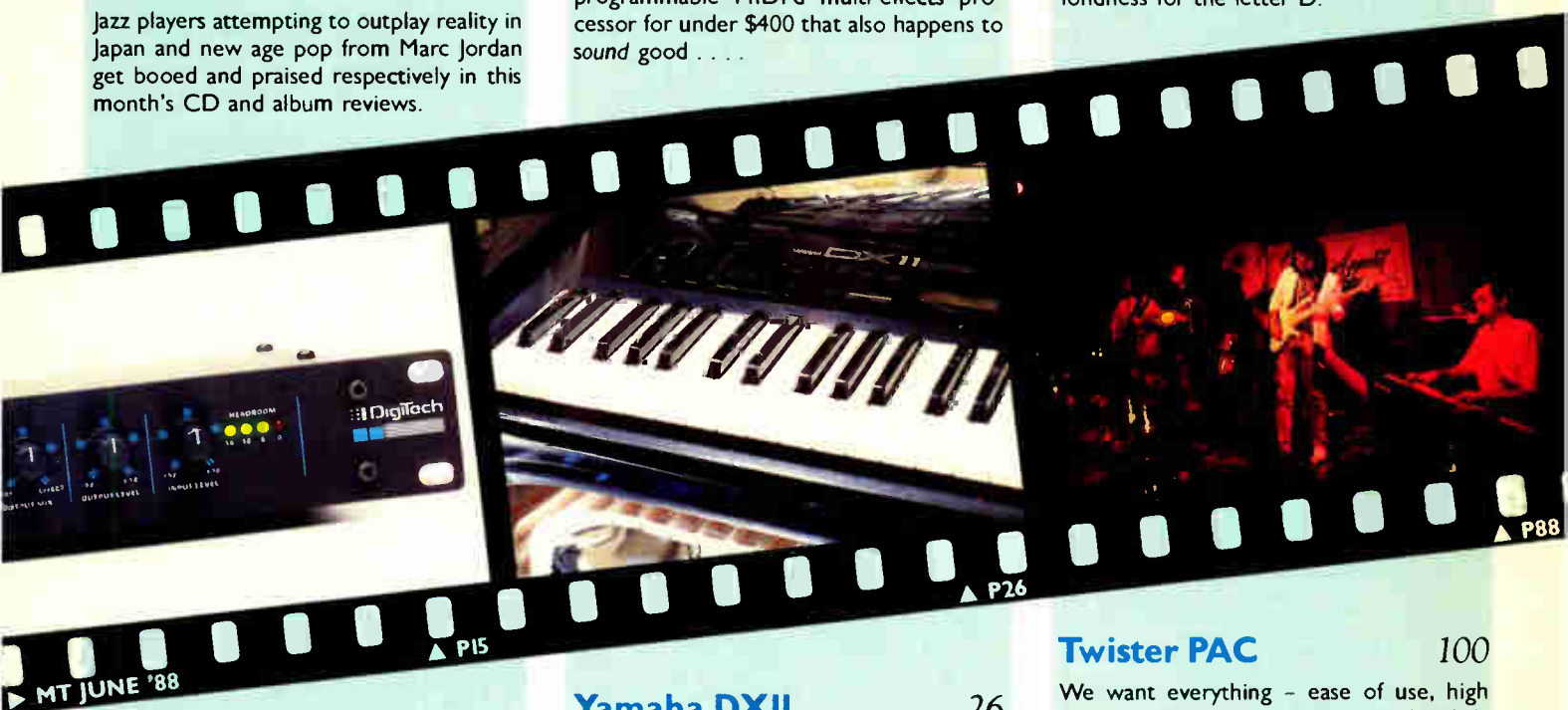
LOS ANGELES: Alesis Corp., P.O. Box 3908, Los Angeles, CA 90078 LONDON: 6, Letchworth Business Center, Avenue One, Letchworth, Hertfordshire SG6 2 HR

IN THIS ISSUE

CONTENTS

MUSIC

REVIEWS



CONTENTS

COMPUTER NOTES

MIDI

TECHNOLOGY

SAMPLING

PROGRAMMING

Of its 90 digital effects, these three are the most amazing: $525.

You can count the price in hundreds on one hand. Yet you'd need the hands of eight more people to add up all the effects you get with the Yamaha REX50 Digital Multi-Effects Processor.

At about $5.85 per effect, amazing is quite an understatement. Add to that not only the number, but the quality of the effects. Then remember you can have them all in your own home studio. In one compact, sleek unit.

First we borrowed 20 preset effects from the SPX90. Like reverb, early reflections, delay/echo, pitch change and modulation effect.

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Yamaha's REX50 Digital Multi-Effects Processor. Just think what you could do once you get your ten digits on it. There's one waiting for a nice home at your Yamaha Professional Audio Dealer. See him today.

Yamaha Music Corporation, Professional Audio Division, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1.

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NEWS DESK

Waving Hello

Those of you who have been watching for the availability of the AudioFrame enhancements need wait no longer. WaveFrame Corporation has announced the release of the Digital Signal Processor (DSP) Module, the SoundStore sample sound storage system, and the SoundProcessor, all for use with the AudioFrame Digital Audio Workstation.

The DSP Module occupies a single slot in the Digital Audio Rack, and is user programmable. Its writeable control store allows it to be software-configured to perform different tasks, including 24-bit digital mixing with equalization, pan and gain; 24-bit digital effects, including reverb and delay; and physical sound modeling synthesis. The Module is available now, with shipment in 30 days, and is priced at $10,000. (An entry level AudioFrame system with the module is around $48,000.)

The sample storage system, SoundStore, provides AudioFrame users with 90 to 900Megabytes of storage. One of the selling points for the unit is the high-speed upload and download performance from disk to sample RAM: 16Megs can be loaded in just over 20 seconds. The system consists of a SCSI adaptor board and software. Prices range from $9000 for a 90Meg hard disk and 240Meg streaming tape backup to $13,000 for a 300Meg disk with 2400Meg streaming tape backup. The maximum SoundStore configuration is three 300Megabyte hard drives and one 240Megabyte streaming tape backup per AudioFrame Digital Audio Rack.

SoundProcessor is the software enhancement made up of a new user interface, cut and paste audio editing, stereo sampling, and AudioTrigger for track replacement. The package combines the functions previously found in the Real Time Control and VoicEdit into a single application window. The package is available immediately and its price is included in the AudioFrame System software license.

MORE FROM Waveframe Corporation, 4725 Walnut Street, Boulder, CO 80301. Tel: (303) 447-1572.

Processing Punch

New from Boss is the ME5 Guitar Multiple Effects Processor, an all-in-one unit incorporating compression, distortion/overdrive, equalization, chorus/flanging and delay/reverb into a MIDI compatible, programmable floor pedal. Up to 26 parameters may be edited, including effect on/off, and stored to any of 64 memory locations, accessible through manual or MIDI program change commands.

Delay can be set from 10 to 500 milliseconds, and digital reverb offers rooms, halls, plates and gates using 16-bit technology with a sampling rate of 31.25kHz. Up to five effects may be used at one time, and two additional effects loops connect the ME5 to external devices. A remote expression pedal can be used for real-time control of chorusing and flanging, and the unit offers a headphone jack, stereo outputs and a tuner output.

The suggested retail is $825.

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

More Ways Out

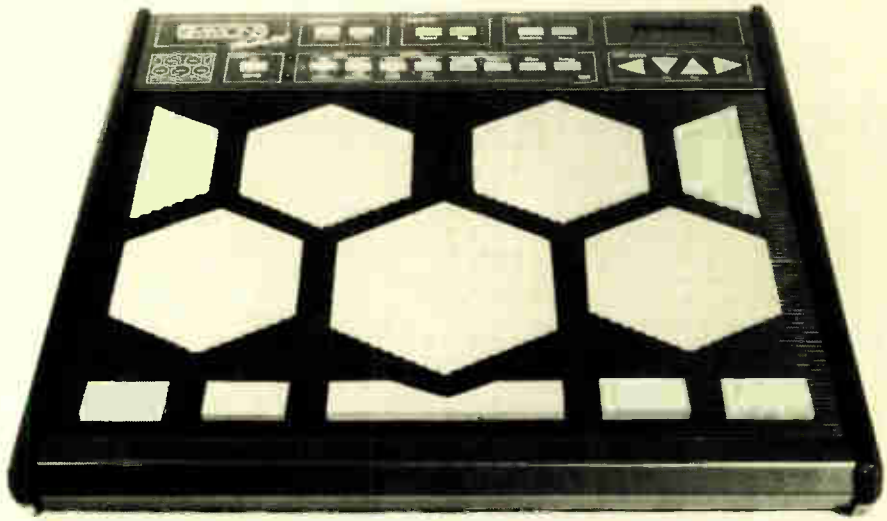
Kurzweil Music Systems has announced the release of the long-awaited Separate Output Option Kit for both the 250 and the 250RMX. The SO option adds 12 direct monophonic audio outputs to the two Mix outputs that come with the basic 250.

The hardware necessary consists of a new rear panel, two circuit boards and a connecting ribbon cable. The new software, Version 5.0, comes in the form of eight ROM chips, providing access to the separate outputs. Output assignments are possible for all 16 MIDI channels, each of the 12 tracks on the 250's internal sequencer, and for the 250's keyboard.

Kurzweil claims that the new software will also offer improved channel-stealing abilities and provision for sending MIDI program change commands to external devices.

Although the outputs can be ordered as an option on a new 250 and can be added as a retrofit to any 250, units from 1984 or earlier may require a CPU upgrade. Installation must take place at a Kurzweil Service Center.

MORE FROM Kurzweil Music Systems Inc, 411 Waverley Oaks Road, Waltham, MA 02154. Tel: (617) 893-5900.



Hi Ho, Trigger, Away!

The company that is now infamous for its design of electronics for drummers has announced the development of yet another object for a percussionist's lust: the Portakit, a self-contained MIDI triggering system with 12 pads and 50 Kit memory patches.

The pads utilize the same force sensing film as the $10,000 SDX, promising a wide range of dynamic control. The sensitivity of each pad can be independently set, and 10 different dynamic curves are held in memory. There is an on-board polyphonic sequencer, with a 5000 event memory, enabling up to 12 real-time sequences to be stored and synchronized with other sequencers and drum machines. There are six inputs for acoustic drum mics. All data is displayed via an illuminated LCD.

The suggested list price is $995.

MORE FROM Simmons Electronics USA Inc, 23917 Craftsman Road, Calabasa, CA 91302. Tel: 1-800-TEC-DRUM.

AND MEMORY FOR ALL

Happy with your sampler, but unhappy with the storage capacity? Well, at least three manufacturers *are* listening.

Roland is offering the HD5/80 hard disk option for the S550, an 80Megabyte system capable of storing over 72 3.5" disks and up to four kinds of system software. The SCSI interface will also allow transfer of data to other hard drives for back-up. Installation is accomplished by removing the bottom cover and mounting the interface board. Suggested retail price is $2195.

Korg has also come up with a memory expander, increasing the capacity of the DSS1 in increments of 256K of 12-bit words up to two megawords (around eight times the standard memory). The expansion permits higher quality sampling by allowing each sample to occupy more time and/or to use a higher clock rate. The SCSI port allows storage on up to seven hard disk drives, offering 750 million bytes or more of on-line storage. Contact a Korg service center for pricing.

Taking a slightly different tack, Akai has introduced a battery-backed RAM memory which allows 10 samples to remain in memory when either the X7000 or S700 samplers are turned off. The newest units are being shipped with this feature, but older units may be retrofitted for $250. Included with the system is a new ROM chip which adds Autoloop and Crossfade looping capabilities to the editing faculties of the machines.

MORE FROM RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141;
Korg USA Inc, 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100;
Akai Professional, PO Box 2344, Fort Worth, TX 76113. Tel: (817) 336-5114.

PATCHERS AND BUFFERS

Two new products for your racks have been announced by 360 Systems, a routing system and a thru box.

The MIDI Patcher features eight ins and eight outs, with voice mapping and 99 user presets in non-volatile memory. The large 7-segment display tells you what's on line, and front panel controls are provided for program numbers, channel numbers, routing, storage and recall. You can switch through programs either manually or by remote control. The suggested list price is $329.

The MIDI Data Buffer is a 2X12 switcher which can be set up for two inputs driving 12 outputs or as two 1X6 thru boxes. The price is nice: $129 suggested list.

MORE FROM 360 Systems, 18740 Oxnard Street, Tarzana, CA 91356. Tel: (818) 342-3127.

DIGITAL RHYTHMS

For those of you who lust after the high-quality sounds of recent digital drum machines, but would prefer not to program them, Yamaha has a new treat. The RX120 Digital Rhythm Programmer is now shipping.

This unit features 38 sampled percussive sounds and 40 preset patterns, with three variations, two fill-ins, break, intro and endings, for a total of eight ways to play each preset. In addition, there are 20 song memories to store programmed songs, each up to 500 measures long.

Best of all, the suggested retail price is a mere $350.

MORE FROM Yamaha Music Corporation USA, Digital Musical Instrument Division, PO Box 6600, Buena Park, CA 90622. Tel: (714) 522-9011.

CURE THE SUMMERTIME BLUES

For those who have higher aspirations for the summer than sipping iced tea by the pool, there are a number of music education programs and seminars which could give you a challenging and rewarding way to pass the time.

First, for you east-coasters, the National Keyboard and MIDI Workshop, a newly-formed division of the National Guitar Summer Workshop, is devoting a major part of their curriculum to the study of keyboards, computers and MIDI. Courses offered include: MIDI Studio and Computer Seminar; Special Advanced Songwriters MIDI-Recording Seminar; Multi-Track Recording Techniques; Making and Selling Records, Cassettes and Compact Discs; Guitar Synthesis; and Keyboards 1 and 2, which cover synthesis, improvisation, theory, programming, and using hardware and software to create music. Students of high school age or older are invited to take part in one or more of the courses which take place during different times throughout the summer. College and graduate school credits are possible, and there are some scholarship opportunities. For further information, contact NKMW, Dept PR, Box 222, Lakeside, CT 06758. Tel: (203) 567-8529.

For those with more conventional schooling in mind, New York University is now offering a Bachelor's or Master's degree in Music Business or Music Technology. Both of these are four- or five-year degrees, requiring completion of courses in music, specialized areas of study, and general education requirements. Interested parties can obtain application forms by contacting the NYU Undergraduate Admissions, 25 West 4th Street, New York, NY 10003.

If you're closer to the west coast, you may want to check out the University of Southern California's second annual seminar in electronic music computers and MIDI to be held Saturday, July 30, through Wednesday, August 3, 1988. Instruction is offered for beginning, intermediate and advanced levels by USC faculty, industry professionals and manufacturer representatives. Lectures, classes, tutorials, hands-on labs, demonstrations, concerts and exhibitions are all part of the program. For further information, contact: SEMCM, School of Music, Ramo Hall 112, University of Southern California, Los Angeles, CA 90089-0851, or Tel: (213) 743-3958.

Happy homework! ■

Creator

Advanced Sequencer for the Atari

Whether you're purchasing your first sequencer or preparing for your next album, Creator™ will allow you to work faster than you ever thought possible. With features like multitasking, which—among other things—lets you load a sequence *while another is playing*. Or "Pseudo Events" recording, which allows you to record on-screen operations like tempo changes and mutes right along with your music. Enhanced graphics let you flip between screens so quickly, you'll think someone installed an accelerator in your ST.

And Creator knows that musicians change their minds. So all quantizing is performed in real-time, leaving your original data unaltered. Tracks that have been merged can always be unmerged. There's even an undo command.

If you're into numbers, Creator will dazzle you. Recording on over 1,000 tracks. Simultaneous playback of up to 64 tracks. Looping with up to 16 overdubs. Assignment of up to 64 individual MIDI channels (for use with the Export™ MIDI Expansion Interface).

See Creator at your nearest Digidesign dealer—then bring your Atari ST up to speed.

Runs on a 520, 1040, or Mega ST; monochrome or color monitor.

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C-LAB SOFTWARE

Works with the Akai S900.™ Soon to be available for the E-mu Emax,™ Roland S-50™ and Ensoniq EPS™!

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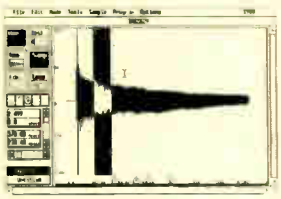


At last—a full-featured waveform editing/digital signal processing program for your IBM PC! SampleVision™ is endorsed and distributed by Digidesign, the leaders in sample editing software.

Using SampleVision's mouse-driven graphic user-interface with variable resolution waveform display, you can edit waveforms with up to 1/50,000th of a second accuracy. Sounds can be analyzed using the three-dimensional FFT frequency analysis, then modified using SampleVision's digital equalizer. Loops can be created easily using SampleVision's visual loop editor and crossface looping feature. You can even create your own sounds using SampleVision's digital mixing and merging capabilities. And SampleVision comes with full-color graphics!

Requirements:

- A true IBM-compatible computer (PC/XT/AT) with 640K memory.
- Dual floppy disk drives or hard disk (recommended).
- Graphics adapter such as Hercules or IBM Enhanced Graphics.
- Roland MPU-401 or comparable MIDI interface.
- MS-DOS or PC-DOS 2.1 or later.
- A mouse and hard disk are not required, but strongly recommended. Digital Research GEM System is included.

Developed by:

turtle beach softworks

digidesign

1360 Willow Road, Suite 101, Menlo Park, CA 94025. (415) 327-8811

READERS' LETTERS

Send any questions or comments that you may have to: Readers' Letters, Music Technology, 22024 Lassen St, Suite 118, Chatsworth, CA 91311.

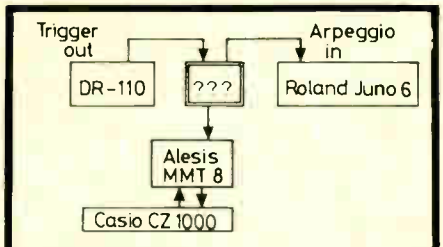
Dear Music Technology,

I enjoyed your series on MIDI. It seems that you understand more than a salesman in a music store; also, representatives of manufacturers are actually ex-salesmen – they do not know much!

After this intro, I wonder if you could help me to combine old and new, pre-MIDI with MIDI gear? For financial reasons I cannot purchase a MIDI drum machine, but the Roland TR707 is the one I like. For sentimental reasons I want to keep my Juno 6. So here comes the question.

When I hit the start button on the DR110, I want the arpeggio to start on the Roland at the same time, and the sequencer should start playing the CZ1000.

It must be difficult to find a synchronizer for this combination. Maybe it does not exist? Again, I think just using a TR707 would solve



So what's in the box with the question marks?

everything but if there is another solution please help!

I enjoy MT, I've been reading it since the time when the UK edition was the only one sold.

Csaba Jaszberenyi
Toronto, Canada

Unfortunately, Csaba, you have fish, apples, and oranges there. The DR110 only has one way to clock the outside of the world, and that's through its accent output. It puts out a trigger every time the accent appears in the pattern (so that may be quarter notes, eighths, etc). The Juno 6's arpeggiator forwards by a note every time it gets hit with a clock – so far, so good. However, the MMT8 wants a pulse that happens 24 times per quarter note (64th triplets). The only way to make the DR110 drive the MMT8 is with one of Garfield's boxes, such as the Master Beat or Dr Click – both of which might cost you more than a TR707.

A TR707 would solve the problem, in that its MIDI clock could drive the MMT8, and its rimshot output could be programmed to drive the Juno 6's arpeggiator. If you have a tax refund coming, you may also consider getting a MIDI retrofit for the Juno, and driving it from the MMT8.

Problems like this make me appreciate what MIDI has done to overcome interfacing dilemmas. – CM

Dear Music Technology,

I'd like to give a vote of support to your mag. I just read Ronald Adams' letter in the April issue, and frankly, don't agree with him. I like the technical bent of your publication. In fact, I would like to see more advanced reporting in addition to some of the good beginners' stuff.

How about something like more on the new Buchla 700? You've got a good thing happening. Keep it up. We don't need more rock hero worship in this industry, and it seems like that's what Mr Adams prefers to technical depth. I frankly like interviews on the order of Carl Stone, and even Steve Reich.

Atau Tanaka

Thanks for the support, Atau. The ultimate goal here at MT is to produce a well-rounded magazine that covers the specifics of technology as well as its role in the creation of modern music. It's a constant challenge, but one we're eager to address.

As for your specific request, we did do a news item on the Buchla 700 in MT April '88 and as soon as one becomes available, you can expect to see a review here in these pages. – BO'D

Dear Music Technology,

I am writing this letter in response to the letter from Ronald Adams (April '88). He was distressed by how the "music" side of Music Technology was being far surpassed by the "technology" side. Some notable quotes include: "Only 13 pages in the entire issue are dominated by something other than equipment," 3 out of 4 of the interviews "turn out to be little more than free promos for manufacturers," and the new editor "devoted 72% of his precious editorial space to 'technoid junk.' "

While I own lots of expensive technology, I use it to make music. *But when I buy your magazine, I want to hear about* technology. *"Music Technology." I don't necessarily want interviews with people about their music. There are dozens of magazines that do that for me already. What I suggest for people who share Ronald's views is to buy a copy of Rolling Stone, and staple it to their copy of MT. Then everybody will be happy.*

"Don't go changin . . ."

Mark Dann
New York, NY

Thanks much, Mark. We received a number of letters supporting the editorial slant of the magazine, giving us the feeling that we are in fact headed in the right direction. As always, letters from readers are taken very seriously around here; keep 'em coming! – DP

Dear Music Technology,

Just a brief note to thank you so very much for your excellent editorial in the March, 1988 issue of MT. It was just what I needed to hear at the time I was ready to hear it.

Thank You!

Barry Wais
Thompson, CT

Dear Music Technology,

Laurie Spiegel's letter and reviewer Stefan Lipson's reply in your March '88 issue both raise some thought-provoking questions on the topic of "remote creative collaboration." However, Mr. Lipson's comments about expert systems are misleading.

He states that, "Expert systems incorporate principles of artificial intelligence in which the software is equipped to 'learn' over time, to increase its own knowledge base. Music Mouse does not do that." While it's true that Music Mouse does not "learn" over time, neither do some other software works that are currently being sold in other fields today as expert systems. Only the most advanced expert systems have the ability to "learn" by gathering and analyzing data during their own normal operation; most, if they learn at all, do so as a result of a human expert manually adding rules to govern the system's operation.

The fundamental common characteristic of the expert systems on today's market is their

embodiment of the knowledge of one or more human experts into a software system that can respond to input sequences (or respond to questions) that were not an explicit part of its pre-programmed knowledge base. Music Mouse embodies the knowledge of a human expert and can create new music in response to a user's input. Thus it fits within the category of today's expert programs.

Glen Newton
Roseville, MN

Dear Music Technology,

I have been getting your magazine for about a year now, and I have always found it to be an excellent resource for staying abreast of the latest developments and judging the utility of new products. Upon receiving the latest (April '88) issue of MT, I was immediately drawn to the "Obfuscator MIDI Desktop Controller" review due to the bizarre nature of its title. Halfway through the article, I was thinking wow! Great – I'd always wondered if such a device were possible. As I read, I realized, however, that the article was a hoax, some kind of prank! And a good one, too – designed to pique the interest of all who lust for arcane new controllers. I especially liked the plastic Easter egg with the BNC connector . . . and then, to add verisimilitude, the reviewer calmly states that it looks like "a plastic Easter egg" – and so it does!

I don't know who is pulling whose wool, and I'm a little sorry that I can't look forward to getting an "Obfuscator" for less money than I might imagine, but I consider it a sign of good health for a publication to contain this kind of humorous journalism. Keep up the good work and thanks for keeping us on our toes!

One Amused Reader
Roland Barker
Seattle, WA

Dear Music Technology,

Thank you for your excellent and very accurate review of the Angel City Audio sound library for the DW8000. I congratulate you for distilling numerous pages of notes, newsletters, manual, and nearly 600 sounds into a clear and succinct report for your readers. Your assessment of the relative strengths and weaknesses of the library was, in my opinion, mostly on the mark.

I would like to clarify two points, however. The first is rather minor, but you should note that we offer data tables as well as cassette format; and by the time this letter reaches the newsstands, we will be able to supply our sounds on disk for ST users. A more important clarification is in order regarding your impression that alongside "excellent" and "useful" sounds are others that are weaker or "too similar for our tastes." Since I probably misled you into thinking that Volume 5 represented a compilation of the sounds in volumes 1, 2 and 4 you were justified in drawing this conclusion. Fortunately, Volume 5 is no such thing! To the contrary, its only purpose at present is to let users access the sounds which were discarded from the library in past revisions.

Having noted these points I would like to take up a more theoretical quarrel I have with one remark you made in your otherwise very perceptive review. You mentioned that volume 7 contained some effects which you found "interesting, but not very useful." There are sounds which are bound to be more or less useful to any one user. The sounds you mentioned are effects which synthesists working in theater orchestras or with stage sound effects crews are expected to produce on cue, namely: telephones, alarm clocks, intercom buzzers, thunder, wind, etc. These people buy my library because they contain these very sounds. I feel that in a library containing hundreds of sounds it is not too much to provide a dozen sounds for this small, but legitimate, minority.

Again, thank you for your thorough, thought-provoking, and very impressive magazine.

James Fellows
Angel City Audio
Middletown, CT

Thanks for the response and clarification. As for the philosophical disagreement, I stand by my review and still believe that the special effects sounds are of limited use to most people. Admittedly, a small audience of users may find them very useful, but why not sell them a special package of sound effects alone, rather than using up valuable space in a general collection of patches? – BO'D ■

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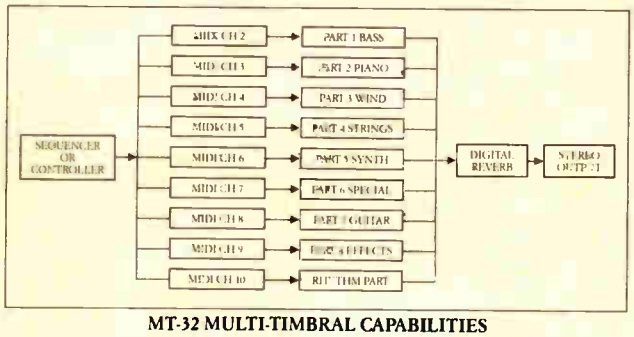

MT-32 MULTI-TIMBRAL CAPABILITIES

Equally impressive is the quality of the sounds produced by the MT-32. All of the 128 preset patches and 64 user-programmable patches are created through LA synthesis — the same synthesis technique used in the Roland D-50 (voted the Technological Innovation of the Year by *Keyboard* Magazine readers). Like the D-50, the MT-32 features 128 PCM digital sound samples, combined with digitally synthesized partials, and built-in digital reverb effects.

The preset sounds are arranged in Sound Groups including several different instruments and timbres from each group: Piano, Organ, Keyboard, Bass, Syn-Bass, Synth 1 & 2, Strings, Wind, Brass, Syn-Brass, Mallet, Special Inst., Percussion and Effects. But don't expect just *any* preset sounds until you hear what the MT-32 can do. Experience the breath of the flute, the bite of the brass voices, the chop of the bow as it moves across the strings — the kind of nuance that gives each patch life other digital synthesizers simply can't touch.

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DigiTech DSP 128

Digital Effects Signal Processor

It does multiple effects at once, it's programmable, and it's cheap. The company's newest offering may just be the signal processor we've all been waiting for. *Review by Aaron Hallas.*

JUST A FEW years ago it was very easy to tell the difference between a demo-tape made in a home studio and one produced in a professional studio. The dry, lifeless one was the home studio version, while the one with the sparkling reverb and special effects was unquestionably done in a pro studio. And there was a good reason for this. The average home studio owner simply could not afford an EMT plate reverb, a large reverberant room, or one of the high-ticket digital reverbs of the day. Thanks to the microprocessor revolution and the race to produce better sounding, more flexible effects units at increasingly lower prices, however, the distinction between the home studio demo-tape and pro studio one is no longer so obvious.

One of the first companies to bring digital effects to the home studio was Yamaha with the RI000 digital reverb, and then the legendary SPX90 multi-effects unit. Though the latter has a spectacular variety of effects, it can only do one thing at a time and its MIDI implementation is very basic. But it got the ball rolling and just about every manufacturer that was making signal processors – and even some that weren't – jumped on the bandwagon. The inexpensive Alesis Midiverb II, the ART DRI with its Performance MIDI, and the Roland DEP5 which offers simultaneous effects all fit into this new generation of processors. But there has always been a trade-off between price and performance. That is, until now. Enter the DigiTech DSP 128 Digital Effects Signal Processor.

The Unit

THE DSP 128 is a programmable, MIDI controllable, multi-effects digital signal processor with 128 presets. It has a wide variety of effects which include reverb, delay, multitap delay, chorus, flanging, filter and special effects. The DSP 128 allows you to use more than one effect at a time, and you can control all of the operating parameters over MIDI with your choice of MIDI continuous controllers. All this for $400 – so what's the trade-off? The trade-off in this case is bandwidth – a mere 12kHz. It's suitable for most applications, but certainly lacking that sparkling high end which the pro units have and which can come in handy on delay and chorus programs. All in all, though, not a bad trade in my book.

Physically, the DSP 128 occupies one rack space. The front panel contains the power switch, a matrix of 12 LEDs which represent each of the 12 possible effects and a four-digit red alpha-numeric display that shows the current program number or parameter and its value if in the edit mode. Up (increment) and Down (decrement) buttons are provided for changing programs or parameter values, the Select button is used in the edit mode to step through the parameters. The Effect/MIDI button switches the effect in or out and also places the unit in the MIDI Program Mode if held for more than five seconds. Three potentiometers, one each for Output Mix, Output Level, and Input Level, and an LED Headroom Indicator are also provided. The rear panel sports a non-detachable power cord, fuse holder, right and left input jacks, right and left dry output jacks, right and left mix output jacks, and three MIDI jacks (In/Out/Thru). The inputs and outputs are switchable between −20dBm and +4dBm and all connections to the unit use ¼" tip-ring-sleeve phone plugs for balanced/unbalanced wiring.

Operation

WHEN FIRST POWERED up the DSP 128 defaults to Program One. By pushing the Up/Down buttons you can step through the 128 programs. When the DSP 128 is connected to the DigiTech PDS 3500 MIDI Pedal or to another MIDI unit, the programs can be accessed randomly as well. The nearby Select button is the source of my first complaint. It is all too easy to accidentally hit it when attempting to change programs from the front panel. Doing this puts the DSP 128 in the edit mode which you cannot get out of until you have stepped through all of the parameters (as many as 11). As you change programs the LEDs in the matrix light up according to the effect or effects being used in that program. It is rather nice to see at a glance which effects are in use. The Effect/MIDI button can be used to bypass the effects. I was also pleased to find individual controls for the input, output and mix levels. It's so nice to be able to reach over and quickly adjust these by simply turning a knob.

Programming

THE BASIC ARCHITECTURE of the DSP 128 includes twelve available effects: six different Reverbs (large, medium and small rooms, hall, reverse and gated), Delay, Multitap Delay, Chorus, Flange, Special Effects and a Low Pass Filter. The Special Effects are Stereo Image (Diffusion) and a very interesting one called Bounce (imagine a ball bouncing after being dropped). They are pre-arranged in a ▶

► library of 17 different Effects Algorithms which combine either two or three effects. Nine of these algorithms offer two effects combined. They include one of the Reverbs, one of the Delays or one of the Special Effects combined with the Low Pass Filter. The other eight algorithms offer three effects in combination. Three of these offer one of the Room Reverbs combined with Delay and Filter. One offers Chorus, Delay, and Filter combined; another offers Flange, Delay and Filter; and yet another has Reverse Reverb, Multitap Delay and Filter combined. My favorites are the two that offer the Reverb, Chorus and Delay combination, which can add an incredible amount of richness to even the most common sound.

The DSP 128's organization is set up in three tiers: the Program Number, the Effect Algorithm, and the Effect Algorithm Operating Parameters. Pushing the Select button once puts the unit in the edit mode and displays the Effect Algorithm number that is active for the currently selected program. You can step through the library of 17 Effect Algorithms with the Up/Down buttons. Pushing the select button again will step through the Operating Parameters for that algorithm. There are 23 modifiable Operating Parameters altogether, with 11 being the most used for any one algorithm. The value of the selected parameter can be changed with the Up/Down buttons. Simple enough. Once you have stepped through all of the parameters for that algorithm you are returned to the program select mode and are ready to go.

It's important at this point to remind you that the DSP 128 uses a four-digit alpha-numeric display to show this information, so they must use two letter abbreviations for the parameters. Like several other companies, DigiTech cleverly chose to print these on the top of the unit, which of course means that you cannot see them once the unit has been rack-mounted. A pull-out parameter card under the unit would have been a nice touch. Enough said.

MIDI

DIGITECH HAS OPTED for a very straightforward MIDI program arrangement. Each of the 128 presets corresponds directly to the appropriate MIDI program change command. All presets can be replaced by a user-programmed effect, but the factory presets can be restored if needed. Patch mapping is not available, so if you want the same effect to have more than one MIDI program number you will have to duplicate it. This is easily accomplished by transferring programs from one location to another.

The DSP 128 really starts to shine when it comes to more advanced MIDI operations. All of the modifiable operating parameters (except MIDI channel number) are controllable through MIDI or with the optional PDS 3500 MIDI pedal and the FX17 Wah/Volume pedal. Each parameter or combination of parameters can be assigned to one of the MIDI continuous controllers. Six slots are available to store these assignments – more than enough for the most ambitious MIDI controller. These assignments are global, not part of a preset, so if an operating parameter is assigned to a particular MIDI continuous controller, it is done so for every Effects Algorithm which uses that parameter. Some of the Operating Parameters cause an audible glitch while being changed so are not well suited for MIDI control. However, I did find that the most musically useful ones worked just fine. One other slot is set aside for assigning the Effects Algorithm selection to a MIDI Continuous Controller. Given sufficient hardware and/or software this will allow you to program all aspects of the presets via MIDI.

I must say that being able to control Reverb Decay Time with the pitch wheel adds a new dimension to solo lines, and controlling the Chorus Depth (Animation Distance) with the mod wheel can add a delicate expressiveness to string and horn pads. I was able to breathe some new life into my DX7 by assigning Delay Time to the Data Entry slider, Delay Feedback to the Foot Controller as well as the two aforementioned assignments.

Dynamic Control *"Being able to control Reverb Decay Time with the pitch wheel adds a new dimension to solo lines, and controlling the Chorus Depth with the mod wheel can add a great deal of expressiveness."*

The Effects

THE DSP'S 128 presets provide just about every digital effect you are likely to need. If the unit wasn't programmable I think most users would be content with the factory preset selection. There are 75 Reverb presets in all, 55 of which combine a Reverb effect with either the Low Pass Filter or the Delay. Various Cutoff frequencies between 400Hz and 12kHz and Delay settings of 170 to 750msec are used. The 10 Reverse Reverb presets are combined with Multitap Delay. Accent Amplitude Level and Accent Envelope are two of the operating parameters. These allow you to place the accent at the end of the reversed sound for a more natural sounding effect. As alluded to earlier, my favorites are the 10 that combine either the Medium Room or the Large Room with Chorus and Delay. All told, not a bad selection of Reverb programs.

Nineteen Delay and Multitap presets are provided with various Delay Time and Feedback settings. The Multitap presets each have four Delay Times: one each for Left, Center, Right and Feedback. Twenty-four Chorus presets are included as well. The first 14 are variations on the Chorus, Delay and Low Pass Filter Algorithm which offers among its nine operating parameters Animation Velocity and Animation Distance (these are roughly equivalent to Chorus speed and depth). The 10 Chorus presets which are combined with Reverb and Delay offer a whopping 11 programmable parameters. The Flange Algorithm includes Delay and Low Pass Filter with 10 operating parameters. The DSP128 has 11 Flange presets ranging from subtle to outrageous.

The Special Effects section includes four Bounce presets. This Effect Algorithm offers only three operating parameters: Low Pass Filter, Decay Time, and Bounce Texture. If you can imagine bouncing a ball on a hard surface such as concrete as opposed to bouncing one on a soft surface such as grass then you can imagine what Bounce Texture does. The Diffusion algorithm has but two parameters: Filter Cutoff Frequency and Stereo Image. It appears to be derived from a more subtle version of the Reverse Reverb program. Preset 127 is set up as a Mute program and for some reason unknown to me, preset 128 is set up as a 0.0 second Delay.

Conclusions

ASIDE FROM THE few small complaints I had, I was very pleased with the DSP 128. The manual I had was a preliminary version that had no application notes and provided just enough information to allow me to successfully find my way around the unit. I am told that a more extensive version is in the workings.

The DSP 128 is a very quiet unit with no sign of digital noise. The Delay and Multitap programs are very clean. Due to the limited bandwidth, however, the chorus, flange and reverb programs are not exceptionally bright. This can be overcome somewhat by boosting the 12-16K range by 6db at the input of the unit. I have had good results using a 10-band graphic EQ.

All in all, a nice unit to have in the studio. ■

PRICES DSP 128, $399.95; PDS 3500, $199.95; FX17 $129.95

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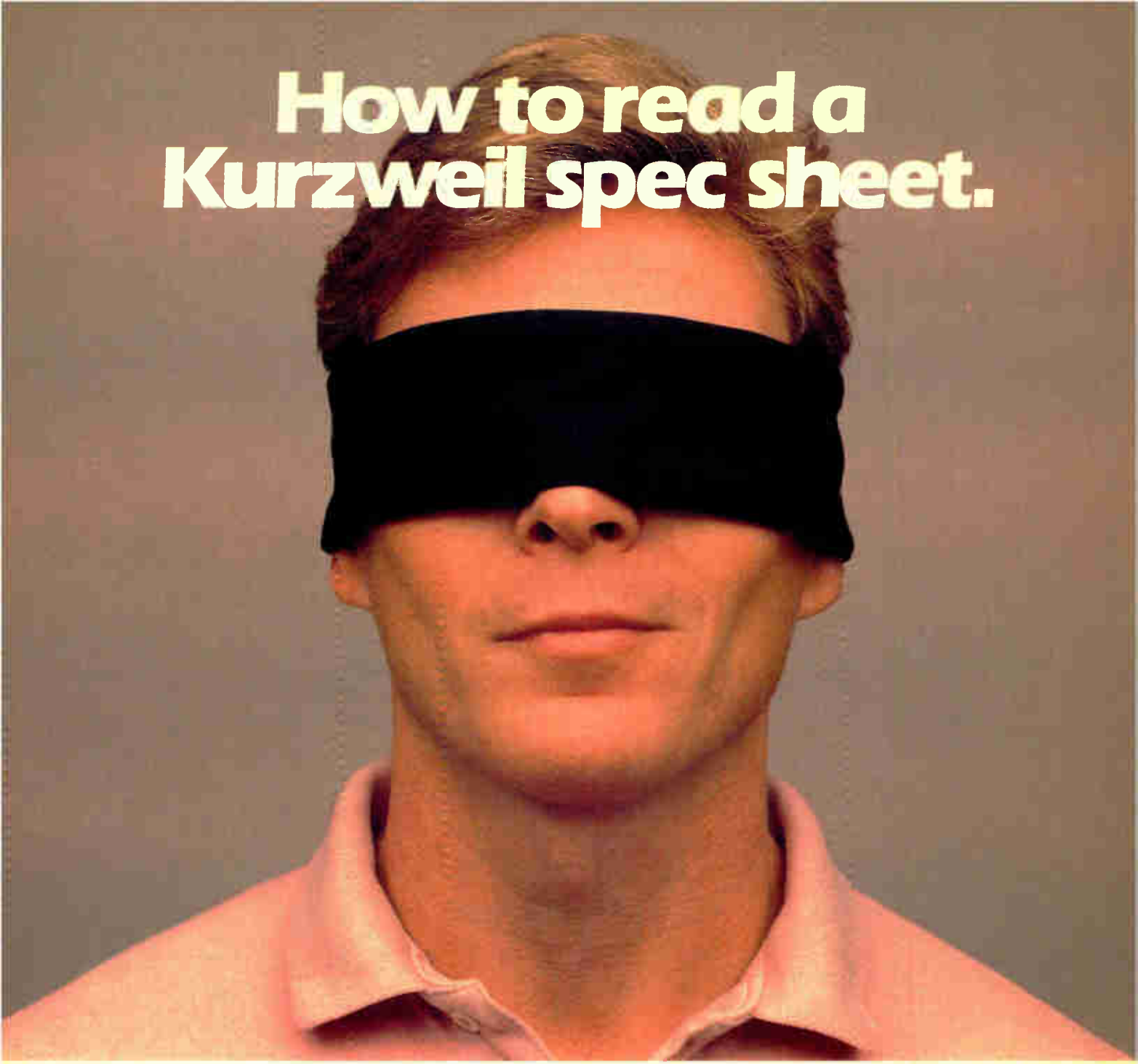

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SYNTHESIZER SOUND SYSTEMS

part one

Wanna make some beautiful noise? Here's what to look for in an amp/speaker combination.

Text by Lorenz Rychner.

SYNTHESIZERS AND SAMPLERS are tough on amps and speakers. No other instruments produce such a variety of sounds: sharp attack transients, relentless sustain levels, frequencies ranging from the lowest bass to extra high overtones, and all shades of colors. While guitarists fuss over degrees of distortion to make their instruments shine, keyboardists need clean sound, with plenty of power, and over the entire audio bandwidth. Two-handed playing and MIDI layering of contrasting colors make things even tougher. And when it's time for a burning lead solo, you want it to cut through like a stack of Marshalls. To top it all off, you want all this at once, at volume levels that even a good home stereo is rarely asked to produce (unless you're a headbanger who owns a place in the desert) . . . How can you have your cake and eat it, too?

Shopping around can be difficult. Stores are limited in what they can offer by franchise restrictions, store space, and other considerations. This is where the listings below come in. A few phone calls to dealers can quickly establish who carries what. Go hear a brand even if you aren't familiar with the name. It hasn't been all that long since the first dedicated keyboard amps came out. Unfortunately, some store owners still don't consider this a very important category, partially because they're more familiar with PA and guitar amplification (both of which, by the way, have their own frequency response characteristics and are not really suited to keyboards).

Through the Mumbo Jumbo

YOU'LL COME ACROSS a lot of technical jargon if you start to search for a sound system for your synths. The most puzzling is the watts rating for power amplifiers. Don't just read the wattage rating in the ad and stop – there are many ways to hide things. Even technical experts would need at least the watts number with the letters RMS and an impedance number, stated as ohms (symbolized as Ω), plus numbers for harmonic and intermodulation distortion, bandwidth, frequency response, slew rate, and other factors, before they could make a judgement. If it's a stereo amp, the specs should say "per channel with both channels driven."

Speaker efficiency is something that can't be measured easily, yet it has a lot to do with the loudness and cleanness of sound at a given output watts rating. Less efficient speakers are not inferior to more efficient ones, they're just designed differently (a variation on this theme are people who think a higher maximum power rating for a speaker means it's louder – in reality, it really tends to mean it's less efficient, and therefore quieter). If the letters RMS are missing from the advertised specifications, or if you see terms like XXX watts music power or peak power, forget it. Continuous RMS power, preferably at a given bandwidth, is the only thing that means something, but it still depends on the impedance, usually 4Ω or 8Ω. Few amps can operate satisfactorily at 2Ω, but 2Ω gives the best looking figures, so it's often advertised.

Here are two examples of seemingly conflicting watts ratings: a power amp that rates at around 80W into 2Ω changes to around 60W into 4Ω, and around 40W into 8Ω. Either way this amp will give you the same modest volume levels. At the macho end of the scale, an amp that delivers around 1600W in bridged mono mode into 8Ω supplies 800W per channel into 4Ω, or around 500W per channel into 8Ω. When matched with the right speakers, this one will be *loud*.

Coils and Cones

SPEAKERS THAT ARE meant to be heard by the audience should be at least 12" models; anything smaller just can't produce low pitches the way you probably want it. The design and placement of the speaker cabinet also has a lot to do with that, so listen critically. A speaker's power handling should be higher than the power amp's maximum continuous RMS power rating at the matching impedance. But not excessively so, because you'll crank a power amp that's too weak for its speakers. In trying to get enough volume, you'll cause the power amp to put out clipped waveforms that are at least as dangerous to the speakers as are signals from an amp that's too strong for its speakers. If you're planning to put together components from different manufacturers, and you're not sure that you're being well advised, get the specifications, then make calls to the manufacturers, telling them the proposed combination. There are a lot of helpful people out there. And *always* trust your ears: they're the experts.

Abuse Techniques

TO HELP YOU you with the decision-making process, consider first your minimum requirements regarding inputs, stage setup, and portability. Only you can decide. This article is meant to help you get there, by pointing out the obvious and not-so-obvious. When you've come up with a list of your needs, go talk to the salesperson. Ask for a time when the store is not busy, so that you'll be able to *crank it up!* See if they have your keyboards there, and bring your own sounds on cartridges or whatever. Turn off all effects (reverb, chorus, delays). Play fat organ and string sounds, with a volume pedal, so that you can use both hands for a wide spread. Start with a mid-range chord, push it to maximum volume, then add a low octave in the left hand. If your chord is a C triad, play low B flats. Listen for distortion. If it sounds too loud in the store, it's probably only an average stage volume, and you must be sure that your sounds are both clean and loud.

Questions to Ask Yourself

THE FIRST QUESTION you need to resolve is this: stereo or mono? Lots of keyboards with stereo outputs produce only a pseudo stereo effect, usually by means of a built-in chorus. But even if you have truly different signals coming out of the two inputs, from Layer or Split keyboard modes, or from dual on-board delays à la the Korg DSSI, can you afford to run a true stereo setup? If so, then you'll have to exclude all the combo units, unless you buy one each for left and right. And can you hear both channels equally well where you set up on stage? If you can, how about the audience? If your band runs a stereo PA, consider using your own stereo mixer, from which you run two sets of master left and right signals. One L+R goes to the band's PA, the other goes to two powered monitor speakers that you may even want to mount on top of your keyboard rig. They let you hear your boards in stereo no matter what side of the ▶

► stage you find yourself on, and at what angle to the audience. This saves you the price of a power amp, but it also means giving up some control over your sound. If your band's foldback mix is a stereo signal summed to mono, you can check the volume balance of your boards from there.

The Options

THE SOUND SYSTEM options for synth players, from the least complicated to the most flexible, are as follows:

1. Powered personal monitors with line outs to a main system.
2. Powered stage speakers (no preamp, use a separate mixer if needed).
3. Combo amps (preamp/power amp/speakers in one unit).
4. Powered mixer, either rack-mountable or free-standing, for use with separate speaker(s).
5. Non-powered mixer (rack-mountable or free-standing), separate power amp (usually rack-mountable), with separate speakers. This last category will be covered in an upcoming article. What follows is a listing of most of the options available in each of the previous categories:

• Powered Personal Monitors

These are the easiest way out if your band runs a main PA system. Most keyboard stands or microphone stands can be adapted to hold monitors, some of which have an amazingly wide range, as long as you don't expect them to produce too much volume. You may also want to consider personal monitors in combination with any of the other system options. Some monitors have more than one input, others require a small submixer if you have several keyboards or rack modules. Monitors can do double duty at home, for practice, etc. While not listed with the monitors, the smallest of the combo amps could be used in this role. The Gallien-Krueger 200MK, particularly when used with the 200MP, can be sufficient for small-room gigs, without the need for further amplification.

- **Boss (Roland) MA12 Micro Monitor:** One 4" speaker; three inputs (all −10dB for line or instrument). Bass, treble, volume control. 10watts. Price: $145.
- **Boss (Roland) MA12V Micro Monitor:** One 4" speaker; three inputs for line, microphone, and instrument. Bass, treble, volume control. 10watts. Price: $145.
- **Boss (Roland) MA15A:** One 5" speaker; three inputs, low gain and high gain with tone control and volume control, auxiliary with volume control; Line out and headphones jacks. 15watts. Price: $240.
- **Boss (Roland) MS100A:** Two 5" speakers; one parallel input and output, switchable to six positions for various in/out combinations. 100watts. Price: $199.50.
- **Fostex SPA11:** Two 4" speakers; two inputs (line & mic). EQ switch speech/music. Master Volume control. Line out. 100watts. Price: $349.
- **Fostex 6301B:** One 4" speaker; one input. Volume control. Line out (defeats internal speaker). 10watts. Price: $350 per pair.
- **Gallien-Krueger 200MK:** One 12" speaker, one 3½" tweeter; three channels, each with chorus on/off, echo on/off, bass and treble controls. Channel one has special gain for acoustic/electric instruments. Master limiter, master volume, footswitch for chorus and reverb. Stereo L&R out (only stereo if chorus is used), stereo/mono switch. Line out to 200MP. Separate output to auxiliary speaker (16Ω if internal speaker is on, 8Ω if internal speaker is off). 100W into 4Ω, 72W into 8Ω. Price: $779.

Barbetta 3105 powered speaker.

- **Gallien-Krueger 200MP:** One 12" speaker, one 3½" tweeter; serves as a self-powered satellite via line input to form a stereo pair with 200MK. Price: $399.
- **Kawai KM15:** One 4" speaker; three inputs: high, low, line. Master volume, bass, treble controls. Headphones and line out. 15watts. Price: $109.
- **Yamaha KS10:** One 4" speaker; one input; low-boost and volume controls. Around 6watts. Price: $90.

• Powered Stage Speakers

These speakers save you the weight and expense of a separate power amp, and the headache of matching an amp with separate speakers. You'll find minimal controls on such units. If your synths don't need equalization (which is also the assumption behind the new generation of line mixers), plug your instrument directly into the box. If you use a reverb or delay, take the instrument's signal to the effect box first, then to the powered stage speaker. For multiple instruments, use a mixer and effects that you keep close at hand, and place the powered stage speakers further away where you can hear them best. Feeding the boxes from instrument or line level means that you're not blowing a power amp if somebody trips the line, because it's not a speaker connection.

For years, the now discontinued Yamaha A4115H was a popular unit, and it's still common on the used market. Be warned though: my expensive repair bills remind me that it couldn't quite handle a full keyboard rig. The Casio AS3000 is almost a replica of the Yamaha A4115H, and it was also discontinued. The Barbetta boxes are the only such system I know of that is capable of filling a large room with clean sound at just about any volume level, from two boxes no more than two-feet high. I punish mine, but they never complain or distort, and I don't even own the heavy-duty version.

- **Barbetta 2105:** One 12" speaker (40oz magnet), one tweeter with 3×7" horn. One input, three-stage gain control, tweeter level control, master volume control. Bi-amped with low-level crossover. Combined audio power 270W into 8Ω. Price: $589.
- **Barbetta 211:** One 12" castframe heavy-duty speaker, one tweeter with 3×7" horn. Input and controls as on 2105. Heavy-duty power supply and cabinet. Bi-amped with low-level crossover. Combined audio power 370W into 8Ω. Price: $749.
- **Barbetta 3105:** One 15" speaker (56oz magnet), one tweeter with 3×7" horn. Input and controls as on 2105. Bi-amped with low-level crossover. Combined audio power 270watts into 8Ω. Price: $649.
- **Barbetta 311:** One 15" cast-frame heavy-duty speaker, one tweeter with 4×10" horn. Input and controls as on 2105. Heavy-duty power supply and cabinet. Bi-amped with low-level crossover. Combined audio power 450W into 8Ω. Price: $849.

• Combo Amps

These are a good solution for small gigs. The largest ones are surprisingly powerful; the smallest are handy monitors or practice amps. Having the preamp, power amp, and speakers all in one box makes for easy transport and quick setup. One disadvantage is that if you need access to the controls during your performance, you need to keep the box close by, which can mean that you can't hear yourself as well as you would if you placed the box further away.

Be sure to check the input configurations on these amps. Do the inputs have their own tone controls and effect sends, or do they share a global setting? If there's a reverb built in, can you adjust the depth per channel? Can you send a line out to another system? Can you add a signal from a submixer through a direct input (called Main In or Power In) to the power amp? Can you feed an

external speaker? This won't turn your mono system into stereo, but it'll give you more spread, and the guys at the other end of the bandstand will appreciate hearing you from close up. Do you really get enough volume out of it, even after midnight when the guitarist goes metal-mental? If you use several keyboards, but never more than two at once (not MIDI-layered), you're less likely to reach distortion too soon.

– **Crate KBA 60:** One 15" speaker and one horn tweeter; three channels, each with level control, peak indicator, and reverb send. Channel 1 has extra −10dB sensitivity. Master level, peak limiter indicator, master reverb. 60W into 4Ω. Price: $400.

– **Crate KBA 150:** One 15" speaker and one 4½" horn; three channels, each with level control, peak indicator, high/low tone control, and reverb return. Channel 1 also has effects return and extra −10dB sensitivity. Master effect send and return, master 4-band EQ with peak indicator, line out on balanced XLR with level control. 150W into 4Ω. Price: $635.

– **Kawai KM60:** One 12" speaker and one HF horn tweeter; four channels, each with level control. Two effect on/off and two reverb on/off for two pairs of two channels. Master 3-band EQ, master effect, master reverb. Line out, effect out, effect return, headphones. 60W (impedance not stated). Built-in MIDI thru box: one MIDI In, 3 MIDI Thru. Price: $399.

Kawai KM60 speaker.

– **Peavey KB100:** One 15" speaker; three channels, each with gain and level control and pre-EQ out/in ¼" stereo jack. Global 4-band EQ and reverb. Preamp out, power amp in, and headphone jacks. 65W into 8Ω. Price: $349.50.

– **Peavey KB300:** One 15" and one HF horn speaker; three channels, each with gain and level control, 3-band EQ and reverb level control. Channel 1 has a pre-EQ out/in ¼" stereo jack. Master reverb, master volume. Preamp out, power amp in, and headphone jacks. 130W into 4Ω. Price: $529.50, or $579.50 with the optional 1505-4 speaker.

Roland CK60 combo amp.

– **Randall RKB25:** One 12" speaker; one channel with three tone controls; volume; line out and headphone jacks. 25W into 8Ω. Price: $299.

– **Randall RK35:** One 12" speaker; two channels, each with volume control. Global 3-band tone control; line out and headphone jacks, effects loop jack, external speaker jack. 35W into 8Ω. Price: $449.

– **Randall RK100:** One 15" speaker and two 6" horns; three channels, each with channel level and reverb send; master 3-band EQ, master reverb, effects send and return jacks, headphone jack. 100W into 8Ω. Available early summer '88. Price: TBA.

– **Randall RK500:** One 15" speaker and two 6" horns; four channels, each with 3-band EQ, effects/reverb controls. Master gain, effects and reverb. Effects loop jacks. Preamp out and power amp in jacks. Line out on balanced XLR and unbalanced ¼" with level control. 250W into 4Ω. On wheels. Price: $995.

– **Roland Cube CK40:** One 10" double-cone speaker; two channels, each with gain and volume control. Master 3-band EQ, master reverb depth. Main in, line (pre-) out, two recording out, and headphone jacks. 40W (impedance not listed). Price: $399.

– **Roland Cube CK60:** One 12" speaker and one horn tweeter; two channels, each with gain, volume, and reverb on/off controls. Master 3-band EQ, master reverb depth. Main in, line (pre-) out, two recording out, and headphone jacks. 60W (impedance not listed). Price: $525.

– **Roland Cube CK100:** One 15" speaker, one midrange horn, one dome tweeter; two channels with two inputs each; each channel with gain and volume control. Master 3-band EQ. Main in, line out, pre out, and headphone jacks. 100W (impedance not listed). Price: $795.

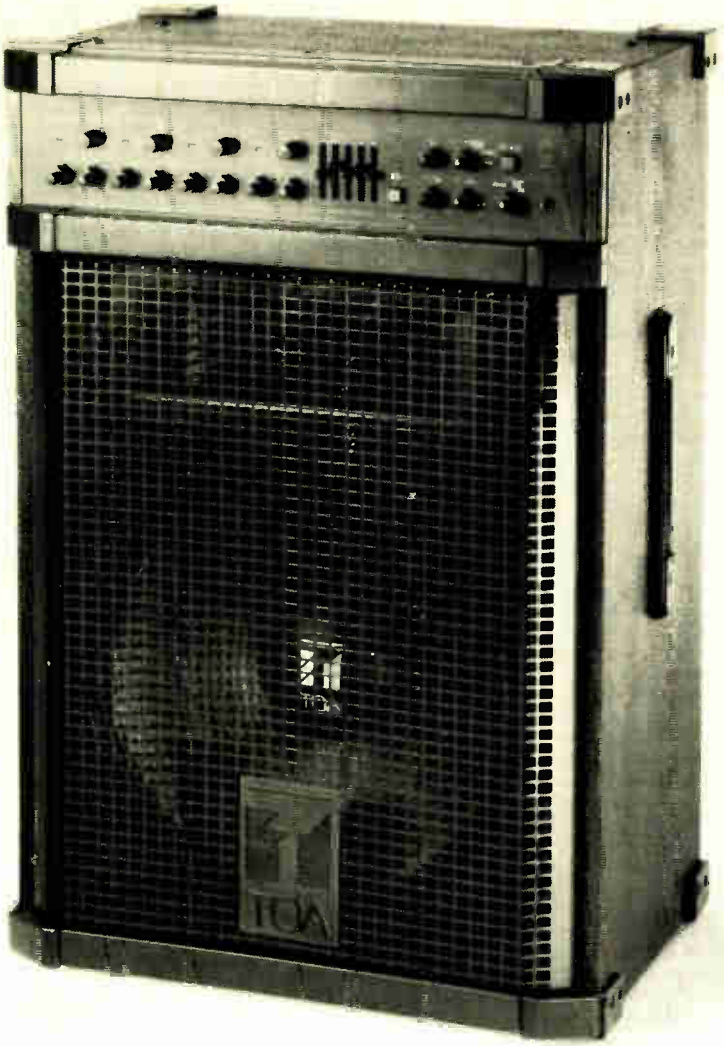
– **Ross Dual Keyboard II:** One 8" speaker; two channels, each with gain control. Master 3-band EQ, master volume. Line out and headphones out. 11watts. Price: $129.95.

– **Ross Keyman Twin 22:** One 12" speaker, twin switching inputs, each with level and chorus send control. Master 3-band EQ, master volume, chorus rate and depth. Line out and headphones out, footswitch jacks for chorus on/off and channel switching. 22watts. Price: $249.95.

– **Ross Keyboard 130:** One 15" speaker, crossover, and horn tweeter. Three channels, each with level and reverb control. Master 4-band EQ, master level, master reverb. Preamp in/out, power amp in, effects loop out/in. Footswitch jack for reverb on/off. 130watts. Price: $499.95.

– **Toa KD1:** One 12" speaker; four channels, each with treble/bass and level control, effects send (post), channel 1 also with XLR and 48V phantom power for microphone. Built-in spring reverb, master effects return level and crossfade, RCA record out, external speaker out, headphone out (mono). 50W into 8Ω. Price: Not available at press time.

– **Toa KD2:** One 15" speaker, one horn driver; four channels, each with treble/bass, effects send (post), level, stereo pan controls; channel 1 with XLR and 48V phantom power for microphone; RIAA phono input (mono) for turntable; direct channel out (mono). Built-in spring reverb, master stereo mixer with effects return level and crossfade, stereo L&R outputs on ¼" and RCA, external speaker out, headphone out (stereo). 100W into 8Ω. Price: Not available at press time. ►



Toa KD3 combo amp.

► – **Toa KD3:** One 15" speaker, one horn driver; four stereo (dual inputs) channels (eight mono), each with treble/bass, effects send (post), level, stereo pan controls, LED clip indicator, channel 1 with XLR and 48V phantom power for microphone; RIAA phono input (stereo) for turntable; direct channel out (stereo). Built-in spring reverb with 2-band EQ; master stereo mixer with effects return level and crossfade; stereo L&R outputs on ¼" and RCA, external speaker out, headphone out (stereo) with level control and stereo/sum/effects selector switch; MIDI In to four MIDI Thru splitter; 5-band graphic EQ; internal speaker input, power amp input. 150W into 8Ω, 220W into 4Ω. Price: Not available at press time.

• **Powered Mixers**

With their integrated inputs, channel controls, EQ, and power amps, these give you the flexibility that most combo amps can't. They're usually configured as PA (Public Address) heads, so make sure that the input sensitivity and gain is adjustable for line or instrument level, not just for microphones. Many are stereo, but can be run in mono, of course. Some have on-board reverb (look for an on/off footswitch); some come with master EQ. Look for multiple speaker jacks, for separate line and monitor outputs with separate level controls, and for effect sends and returns (often called auxiliary, or echo even though you can hook up whatever effect you want).

At home, you may want to use them for practice and even for home recording. Check for hiss and hum noises. If your instruments and the powered mixer are all grounded in the same circuit, look for a ground lift switch, or use ground lift adaptors for your instruments. If the system comes as a package, it probably has speakers designed for vocals – they may not handle your keyboards too well. Talk to your dealer, and call the manufacturers. If they know what you're going to use the product for, they may have valuable suggestions. (Next month's installment will look at speakers.) There are too many powered mixers on the PA market for me to list here with all the specifications, so I'll summarize products per manufacturer. Call the phone numbers I'm listing here, and ask for literature, and for names of dealers in your area.

– **Biamp** makes the rack-mountable MixPak series (six, seven, or eight channels) and the 29 series (eight or 12 channels). Call (503) 641-7287.

– **Carvin** sells direct only. The six-channel MX601 (rackmount or in a box) comes as 100W into 8Ω or 150W into 8Ω. The MX22 series has three powered consoles from six ($999) to 12 ($1449) channels. Call (619) 747-1710.

Carvin MX602 rack mixer.

– **Crate** has a three-channel keyboard amp head (KBA150H, Price: $450), two PA amp heads, and five PA consoles from four to eight channels, all mono, from $300 to $750. Call (314) 727-4512.
– **Electro-Voice** has the EV/Tapco 10-input model 100M, 100W into 8Ω, at $1914. Call (616) 695-6831 or (209) 651-7777.
– **Fostex** has eight and 12 channels on the MP800 and MP1200, at $1850 and $2195 respectively. Call (213) 921-1112.
– **KMD** offers one head and two console mixers, mono, four and six channels, from 75W to 150W into 4Ω, from $399.50 to $649.50. Call (203) 243-7855.
– **Peavey** makes ten different powered mixers, from four channels/50W mono ($250) to 16 channels/250W per stereo channel ($1799.50). Call (601) 483-5365.
– **Polytone** makes a rack-mountable keyboard amp head with four channels, and is bi-amped in stereo. Price: $695. Call (818) 760-2300.
– **Randall** has a powered, rack-mountable keyboard amp RK500HT with four channels and 250W into 4Ω ($749), and six- or eight-channel PA mixing amps RPA601 ($769) and RPA801 ($899). Call (800) 854-0529 or (714) 261-6304.
– **Ross** has the PC series from five to 12 channels. Price: $399.95 to $1199.95. Call (817) 336-5114.
– **Studiomaster** has the 8:2 stereo powered mixer/amp, rack-mountable or free-standing, with three power amps (80W into 8Ω each) for L&R channels plus monitor mix. Price: $1595. Call (714) 524-2227.
– **TOA** has a six-channel upright mixer/amp, the MX106R (soon to be modified and re-released as the MX601) at $875.50, and the 12-channel powered console RX8212 at $2513. Call (415) 588-2538.
– **Yamaha** has the lightweight EM85 and EM1400/1600/1800 powered mixers, from four to eight channels into mono; the EM1001II six-channel stereo, and the EMX300/200 series (eight or 12 channels, stereo). Call (714) 522-9011; ask for pro-audio.

And Next Month . . .

THE INCREASING NEED for more inputs has produced a new generation of line mixers that you can use for extended keyboard and rack-module rigs. They require separate powered speakers, or separate power amps with speakers of your choice. I'll cover these options in an upcoming article. Here's for more bang for the buck . . . ■

The prices and wattage ratings listed in this article were obtained from the manufacturers and their distributors. Prices are "suggested list" or "average retail," depending on company policy. Use them as a guide only. Watts ratings are assumed to be continuous power RMS into the listed impedance.

POWER TOOLS FOR

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Both the EPS and SQ-80 feature an Ensoniq exclusive—the Poly-Key polyphonic pressure sensitive keyboard. With this expressive breakthrough, *each individual note* has its own aftertouch control over volume, brightness, vibrato, pitch, or dozens of other dazzling effects. You get far more creative control over your sound than with any other synth or sampler.

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THE TECHNOLOGY THAT PERFORMS

Photography Rosemarie Ronnseville

Yamaha DXII

FM Digital Synthesizer

Known as the V2 in their native Japan, Yamaha's latest instrument brings the multitimbral, multi-waveform power of the TX81Z to a keyboard. *Review by Mihai Manoliu.*

YAMAHA HAS DONE it again: the recent release of the DXII may prove almost as influential for synthesized music as the DX7 has. The combination of a 61-note keyboard sporting velocity and pressure sensitivity with the power of an 8-algorithm 4-operator FM synthesizer that can use eight different waveforms and allows up to eight patches to play simultaneously is sure to be a hit with a wide range of musicians. Yamaha's first fully multitimbral keyboard is priced under $1000, yet it does not compromise the sparkling sound popularized by the DX7 series.

The DXII is essentially a TX81Z sound module with a typical Yamaha keyboard that feels like the same one used on the DX7II (for more details on the TX81Z see the review in MT July '87). There are some improvements over the TX81Z, however: the editing and utility features are much more easily accessible, the new Pitch Envelope Generator allows one to vary the overall pitch over time, the Quick Edit section is a way to make major changes efficiently, and the memory capacity has been greatly improved by the addition of a cartridge port for the Yamaha RAM4 cartridge – it can store 64 more voices and 64 performance memories.

The DXII can be played in two different modes: Single and Performance. In Single mode you can only play one voice at a time with up to eight notes sounding simultaneously; using the Single Edit functions you can edit the preset voices or create your own. In Performance play mode the DXII can be used as up to eight independent instruments, each of which has its own set of control parameters (maximum number of notes, keyboard section, MIDI channel, note shift, voice number, etc). The simplicity of its modus operandi is reflected in the way the front panel is organized: a section of 32 keys for selecting voices or editing functions (Single Edit ones are listed above the keys. Performance functions are listed below); a Bank section to select the four banks of presets or turn the four operators on/off while editing voices; a backlit 16-character two-line LCD; a 6-key section for choosing the play/edit modes (and store, utility functions, and memory protect); a data entry section that contains step keys and a data slider (and cursor keys); and of course the pitch and modulation wheels, volume fader, and cartridge slot.

A breath controller can be plugged into the front to control the pitch modulation, amplitude modulation, pitch bias, or EG bias of a voice. A special cable comes with the DXII and lets you store your data to cassettes. This cable plugs into the back panel, where you'll find other important goodies: the typical MIDI In/Out and Thru; a footswitch jack that can be used to control either sustain or portamento; a footpedal jack for pitch modulation, amplitude modulation, or volume control; a volume pedal jack; two output jacks; and a stereo

headphone jack.

It is a simple matter to get started with the DXII. Turn it on and push the Single key to enter Single play mode. Choose one of the Banks and select one of the voice numbers. You have a total of 128 preset voices (four Banks of 32 each) and another 32 voices in Internal memory. You can only store to Internal and Cartridge memory for a total of 96 programmable voices. One or more cartridges seem to be a necessary investment, especially for performance setups.

A good way to begin your editing experience is to use the Quick Edit section to explore some of the basic changes you can make to a voice. Press the Edit key while in Single play mode, then select key 32 (Quick Edit). You can now change Attack and Release rates for all operators equally and simultaneously. Volume changes the output level of all carriers, and Brilliance affects the output level and first decay rate of all modulators. It's a quick and dirty way to get an idea for the editing direction of a particular voice.

Among the functions available in Single Edit are: Algorithm (eight possible choices); Feedback (the amount of self-modulation of the fourth operator in any algorithm); LFO (Speed, Delay, Sync, Depth-pitch modulation and amplitude modulation), Sensitivity (pitch modulation, amplitude modulation, operator EG Bias), Key Velocity; Oscillator (Frequency, eight possible waveforms, Detune); Envelope Generator (Rates: Attack, Decay 1 and 2, Release; first Decay Level, EG Shift); Pitch Bend range; Portamento (three modes; time); Foot Switch assign; Controller parameters (Aftertouch, Breath Controller, Foot Control, Modulation Wheel); Reverb; Voice Name; and Quick Edit. It should be noted that the Reverb is a "pseudo-reverb" effect achieved by slowing down a portion of the EG Release rates, and that it is possible to turn off any or all of the operators while editing (useful for isolating one or more for accurate adjustments).

You can think of Single mode as the appetizer and Performance play mode as the main course (and dessert, and assorted snacks . . .). An overview of the main functions available in this mode includes: Assign (Normal, and Alternate – where each successive note will alternate through the instruments – an interesting and useful effect); Maximum notes for each instrument; Voice numbers chosen; MIDI Receive Channels; Note limit Low/High (range for each instrument); Instrument Detune; MIDI Note Shift (incoming notes can be transposed independently for each instrument; 2 octaves up/down); Volume; Output Assign – either/both/neither; LFO Select (selects source of pitch and amplitude modulation for each instrument); Micro Tuning Select; Effect Select; and Performance Name.

Two particularly useful features of the DXII are its Effects section and the 13 Microtonal scales stored in memory. These scales include 11 presets and two user-programmable ones (Pure major and minor, Pythagorean and Mean tone are among the presets). Booklets with more detailed data on these tunings are available from Yamaha.

The Effects section includes a pitch-shifted delay of up to 1.28 seconds, a pan effect, and a Chord Set effect which allows you to specify a four-note chord for each of the 12 notes. Each effect has four separate, programmable performance settings, any of which can be called up by a performance patch. The scales and Effects are part of the Utility section, which also includes Master tune, Save/Load to cartridge and tape, and all MIDI functions.

To get a good idea of the creative power possible with Performance mode I suggest you listen to these factory presets: P2-Tight Bass; P3-Glocken; P8-Wind Band; P9-Progressiv; P24-Tension; P27-Fantasy; and P30-Blues Time. The Glocken patch with its pitch-shift delay and the Blues Time preset (with C1-F2 set to a normally tuned bass, white keys G2-C6 tuned to the blues scale, and black keys above F2 playing a jazzy chord – C,F,G) were especially interesting and indicative of the many worlds yet to be explored on this versatile instrument.

While on the subject of patches and tricks, what about The Big Question – how does it sound? Surprisingly rich for a 4-operator synthesizer. The availability of seven other waveforms besides a pure sine wave has placed the DXII in a class by itself (the TX81Z is the only other Yamaha synth to have complex waveforms). From warm strings to biting leads and crisp percussion, the tonal possibilities are endless.

To get an idea for yourself of what some of the single patches sound like I suggest you check out some of the following factory voices: A1-Syn.Str 1; A21-Sy.Organ; A32-Sy.AftrTch; B1-Upright; B19-Marimba; B23-Tube Bell; B30-Wood Bass; C8-Cello 2; C24-Recorder; C26-E.Organ; D20-"Air"imba. I am certain that listening to these voices will not only convince you of the power of the DXII but it should also make clear the fact that learning how to program it is the only way to take full creative advantage of that power. The simplicity of its architecture should be easy enough to learn even for a total novice; there is also an abundance of reference material available to make FM programming more understandable.

The DXII is likely to find its way into the hands of many musicians whose needs may be as simple as a starter keyboard synthesizer or as complex as an extensive multi-keyboard setup for performance and studio work. It could be particularly attractive for guitarists starting to explore MIDI controllers. The depth of its sounds combined with a solid programming structure and a reasonable price should make the DXII a leading choice for anyone who has the money to invest in one of the latest leaders on the frontier of music technology. ■

PRICE $995

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

REVIEW

TECHNOLOGY

THE secrets OF TIMBRE

Looking at sounds from an audio theory point of view goes a long way towards explaining why certain ones seem to blend well together and others just don't. And as the following piece relates, you can use that knowlege to your mix's advantage.

Text by Robert Rich.

AT LAST YOU'VE found the perfect sound . . . that killer lead line, the gated snare that ate Miami. Faster than you can say "Fix it in the mix" that new patch or sample has found its way onto your latest demo-tape. But somehow, it just doesn't sound as good in the mix as it did on its own.

At times, the opposite scenario can occur. Some timbres that sound really boring on their own turn out to be the ones that sound "just right," given the right context.

There are plenty of ways to make a mix sound good or bad, but if the instrumentation doesn't work to begin with, you'll have a hard time fixing it later. Good orchestration is an art in itself, but it becomes an especially big challenge when the sounds are synthetic. We can guess what a piano sounds like together with strings, but what does a Prophet 5 going "glish" sound like with a DX7 going "fwoomp"? Are there any guidelines to help organize synthetic timbres into a good sounding mix?

I will try to present a few such guidelines in this article. Because the topic primarily being dealt with is timbre, I will overlook such issues as reverberation and dynamics, although you will soon see that timbre plays a role in these areas as well.

Theory

IN OUR HUNT for the elusive good mix, few things will help us more than an understanding of the nature of sound and human hearing. (Well, having a good ear can help a bit, too.)

Vibrations are the raw material of sound. Current music technology converts vibrating electrons into vibrating air molecules. These vibrating molecules tickle the hairs in our inner ears, causing nerves to fire in our brains. But, alas, what we hear in our brains only indirectly relates to what is happening in the air. The ear has its own logic, its own prejudices. In essence, a good mix panders to the tastes of the human ear.

We can better understand the ear's logic by breaking down the spectrum of sound into its constituent frequency components. Anyone who has worked with additive synthesis or who has seen a frequency domain graph of a digital sample will be familiar with these ideas.

Any sound – including the sound of an entire mix – can be broken down into a set of sine waves. Each sine wave represents a discrete frequency in the sonic spectrum. The amplitude of each of these sine waves tells the amount of that frequency found in the original signal. This is the essence of a Fourier transform. (Chris Meyer's article on additive synthesis in MT April '88 provides a good introduction to this approach to sound.)

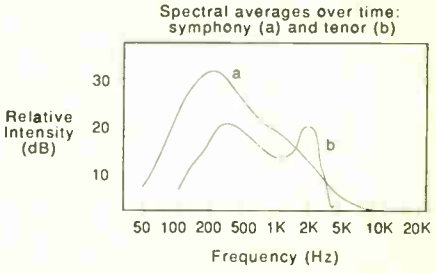
For anyone who thinks that the Fourier transform is a mere abstraction, consider that the ear uses this very technique to break down incoming sound. Different nerves in the inner ear respond to different frequency bands, leaving it up to the brain to build a complete perception of the sound. A graphic equalizer also uses these principles, though with much lower resolution.

Let's begin by looking at some of the overall frequency characteristics of a good mix, and the perceptual qualities of various frequency bandwidths. With these characteristics in mind, we will then look at the role of individual timbres within the mix. Remember though that none of the recommendations here should be taken as gospel. These are rules-of-thumb which can help guide the direction a sound might take. In the end picture, nothing will help more than a good ear.

Practice

IN GENERAL, A good sounding mix will appear to contain a relatively balanced amount of signal throughout the audible frequency spectrum. If we draw a curve showing frequency against amplitude, averaged across time, we should see no sharp peaks or dips. This does not mean that the curve should look flat, though. Playback response should be flat, but we are looking at the music itself. For an example of typical musical frequency content, examine Figure 1, the averaged

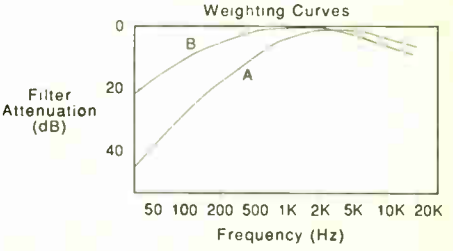
Figure 1.



frequency spectrum of a symphony orchestra and an operatic tenor. (Notice how the resonant peak of the singer's voice stands out from the orchestra, allowing him to be heard more clearly.) If this graph showed a typical rock song, there would be more information in the high frequencies, but the basic shape would be pretty similar.

The ear responds far better to high-mid frequencies (about 1000 to 8000Hz) than to low (20 to 200Hz) or very high (10,000 plus) frequencies. The response will change with overall loudness as well, so it is a complex state of affairs. This mess is why we have so many ways of representing sound level. Decibels (dB) measure absolute sound pressure. Various standardized filtering (or "weighting") schemes attempt to match the dB curve to human hearing, the most common being A-weighting (dBA). Figure 2 should clarify some of this.

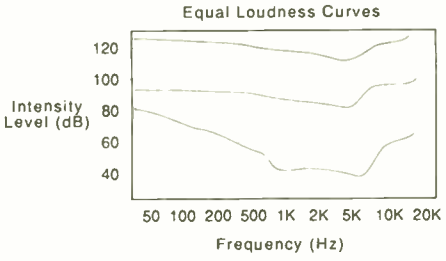
Figure 2.



These technicalities bring us to a very important idea in mixing sounds: the loudness curve. To put things simply, increasing the extreme low and high frequencies of a mix will make the music sound louder, even when the absolute sound level (dBs) remains the same. This

sense of loudness can also increase the perceived clarity of the sound. There is more to it than this, though. The ideal loudness curve will change depending on the listening level of the music, and upon the style of music. As a rule-of-thumb, the shape of these loudness curves will resemble the "equal loudness" curves shown in Figure 3, but of course they will

Figure 3.



be far less extreme. The equal loudness curves show the levels that various frequencies must be played at in order to sound equally loud to the ear. The "loudness" EQ curve works by slightly over-accommodating for this natural response.

For quiet musical passages, a lot of bass is needed for the low end to be audible. The upper few octaves will dominate the mix at low levels (1-8kHz) due to the sensitivity of the ear, so one should balance this range accordingly. Generally, the extreme high end (10-15kHz) will cut through fairly clearly, due more to the efficiency of most speakers than to the sensitivity of the ear. While the ear does not tend to expect high frequencies during quiet passages, one good reason for including high-frequency material is to hide noise, an unfortunate reality in quiet music. (Perhaps this explains the ubiquitous cricket sounds in so much new age music?)

For loud music, extreme amounts of low or high end can get annoying. At rock concert volume levels, the ear's response comes pretty close to flat, which explains why music usually sounds better when it's loud. Due to the ear's improved response curve at high volumes, it's especially important to avoid big resonant peaks in music that may be played loud. Not only can one hear these resonances more clearly, but they can be downright painful.

Instruments

THE RELATIONSHIP between harmonic content and perceived loudness plays an essential role in the placement of instruments in a mix. Consider the behavior of nearly all acoustic instruments: the harder you blow, pluck, or hit, the louder they get. As they get louder, they also get "brighter." In the natural world, loud sounds generally contain more overtones than quiet sounds. The ear expects this to be the case, so much so

► that we assume a sound is loud when it contains many overtones. If you compare a sine wave with a square wave of the same energy, the square wave will seem much louder.

Acoustic sounds naturally get brighter as they get louder, but in the world of electronic timbres, we have to plan for this to happen. Herein lies a solution to many a muddy mix. For example, the best way to add more "punch" to a kick drum is not to make it louder than everything else, but rather to boost its high-mids. The same applies to muddy basslines: try mixing in some velocity-sensitive "pluck noise" overtones. Only the slightest bit of high-end can do wonders to clarify a bass sound. This is exactly what makes such gadgets as Aural Exciters (a trademark of Aphex, I believe) so popular. But if your sounds are well structured to begin with, you should never have to fix the sound with lots of outboard gear.

"You don't need a dozen different reverbs to create subtle imaging and layering in your music. Just be aware of the fact that sounds with fewer overtones appear farther away than sounds with many overtones."

Of course overtones affect perceptions other than just loudness. An awareness of the effects of harmonic content on imaging can help clean up a mix. One of the most abused imaging characteristics is that of distance, or depth. You don't need a dozen different reverbs to create subtle imaging and layering in your music. Just be aware of the fact that sounds with fewer overtones appear farther away than sounds with many overtones. The reason for this lies once again in our expectations based on the behavior of sounds in nature. High frequencies are absorbed more easily by the atmosphere, while low frequencies can propagate over very long distances. (Whales can communicate across hundreds of miles using low-frequency thumps.)

Now that digital reverb is so cheap, people are getting into the habit of sending everything into a big wash of synthetic space, with little thought for the actual perceived placement of sound. If you want a sound to appear far in the distance, don't just drown it in a reverb soup. First make it *sound* like it's far away by rolling off the high-end a bit, *then* drown it in the soup (well . . . you know what I mean.)

On the other hand, sounds that you want to stand out clearly in front of the mix need not be louder than the rest of the music, they need only contain a wider harmonic spectrum. Notice how clearly most DX7 voices stand out in a mix – FM synthesis turns out to be a great way to generate lots of overtones. Several years ago, when the DX7 was the only really common digital synth, one could almost always spot it as the sound that pushed right up into your face while the rest of the music played in the background. This characteristic can either help the music or hurt it, depending on the context.

Another important frequency-related characteristic of imaging involves left-to-right discrimination. The ear is far more sensitive to the stereo placement of high frequencies than to the placement of low frequencies. In controlled environments, people have a hard time discerning the location of tones below 200Hz. Only with tones above 1-2kHz can we accurately determine location. So, if you want a sound to have a clear stereo image, make sure it has plenty of overtones.

Don't mess up a stereo mix by hard-panning low-frequency sounds. Panning the bass generally confuses the imaging by altering the mix depending on where a person stands relative to the speakers. In other words, the bass might sound louder in one speaker than the other, but that won't necessarily help the stereo image.

If you want stereo imaging on a bass track, try splitting the high frequency components from the low frequency ones, then process and stereo pan only the highs. With acoustic instruments this splitting requires drastic use of EQ. The trick works well in theory, but in reality it is not easy to keep an acoustic timbre sounding good after such drastic equalization. With a couple of synthesizers and MIDI, though, you can create your own acoustic reality, and the stereo image can become your playground. Split a sound across two synths, with one covering just the low-frequency components of the sound, panned toward the middle. The other synth, producing only the upper harmonics of this composite timbre, can play the role of imaging. With careful programming, this setup not only tricks the ear into fusing the two sounds, but allows a huge amount of control over the stereo image without muddying up the low frequencies.

Cohesion vs. Separation

THE EAR IS unbelievably sensitive to the timbre of an instrument. For example, if two violins play the same melody at once, we can usually track the two instruments with little difficulty. Even the most advanced computer systems have yet to come close to our abilities in timbre discrimination. As a result, we rarely give much thought to the overlapping qualities of different instruments in a piece of music. But a passing understanding of these qualities can really help when orchestrating electronic timbres.

Have you ever wondered why most lead lines occur in the upper register? Try playing a fast arpeggio with a smooth sinusoidal timbre, first at the high end of a keyboard, then at the low end. The bass arpeggio is very hard to discriminate. This has to do with many factors, primarily the fact that the ear has very poor pitch resolution at low frequencies. If a low sound is going to move quickly, it needs lots of overtones. Better yet, leave the busy stuff for the upper voices.

When music has a lot of activity, and you want each part to be audible, the timbres of each instrument should be fairly distinct from each other. When multiple instruments play the same note, the ear uses two major cues to distinguish them: vibrato and overtones (especially transient overtones). If these combined sounds have no vibrato, then the ear must remember the harmonic spectrum of each sound (the timbre). These spectra are not static, but change with the envelope characteristics of the instruments. If the combined sounds have no transients as well as no vibrato, they will sound like one instrument. Herein lie some of the keys to interesting timbral balance.

I do not believe that there can exist any rules for ideal instrumentation or orchestration, except for one: keep it interesting. Because instrumentation involves mixing together different timbres, interesting orchestration should introduce changes in the interplay of these timbres. For example, taking a hint from the previous paragraph, we can make two instruments fuse together, separate, then fuse together again. Two very similar timbres will take on independent identities if their harmonic transients (envelopes) differ even slightly, yet when played together their similarity can contribute a sense of richness. In general, one gets a big sound by fusing together the timbres of many similar sounding instruments. On the other extreme, two very dissimilar timbres can lend clarity to simultaneous melodies or harmonies, yet their combination will not generally make the music sound any bigger. Control over these characteristics of instrumentation can really help make music come alive.

None of the above suggestions should be taken as set recipes for good sound, but they may help guide you into some interesting areas. Nothing helps music better than careful listening, and that requires patience and a good ear. A magazine article cannot teach those skills, but knowing why things sound like they do can help when trying to make music sound better. ■

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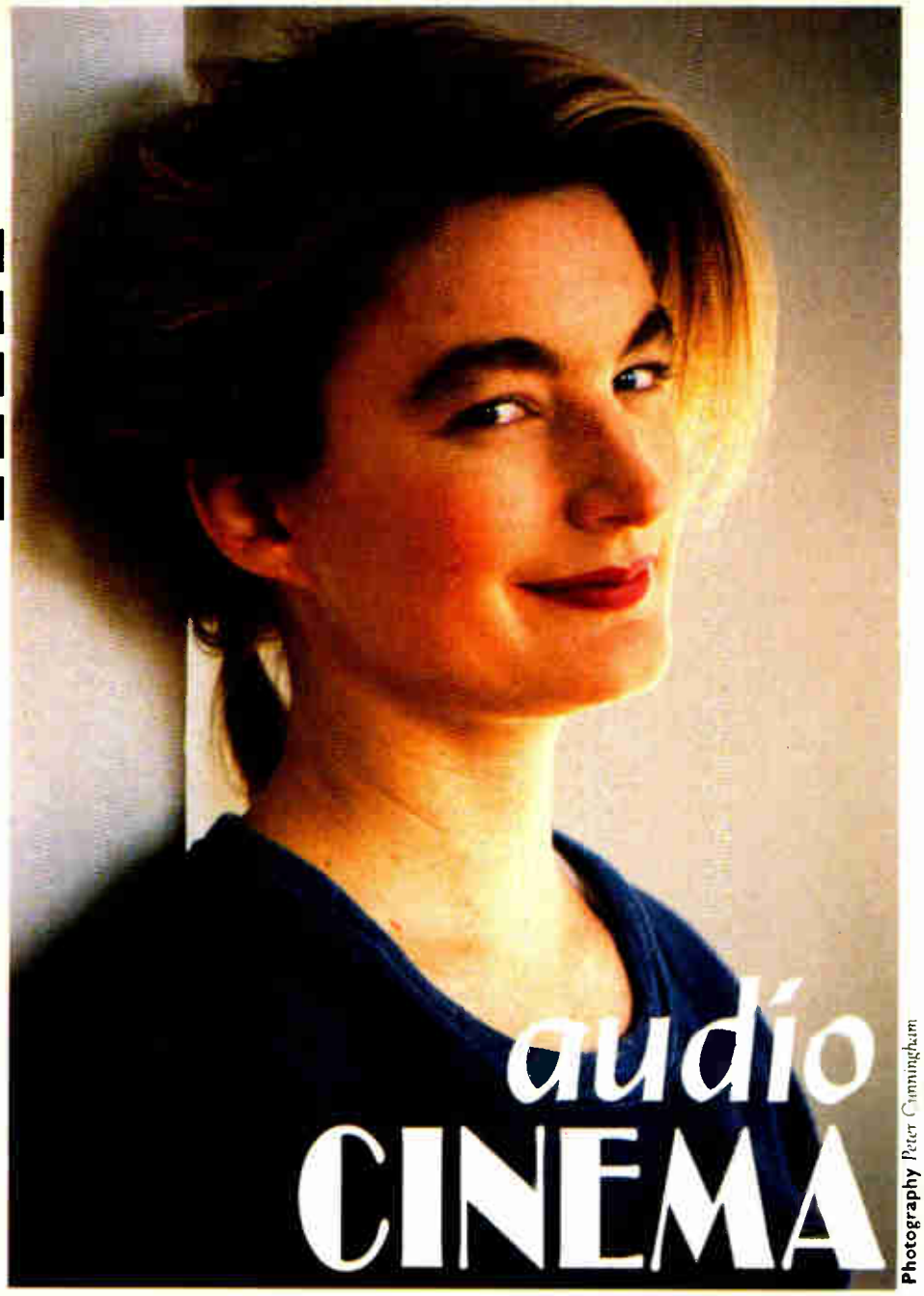

audio CINEMA

Photography Peter Cunningham

The thoughtful, engaging music of Canadian composer/performer Jane Siberry has been a moving force in her native country for several years. Now with the recent US release of *The Walking*, she's begun to make impressions here as well.

Interview by John Diliberto.

JANE SIBERRY DOESN'T write pop songs. She writes audio movies. Her music cuts with the visual richness of Steven Spielberg, but her subjects are closer to those of Scottish director Bill Forsyth (*Gregory's Girl, Local Hero*) – slices of life that are full of tiny details, hidden secrets, embarrassing moments, relentless joy and remorseless pain. The normal becomes surreal; everyday events become epic scenes.

In the center of these movies is Jane Siberry, who doesn't play characters so much as facets of herself. It is Siberry herself who is revealed in these songs, from the celebratory naivete of 'One More Colour' to the emotional pain of 'The Walking (And Constantly).'

Backstage after two triumphant performances at The Spectrum, a large club in Montreal, the fragility and vulnerable introspection that emerges in Siberry's songs is fully apparent. "Everyone is," she says softly. "Maybe they see me as vulnerable, but maybe I'm just writing about vulnerability and they see that as me. That's a beautiful quality about people. It's believable somehow."

In Canada, Siberry is regarded as the heiress apparent to her countrywoman Joni Mitchell. But she's distressed because fans appear to be perplexed by her newest album, *The Walking* (Reprise 25678-2). You see, Siberry thinks she's writing simple pop tunes.

"People seem to be having problems with this record," she says, apparently surprised. "It was released early in Canada, and I'm from Canada, and everyone's sort of had an affair with me. All the people in the music industry who supported me so far, for some reason thought that I would come through and make them really happy with a top forty hit single. Which I sort of thought this record was. It's filled with hooks. People were expecting something different, although I disagree. I think this is an accessible album."

Jane Siberry has a different concept of accessibility. After all, *The Walking* is sandwiched by two elliptical 10-minute pieces, 'The White Tent The Raft' and 'The Bird in the Gravel,' which feel more like compressed movies than songs. They're bursting with images, shifting scenes and provocative psychological undercurrents. "I think of it more as audio cinema," says bassist and co-producer John Switzer. "A couple of the songs on *The Walking* are, to me, soundtracks for movies that don't exist. They don't follow typical song formats. They almost feel like visual edits that happen and therefore the music had to change. There's not necessarily a logical musical reason, a typical formal reason for that change to happen. It's more to do with the vision."

Siberry actually produced her own film of 'The Bird in the Gravel,' a Bergmanesque meditation in black and white. "When I wrote the piece, I pictured it as a film," she says. "I already knew which side of the frame someone walked into, so panning-wise we just copied that (on the record); when I did the film, it was very simple."

Siberry's idea of a hook is also different. She works with her keyboard player Anne Bourne in generating sounds she thinks will tweak the listener's mind. "We always try to get things that become hooks themselves," explains Siberry. "As soon as you hear that sound you think of that song. You have to use everything that way, creating hooks on every level. On 'The Empty City' from *The Speckless Sky* [Open Air OD-0305], there's a really hollow flute-like sound. As soon as I hear that I see the skyline, I see all the stars. That's how it works on me – I don't know how it works on other people. I immediately am moved without knowing what the song is about, I recognize that association."

Her images come from her surroundings, a sort of hyper-reality that magnifies life and examines it from every angle. She wants to capture the moment, which is what 'The

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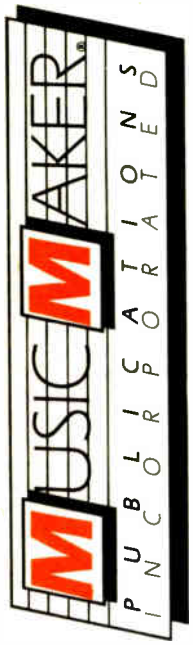

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Empty City' is all about, and why Jane Siberry writes. " 'The Empty City,' I think that's my song," she says thoughtfully, "It just says so much about what I think about everything. People might think 'The Taxi Ride' and 'The Waitress' and all those other songs are my personal ones, but to me 'The Empty City' is a real Jane Siberry song. It's how I feel about writing, how I feel about the humor that a lot of people don't get, and these white buildings that sort of crack off and float away into the air. And she just happens to pick the right one that does go up into outer space."

Siberry once was a waitress, as well as a secretary and a degreed microbiologist. All these images turn up in her music, which initially grew out of the Toronto folk scene. She financed and produced her first album, called *Jane Siberry* (Street Records SR4 002), in 1981. Its sparse arrangements, guitar, piano and bass from longtime associate John Switzer, pegged her in the tradition of other Canadian folk artists, like Joni Mitchell and Leonard Cohen. She even learned guitar from a Leonard Cohen book.

It's a reputation that she shook loose with the help of synthesizers. She was introduced to the Fairlight by Jon Goldsmith and Kerry Crawford, who co-produced her second album, *No Borders Here* (Open Air OD-0302). By the time of *The Speckless Sky*, it shaped much of her music. "The basis of *The Speckless Sky* was keyboards and the Fairlight," admits Switzer. "Jane comes from an acoustic background and for a long time she was very afraid of that. With *No Borders* and *Speckless Sky*, she didn't want an acoustic guitar because she was fighting the image of herself as a folkie."

"It was a reaction against the easy stigma that people have about folk music, which is inaccurate and an unpleasant generalization," agrees Siberry. "So I bent the pole far to the right just to free myself from that."

Liberation came with *The Speckless Sky*, which was almost a techno-album, full of drum machines and the electronic textures of the Fairlight. But on *The Walking* she has reconciled her acoustic roots with technology. "Now, I suppose I just feel comfortable with being seen as a songwriter, period, without a stigma," she says. "I've tried to define myself the way I feel I am and I think it's been successful."

"I felt like those were her roots in a way," says Switzer. "There's nothing like an acoustic guitar and there's nothing like an acoustic piano. I thought, let's go back to that a little bit and make this album warmer, more human sounding. It was conscious, even though we were still using the technology, to make it more expressive and use natural timbres and real instruments as well."

For Siberry, the Fairlight and electronics became a liberating experience, in much the same way as for Kate Bush, to whom Siberry is frequently compared. Working with programmer Rob Yale, she learned to communicate her ideas through the instrument. "I started using electronics and sequencing as things to help me learn about arrangement," she claims. "Because working with a band, I didn't know how to articulate. I'd want this feel but I couldn't get it, and I didn't realize a feel can come from a contrapuntal guitar part over a straight drum groove. You don't want the drummer to change the drum groove. In some cases, you get the guitar to give you that feel, that's where the feel will come from. Just learning subtle things like that. So I worked with the Fairlight for a while. I'd take arrangements and write them out in rough charts and Rob Yale would punch them all in, so that I could change things really fast and hear them without frustrating band members."

She expresses her music more in terms of feeling than sound. "Often I have an idea for a song that isn't even visual," she says, reaching for the words that will explain her methods. "It's almost like a poly-dimensional shape and I say, 'That's a distinct song.' I'm not really sure what the content is about until I find the right example that attaches itself to the shape and that shape has an inherent musical form to it. When I hear music I hear it in shapes. I can see the shapes moving against each other and that's part of my appreciation of what music is, seeing the shapes of the sounds and the shapes of the arrangement."

"She would say things in words that you can't say in words," laughs John Switzer, who has become a conduit between Siberry ▶

► and their engineer/co-producer, John Naslan. He says that after she generates the melodies, changes and lyrics, she often works out the rest of the arrangement with the band. "She'll say 'I'm trying to create this kind of feeling or mood.' She's trying to get out something that can't be easily expressed."

Keyboardist Anne Bourne agrees that Siberry's descriptions are often conveyed in the abstract. "I could almost say through sensation," she laughs, "Invisibly with visible images and ideas or jokes sometimes. Sometimes it's a little joke that gets expanded, like 'Ingrid and The Footman' [from *The Walking*]. She said one lyric like, 'OK, I'll be the Indian' and your mind starts to work from there."

Bourne, a classically-trained pianist and cellist, was performing avant-garde experimental music in Toronto when Siberry asked her if she could play synthesizers. Bourne said yes, and found herself on stage with a Korg Polysix. "At intermission I asked somebody in the audience to come up on stage and show me what all the knobs and buttons were for," Bourne recalls, laughing.

Despite the extensive use of electronic keyboards, Siberry has never thought of her music as electronic, even the atmospheric tone poem of 'Vladimir-Vladimir,' with its electronic gurgles and space whispers. "I wrote it and then got the sounds," she says. "There was a need for a certain type of sound and then we'd look for the sound. Most of it was done on a Korg Poly 800, a really rinky-dink keyboard that I still have and use to write on sometimes. It didn't create the song, but it completed the song."

"We find ways of using electronics, but making them natural sounding," claims Bourne. Some of the sounds are more natural than others, like one of the samples on 'Lena is a White Table.' "In 'Lena is a White Table,' there's a section where the chair comes up to the table and they have passionate, uh, interaction," Bourne laughs.

"Furniture sex," offers Switzer.

"So one night we tried to sample a chair and table having sex," Bourne attempts to explain. "Just banging sounds. We like to use percussion sounds, come up with original percussion sounds. John did some banjo samples. He wanted to have banjo on the album, so we got some neat plunky banjo sounds that are also on 'Lena.' "

'Lena is a White Table' is one of the more cryptic songs on *The Walking*, which is Siberry's most complex and compelling record to date. Layers of meaning and sonic nuance unfold with each listening. Secure in herself as a composer, the album relies more on acoustic textures than *The Speckless Sky*, but her structures still shift dramatically in dynamics. Caressing whispers give way to pounding drums on 'Lena is a White Table,' and oddly metered rhythms shift gears on 'The White Tent The Raft.'

IN THE INTERIM between *The Speckless Sky* and *The Walking*, Siberry bought a Macintosh computer and outfitted a small home studio with an Akai MG1212 12-track recorder/console, an Akai S900 sampler, a Yamaha DX7 and the Korg Poly 800. "Anne and John get frustrated with me sometimes," she laughs, "because I'll play a really rinky dink sound for a sketch demo. I won't worry about the sound, I'll just put something rough in there. And then I get really used to it so I start to love it and start to see the charm in this really stupid sound. They have to really pull me away from it, but sometimes I'll keep it."

For the Macintosh she uses Performer sequencing software. "The idea was that she could do a lot of stuff at home that could actually be kept," explains Switzer. The intent was to keep the initial inspiration and spark which is often lost between basement creation and studio re-creation.

"So we thought if she had a sequencer at home, if she does things she likes, that's it," continues Switzer. "It's in the computer and we can go into the studio and lay it down. And with a good recorder like the Akai you can use the actual recording. So if she does a vocal take or a guitar thing we can keep it and just lock it up to the multitrack in the studio. We didn't do much of that but we did use a lot of the sequences that we set up."

One of the songs that seems obviously conceived and performed on the Macintosh is 'The White Tent The Raft,' an epic nine-minute work of songs within a song, using the classic river metaphors of Joseph Conrad's *Heart of Darkness* or *The African Queen*. "Yeah! And *Moby Dick!*" exclaims Siberry. " 'Call me Ishmael.' The first paragraph of that book deals with why there is so much water imagery in everyone's work. It's a basic theme. People are moved by it."

The song is structured around the idea of a raft floating down a river on which you keep coming across openings in the jungle

foliage. In each clearing is a scene, rendered as another song. "I look at time as a four-dimensional thing," she explains. "It's not linear. So 'The White Tent The Raft' was talking about moving past things, and they exist as clearings. They're still happening. Even when you've gone past them."

'The White Tent The Raft' is one of Siberry's blood and guts songs, so emotionally tumultuous, you can feel it. It doesn't take on first listening, except as a musically rich odyssey, but the layers of its meaning are peeled back with each hearing. "I have two lovers arguing," says Siberry, explaining some of the "clearings." "Then you have a girl and her grandmother struggling together. She knows the grandmother is going to die soon. In another clearing is a guy with a hat on and a gorilla suit shooting a tiny little garter snake. I tried to make the clearings not so universal. I tried to make them like rich moments, fragments rather than statements.

"It says 'Tears streaming from the mind's eye, streaming back beyond the white sheets that flap and fly and the river never runs dry.' That's what life is fed on, all these moments of passion and times when you're truly alive and you keep moving past them. You move past them, you're always alone. That's what I never said really clearly. You can love someone but still, in the long run, when you're teeter-tottering on the steaming rubble of the end of your life, you're always alone, you're always alone. Just you and your God, whatever that is. That's what 'The White Tent The Raft' is. You're always alone, moving, passing."

The song grew to thirty minutes when she composed it. Although it was edited for recording, she printed the unrecorded lyrics, which she calls "transparencies," in the lyric sheet. "She printed them so people would know what should've been there and to give more information for each clearing," says Switzer. "I think maybe she confused people even more."

'The White Tent The Raft' was a challenge to record, full of sudden rhythmic changes and dynamic leaps. "It's the perfect kind of song for programming something," agrees Switzer. "But this song is so strange, that if it was programmed on the Fairlight, people would say they could never do that live. So we decided to do it with the band, start to finish with all the changes. We had a click and a basic synth pad and some of the more percussive keyboard parts that we had worked in the basement with Anne. But as far as the bass, drums and guitar we just played it as a rhythm section with that click. We thought it would be stronger emotionally, as weird as that song is, if it was actually played by a band."

More so than any of her albums, *The Walking* surrounds you with its spatial depth. Instruments are pinpointed in space while Siberry's multitracked voices swirl in call and response, conscious-subconscious dialogs. "When I do demo-tapes at home on my own, I love vocals," exclaims Siberry. "I love singing with other people, and myself, so often I just put up tons of vocals and then I end up keeping them. 'The Lobby' was just tons of vocals. I'd overdub and overdub. I get so used to it that I just create a space for them to keep them all. I like that warmth."

Making those voices cohere is part of Switzer's job in the studio. "There are songs where there are two or three people speaking at once," he says. "Since she's doing all the vocals you have to EQ each voice a little differently and put it in a different place in the stereo spectrum and give this impression of more than one voice, more than one person, speaking. It can be confusing to people listening to the records."

Although *The Walking* is based in acoustic instruments, great care was taken with studio ambiences and precision mixing. " 'The White Tent the Raft' took almost three days to mix," recalls Switzer. "And some of it would be virtually impossible without automation. Each of those 'clearings' would need a completely different kind of ambience, a completely different set of effects. It would've been impossible to do manually. We would've had to mix them all separately and edit them all together. With automation we were able to pull it off. We were using an MCI console with Disk-Mix automation. And it was recorded on a 32-track Mitsubishi, so we had a lot of tracks to play with."

None of those tracks are brought to the stage on her current tour. No sequencers. No tapes. Everything is played in real time. "Everything's played with two hands and ten fingers," says Siberry proudly. She only occasionally picks up an electric guitar, and plays keyboards on only one tune, but her band makes up for it. Switzer plays a custom bass with "the usual Boss foot pedals;" Flanger, Chorus, Fuzz-Tone. Ken Myhr plays electric guitar through a Roland GP8 and drummer Al Cross plays an acoustic kit outfitted with contact microphones that trigger an Akai S700 sampler. "I like to use the attack of the acoustic drums and then crossfade to a drum sample for the tail," he explains.

Anne Bourne's keyboard setup is centered around the Akai S900. "I wanted to base everything on a good piano sound, so we had a good Akai sample that we liked," she says. "but because we wanted more bottom I mounted it with a Roland Digital Piano, the RD200, which isn't great on its own but I find the combination is pretty good." She also uses the Roland Juno 106 and the Roland JX8P, "for warmer pads and transparent sounds.

"I have the Yamaha TX7 for the DX7 sounds," she continues. "I appreciate the clarity of the attack for brass sounds." Also included is a Roland D550 module and an Axxess Mapper, which changes all the programs on her keyboards. She also uses an SPX90, but very rarely in concert. Most of the ambiences are handled by the sound engineer who has pairs of Yamaha REV7s, REV5s, and SPX90s.

In concert, Siberry's music takes on a different character. Surrounded by two dancing, pantomiming blonde back-up singers, Rebecca Jenkins and Rebecca Campbell, Siberry looks even more idiosyncratic, wearing her dress backwards and a man's hat, also backwards. She is charmingly self-conscious, flicking a wrist, doing a timid Egyptian strut, mock-conducting the singers. She commands the stage by the unassuming modesty of her presence. While she stands fairly still and small center stage, moving with the flexibility of a stick figure, the band charges around her with hard rock intensity. New songs are faithfully rendered, but with a harder punch and spontaneous looseness. Older songs, like 'Mimi on the Beach' make their recorded versions sound pale.

Jane Siberry is pushing the envelope of what is considered pop. She really would like to have a hit. "I'd like to have a top forty single," she claims. Certainly songs like

'One More Colour' and 'Ingrid and the Footman' have a pop vitality and hook-laden drive that would brighten any playlist. But she is writing from a place inside that makes it a dubious possibility.

Siberry has become one of the road signs to the outposts of pop, a reference point for just how far you can go. The charm of it is, she really doesn't think she's that far off center to begin with. "I think I come more from the pop end of things," she says. "There's a certain line I won't cross as far as experimenting too far, where I'll feel uncomfortable. Before I listened to Neil Young, Joni Mitchell, and Laura Nyro, I was a real bubblegum pop fan and that's where my roots are. That's a real guideline when I write; I will always pull back from being too experimental if I feel that it stops making someone feel good." ■

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SAMPLER EVOLUTION

Roland S550
E-mu Emax SE HD

Photography *Rosemarie Rounseville*

The mid-range sampler market is getting crowded. Here's the scoop on how two manufacturers have updated their products to shoulder ahead of the pack.

Reviews by Chris Meyer and Bob O'Donnell.

UPGRADING WE SHALL go, upgrading we shall go. It seems that sampler manufacturers are singing a tune similar to this one these days. The competition is getting fierce out there, particularly with the recent introduction of the highly-touted EPS and Yamaha's long anticipated TX16W. Companies are being forced to come up with more functions and even better features to draw attention to their instruments. Nobody's really sure how many people are going to be willing to spend a few thousand dollars on a sampler, so manufacturers have got to make sure that *theirs* is the one that people want to see and hear. The great thing about this competition, of course, is that we're all benefitting from it (now if they could only get those prices down a *little* further . . .).

The E-mu Emax SE and Roland S550 are two of the more recent entries into the fray. They face a particularly difficult challenge because they're both on the higher end of the price spectrum – over $3000. To their benefit, however, both instruments are directly related to successful existing products. In fact, the Emax SE is simply an updated Emax; existing Emax owners can add the Synthesis Enhanced capabilities of the SE machines for a nominal charge. The S550, on the other hand, is actually a new product which takes the principles of the S50 and goes a step further by adding features and memory.

In either case, both products offer significant changes from their predecessors, so it's time to look at them from a fresh perspective.

Roland S550

WHEN THE FIRST wave of 12-bit samplers was being announced, the Roland S50 looked to be the winner in the specs department. Unfortunately, custom chip problems delayed the release of the S50 for almost a year, and when it was finally released, many of the promised features were not implemented. Roland rectified this with the release of the S50's version 2.0 software (reviewed in MT July '87), and ▶

► succeeded in making people reconsider the S50 as a new, viable sampler. They also released a rack-mounted version with some nice hardware upgrades – the S550, the review of which will concentrate on what sets this apart from its ivory-endowed cousin (and other samplers).

REVIEW

How Many Each of What

LIKE THE S50, the S550 boasts 16 voices (most samplers have eight) with sample rates of 30kHz and 15kHz (a touch on the low side, compared to its competitors). The back panel features eight individual outputs (a large improvement over the original S50) and a single mix output. Sample memory is double that of the S50, totalling 28.8 seconds at 30kHz (that works out to roughly 844 Ksamples, or 1.266 Mbytes given 12 bits per sample), divided into two blocks and two banks per block (thus limiting any one sample to 7.2 seconds at the highest rate). Unlike some other double memory upgrades (Prophet 2000, EII, etc), all samples in all banks may be played at the same time – thankfully, there's no bank switching scheme. The operating system is stored on disk, and the system and sounds are saved via the expected 3½" disk drive. It takes two disks to fully load the machine.

Thirty-two "tone" locations are available in each bank of the S550. A tone is Roland's parlance for a set of parameters (such as envelopes, etc) and a sample (or "wave"). Different tones can share the same wave. There are 16 patches (key assignments, etc) per block, yielding 64 tones and 32 patches overall. Up to eight patches may be played at the same time (on the same MIDI channel or different ones) making the machine nicely multitimbral. A slight downside of this is that the manual warns that there will be delays if too many patches are on the same MIDI channel (I heard some strumming when I got up to three – annoying for the delay, but the imprecision sounds more realistic if you can deal with it).

Each patch may be assigned an individual output and have its level set in the screen where the patches for playback are selected. Each tone also has an output assignment (such as different drums going out of different jacks), and this can be invoked by selecting "T" in the output assignment screen (more on user interface shortly). Unlike some individual outputs that are monophonic, each one on the S550 is polyphonic, so mixing between different patches is no problem. Voice assignment modes include two variations on dynamic allocation (a free-for-all where whoever needs a voice gets one until all run out) known as Last Note Priority and First Note Priority, and Voice Fixed Mode. The difference between the first two is whether old voices get stolen or new notes ignored if the demand exceeds 16; the latter allows a fixed number of voices to be assigned per patch. Instead of allowing you to decide exactly who gets how many as you would expect, though, there are 22 different combinations of one to all eight patches getting from 2 to 16 voices that you have to choose from. You may have to juggle which patch appears where in the list of eight to get the assignments you want.

In this fixed mode, notes requested beyond voices a patch has are ignored (I would have preferred older ones to have been stolen). Unfortunately, there is no combination that gives a patch just one voice for monophonic playback – you have to pull some tricks like selecting a voice mode such as velocity crossfade with the same wave to force it. The same goes for having one wave cut off another (such as open and closed hi-hats) – you have to set up two waves on the same patch that each act like they're taking up two voices, and give the patch two voices in the allocation scheme. These are minor gripes that'll buy me little sympathy, but I'm lazy – I hate having to be clever to do something I consider normal.

Roland S550 *"The S550 has some nice touches (such as keys or patch letters flashing as you're playing them) that make monitoring and troubleshooting a MIDI setup that much easier."*

User Interface

ROLAND'S SAMPLERS ARE the first instruments down on the reasonable end of the price scale to feature a CRT and mouse (or other advanced input device). As a matter of fact, one of the first notices you run across in the manual is "To operate the S550, a CRT display is necessary." Roland does not supply a CRT with the S50 or S550, nor do they sell one – you'll have to acquire a monochrome or RGB color monitor yourself. In selecting a color monitor, pay *careful* attention to the specs provided in the back of the manual, and the specs of your prospective monitor – "RGB" is a blanket term for a group of widely incompatible standards, and you may get stung. I used an inexpensive monochrome monitor for my tests with only minor hassles (when something changes color, it changes shades of gray – or green, in my case – on a plain monitor) and no compatibility problems. A company called Peripheral Brokers makes a pair of convertors – the STV1 and STV2 – that convert from RGB to either composite video or composite and RF (for using with your normal TV, etc) if you'd prefer taking one of those routes.

The S550 is also supplied with a two-button mouse that connects to the front panel. An optional remote control panel is available (that the mouse plugs into), along with a graphics tablet. Upon powering up the S550, you must hold down a button on the front panel keypad to let it know what's connected – another minor hassle; I wish it could auto-sense it (for when you're bending over hitting your terminal strip, or power blips out for a handful of milliseconds).

The screen operates a bit differently than an Atari or Macintosh, but is easy to get familiar with. It's easy to lose perspective and complain about how it could be more Mac-like, but in reality this baby is far quicker to get around on than any cursor control, continuous rotary knob, and LCD I've ever twiddled or peered into. My only lingering gripe is that the mouse doesn't have a pointer – you tell where it is by what highlights as you move it around. On the flipside, the mouse buttons work as inc/dec controls when you get there, which is a nice touch.

The next thing that comes to mind is comparing this to other visual sample editors available. The S550 has some sound editing features built in, such as mixing, truncating, smoothing, crossfade looping, digital filtering, wave drawing, etc, that all work but don't have quite the options of dedicated software packages. The S550 has some nice touches (such as keys or patch letters flashing as you're playing them) that makes monitoring and troubleshooting a MIDI setup that much easier. For extreme sample editing, a stand-alone package is still better (and for Roland's part, they encourage development of such software), but having everything else onboard is a definite advantage.

No matter where you're editing it, though, making the user perform contortions like going back into "Play" mode to audition changes made in "Edit" mode is *not* nice. On the upside is the fact that the operating system seems to reinitialize parameters in all the right places. A split decision is making you save any new creation (like after a mix) in a new wave location. It's a pain to then have to go back and reassign a wave to a tone, but this creates an automatic backup (and there's enough memory in this machine to deal with it) whenever you try to damage your work. Personally, I'd trade speed of operation for safety, but I'm told not everybody's as reckless as me.

As mentioned, the S550 uses a disk-based operating system. The ease with which these are updated is great (the unit I have has version 1.0 software; they're up to 1.11 now with additional tweaks and features such as the ability to read and

write S50 disks). However, machines that have to go out to the disk for some (Ensoniq EPS) or all (E-mu Emax) of their functions drive me crazy (one strong point in favor of the TX16W I reviewed last month was that once you loaded the system, that was it). In Roland's case, there is a separate "Utilities" disk that needs to be inserted into the drive whenever you want to sample or manipulate the sample. Give us a little bit and we want more; I want enough memory onboard to hold all the operating system – which you can have with the HD5/80 hard disk option.

Let's See . . . What Else . . .

ONE OF THE most significant features that appeared between the S50 and S550 was the addition of the Time Variant Filters that are in the D50. I'm a bit stiff-necked on this issue: I don't consider a sampler to be an "instrument" unless I can modify the timbre in real time – otherwise, they're just fancy digital tape decks. In spite of this, however, it is nice to have variable digital filters. The filter is of the lowpass variety with resonance, and includes the eight-point and slope envelopes that accompanied amplitude and pitch on the S50 (and yes, you can edit them with a mouse – a place where graphics come in *real* handy). On top of all this, the filters sound rather good.

The one other nice point that needs applauding is the sample mode that is always filling memory, and allows you to say "keep everything *before* I hit this button" – great for catching things on the fly). This can be toned down to just a nice pre-sample buffer for making sure the starts of samples don't get cut off.

Roland's variations and expansions on the S50 theme don't end with the S550. There's a one-space rack version called the S330 that is basically one half of an S550: half the memory and half the size, but otherwise identical to its bigger brother. The HD5/80 80Meg SCSI hard disk for the S550 (the S50 and 330 cannot add a hard drive) can hold up to 72 disks worth of sounds and four operating systems. The family keeps growing.

Conclusions

THE BOTTOM LINE is this: the Roland S550 is a very solid, competent sampler. It has a couple of quirks that slow me down, but nothing that is unusable. Having a mouse and CRT to control the machine throws up the price and development time a bit, but it results in a machine that's quicker to use than if it didn't have them. Some of its features will set standards for other "serious" instruments to meet. ■ CM

PRICES S550, $3495; RC100 remote control, $350; S330, $2295; HD5/80, $2195; STV1, $79.95; STV2, $89.95.

MORE FROM RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141. Peripheral Brokers, 11026 Washington Blvd, Culver City, CA 90230. Tel: (213) 838-6841.

E-mu Emax SE

E-MU'S FIRST ATTEMPT at a lower cost sampling keyboard was generally well received in most quarters (see MT January '87 for review), but along with the introduction of the Emax came the promise that even further enhancements and updates would be added. The first of these is an internal 20Meg hard disk option (HD) which can be retrofitted to existing Emaxes or bought as a standard feature on new instruments. The HD option adds about $1000 to the Emax' price – not exactly pocket change – but if you use the instrument for live performance or need quick access to lots of sounds, it is well worth it. Once you get used to working with a hard disk, you'll never be able to go back. The internal disk can hold the equivalent of 36 floppies in separate banks and load time from it is a mere three-and-a-half seconds. One other nice touch is that it comes loaded with 30 banks of sounds (actually 33 if you get the SE HD) from the E-mu library.

Backup, Restore, Formatting and Scanning functions have also been added specifically for the hard disk so that you can prevent (or at least try to avoid) a catastrophic loss. I can't vouch for the durability of the option – manufacturers get a bit upset when we try drop testing their gear – but I've been informed by E-mu that it is shock-mounted and should be able to stand all but the most inconsiderate roadies.

The second, most recent enhancement to the Emax is a major system software upgrade which adds a number of new features, including two new methods of sound generation. The upgrade comes in the form of three disks for existing Emax owners: one containing the new operating system; a preset with 30 different D50-like sampled attack sounds and 95 different factory Spectrums for use in the synthesis mode; and two example disks with sounds created by Spectrum Interpolation Digital Synthesis and Transform Multiplication. If you're buying a new instrument, the new operating system can be a built-in function, like the HD option. Properly equipped Emaxes are referred to as Synthesis Enhanced (SE), highlighting the fact that synthesis features are the main portions of the upgrade, but there are some other new features which also deserve mention.

First off, you can now load entire banks of sounds off the hard disk with a MIDI ▶

► program change. The process still takes a few seconds, so you'll have to send the message far enough ahead of time, but it will remotely initiate the load. Also, the Preset Definition Module now includes a Stack Presets function which will allow you to layer up to four consecutively numbered presets for those all important mondo layered sounds. Depending on whether or not each of the presets uses Dual Mode or not, you'll either have monophony or dual-note polyphony with the stacked sound.

A transparent change made to the operating system of the Emax when you load the new software is that it adds CD-ROM interface capability. In conjunction with this, Optical Media International recently announced a CD-ROM disk made specifically for the Emax which stores the equivalent of 505 floppies.

The biggest changes, however, occur in the Digital Processing Module, where a number of different digital signal processing (DSP) functions have been added. Four of the functions allow you to tweak or alter existing samples in the digital domain, and the last two are the new methods of sound creation. First, the Gain/Attenuation feature adjusts the level of a sample over a range of +/−40db. By cranking the level way up you can produce some really ugly, distorted sounds – which have a worth of their own – or by making smaller adjustments you can match the levels between samples and perform other housecleaning chores. The Reverse Sound function does exactly what it says: it permanently and unalterably swaps the numbers in a sample. The Emax needs a bit of RAM to perform this and all the following operations, by the way, so you need to make sure that you leave some space with which to work. Otherwise you'll start running into the very tiring "Not Enough Sample Memory!" message. It's not fun.

The Change Sample Rate function is a very handy tool for converting samples received via the MIDI Sample Dump Standard into a format which the Emax can use directly. In other words, you could take a sound sampled by the Akai S900 at a rate of 40kHz and convert it into the Emax' standard rate of 27.778kHz. The process involves setting the original sampling rate of the sound, setting the desired new rate, and then letting the Emax resample the data. You can also use it to take existing samples originally sampled by and stored in the Emax, and convert them to a lower sampling rate to save memory space.

The Change Pitch features lets you digitally alter the pitch of a sample over a range of +/−35 semitones, 99 cents. If you need to fix the pitch of a slightly – or grossly – out-of-tune sample, or if you want to use the same sample at a different pitch, this function can prove to be very useful. I should point out that both the Change Sample Rate and Change Pitch functions can require several minutes of processing time – which the Emax will warn you about – so don't plan on using these in a tight, time-dependent situation.

New Sounds

THE TRANSFORM MULTIPLICATION feature is the first of two new sound generation methods offered by the SE upgrade. Both methods give the Emax synthesizer-like capabilities but in actual fact they produce samples and must be treated accordingly. In other words, you still have to deal with synthesizing sounds for different sections of the keyboard and mapping presets to their proper location, etc. You can generally get away with less samples across the keyboard than you normally would be able to – two or three should be fine – but, unlike a synthesizer, you still have to worry about the problems of pitch-shifting when you transpose the samples down a long way.

What Transform Multiplication does to produce its sounds is take two samples – the current sample and whichever other one you choose – and combine them in such a way that all frequencies shared by the two sounds are kept and accentuated and all other frequencies are dropped. The results, which are equal in length to the current sample, are often very wild sounds that share characteristics from the two sources but in a way much different than simply combining the two. E-mu provides a disk full of excellent examples, as mentioned above, to give you an idea of the things you can do with this feature. Most of the sounds on the disk are really ►

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► unique timbres that I can't imagine being produced by any conventional synth or sampler.

According to the manual, Transform Multiplication can be used to experiment with room impulse responses – a rather esoteric application if I've ever heard one – but I think you'll have more fun just playing with it. Be prepared to be extremely patient, however, because as nice as this feature is and as interesting as the resulting sounds may be, they take a *long* time to produce. One experiment I tried took 41 minutes and the result was basically useless noise. Another point to be aware of is that you can only use very short samples when using the TM function and consequently, you can only produce short samples with it – looping the result is almost mandatory. The maximum combined limit of the two samples can only be 32K, which works out to a little bit under 1.2 seconds at the 27.778kHz rate. The sampled attack waveforms which come with the new development disk turn out to be excellent fodder for experiments . . .

Spectrum Interpolation Digital Synthesis is certainly a mouthful, but what E-mu has basically added to the Emax with the Spectrum Synth feature is a slight variation on true additive synthesis. You have access to 24 sine wave "oscillators" which can each be controlled by independent, 24-stage frequency and amplitude envelopes, or contours in E-mu speak. You can also set the pitch of the sound's fundamental and the pitch ratio for each of the remaining harmonics.

As nice as that much control and flexibility may sound, however, producing sounds by individually defining each of the available parameters can get boring, fast. E-mu realized this, so they came up with a number of short cuts to speed up and simplify the process. The two basic concepts they've incorporated into the Emax are Spectrums and Time Slices. Spectrums are simply the static amplitude and frequency ratios of all 24 harmonics at a given point in time. In other words, they describe a single cycle waveform. E-mu supplies 95 of these waveform Spectrums to start with, but you can create as many of your own as you want. Time Slices are simply Spectrums placed at a particular point in time. Each SE sound consists of 24 Time Slices equally spaced out across the length of the sample time you're working with, and each of these Time Slices holds its own Spectrum.

The Interpolation part of the name comes from the fact that you can define the Spectrum at certain Time Slice locations and then let the Emax figure out what the Spectra should look (and sound) like at the other Time Slice points. In other words, you could put a sine wave Spectrum at Time Slice 1 and a more colorful brass-like Spectrum at Time Slice 24, then select the Interpolate Function from the ten-option Spectrum Synth menu and the Emax will do all the dirty work of filling in the other 22 Time Slices for you.

The actual operation of the Spectrum Synth is straightforward. After you've created an empty voice to work with you can either place an existing Spectrum at a certain Time Slice location, draw a new Spectrum or Time Slice, or edit an existing one. Drawing is achieved by moving the data slider up and down as the cursor moves across the LCD – the Emax gives a count-off and then starts to move the cursor automatically after you select the Draw function. Similarly, editing is done by stepping through the various harmonics with the cursor controls and making adjustments with the data slider. You can also do the same for individual harmonics' frequency and amplitude contours, but in that case you'll draw out the levels at the 24 different Time Slice locations. In other words, it's like working along the y-axis as opposed to the x-axis.

The process of creating Spectrums, Time Slices and contours works pretty well but it gets slowed down by the Emax' aggravating habit of returning to a main menu after it has performed a function. So, for example, after you've drawn a Time Slice, you get the option of editing or copying it, but you can't start drawing another one without having to leave the menu, select a new Time Slice location and then start again. My only question is, why? Thankfully, choosing the fundamental pitch and ratios for each of the harmonics – which can range from 1.00 to 40.99 in increments of one hundreth – can be accomplished in one menu access.

Once you've created a set of parameters that you like, you can save them in one of three backup banks and then load them back into the active voice at any time. You can also erase any Spectrums, Time Slices or contours that you've created.

The final option in the menu is the Synthesize function, which takes the parameters you've created and crunches them into a sample which the Emax can play back. You can choose from two types of synthesis: smooth or stepped. The smooth synthesis function will interpolate from Time Slice to Time Slice to produce gradual timbre changes, while the stepped function will jump abruptly from one Time Slice to the next, for PPG-like sounds. The amount of time it takes depends on the complexity of the Time Slices and the length of the voice you're working with, but to give you an idea, you can synthesize a fairly simple one-second sample in just under a minute.

Like any synthesis method, the quality of the sounds you can create with the Spectrum Synth ranges from awful to quite nice. Again, the sample disk provided with the update gives a good example of the types of sounds you can create. Theoretically, of course, you should be able to create or recreate any sound with additive synthesis, but practically, most of the sounds you'll hear emanating from this section of the Emax have a bright, metallic edge to them.

Methinks . . .

E-MU HAS DONE an excellent job of continuing to support the Emax. Both the HD and SE options offer some powerful features not available in any other sampler in its price class. Certainly other manufacturers have hard disk options, but none offer the power and convenience of an internal hard disk. Likewise, some samplers have basic wave drawing functions, but none have the sophistication of the Emax' Spectrum Synthesis, let alone Transform Multiplication and the other DSP functions.

Problems do exist with the SE upgrade – some of the time requirements to perform certain functions border on the absurd – but I think it is more appropriate to applaud E-mu for their efforts to get as much out of the limited processing power of the Emax as they could, than to chastise them for making us be patient. This is particularly true considering the low price of the upgrade. Any viable attempts to incorporate new methods of sound generation should be welcomed with open arms. ■ *BO'D*

PRICES SE upgrade $95 to Emax owners who purchased the instrument before 3/1/88. $300 to those who bought it after; Emax SE $3295; Emax HD $3995; Emax SE HD $4295.

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

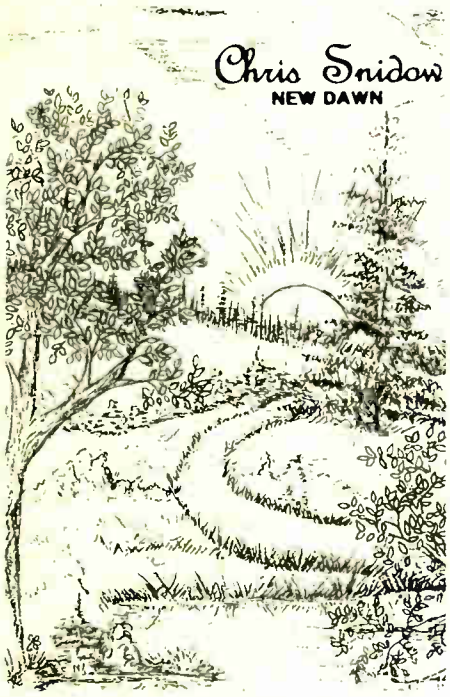
READERS' TAPES

REVIEW

Reviewed by Yung Dragen.

WHEN I FIRST started playing around with synthesizers, the role model of the time was Tangerine Dream. Most of us did poor imitations of their style (referred to as the "Berlin Movement" – Moog bass, washes of string synths, endless repetitive sequences). Today, everyone's trying to do a new age tape, which is essentially Berlin Movement with less drive and more fluff. And a lot of the current imitations are as thoughtless as those we committed a decade ago.

So it's pleasant when a new age tape crosses my karma that has some flavor. This



month, it's *New Dawn* by **Chris Snidow**. Others (in Snidow's press kit) describe his style as "a mixture of 18th century European Romantic music mixed with today's New Age." The first side is indeed gentle, relaxed, and contemplative. No boring drum patterns or inane sequences; instead, harmless atmospheres with occasional unique sounds are painted with a Yamaha PF15 electronic piano, an Ensoniq Mirage, and a six-piece Ludwig drum set with Zildjian cymbals. The drums are primarily used for accents and background tom and cymbal rolls – a *very* nice effect. The hazy quality of the Mirage fits nicely, too.

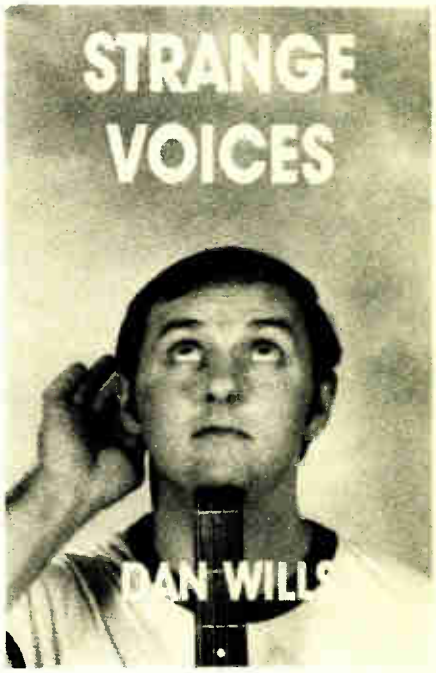
Side two shows a bit more variety – a bit of Vangelis' 'China' is apparent on 'Dream Reality.' The remaining numbers show a lighter, playful side that's nice but doesn't seem to cut it as well as side one. Extra points for some occasional unique timbres (like the cymbal/noise wash, or various gong and vocal-like tones); points off for the few times a unique sound is repeated on more than one song (such as the synth horn/breathy flute hybrid used as a lead tone throughout side one). The tape is well recorded on an Otari 8-track, Crown half-track and Nakamichi MR2 cassette deck, and nicely packaged. Not a path-forger like Steven Van Handel or Jaxon Crow, but relaxing – I'll continue to use it to create meditative moods.

Ever buy an album for the unusual, innovative single, and found the rest to be vapid, conventional, and uninspired? Kim Carnes ('Betty Davis Eyes', 'Fall of the Cards') and Phil Collins ('In The Air Tonight', 'I Don't Care Anymore') spring to mind for pulling that trick on me. Let me shake a similar finger at songwriter **JB White** for pulling the same thing (the only difference is he sent in the tape; I didn't buy it). The lead-off tune on his demo – 'WYSIWYG (What You See Is What You Get)' – is one of the most innovative songs I've heard in a long time. It's in a slow, almost shuffling rock style with a sly feel. The lyrics are sung in the center and whispered/spoken with a different phrasing in the right ear.

I'm a big fan of trying to untangle dual lines (like the dual drummers of Brick or early Adam and the Ants, or the dual lead guitars of Sacred Mushroom), and this was lots of fun. Orchestration is sparse and minimal, which also adds to the clean slyness. Instruments consist of a DX21, YCM10, TR707, 360 Systems Midi Bass, and non-fuzzed electric and acoustic guitars. I've scoffed at the idea of the Midi Bass as a product, but the solid bass on this tape makes me rethink my position after listening to endless attempts at an unusual bass noise – many of which end up failing (weak, etc).

Unfortunately, the rest of the songs don't answer the promise of 'WYSIWYG' and devolve into MOR, even though the lyrics remain excellent throughout (extra points to 'Deaf Child at Play,' where the subject matter is revealed like opening a lotus blossom a petal at a time – at first, you have no idea what's there; by the second petal (verse), you have a fix what it is; the last petal/verse reveals something else (the pistil and stamen) you didn't expect). The recordings themselves are simple and unpretentious, with a Tascam 38, M216, and Yamaha SPX90 employed. The SPX90 provides a cute trick on 'Runnin' with the Dinosaurs,' where JB's harmonized backing vocals step out on their own in the chorus for a bit of a vocal round. Write more songs like 'WYSIWIG' (I know you've got it in you) – believe me, you'll sell records.

A little less successful in the MOR vein is **Dan Wills** and *Strange Voices*. With the exception of **Kevin St Germain** on vocals on one track, Dan plays all the instruments (no list is provided, but the simple drum parts seem live; there's guitar, vocals, simple keyboard pads with thin, resonant leads, and he poses on the cassette cover with a Steinberger bass under his chin) and he recorded them to an Akai MG1212. The style is a bit like a relaxed MOR/country and



western hybrid (I recognize the feel – to make money one summer, I mixed live sound for a country rock band – yes, I have no shame). There's nothing *wrong* with this tape; it's just fairly uninspired. There's a lack of high end or punch to the recording, echo on the voice is occasionally over-used, and stereo effects and processings are all too rare. There is almost a feel of something done a few years ago here. With nothing special to radiate a shine, you gotta keep moving down the path, as opposed to *sitting* on it . . .

A rapid shift of spaces, and we're over in the land of Styx-clones **Advent** and their *Searching for the Heart*. Advent consists of **Jeffrey Burkett** on drums and vocals, **Garth Hjelte** on keyboards, guitars, and bass, and the help of **Bruce Kriskovich**, **Ken Van Allen**, and **Kevin Reep** on additional guitars and bass. The music was composed by starting with a sequencer track, and having everybody record around it. The feel is indeed live but tight, with competent but thankfully restrained playing.

Garth reports that specific instrumentation▶

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► included an ESQ1 ("main sequencer and work station"), DW8000, DX7, Poly 6l, Mono/Poly ("underrated star of the year"), Taurus bass pedals ("never sell them"), CP70, Mellotron (I'm asked to guess where the Mellotron was used – I couldn't find it – which prompts me to ask what was the point? Why use something unique if it's hidden?), Arp Omni II ("*the* high string synth"), and a Mirage along with real acoustic piano, vocals, guitar, bass, drums, and magnetic tape. That last bit is kind of important to Garth – he comments "Look, Mom, *no computer*! (Despite) all the hype personal computers get, I still don't see the need for one. I just borrowed one for looping the Mirage. That kinda ruins half of most music magazines for me . . . " So, the sequencer versus sequencer battle mentioned a few months back continues.

Anyway, as mentioned, the style is in the bombastic Styx style and sound (even

Jeffrey's vocals), which is fine as far as it goes – but it isn't too far with me. There are some good production tricks, but sound quality isn't as up-front as I would like. Also worth mentioning is that the lyrics are of a definite Christian bent, for those who like this style of music but get tired of hearing about approved gang rapes. One last note – I *loved* the cassette insert – textured coated paper, good graphics, etc.

The final point on this month's pentagram is **Howard Tiano**'s *The Tape of Things to Come*. Tiano's band consists of himself on vocals, guitars, Mirage, and drum machine programming (an SPI2), **Marc Andes** also on drum programming, **Linda Miller** on backing vocals, **Tony Montalbo** on bass, and **Jon Werking** on Mirage, CZ101, and a touch of DX7. Style is pretty much straight-ahead scorching rock, with the exception of the dreadful (*no* pun intended) reggae of 'Siren Song.' For lack of tracks (he used a Tascam 38 and Ramsa 10-channel board), the drums were printed in mono and spread out with reverb. Mixed in the background, they work pretty well, with good sounds and solid programming. Background vocals were also bounced together early with a bit of delay for a stereo spread.

I have to admit that, though solid, not much impressed me here except the last piece – 'Showdown.' It features a good groove, a flange-death keyboard sound on the turnarounds, and an extremely brief psychedelic breakdown (with the weak spot being some sharp cello cuts that don't work – they need a bit of softening). It feels closer to what this band was born to do (as opposed to 'Siren Song'), and perked my ears up the

Howard Tiano

most. This last piece was written by **Jeff Lynn**, and Howard could learn a bit from him. Again, it's the unusual piece that makes it for me – while false façades (like false gods) only tick me off.

Before ending this séance, you all should be informed of **Radio Free America**, who "will promote anyone who records their own music at home, as long as it is not offensive and ideally of good quality." It's a 60-minute radio program distributed to NPR and other independent stations. In exchange for this free promotion, they request that you send them a copy of your home-recorded work (original, not currently in commercial release) along with lyrics, bio, and a release (to allow them to air it).

Meditation ended. ■

Contact Addresses:
Chris Snidow, 6218 Vanderbilt, Dallas, TX 75214
Advent c/o Advent Productions, 15105 51st South, Seattle, WA 98188
JB White c/o Emry Music, Box 1862, Church Street Station, New York, NY 10008.
Dan Wills c/o Slab City Records, Earlville Road, Chateaugay, NY 12920
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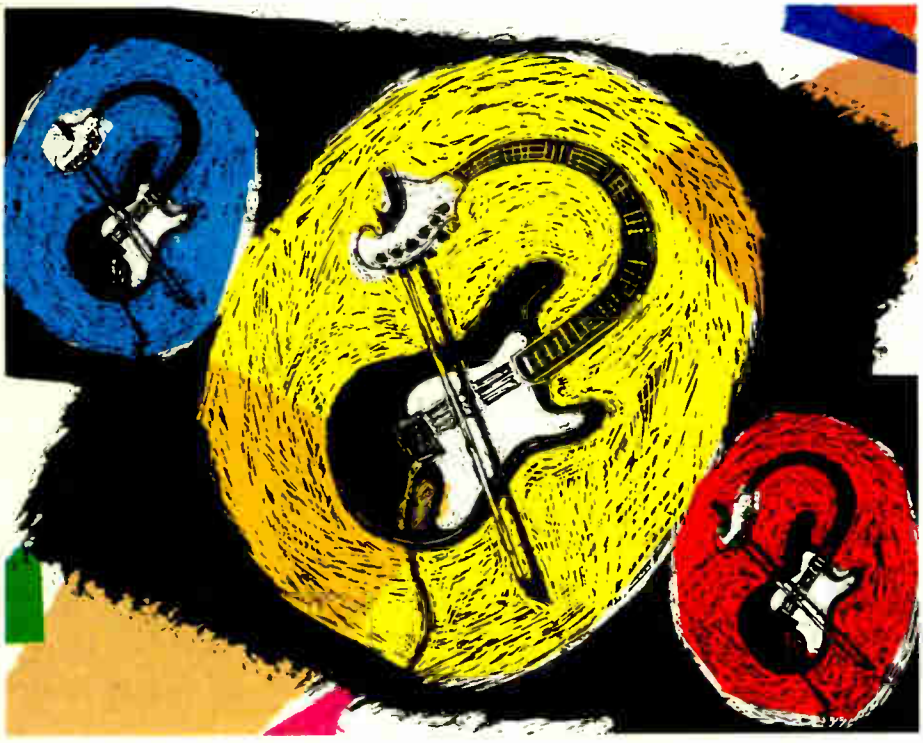

Illustration Sophie Laurence-Jones

If you find synth strings clichéd, commercial samples too identifiable and a violin impossible to play, the answer to new string samples may be no further away than your old acoustic guitar and a little ingenuity. *Text by Tom McLaughlin.*

GOT PROBLEMS WITH your string samples? Well, instead of taking a crash course in learning to play the violin, you may find the solution lies in your acoustic guitar. Acoustic guitars and most electric guitars and basses are so constructed as to permit their lowest and highest strings to be played with a conventional double bass, cello, viola or violin bow. This should open up a whole new world of tone colors to you and your sampler. You may even sleep easier at night knowing that you're not putting string players out of work.

Unlike members of the violin family, with their curved bridges, the flat bridge on most guitars prevents their innermost strings from being bowed individually. As we're dealing with sampling and not a live performance situation, changing strings or re-tuning for different patches should pose little problem for anyone interested in acquiring a set of samples representative of the guitar's range.

It's surprising how musical the sound of a bowed guitar or bass can be. As would be expected, the nylon strung classical guitar produces a mellower tone than its steel strung acoustic counterpart. Both instruments have a sonority somewhere between a viola and a cello. As a matter of fact, a sampled, bowed acoustic guitar should blend very well with any existing bowed strings in your sample collection, and don't forget, with overdubbing onto multitrack tape or digital sample mixing, entire bowed guitar sections can be constructed.

"It's surprising how musical the sound of a bowed guitar or bass can be – both instruments have a sonority somewhere between a viola and a cello."

Compared to the acoustic guitar, the electric guitar and bass offer a plethora of sonic possibilities. Electric guitars offer you the choice of feeding their signals straight into your sampler or miking them up through an amp, as well as the wealth of tone colors available using the onboard tone control and pickup switching circuitry (not to mention the use of standard electric guitar effects such as chorus, phase shifter/flanger, overdrive/fuzz and sustain pedals). For the time being, we'll leave the possibilities of the electric guitar up to your creativity and imagination.

Getting hold of a bow shouldn't prove very difficult. The chances are that you know someone (or someone who knows someone) who plays or is learning to play, a bowed instrument, and who is willing to loan you their bow and a bit of rosin for a weekend. Failing that, local music stores, string instrument repair shops and sometimes music schools or tutors will rent you a bow for a small fee. The same goes for a guitar if you don't happen to have access to one.

Preparation

YOU'LL NEED TO either remove or tape up the innermost strings so they don't resonate when you bow the outer strings. For a serious set of multi-samples, I prefer to remove all the inner strings so as to prevent even the slightest sympathetic vibration coloring an otherwise perfect sample.

After removing or taping up the redundant strings, make sure there is enough rosin on the bow, and no excess finger-oil on the strings that are left. This will ensure that the strings will sound clearly when bowed.

To remove finger-oil, grease and grime from the strings, sprinkle a little isopropyl alcohol or tape-head cleaner on a piece of cotton or fabric and rub it up and down the string in question, being sure to keep the solvent well away from the instrument's finish to avoid any accidental damage.

Rosining up a bow is easy: simply rub the block of rosin (you did remember the rosin when you borrowed the bow, didn't you?) up and down the length of the bow hairs until they are evenly coated with the now finely-powdered rosin, then gently tap the bow to dislodge any excess.

The Position

FINDING A COMFORTABLE position to bow a guitar in is not the easiest of tasks. Guitars are designed to be played with a plectrum or the fingers, not a violin bow (despite what Jimmy Page would have you believe), while suspended from the shoulder by a strap or rested upon the knee. Attempting to bow a guitar while it's resting on your knee may result in untold damage to your nether regions, and since gripping a 5" deep guitar under your chin is nigh on impossible, there are certain

compromises open to you. The positions I've had most success with are:

1. Resting the guitar, upright, upon your knees while seated.

2. Resting it, again upright, on the floor or, preferably on a table top with a soft cloth or towel underneath to prevent any buzzing or rattling between the guitar and the surface it's resting on.

Bowing Technique

BEFORE YOU EVEN consider sampling your bowed guitar, you really should experiment with how you're going to bow the darn thing. Not that I'm an expert on the subject, but the main objective seems to be to draw the bow across the string in as smooth a motion as possible and with a consistent pressure; the consistency of pressure being directly proportional to the evenness of the tone produced. Consequently, you'll find that a certain amount of pressure is needed before you can coax anything resembling an acceptable tone from the instrument. (After experimenting with bowing guitars my respect for string players has increased many-fold). Once you find the minimum amount of pressure required to get the string to "speak," you'll hear that firm pressure produces a brighter tone color than a more gentle pressure.

As with plucking a guitar, the position at which the string is bowed has a lot to do with the resulting timbre. Bowing close to the bridge produces a harsh, almost brittle sound, while bowing the center of the string produces a very rounded tone, reminiscent of a square wave. For what sounds to my ears to be the optimum position, try bowing the strings where you would normally pluck them: 3-6 inches from the bridge.

Take time experimenting with the bow to find out why The Strings are universally considered to be the backbone of the orchestra. Play around with different bowing pressures. Practice starting a note off with a soft bowing pressure fading up to full, and vice versa. This is easier said than done.

Try some "spiccato" playing – short staccato notes in the best Beatles/George Martin style. Or bow fingered harmonic notes for a hollow, almost glassy tone color. Tapping the string with the back of your bow (con legno) yields a hollow, woody, almost ethnic percussive sound and is one of my favorites. (How long did you say you borrowed that bow for?)

Microphone Placement

THE POSITION OF the microphone for recording bowed acoustic guitar is more akin to that for other bowed strings than to the position you would use for a standard plucked or strummed acoustic guitar. Unless you purposely want to exaggerate the sound of the bow being drawn across the strings, the mic should be positioned no closer than 18 inches away from, and pointing towards, the sound hole at a slight angle to prevent any boominess. Miking distances of 3-10 feet will give a more natural bowed string sound, allowing the entire instrument's tone color to develop and interact with the room.

Ambience

THE ROOM YOU choose to do your sampling in will add much character to the finished sound. As a matter of fact, the larger and more complex the room you record your guitar in, the more interesting your sample will probably end up.

Alternatively, if you have a concert hall setting on your digital reverb, try using it when sampling. Large room and plate settings can also be used to good effect. Experiment with reverb decay times between 1.5 and 4.5 seconds with brightness up almost full. Care needs to be taken with long reverb decay times as the initial reflections may cause a repeating echo effect if you loop too early on in a sample.

If you can manage it, try taking samples in a local school gymnasium, church, meeting hall or whatever. Remember, properly recorded, a real room is preferable to using all but the most expensive reverberation devices for adding ambience. Keep in mind also that you can exaggerate the size of a room by mixing in one or more microphones facing distant walls in addition to the one aimed at the instrument.

Sample Rates

OF COURSE THE higher the sample rate, the greater the fidelity your samples will have. This should go without saying. With most samplers a comprehensive multi-sample will limit you to fairly short samples at your highest available sample rate, and will often mean having to settle for "shortish" loops. Rare is the instance where I've heard a convincing short loop on strings. You'll most likely need to trade off a bit of top end with a low or mid sampling rate to enable working with longer, more natural-sounding loops.

As with other things in the order of the universe, there is a time and a place for everything, including sampling rates. I've been in on recording sessions where I'd presented the clients with some of my best string samples (the ones sampled at the highest rate where the string players sound like they're just on the other side of the speaker and you can almost smell the rosin on the bow) which were too realistic for the project at hand. Instead, clients preferred samples from the bottom of my barrel that were "mellower and rounder" to "pad things out a bit." Unbeknown to the clients, they had chosen sounds that had been recorded at mid sampling rates (so much for hi-fi). After getting over the "all that work for nothing" bit, I started to think in terms of where the strings would be placed within an arrangement. Between assorted library samples, and some of my own, I divided my samples into two sets: Solo strings/Foreground sections (high sampling rates) and Background solo strings and Sections (mid sampling rates). They stayed that way for a week.

Multi-Sampling

CONSIDER TWO DIFFERENT string multi-samples layered on top of one another for a Mega String Section Multi-sample . . . one with fewer samples recorded at a high sampling rate (foreground set), and a second one using samples recorded at mid sampling rates (background set). This can be executed either as one enormous multi-sample, if your sampler has enough memory and layering facilities, or as two different overdubs onto tape.

"For a serious set of multi-samples, I prefer to remove all the inner strings so as to prevent sympathetic vibration coloring an otherwise perfect sample."

Constructing layered string ensemble keyboard maps with staggered sample crossover points not only offers the lushness and depth of two different sampling rates and looping cycles occurring simultaneously, it also demonstrates a psycho-acoustic illusion useful to the sampling fraternity: two loops of differing length when played together are much less noticeable to the human brain than individual loops. Loops with slight imperfections can often prove quite usable with this mapping technique.

Bowing Other Strings

IF YOU LIKE what you've been hearing, don't just stop at sampling standard guitars. The dobro guitar, pedal steel guitar, acoustic bass guitar, banjo, mandolin, dulcimer, harp, zither, autoharp, ukelele, piano, yang t'ching and so on, are all sources of virtually unexplored bowed string tone colors.

Without having to worry about the inherent difficulties of bowing these instruments in a live situation, sounds and musical passages previously undreamed of can now be played with ease – thanks to the magic of digital sampling. So let's start hearing some new sounds, OK? ■

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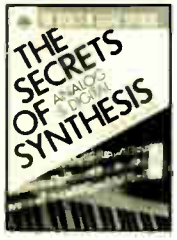

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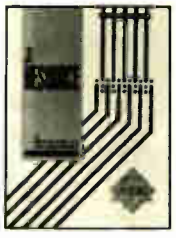

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OFF THE RECORD

GRP

Super Live in Concert

GRP

"The only thing deader than my ears was my bottom." - Lucy Seligman-Kanazawa, The Japan Times Weekly.

Well, yes indeed. I taught my sister a lot about journalism. But that comment, voiced the day after a marathon concert of GRP artists, burst forth untutored from Mrs Boo Boo. The evening's concept was a great one – have some of the hottest talent from one of the most exciting new jazz labels perform *en masse* for a crowd of jumping Japanese jazz fans. The evening was recorded for LP, cassette, CD and DAT; videotaped for Japanese television and a future home video; written about hysterically by the various corporations involved; and promises to be out as a board game by next year. The one thing the evening wasn't – as several in attendance have told me – was interesting or enjoyable. According to them, the volume level made most nuances invisible and the sheer amount of music and talent offered tended to blur into a cacophonic mess.

GRP has kindly offered us an edited version of the evening on double album, double cassette or double Compact Disc. I chose to review the CD because it includes several bonus tracks adding up to about 109 minutes.

Lee Ritenour has a reputation based more on the sheer amount of record dates he's done than anything else, yet surprisingly he's a very good guitarist on the evening's first three songs. Starting with 'Early AM Attitude' (no groveling for radio play here), a bouncy song written by Dave Grusin, Rit struts his stuff in a very tasteful way. Grusin sounds more interesting than on recent solo records, and the mood on this section of the concert is reminiscent of the *Harlequin* collaboration of a few years ago. A lively latin funk workout, 'The Sauce,' allows drummer Vinnie Colaiuta to show off some amazing but in-the-pocket groove playing, while Tim Landers provides bass in a basic but functional manner.

Ritenour's showcase, a medley of 'Water From The Moon/Earthrun,' is delightful, adding some new interpretations to two songs which are pretty appealing to begin with. At this point Tom Scott appears, and the evening begins to look very long. Now, I don't know how many of you sit around thinking to yourselves "Gee, I wish somebody would record the love theme from *Tootsie*." For those of you that do, buy this record. For those of you who don't, avoid this clichéd and tired film score pretending to be a jazz song.

The second half of the evening is spent in the company of the Chick Corea Elektric Band. Featuring Corea on keyboards, John Patitucci on bass, Dave Weckl on acoustic and electronic drums, Eric Marienthal on sax and Frank Gambale on very loud guitar, the group has developed into Corea's most consistent band since Return To Forever. The electronics employed by the band are used well, with some sequencing by Corea and Weckl, but a lot of live interplay among the band members.

The CD starts with 'Overture,' a medley of melodies with some involved trading and themes. After listening to it several times, I found myself pressed to say whether I liked or disliked it. It was just there, showing off chops, and not really working as a song.

'No Zone' features John Patitucci on acoustic bass, and other than the fact that this is theoretically the Elektric Band, the song stands out as the highlight of the concert. Next comes an exciting version of 'Light Years,' which features an involved set of trades; a quintet version of 'Rumble,' which is a showcase for Weckl and has one truly weird bit of guitar playing by Gambale that put him back in my good graces; a neat arrangement of 'Sidewalk' which showcases the whole band (in a very uninvolved non-trading situation); and one weird solo by Corea, 'Full Moon,' which demonstrates, for those who didn't realize it, that a synthesizer can sound just as dull as a string quartet on a mediocre out-of-context classical piece. To Corea's credit, he trades in an involved way with himself, an impressive feat thanks to Yamaha instruments and Chick's left and right hands.

I really do like a number of GRP artists; too bad I can't recommend their work here. ■ *Adam Ward Seligman*

MARC JORDAN

Talking Through Pictures

RCA

Singer/songwriter Marc Jordan has put together a cast of LA's hot studio cats and come up with a winning debut album.

Talking Through Pictures is a collection of extremely polished "new age" pop tunes. The big sound of this record comes from very tight production. Keyboard player Kim Bullard and programmer Paul Devilliers share production credit and half credit for writing several of the ten songs that make up this record. Fat synths with imaginative sound programming along with big drum sounds give the album its dreamy but forceful sound. Marc Jordan is not listed as playing any instruments but is given credit for co-writing every tune, even the instrumentals.

Jordan's voice fills out the sound and feel of the album. The lyrics are not too deep, and choruses are repeated several times for each song. There are a couple of psuedo-political songs, several quasi-love songs and two about modern lifestyles. The music, however, is what really makes this album. In each song the synth and guitar develop a real sense of being someplace, either in the jungle for 'Soldier of Fortune' or the beach in 'Catch The Moon.' Even the inside of a television, for 'The Glass Bead,' comes to mind. There are no individual song credits, just a list of musicians. Outstanding performances go to the guitarists (amazing "compressed to hell" guitar sound) on several tracks. The bass and drum playing are equally good performances. The big cheer, however, goes to the keyboards. Kim Bullard isn't really flashy, just solid.

Although you can dance to some of the tunes, I personally recommend a bottle of Chardonnay, a candle or fire (but only if you have a fireplace), and a close friend to listen with. ■ *Rick Huber*

Photography *Ebet Roberts*

from ZEN *to* VICE

Jan Hammer's contributions to music span nearly two decades, from the impromptu jams of the Mahavishnu Orchestra to the acclaimed scores of *Miami Vice*. Now he's off in new directions, with a solo album and a desire for more of everything. *Interview by Deborah Parisi.*

ESCAPE FROM TELEVISION is a rather triumphant-sounding title for an album, particularly from a composer known for his television work. Since it was already known that Jan Hammer was leaving his coveted *Miami Vice* gig when the record was released, I presumed that he was using it to announce his departure by putting out an album of rock or pop songs. It sounded logical anyway.

So much for logic. The only thing escaping here is his music, originally written for *Miami Vice* and now presented without a bunch of goons running around on a set dripping with humidity. At last you can hear the music as the composer intended, setting its own mood, evoking its own images. A truly different experience than sitting in front of the tube on a boring Friday night.

Hammer's experience with writing to picture is nothing new, although he's probably known more for his part in the grueling speed duels and rhythmic ferocity of the Mahavishnu Orchestra. Before any of that, he wrote a score for a film in his native Czechoslovakia, a fairy tale with music composed in a classical style. Even though the musical is still extremely popular in Prague and is shown every year at Christmas, Hammer's name no longer appears in the credits. "I don't exist in Prague any more," he says. "Nobody wrote the music.

"I was playing around Europe as a jazz pianist and lived in Germany for a while," he goes on to explain, "playing in studios and in a jazz club every night. Then the Russians invaded, and I was faced with the reality of not ever going home. That's when I decided to come here." More than a minor social adjustment was necessary, but Hammer seems to have reconciled himself to the inevitability and the positive aspects of his fate.

Once in the States, Hammer went to Berklee for a while; but having just completed an intense music degree at the Academy in Prague, he was not prepared to subject himself to more schooling. "All I really wanted was to be as good a jazz pianist as I could be and play with the best people. Fortunately, after struggling around Boston for a while, I got my first big job with Sarah Vaughn. And what that did was to make me a member of a certain club. I was no longer on the outside looking in. I was heard by more important people, and my name got around much faster." He sighs. "It seems so far, far away now."

The next big break for Hammer came with the formation of the Mahavishnu Orchestra. "Things changed completely," he says. "And about that time I went from acoustic to electronic. The first year of the band was actually the first time I got my hands on a Minimoog. And again, I was able to stand up and be counted in the rock world. With the piano it's very hard, because the piano makes very little contribution in a way that I would like. It's

a great accompanying instrument, but overall there's no chance for a piano to really shine like a guitar can. Whenever a piano would play with the band, the electricity would go down. With the synthesizer, I could keep right up there.

"Once I got to the Mahavishnu Orchestra, the amount of equipment grew geometrically," he recalls. "All of a sudden it was impossible; we had to get a crew and everything. We had tons of gear. That band was the loudest thing I had ever heard. And it was the synthesis of everything at that point that I wanted to do. It was jazz, and it wasn't jazz; and it was fun, and it was very new for all of us. We were all freaked out because we didn't know what was happening."

From what I remembered of the group, audiences weren't exactly sure of what was happening either. "Yes," he says. "The first few performances, people didn't applaud for quite a while. There was just a stunned silence. A piece of music would end after a half hour of total crazy madness, and the audience was silent. It always took a delayed reaction.

"I really reached the peak of complexity with Mahavishnu, and that was as complex as I ever care to get," he says. "I find it rather tedious, especially listening back to it. It was like the Olympics. It was like, OK, we did 19/8; the next tune's going to be in 23/8. And we'll break it down a different way in each measure. And I'm going to take the first 3½ measures, and then you'll do your solo . . ." Hammer shakes his head. "We were trying to make a statement, certainly, and we got our point across: We can play the most complicated music in the history of the human race, and play it louder than anybody and faster than anybody. Great. So we accomplished that; now what's next?"

What was next for Hammer came in 1974, with the construction of an eight-track home studio, getting a band together that suited his style more than Mahavishnu, and going back on the road. "A lot of the Mahavishnu music went completely over people's heads. We were playing arenas, 20,000 people every night, and it was all boys. They enjoyed the music for the wrong reasons; they wanted to see how fast you could play. I just knew there was something I could do that would be more fun, and the audience would change overnight. And that's what happened.

"Once I started peeling away all the layers of brain stuff, I started injecting more and more fun and more rock 'n' roll and more melodic invention into it, and attracted a whole different crowd. There were not these guitar freaks, those sort of glazed eyes that hang on your fingers. I began to be liked for the right reasons. Then Jeff Beck came to see a concert, we'd been friends from before, and he eventually just took on the whole band. And that was

fantastic – those years were great. Still, Jeff ultimately wanted to play more fusion than I did. I kept saying, 'Let's play more rock 'n' roll,' but he was still trying to prove something. I have no *need* to impress anybody with that after Mahavishnu, but most musicians do. They would like to have that sort of credential." Again, Hammer wanted to change directions.

"I continued on after Jeff had one of his sort of remissions into automobile construction and modifications of hot rods, which he does most of the time," he laughs. "I went out with my band in different incarnations and made a bunch of records, which were all more pop and rock. But that was another frustrating period, because I was never given a chance to really be successful commercially. Everybody from the record industry just wanted me to be the fusion whiz, which I always had been and didn't want to be. I finally gave up on ▶

the record industry, after making a record which had a hit on MTV and the single wasn't even put out as a single. I told them that if this is not enough, I'm on the wrong planet."

Timing was once again on Hammer's side. "By that time, around '82, I had made enough contacts in the film industry to be able to start scoring. About a year later, I got involved with *Miami Vice* because I wanted to try TV. That turned out to be great. And now I have another record out. It's funny," he sighs, "just when you give up on everything . . . when you completely give up, it happens."

MUSIC

ALL ALONG THE WAY, Hammer has been into computers and electronic instruments. "But I had no idea that I would end up this way," he says, gesturing towards the keyboards and terminals which surround him. "I was going to be a doctor. It didn't hurt me that I was always fascinated with computers, though – that was something that my father got me into from the medical end, because he was involved very early on with them. I was fascinated by them, and took to them like a fish to water. Even before I could find an application for a computer in music, I was already hacking away, trying to find out . . . I had the first Vic 20. Now they're all around the house – I'm only using about four at a time, but it still gets crazy between the Fairlight, IBM, Macintosh and C64."

He offers a warning to those who might think computers are going to make it easier to be successful in the music industry. "You just cannot rely on them to do the work for you, you know; you have to do the work still."

Even now, when technology in music seems to be an undisputed necessity, Hammer runs into folks who need to be convinced of the versatility of electronic instruments. "A lot of the people I work with, especially producers and directors, are older, and they still think of electronics as a one-dimensional sound. I tell them, 'I may surprise you, because all you're going to hear are acoustic sounds.' And these guys are knocked out; they can't believe it. But electronics are more than they used to be. If you want electronic sounds, I can buzz with the best of them, but I don't necessarily like to do that all the time. Sometimes it's nice to go completely neon and chrome, and sometimes it's nice to go grass and trees. It depends completely on the musical idea that comes first. The trick is letting the soul of the artist shine through.

"A string quartet can sound as tedious as electronic music," he continues, "or a punk band can be just as unpleasant. They're playing 'real' instruments, but if they are as bad as they want to be, then it's going to be just as bad as computers and electronics can get. The medium doesn't really matter."

Neither, in Hammer's opinion, does a particular patch mean much towards the success of a piece of music. "In the early days when I first started, people would say my playing on the Minimoog reminded them of electric guitar. And I tried to explain to them that it's not any particular patch, it's the playing. But nobody would believe me," he says. "Sometimes I would get together with somebody and say, 'Well, this is the sound; you play it.' But it wouldn't sound like a guitar, simply because they don't think like guitar players. All the bends and all that, that's what makes it sound like a guitar. It's the playing."

Escape from Television (MCA Records) has a lead guitar sound on it that – I swear – really does sound like a lead guitar, but Hammer denies that it is. "There is some rhythm guitar," he admits, "but no lead. I can't play guitar to save my life, but I love the sound and I love the energy. And I try to get that any way I can. All the leads on the new record are either done on the DX7 or the Memorymoog. Guitar players could tell it's a keyboard, because there's a certain system of how notes fall and they could tell I'm not following that. The melodies have a little different twist to them. But non-guitar players . . . I don't think they could tell."

There's no denying that at least part of Hammer's success in recreating the sounds of "real" instruments rests in the Fairlight. The Series III is the heart of his new studio, and his relationship with it hasn't stopped growing since his first experience with it at the Caribou Ranch on a project with Al Dimeola. "Even after recording for 10 or 12 hours a day, I would still go back and just sit at the Fairlight, with my mouth wide open, going through the sounds, setting up different performance layouts, listening to the samples. I would just sit there for hours and go nuts.

"I knew that I just had to have it, but it was a lot of money," he says. "I finally said, 'I'm going to get a loan, mortgage, anything' – there was just no way anybody was going to deny me this instrument. And, sure enough, within three months I just bought it. I couldn't afford it, but in the next year I did two films with it that more than paid for the Fairlight.

"It's still the most important thing in my composing," he continues, "especially now with the fidelity of the Series III. With the Synclavier, you have to always add things, and by the time you have a system like the Fairlight, you've spent $300,000. Not to show any disrespect to Synclavier; I'm just extremely happy with the Fairlight. Especially with the human interface, and especially the concept of Page R."

Hammer's enthusiasm for the Fairlight comes close to gushing praise, stemming from the time it saves and the capabilities it provides. "When you have to turn out the equivalent of an album every two weeks, you need something," he says. "In the first year of *Miami Vice*, I was doing probably 15 or 20 minutes of music; then in the second year, we got more surreal, and I averaged between 25 and 30 minutes. It was an unbelievable amount of music. It was like a fabric, going through several different scenes, in almost an operatic sense. I got an incredible kick out of it; it was so much fun. And a lot of the results are on *Escape from Television*."

The pressure of scoring films is at least as

demanding, and Hammer is relying on the Series III in working on his current project. "It's an HBO premiere film, a thriller, with Ellen Barkin and Andy Garcia called *Clinton and Nadine*," he says. "It's really a great and exciting film. And here I am – I don't have a studio, and I'm already writing music, and I have three weeks to deliver the movie. Deliver, finished, the whole score. And all I have is a rough cut of it. It's really like Russian Roulette. I have to do one big commercial as well, next week. But these things come together really fast, and you cannot be picky. I wanted to do it. Now I have to do it." Somehow you get the feeling that he won't miss the deadline.

"Since the Fairlight III now has the whole SMPTE implementation, it really works well," he says confidently. "It makes it possible to really work the way I like, to just go instinctively, watch a scene and play something off the cuff, and then go back and edit. That's the best way to write. I mean, I cannot figure out minutes and seconds – that's a nightmare if you have to do it with a stopwatch and a pencil. I could never work that way. Even in the pre-computer MIDI days, I did scoring, but I did it all on the fly. The only thing that was repeatable was a certain click that I would establish for myself, and I would play against the click sometimes, sometimes with it. And I would lay a guide piano track or something against the click. It was a very laborious process.

"But technology is what enables me to create so much music in such a short time. You need technology to take care of the mundane. Especially with the changes in television – like this is Sunday night, and all of a sudden you see the new version of the show, and there have been so many cuts that your music doesn't fit any more. You have to be able to just go and do it on the computer.

"Of course, these are the obvious advantages of technology," he smiles. "There are other things that are happening now that really fascinate me – the random things. Algorithmic composition programs, which in the right hands can produce incredible results, are great. The Dr T's program, Algorithmic Composer, just blew my mind completely. You can actually feed certain ideas, patterns, outlines of scales, how many measures you want, chord changes and stuff like that in, and it'll start playing things at you. And you just pick – I like that one, try another. And then you can combine them into a sequencer and have the whole polyphonic version of your idea right there, and go in and do fine editing and correct some obvious mistakes that the computer makes that are just dumb." Hammer laughs again. "You know, it doesn't have any feelings, but it is capable of generating an infinite number of variations on the theme.

"Now I'm learning to work with M and Jam Factory on the Macintosh," he says, his enthusiasm growing. "They have levels this deep. But they are fantastic. Also, the Macintosh is becoming *the* computer for me, as far as off-the-shelf computers go. It's fun whether you do music or not. I use it as an everything tool. We designed the control room in the studio, all the layout, everything was done on the Macintosh."

"I finally gave up on the record industry, after making a record which had a hit on MTV and the single wasn't even put out as a single. I told them that if this is not enough, I'm on the wrong planet."

HAMMER'S NEW STUDIO, which was in the final stages of construction at my visit, would be any musician's fantasy. His home in upstate New York is actually a farm, and the building housing the new studio was, in its former incarnation, a barn. ▶

►spacious. Sliding glass doors in the studio open to a porch, where he can actually watch the deer walking by, nibbling on the stubbles of grass outside. Even the control room has windows to the front and rear, spaced so that they are not parallel to avoid unwanted sound reflections. The control room is immense, as control rooms go, to allow enough room for the Fairlight, Yamaha DX7II, Oberheim Xpander, Roland D50 and MKS20 piano module, Minimoog, Kawai K5, and everything else he uses in scoring. It's quite a step up from the cramped room he's working in now.

"If you want electronic sounds, I can buzz with the best of them, but I don't like to do that all the time. Sometimes it's nice to go completely neon and chrome, and sometimes it's nice to go grass and trees."

Nevertheless, with the assistance of the design consultants from Personal Recording Environments Inc, there are no longer any thoughts (or remnants) of horses or cows in the structure; it is a superbly professional musical environment.

It is not, however, typical. Unlike most studios which are designed and lit to make you feel as if it's always the middle of the night, Hammer's place is open, airy and

Most of his existing recording equipment will be moved over, however, not replaced. "I really am happy with my setup," he says. "An Otari 24-track, Sound Workshop 34 console, with an automated DiskMix that runs on the IBM. I'm still living in the analog world simply because I can't afford digital. And also because, having worked in both mediums, I tend to prefer the sound of analog for my particular kind of music. There are certain classical things that I do with piano and strings which would benefit from digital; but for pop and dance music, the stuff that I'm most known for, it sounds better on analog. Done right, done at 30ips, ½". I will probably get a DAT recorder, just to mix down to, for two-track mixes."

The mere mention of DAT seems to set him off, and he asks if he can offer his opinion on the controversial digital recorder. "The whole controversy is just so ridiculous," he states. "I am one of the people who supposedly stands to lose a lot if there is taping going on, but I'll be the first one to fight for the right to have the latest technology – unadulterated – available to everybody. We have to have the best technology. Why make it so good and then degrade it? We certainly didn't impede technology with the birth of the atomic bomb. That was a good time to stop, right there, and we didn't stop. If we didn't stop then, we certainly shouldn't hold DAT back now." It's refreshing to hear, especially coming from someone who could lose some bucks.

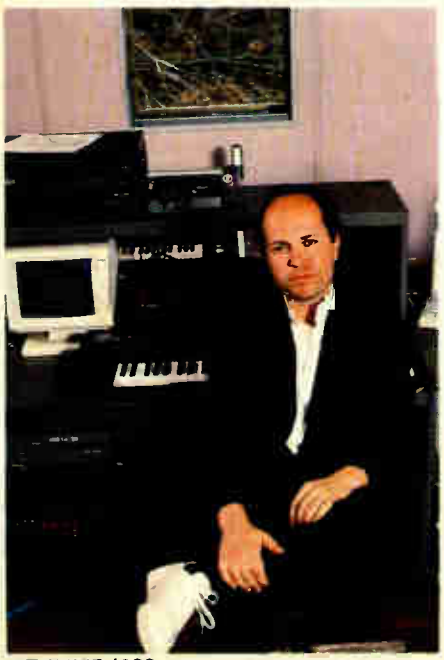
Of course, most of what Hammer is multitracking comes directly from the Fairlight. And he has strong opinions on doing your own sampling rather than relying on the library which comes with the instrument. "All of the orchestral things are coming from the Fairlight library," he qualifies. "I don't even know any clarinetists. But all of the drums, all of the guitars, basses, percussion are my own samples, because only you know what you want to hear, and you can then achieve a certain ideal of that. With most of the drum samples people provide you with, those drums are not really hit by drummers. I find that, when you go to the usual library of drum sounds, the idea for sampling it was getting a recording engineer and some technical guy together and saying, 'OK, put the snare here and hit it; Wow, it's a snare.' But it's not like that. Being a drummer, I'm very sensitive to that, so I have to hit it myself. And it goes that way with snares, bass drums, toms and cymbals. Playing cymbals really requires a technique. When I play it, I know when it feels right."

Propped up against the Fairlight, I spy a little keytar, a remote keyboard controller, and wonder why, amidst the technical

sophistication of the rest of the gear. So what, pray tell, is it doing here? Hammer laughs again, an infectious, apologetic laugh. "It's not the most beautiful instrument, unfortunately, but it's small and portable," he says. "And it's been on the road with me for 10 years. When I'm touring, I'd rather have something off the shelf, so if something goes wrong, I'll be able to go into a music store and just pick up a KX5. Now I have several of them, but even these have been modified. Andy Topeka, my right arm, the guy who's putting together the electronics in the new studio, devised a way to put the pitch-wheels on the DX7 into this little mechanism. He built a little compartment, and I had all of mine retrofitted. I went to Japan last year with Jeff Beck, and I played this. But I use it in the studio, too, especially when I want to walk around and hit different modules and go to the console. I can stand up and feel the music in my legs – it feels different when you stand up. So I always have one around."

From someone who has found such tremendous success, both financial and personal, from his love for music, you'd expect some cheerleading from Hammer to all budding musicians. Unexpectedly, however, the composer takes a turn on this point, and charges in a completely different direction.

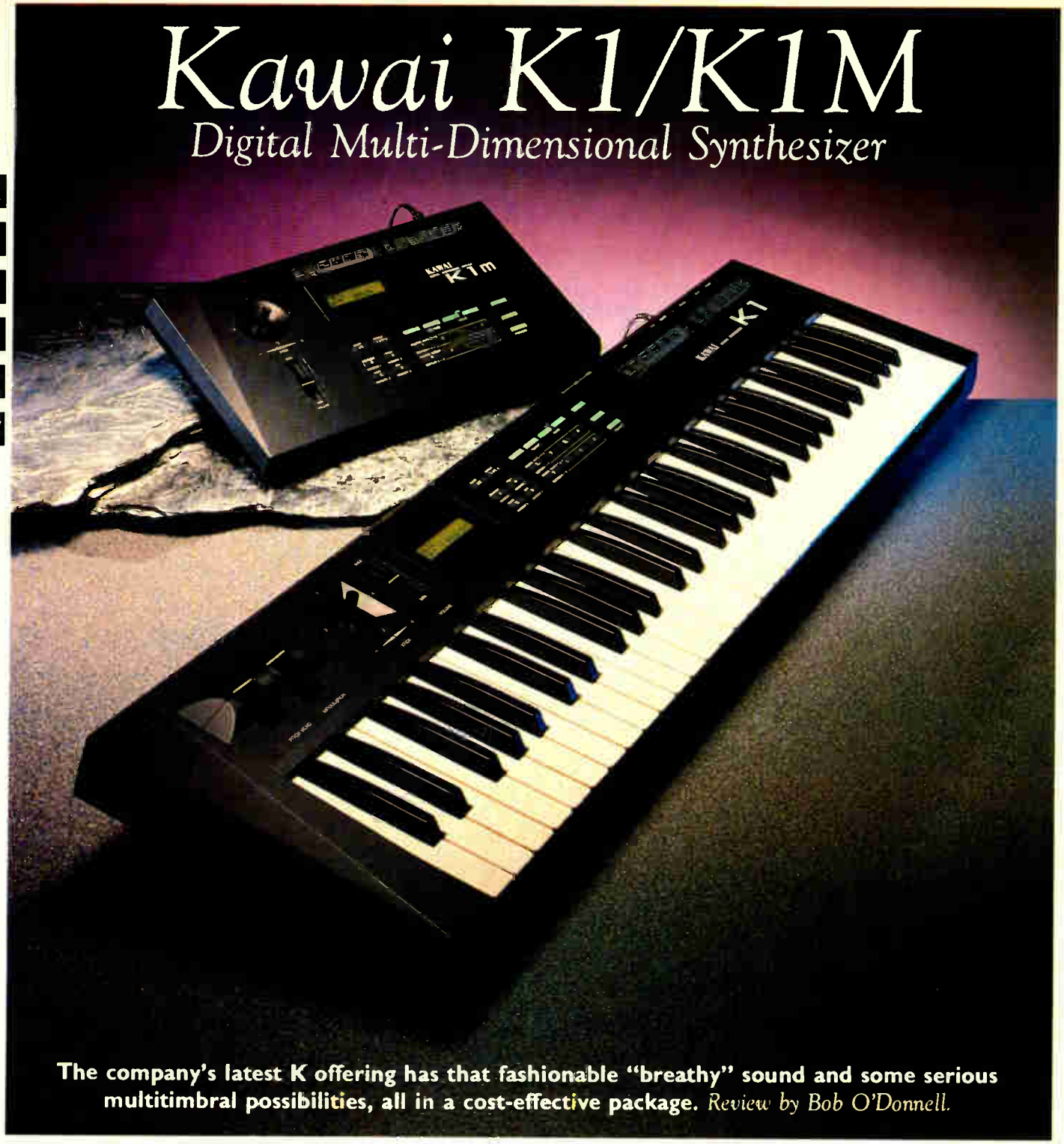
"The music business is impossible," he says. "I wouldn't advise it as a career – to *anyone*. You really have to know that you're onto something, and it will give you a certain relentless feeling, where you're driven. Once you're at that point, then you don't even need advice because you're going to do it anyway. But if you don't know, if you're thinking about it, I don't think you should attempt it. Music shouldn't be a matter of choice; it should be a matter of inevitability. I had to do it. I still have to. I live for it. And that's that!" ■



REVIEW

Kawai K1/K1M

Digital Multi-Dimensional Synthesizer



The company's latest K offering has that fashionable "breathy" sound and some serious multitimbral possibilities, all in a cost-effective package. *Review by Bob O'Donnell.*

AH, PROGRESS. IT'S a wonderful thing. A few years ago, an instrument like Kawai's new K1 would have cost thousands of dollars, if it would have been possible to produce at all. But technology continues to advance, prices continue to fall, and now nearly anyone can enjoy the benefits that advances in music technology have wrought. Particularly as manufacturers begin to break that magic $1000 price barrier, more and more people will start making the plunge into (or expanding their habit of . . .) new synth gear.

Along with the excitement created by advancing technology, however, come new challenges. After a while, people start to expect more for their money. Any kind of polyphonic synth will do at first, but pretty soon people start expecting a $2000 sound for a $1000 (or less) price. In a sense, Kawai has accepted that challenge with the K1 by producing an instrument that can make modern, D50-type sounds, but for significantly less money. The question is, have any corners been cut to make the instrument fit into the price range it does, or have things simply progressed to the point where the improvement is possible? In actual fact, it appears that the answer to both questions is yes, as you'll soon see . . .

The Instrument

THE SMALL AND sleekly-shaped K1 keyboard is of the 61-key weighted variety and responds to both velocity and pressure – an extremely impressive feat for this price. In fact, I believe it's the most inexpensive synth with aftertouch currently available. I received a K1M for review, so I can't vouch for the feel of the keyboard, but based on my brief

experience with it at the NAMM show, I know it's certainly worth investigating.

The KIM is an oddly-shaped desktop unit, roughly equivalent in size to the company's R50 drum machine. Some may complain that it's not rack-mountable, and certainly in some situations its shape will create a problem; but the fact is, it's a much friendlier unit to work with because of its design. It's very nice to be able to set it on a desk or other flat surface and program it. In fact, I think you'll find that if you're using it in a home studio environment you'll be more inclined to work with it than other rack-mounted gear. One other nice point about the KIM's shape is that it permits keeping the joystick (used for data entry and balancing different parts of the patch à la the D50) found on the KI.

The back panel of both units features a number of connections including a RAM/ROM card slot, stereo outputs, a headphone output, the AC adaptor input and the MIDI In, Out and Thru jacks. The KI also features a socket for a hold pedal.

The Voice

THE KI AND its related KIM module are multitimbral digital synths which combine PCM sampled digital waveforms with a VM (Variable Memory) tone generator. In English this means that the KI generates its sounds by playing back combinations of the 256 waveforms stored in its memory – 52 of which are 8-bit PCM samples and 204 of which are single-cycle digital waveforms produced by the VM tone generator. Up to four of these sounds, or Sources, can be combined in a single KI patch, which is eight-voice polyphonic. If you only use two sources, however, the patch will be sixteen-voice polyphonic.

The KI's Multi Patches – similar to those found on its big brother, the K5 – permit you to combine up to eight Single Patches, thus offering the possibility of having 32 different waveforms play at once (though it would only be a monophonic patch). The KI and KIM hold up to 64 Single Patches and 32 Multi Patches internally and an equal amount can be stored and accessed via the ever-popular credit card-shaped RAM and ROM cards.

The voice architecture of the KI/KIM fits into the wavetable synth category, not totally unlike Roland's L/A synths or Ensoniq's ESQ1/SQ80. One big difference between the KI and other wavetable synths, however, is that the Kawai does not have any sort of programmable filter. You have control over the waves used in a patch, their frequency and their amplitude – period. Roland's L/A synths don't allow filtering of their PCM samples either, but they do offer filters for the normal "synth partials." It seems unfortunate that Kawai doesn't offer any type of filtering, but the lack is undoubtedly related to their decision to produce an inexpensive synth. Surprisingly, the KI does not suffer that much (or at least as much as you might think) because of the omission. Thanks to the large number of waveforms – which starts to look a bit smaller because of this filter limitation (see below) – the KI can produce a wide variety of big, full sounds. You achieve timbral differences and timbral modulation on the instrument by using the more basic, brute force approach of simply selecting different waveforms.

Kawai did attempt to address the filter problem by including a whopping 204 single-cycle digital waveforms in the KI/KIM (which are well documented and illustrated in the Wave List booklet, by the way). Many of these are actually variations on the same basic sound. In other words, it's almost (but not exactly) as if they sampled and stored the same waveforms a number of times with different filter settings, or broke down complex sounds into a number of different single waves. So, for example, there are nineteen different sawtooth waves, each with a different harmonic spectrum, and six different waves labeled Brass.

The waveforms stored in the KI are broken down into six groups: the Basic Wave Group, the Low Frequency Range Group, the Mid Frequency Range Group, the High-Mid Frequency Range Group, the High Frequency Range Group and the PCM Wave Group. The Basic Wave Group

► contains variations on sine, saw, square and other standard synth waveforms. Within each of the four "Frequency Range" groups are further demarcations (and varying numbers) of Brass, String, Piano/Electric Piano, Guitar/Bass, Wind/Lead, and Bell/Percussion/Organ waveforms. Finally, the PCM group contains 30 one-shot samples, eight sample loops, eight Omnibus (or combined) sample loops – similar to those found on the D50 and MT32 – three reverse samples and three alternate samples.

The samples are all 8-bit and do lack the clarity of the ones found in Roland's LA synths, but they're certainly usable and work well in the instrument's excellent factory presets. (The only really disappointing one is the acoustic snare sample, which is so soft in comparison to the other onboard percussion samples that it's practically worthless.) Most one-shot samples are transients (like guitar, piano, string and trumpet attacks) and percussion sounds (nine of them), though there are a few non-looped sustain samples (strings, pan flute, etc) which are up to one second long. Many sounds are of the "breathy" variety (shakuhachi, voice, white noise, etc) and they contribute a great deal to the instrument's character. The looped samples are fairly seamless but not completely so; you can hear a subtle vibrato-like effect in a few of them.

Some of the sounds stored in the KI were multi-sampled across the keyboard to prevent aliasing and transposition problems. Unfortunately, Kawai was not completely successful in this regard because if you listen to some of the waveforms (PCM or VM) on their own, you will still hear some occasional sidebands and other extraneous noises when the sounds are transposed much higher or lower than their original C3 pitch. Clock noise, sidebands, and their related "associates" are an inevitable part of most sample playback processes, but it would have been nice if they were completely unnoticeable. You may be able to use some of these oddities to your advantage in programming patches, but they could cause headaches at times. Of course, a basic filter with only a cutoff control would have helped immensely, but you can't have everything . . .

The Patch

THE BASIC UNIT within the KI's voice is a Source. Either two or four of these can be combined into a Single patch, which will either be 8- or 16-voice polyphonic, as mentioned above. You can also mute individual Sources if you want to create a one or three Source patch, but the polyphony won't change. You select the number of Sources, as you do any of the parameters, by pressing one of the four main edit buttons, and adjusting the value with the +/– buttons or the joystick (which doubles as a data entry slider). The KI and KIM have very sleekly designed panels with a minimum of controls, which means that you often have to push a button several times to reach the appropriate software page. Luckily, the system is logically laid out and well illustrated on the front panel, so getting around is fairly easy – even without the help of the well done manual.

Parameters included under the Common Edit Mode, which affect all Sources in a patch, include control over Vibrato Depth, Speed and Waveform Shape, the amount that aftertouch affects Vibrato Depth, and whether the KI's mod wheel or external MIDI mod wheel messages affect vibrato depth or speed. The KI also has an auto-bend function for simulating horn blips and other slightly out-of-tune attacks. You can set an auto-bend depth and time amount, adjust how much velocity affects the auto-bend depth and how much the Keyboard Scaling curve (see below) affects the auto-bend time according to key or MIDI note number position. Finally, you can link frequency to aftertouch – in other words, do pitch-bends with pressure, set the pitch-bend range, choose from one of five Keyboard Scaling curves and select one of three voice assignment modes. Poly 1 cuts off a note the second time a key is hit (or a MIDI Note On message is received), Poly 2 allows the note to retrigger while the first strike (or Note On) fades away, and Solo is a retriggering monophonic mode.

The Frequency, Wave and Envelope Edit Modes are all used to set various parameters *per source*. Kawai has thoughtfully dedicated four patch select buttons for jumping from Source to Source within these modes and four more for muting or unmuting each of the Sources. By making use of these buttons you can easily keep track of where you are and quickly hear the results of your editing. They make working with the KI a breeze.

The Frequency of each Source can be adjusted with Coarse and Fine controls as well as be set to a specific pitch by turning off the Keyboard Tracking function. You could use this for keeping a transient sample the same across the entire keyboard. You can also turn the Vibrato and Auto Bend, and pressure-to-frequency functions set in the Common Mode on or off per Source, which offers some nice flexibility. Finally, you can choose how much the pitch of each Source is affected by the Keyboard Scaling curve set in the Common Mode. Though you won't be able to set up any specific microtunings with this, you can get some interesting effects.

The Wave Edit Mode is where you select waveforms for each source and also where the copy functions are found. You can copy any group of Frequency, Wave or Envelope parameters from one Source to any other. This mode also has Amplitude Modulation (AM) parameters which permit you to use one Source to modulate the output of another. As the manual succinctly explains, "This type of modulation produces overloaded sounds that are difficult to produce with harmonic synthesis alone." Basically, AM is another tool for producing some different sounds.

Photography Lucy Ellis

The Envelope Edit Mode allows you to set up an Amplitude Envelope and adjust its "shape" with several real-time parameters. The envelope is a basic ADSR with the addition of a delay control before the envelope begins and an overall level setting control. You also select from one of eight velocity curves in this mode and you can then adjust how closely different velocities will follow the shape of the curve. Overall volume per Source can also be controlled by pressure and key position, according to the Keyboard Scaling curve set in the Common mode. The attack time for the envelope can also be adjusted according to the Velocity curve and the Keyboard Scaling curve.

The Multis and MIDI

ONE OF THE nicest things about the KI/KIM are the Multi Patches you can create by combining up to eight Single Patches. Up to eight-way splits and various split/layer combinations can be easily put together in the Multi Edit Mode. Each patch, or Section, can be assigned its own High and Low Note Range, Transposition, ►

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▶Fine Tuning, Level, Panning (L, L+R or R), MIDI Receive Channel and Polyphony (a set number of voices, or a variable number to take advantage of the instrument's dynamic allocation capabilities). In addition you can set whether each Section should respond to high or low velocity settings – the threshold is *not* adjustable – for velocity crossfade effects, and on the KI you can set a Mode function which determines whether each Section will respond to the keyboard, external MIDI messages, or both. All in all, it's a thorough, flexible approach that makes the KI well suited for sequencer and live performance applications.

The KI/KIM's MIDI implementations have a similar thoroughness. The KI permits you to select a MIDI transmit channel for the keyboard and independently turn on or off the transmission or reception of aftertouch, pitch-bend, modulation, hold pedal and system exclusive data. You can do the same for program changes as well, but the KI and KIM offer four different options for their reception. Off ignores all program changes; Normal permits numbers 0-63 to change Single Patches and 64-127 to change Multis; Section uses 0-63 to change a Section within a Multi on the same MIDI channel and 64-127 to change Multis; and Link takes any program change and progresses to the next patch in the user-programmable Link function. In addition, you can have the KI either receive or ignore MIDI volume and velocity data. You can also set a separate receive channel (independent of the individual reception channels stored with Multi patches) and turn Omni Mode on or off.

The reception parameters are the same for the KIM, but the only transmission it can do is SysEx data; it can either send

individual patches or entire banks of 32. One nice detail included on both instruments is a MIDI reception indicator, which takes the form of a blinking cursor in the 32-character (2×16) backlit LCD. It's invaluable if you can't figure out whether or not the instrument is receiving MIDI data.

The Sound

NOW HERE'S THE real test. Though everything listed above is important, the ultimate test of any synth is its sound and I think the KI/KIM sounds pretty good. I wish I could've said excellent, but it has an annoying noise problem which prevents it from being as good an instrument as it's capable of. Unlike the MT32 – its most obvious competition – which is rather noisy while standing, the KI is quiet when it's not running because of a built-in noise gate, but it has a noise floor which kicks in when you begin to play certain patches. The annoying hiss lasts until the noise gate kicks in again as the patch fades away (sometimes a bit abruptly).

The actual sounds you can get from the instrument are well represented by the factory presets and an extra factory RAM card I was given for review. Most of the sounds are bright and punchy (no filter cutoff to mute the sound) with a fair amount of warmth to them. The low end is particularly solid, especially on some of the excellent bass sounds included. A number of the layered Multi Patches on the extra RAM card (like 'Miniseries', 'Miami' . . . and other TV-inspired names) are particularly full-sounding, though at the expense of polyphony. Interestingly enough, some of the excellent breathy sounds, like 'Ahh', 'Pan Flute', etc, are not adversely affected by the noise generated by the KI; instead it actually adds a bit to their breathiness.

The Conclusion

I LIKE THE KI/KIM for what they are, and I think they represent a good value for the dollar, particularly for those working in a home MIDI studio environment. However, I can't help but think how much better they could've been if they had a filter of some sort and were a bit quieter. The sound quality is certainly acceptable at worst, and extremely usable at best but it's those little flashes of sonic brilliance which make me wish for more.

Working with the KI is a joy. It's laid out and operates logically, it's got a very flexible MIDI implementation, and its dynamic allocation and multitimbral capabilities make it ideally suited for any type of sequencing situation. The KI keyboard also represents an excellent value for those looking for an inexpensive controller with aftertouch.

The voice structure of the KI – outside of its inherent limitations – is sophisticated enough to allow for very subtle control so that with a bit of programming you should be able to conjure up quite a variety of highly finished sounds. The factory presets are also quite good, if you prefer not to have to worry about programming.

Kawai is definitely onto a winner with the KI; too bad it's not a gold medalist. ■

PRICES KI $899; KIM $549
MORE FROM Kawai America Corp, 2055 E. University Dr, Compton, CA 90224. Tel: (213) 631-1771.

COMPUTER NOTES

HARD DISK RECORDING

Leaving Tape Behind

REVIEWS

Blank Software Alchemy

MIDI Concepts Concepts:One

Music Quest MIDI Starter System

Micro Reviews . . . and more

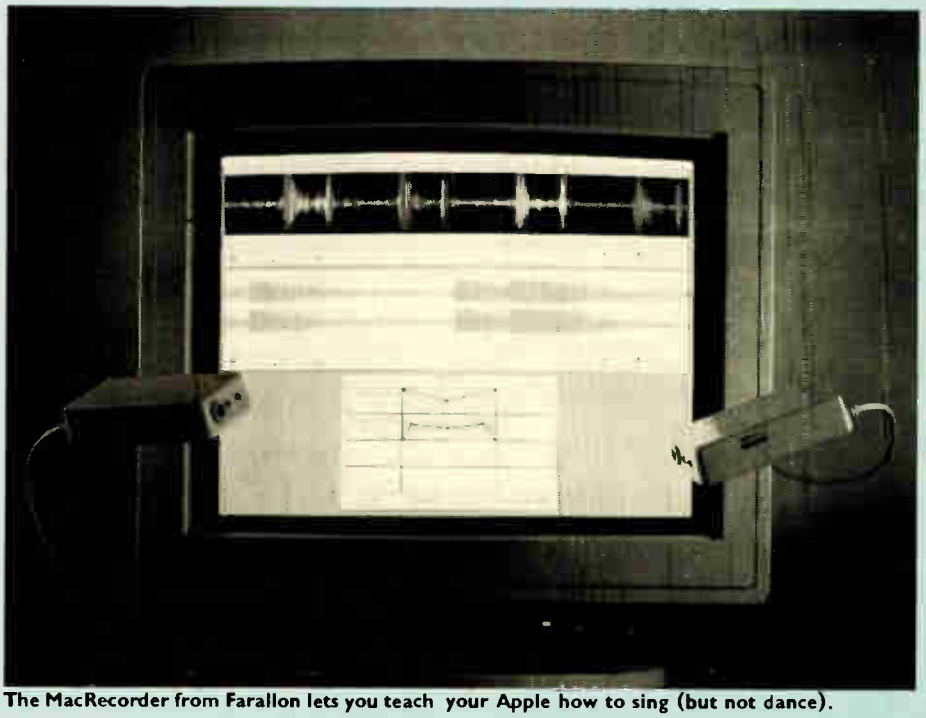
COMPUTER NEWSDESK

Shut That Computer Up!

Not a chance. At least, not with Farallon's MacRecorder Sound System. It is a sampling and sound editing system that records directly into their HyperSound, a HyperCard stack on the Macintosh. Soundfiles may also be saved to the system folder, or into Studio Session, Jam Session, SoundCap, or VideoWorks file formats. Maximum sample rate is 22kHz using the Macintosh's 8-bit format. It features a built-in microphone, and includes an input anti-aliasing filter. SoundEdit software allows downsampling (down to 5kHz) and data compression (down to 8:1), level changing, reversing, bending, echoing, filtering, flanging, and looping the sound. Other tricks include FM synthesis, ping-ponging, mixing, smoothing, and other sample manipulation through a visual interface. Two units may be used at once for stereo.

Aside from just playing around or adding sound to some of your other Macintosh programs or stacks, this is an easy way to get into sampling (keep in mind that bands like Big Audio Dynamite use Casio SK1's in place of Fairlights and the like). List price is $199, including a sample (no pun intended) disk.

MORE FROM Farallon Computing, 2150 Killredge Street, Berkeley, CA 94704. Tel: (415) 849-2331.



The MacRecorder from Farallon lets you teach your Apple how to sing (but not dance).

Tin Drummer

Gateway has recently overhauled their Rhythm Machine software for the IBM PC and Roland MPU401 or Voyetra 4001 MIDI interface. The Rhythm Machine is a program to allow visual construction and playback of drum patterns. Enhancements in version 2.0 include editing of any voice, ability to reassign sounds to any voice, extensive file saving and retrieving, real-time adjustments of tempo and dynamics, a song module that allows linking together of your patterns, a moving cursor that follows the performance, the ability to reconfigure the start-up defaults, and many more features. Rewriting the program in C from its original Basic is credited for improving performance and graphics. Any external MIDI'd devices such as a drum machine or sampler may be driven by the Rhythm Machine.

The program lists for $50. The disk includes an on-disk manual plus some demo patterns. An additional utility, Rhythm Plus, adds conversions into Voyetra's Sequencer Plus and Jim Miller's Personal Composer sequencer formats (with the MIDI Files defacto standard promised in the near future), and lists for $25.

MORE FROM Gateway, 1700 Cleveland Avenue, San Jose, CA 95126. Tel: (408) 286-5490.

The Year of the Ear

When MIDI and music software first started to appear, there was a prediction that it would be a boon to music education. We are finally starting to see the fruits of some of that in ear training: First with Listen for the Macintosh from Resonate, and now The Ear for the Atari ST from Steinberg/Jones.

The Ear grills the prospective student on chord structures including four or more notes and varying inversions and scale modes include Major, Melodic Minor, Natural Minor, Hungarian Minor, Aeolian, Dorian, Mixolydian, Hungarian, Whole Tone, and more. Other studies include transcribing melodies and interval naming. Testing takes place by giving the student a musical cue performed over MIDI. Note ranges, velocity, and tempo are all adjustable (including making the velocity of the accented note of a chord different from the rest). Chords may also be played as arpeggios. A student may save his or her course level and retrieve it when it's their turn to practice. The program will even print out a student's statistics (so they can better remember what they don't know and need to brush up on). List price is a modest $99.

MORE FROM Steinberg/Jones, 17700 Raymer Street, Suite 1001, Northridge, CA 91325 Tel: (818) 701-7452.

Integrated Madness

Performance Computer Concepts is betting on the fact that though some of us may like to piece together a component system, others of us would like a complete package, like their MIDI-Manager 7. The package includes an interface, sequencer, patch librarians, a performance programmer/controller, and even the computer itself if you should so choose. The interface is a custom device with seven MIDI In's and Out's each. The sequencer includes 16 tracks,

playback-only quantizing, MIDI advance and delay per track, microscope editing, velocity scaling, transposition, track sheets, and a host of cut, copy, and merge functions. Synchronization includes 24, 48, 96, or 192ppqn FSK read and write (plus, of course, MIDI, with SMPTE and song position pointer promised soon).

The librarians work with a host of instruments, including the Yamaha DX series, SPX90, Korg DW8000, Oberheim Xpander and OB8, and the Sequential Prophet 600. A generic librarian is promised in the near future, and will be free to registered owners.

The X6000FS footswitch includes six switches for starting, stopping, continuing, muting, fast forwarding, repeating, restarting, or changing the tempo of the sequencer. The computer is an IBM compatible (you can use your own, of course). Prices start at $849 for the software and interface (without tape sync) and run up to $1795 for the complete system (computer and all). MIDI-Manager comes with a 30-day money-back guarantee and free software updates for a year (a pretty good deal).

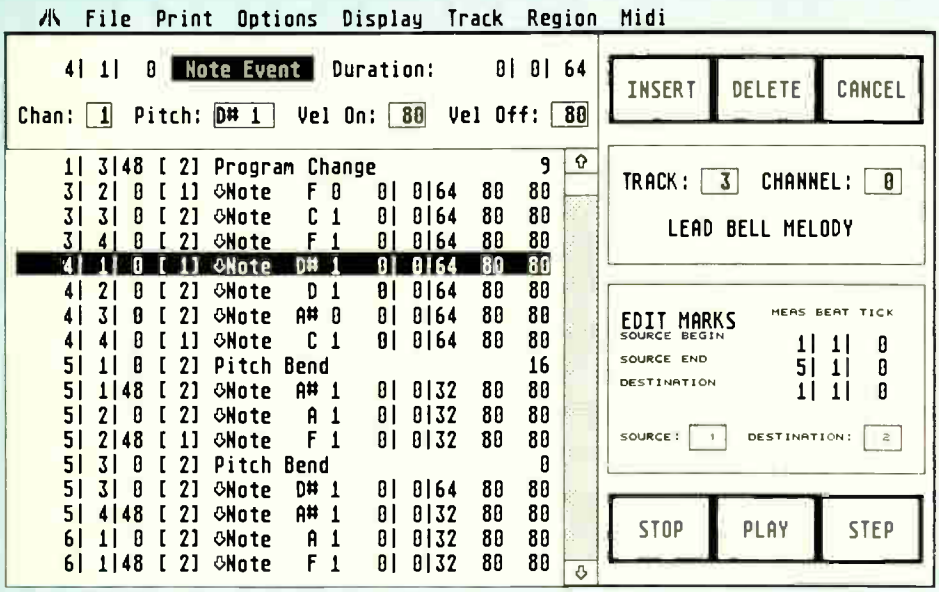
MORE FROM Performance Computer Concepts, 2378 Sirius Street, Thousand Oaks, CA 91360. Tel: (805) 493-1476.

MIDISOFT UPDATE

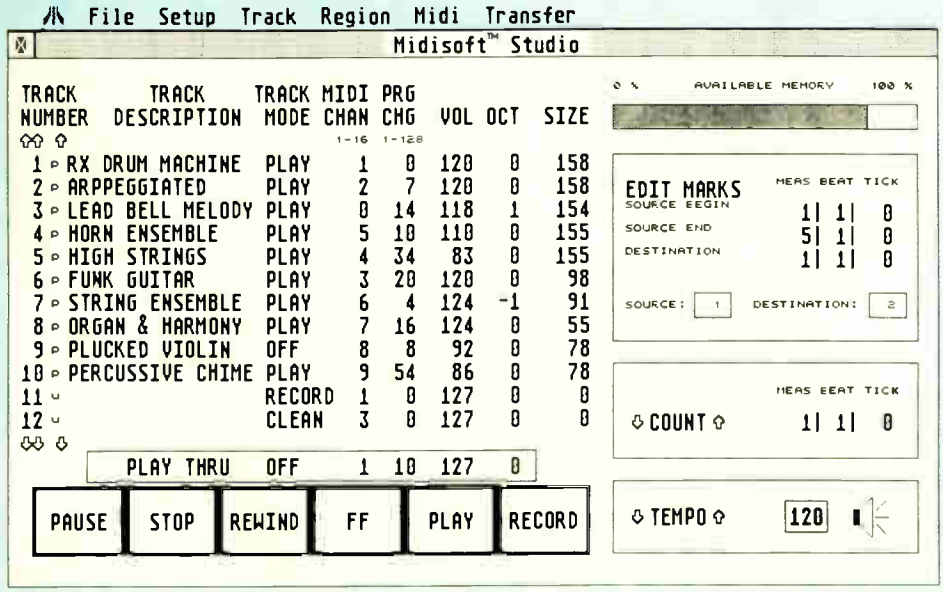
Gripped with update fever, MIDISoft has just announced an advanced edition of its MIDISoft Studio sequencer for the Atari ST. The list of new features is quite impressive, including (big breath): programmable tempo changes, recording and playing system exclusive information, support of up to 16 MIDI channels per track (it has 32), equivalent keystroke commands for most menu items, real-time MIDI volume control per track, real-time octave transposition per track, loading of individual tracks from song files, saving of preferences (including colors), transfer directly into (and returns from) another ST program, and the ability to format a disk and delete files without quitting the program. New file compatibilities include MIDI Files and the ability to read Activision Music Studio song files. List price is $149.

The original MIDISoft Studio program lists for a mere $99, and features 30,000 notes per song (520ST - 70,000 on 1040ST), on-screen tape recorder transport buttons, combine, move, copy, erase, insert, delete, and paste functions, and a rather complete, user-friendly interface. A new feature is the ability to also read Activision Music Studio song files.

MORE FROM MIDISoft Corporation, PO Box 1000, Bellevue, WA 98009. Tel: (206) 827-0750.



Main screens from MIDISofts' Studio sequencer package for the ST.



BOOT-A-CLASSIC

Future Music has the answer for those who would like to spend a little time listening to MIDI music, instead of composing it - the MIDITRAX series of pre-programmed sequence disks. Styles are supposed to cover '40s through the '80s, and "the arrangements are carefully done so that the songs can be performed with minimal equipment and still sound right." Each volume comes with track, channel, and instrument lists, along with tips for how to get the most out of each sequence without editing. Some of the supported sequencers include Dr T's KCS and MRS for the ST and their KCS for the C64, Roland MC500, MIDI DJ, Sequencer Plus, Texture, Glasstracks for the C64 and Apple II, Studio I and 2, Master Tracks Pro and Junior (ST and Mac versions), Steinberg Pro-24, etc. Each volume includes 10 songs, and lists for $59.95 each. Custom volumes are available.

MORE FROM Future Music, PO Box 1090, Reno, NV 89504. Tel: (702) 836-6434.

SOFTWARE FRIEND

If you've got one of Roland's GP8 guitar effects processors and an IBM PC or compatible with 128K of RAM - OK, so it's a limited audience - then you'll probably want to know about Snap Software's new editor/librarian for the beast, GP8 Companion. Following on the heels of the company's GM70 Companion - they seem to specialize in esoteric applications - this offers complete on-screen editing of all parameters and extensive librarian functions. The results of all editing are sent immediately to the GP8 so that you can quickly hear the results of your work. A Macintosh version of the program is also being planned.

The IBM program lists for $100.

MORE FROM Snap Software, 1116 Janey Way, Sacramento, CA 95819. Tel: (916) 451-9914.

MICRO REVIEWS

Snap Software GM70 Companion

A patch editor/librarian for the Roland GM70 guitar-to-MIDI converter and the Macintosh. *Review by Harvey P Newquist III.*

BY WAY OF information, the Roland GM70 is capable of manipulating all kinds of wonderful things for those of us who control our sounds from strings instead of keys. It can control up to four sound modules simultaneously – via branches – and also assign individual sounds to individual strings. Great stuff, but sometimes you need to perform mental gymnastics that would've made Einstein cringe in order to get all this information sorted and organized. This is especially true when you're using the not overly-informative 16-figure display panel on the GM70 rack.

Enter the Companion librarian. The single-disk product creates libraries (each is an individual patch window) for use with different sound modules. Each window is conveniently divided into two subwindows, one for GM patches 11 to 88, and the bottom half for patches −11 to −88. This gives you all 128 patches in each window.

Much like the initial window of the Macintosh Finder, you can open individual patch windows (libraries) once you are inside the GM70 Companion. A total of four libraries can be visible on your screen simultaneously. If you want to open an additional window, you just have to shut one of the ones already on the screen.

Most of the activity in the Companion takes place under the Options heading, which includes three basic commands: Control Assignment, Edit Patch, and Channel Selection. Control assignment lets the user whip through 11 controls on the GM70 and rapidly set them to the myriad of parameters found on the guitar synth. Edit Patch is a little more intimidating in that it gets the user into branching (assigning module controls) and individual string controls, but this is due to the fact that every single setting has its own scaling arrow function (for a

SoundQuest MT32 Editor/Librarian

An editor/librarian for the Roland MT32 and the Commodore Amiga. *Review by Stefan B Lipson.*

HOW MANY SOFTWARE engineers does it take to screw in a light bulb? None, say the software engineers: that's a hardware problem.

The specs on Roland's MT32 look great. The module is multitimbral with 128 internals, 30 percussion sounds, and built-in reverb. Although the module is not programmable from the front face, Editor/Librarians are intended to bridge that gap.

Unfortunately, documenting the MT32 and its capabilities is a responsibility that Roland failed to adequately address. So who should take care of it? Explaining the capabilities of the machine is not a responsibility for the software Editor/Librarian manufacturers. Without the resources of a large corporation, the task is too costly and time consuming to start sending out documentation for someone else's hardware.

I say all that because it stands as an obstacle to learning SoundQuest's Editor/Librarian – an obstacle that isn't entirely SoundQuest's fault. Here's the problem: Soundquest's Editor/Librarian gives you access to the MT32's features but no one has provided adequate documentation to easily access or translate the features.

As such, you can expect to do some hacking to get to the functionality of the program: the documentation that's provided on the actual software is not procedural and instead gives you an overview of the available features. Granted, the program runs in a windowing environment, but windows do not guarantee ease of use and procedurally the program is not intuitive. That's the bad part. Now for the good part.

Once you learn your way around the program, it's a good editor with some very good features. The software gives you a variety of windows including timbre, patch, and partial edit windows. The windows give you quick access to a number of editing features including parameters to define the envelopes of your partials. Soundquest's E/L makes clever use of the Amiga's multitasking capabilities, allowing

MIDIcaster

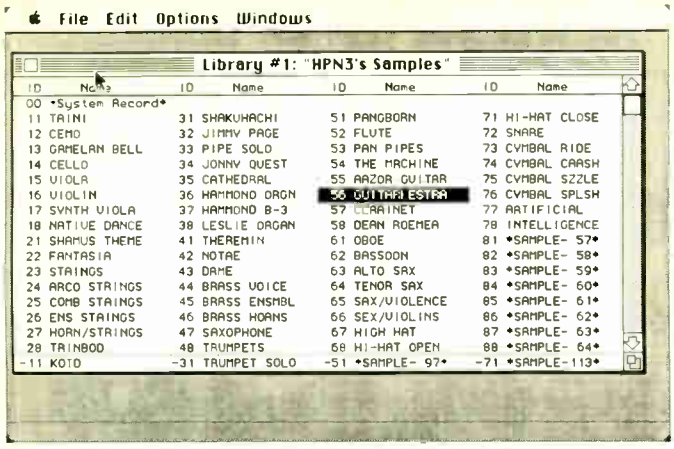
An alternate Operating System for the Ensoniq Mirage.

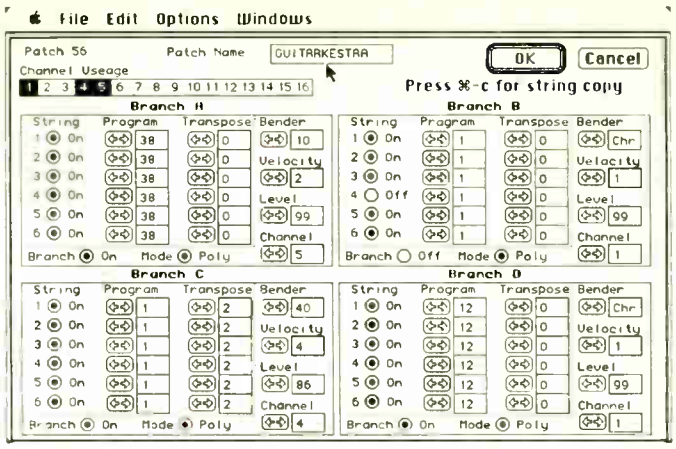
Review by Carter Sholz.

MIDICASTER IS A piece of software that turns the Ensoniq Mirage into a generic patch librarian for other MIDI equipment. It uses the Mirage's disk drive as a storage medium for system exclusive data, meaning that you can save and restore voice banks, sequencer patterns, or any other SysEx data your gear can transmit and receive. It's a way to get the bulk data storage a computer offers without having the computer. This could prove especially valuable on the road, where you may not want to take a delicate, expensive item like a computer.

MIDIcaster is simple to use: just boot your Mirage with the program diskette in the drive. It's an extension to the standard Mirage operating system, so you can play your Mirage normally while it's installed, with a couple of restrictions: you can't sample, and you can't keep a sequence in the Mirage's memory. And you may have to turn off MIDI thru.

MIDIcaster has two modes: one in which it filters most MIDI data, recording only SysEx





total of 64 on the screen at once). However, seeing it visually on a computer screen makes it one hell of a lot easier to understand and manipulate than trying to keep track of it on the GM70 itself. This Edit Patch function also lets you change channels, copy different string parameters to different branches, allows for transposing, and setting of MIDI modes. Pretty comprehensive, even if it is a little cluttered.

Finally, you get all this information to and from the GM70 by sending the information via file commands simply and adequately entitled "Transfer to . . . " and "Get From . . . " the GM70.

If confronting large instruction manuals gives you the same kind of thrill as having your teeth drilled does, there's no need to worry here. At 10 pages, the GM70 Companion manual is the shortest manual I have ever come across for any type of software – IBM, Apple, Atari, and anything else you can dream up. My pocket calculator has a thicker manual.

This, alas, is a mixed blessing. On the plus side, it gets you up and running on the software faster than you can tune your guitar. There are no instructional frills *at all*, just very straightforward descriptions of each function. The trade-off here is that the software presumes, from page one, that you are very familiar with the patch commands on the GM70 and all the essential operations of the Mac. If you're not, you're out of luck.

It's worth mentioning at this point that Snap also produces an IBM version of the GM70 Companion.

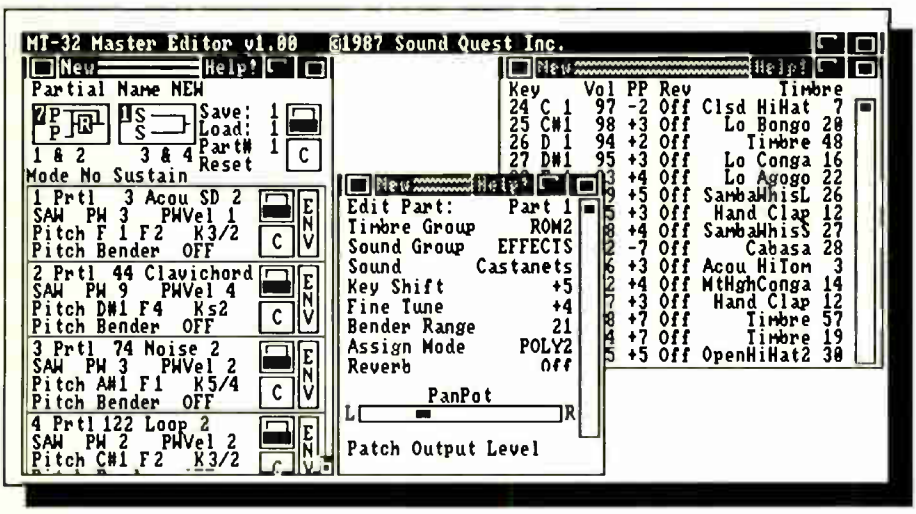
All in all, compared to doing all of the above functions on the GM70 itself, the GM70 Companion makes you feel like you died and went to heaven. Or at least Cloud Nine. ■

PRICES $125; $75 for IBM version

MORE FROM Snap Software, 1116 Janey Way, Sacramento, CA 95819. Tel: (916) 451-9914.

you to edit several partials simultaneously in different windows.

The editor also gives you access to the four



different reverb options (delay, room, hall, and plate). These include two associated parameters, level and time. Although the MT32's built-in reverb is noisy, SoundQuest's E/L lets you find some settings that aren't quite as noisy as the front panel default.

The rhythm editor is another nice feature of the system. It allows you to turn the reverb on and off for individual drums and to re-order the assignment of sounds to particular MIDI note numbers. You can also fill in those blank MIDI notes with either drum sounds or timbres.

The SoundQuest Master E/L also includes Quicksend, a utility which lets you load your MIDI files directly to the MT32 without bringing up the software. That's a nice plus.

SoundQuest is also responsive to user input and is genuinely interested in user suggestions and/or gripes. In addition, they are constantly upgrading the software. If you have any questions, a telephone call will get you an answer, not a cold shoulder. ■

PRICE $150

MORE FROM Sound Quest, 5 Glenaden Avenue East, Toronto, Canada, M8Y 2L2. Tel: (416) 234-0347.

messages (fine for most voice dumps), and a second in which it records everything without filtering (including the "active sensing" bytes that a lot of Yamaha equipment uses – look out for that). It stores the incoming data in the Mirage's memory – up to 128K – from where you can save it to a data disk. You can save any number of messages, up to the 128K limit, together as a single data file, which will later play back all its messages without a pause. A single data disk can hold three data files.

A "MIDIcasted" Mirage won't necessarily work with all MIDI equipment. In particular, the Casio CZ series performs a peculiar piece of handshaking business that will leave MIDIcaster gazing off into space, but that's the only exception I know of (though there may be others), and it's Casio's fault for violating the MIDI spec.

The MIDIcaster package is a bit overproduced. A glossy three-ring binder contains all of fifteen wide-margined pages, about half of which are peppered with technical details you'd rather not know. It's not useless information, but it's badly organized (fortunately, the software is simple enough that you can figure it out without too much trouble). The label on the disks tell how to use them, and once you've got through the "big" manual, the disk label is all the manual you'll need.

If you've got a Mirage, and some other MIDI gear, and you need disk backup without a computer, check this one out. ■

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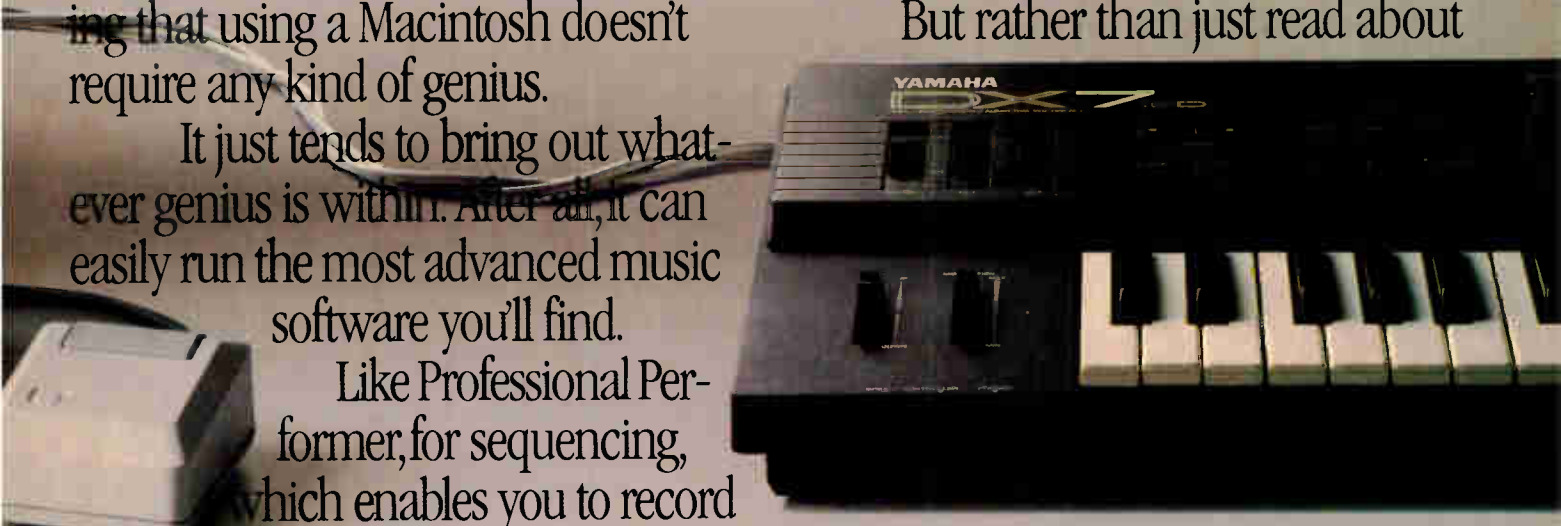

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Alchemy
Sample Editing Software

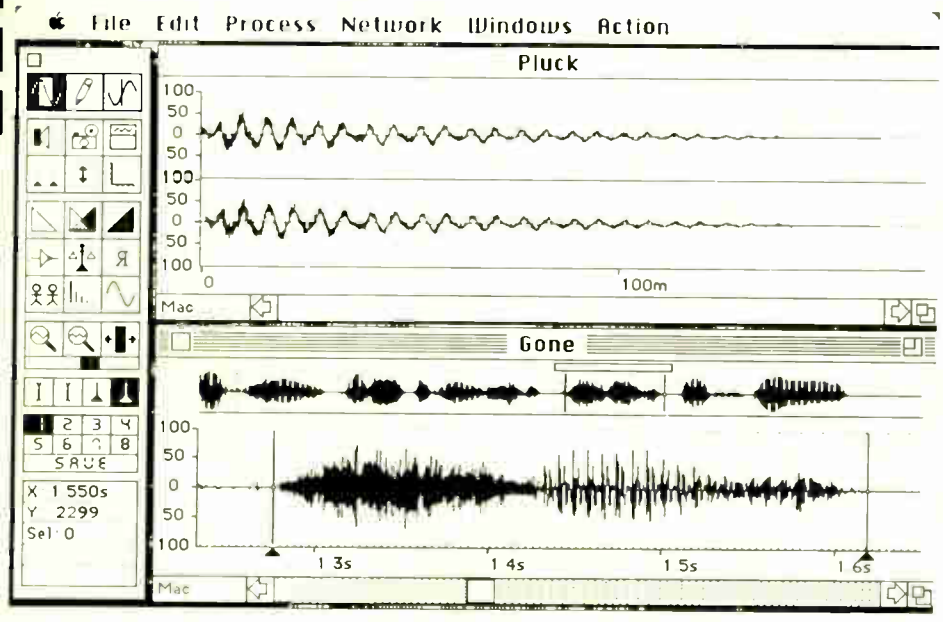
Though originally intended as an editor for Ensoniq's new EPS, Blank Software's latest creation for the Macintosh grew into a universal sample editing program with some very unique functions. *Review by Robert Rich.*

IN THIS LITTLE world of hi-tech gadgets, buzzwords seem to come and go with the wind. Those mercurial clouds of hype and excitement can obscure good and bad developments alike. After the hype boils away, we are occasionally blessed with that rare gem: a useful tool. At the last NAMM show, everyone was babbling about a new sample editing program called Alchemy, and the buzzword was "resynthesis."

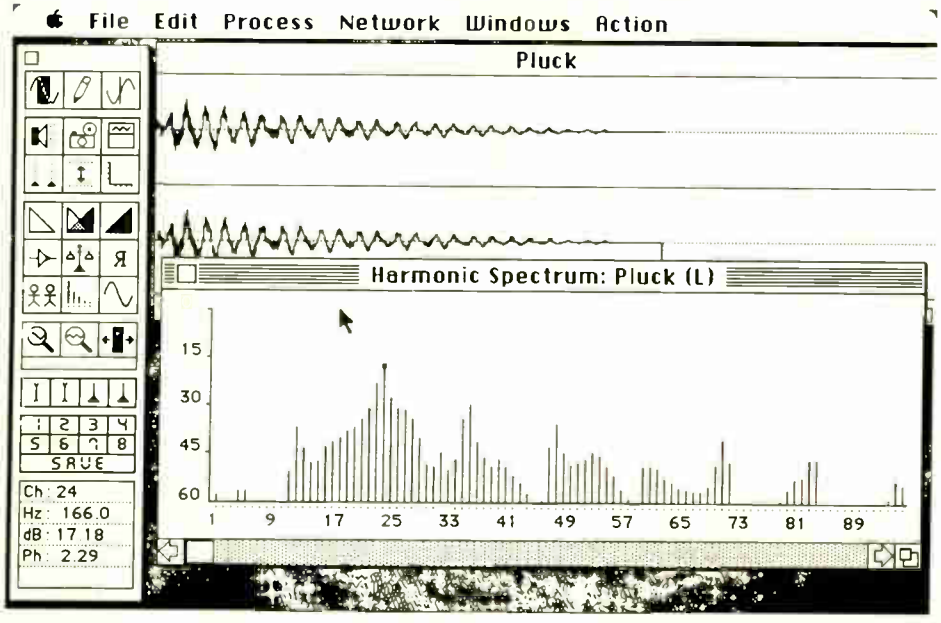
Admittedly, resynthesis is a pretty exciting idea. It can allow very precise control over the editing of a sample. First, an analysis breaks the sample down into its constituent frequency bands. The user can edit this information in the frequency domain, then through resynthesis convert it back into a waveform. Until recently, high resolution resynthesis has been reserved only for expensive digital workstations and computer research facilities. The thought of having such capabilities with only a Macintosh and a sampler sets the mind adrift in an ocean of possibilities.

I must confess that I had very high expectations for Alchemy. To approach this program fairly, I had to revise my expectations a bit. Alchemy will not replace a big mainframe, but it is one heck of a nice sample editing package.

Although it is hard to ignore the untapped potential of some of Alchemy's more advanced features, this editor can perform a few other stunts that might justify some of the hype surrounding it. In fact, the people at Blank Software seem to downplay the resynthesis part of the program as a sort of afterthought. Some of Alchemy's other features include: communication to many kinds of samplers (what Blank calls a DAN, or Distributed Audio Network); stereo sample editing; resampling; computer-assisted looping with variable crossfades; digital EQ, and the usual complement of visual waveform editing functions. Here's the scoop . . .



Stereo sample above ('Pluck'), overview window below ('Gone').



Analysis/resynthesis editing window.

OVERVIEW

Alchemy comes on two double-sided floppy disks, one containing the program, the other containing some samples to practice with. The program disk is very well copy-protected, and it comes with a hard-disk installer that allows only one installation. These restrictions seem pretty stingy for a nearly $500 program, but at least Blank promises inexpensive updates and a backup disk to people who send in their registration form.

The manual is fairly complete and very well written. It begins with an introduction describing the basics of sound and digital audio, which may prove useful for those confused by some of Alchemy's features. The manual also provides a number of tutorials which demonstrate most of what Alchemy can do. The only things the manual lacks are an index (shame, shame) and more advanced technical information.

I reviewed Alchemy with an S900 and a Mirage. Although everything worked great with a generic (Austin) Mac MIDI interface, I ran into some strange problems when I tried to use Southworth's JamBox 4+. Only one channel of

a stereo sample would make it through to the S900, and I couldn't load anything from the sampler. MIDI transmission would mysteriously shut off after a sample dump. Most of the big problems went away when I put the JamBox into non-MIDI mode, but that meant constantly changing modes to hear the sample. These problems are not really Blank Software's fault – the JamBox has a bit of a reputation for such complications.

The designers of Alchemy clearly intend the program to form the central hub in a network of patchbay controls, clock rate, and Mac serial port outputs. Alchemy can communicate directly over SCSI or RS-422, as well as over MIDI, so if your sampler can take one of these faster protocols you can really save time when dumping data. The Network menu shows all of the samplers that you have set up, and Alchemy communicates with whatever sampler is selected under this menu.

Alchemy can read and save files in a number of different formats. Its preferred file format is Audio IFF, which holds 16-bit stereo or mono samples along with Alchemy's View Memories (see below). Alchemy also automatically recognizes Sound Designer (16-bit mono) and Sound Lab (8-bit mono) files. You can save to these formats as well. This is great news for people with large collections of samples for incompatible samplers – at last there is a way to move these things around in the digital domain.

Compatibility *"Alchemy's ability to work with several file formats is great news for people with large collections of samples for incompatible samplers . . . "*

One of Alchemy's nicest features involves the ability to handle stereo files as one entity. If a file is already in stereo, Alchemy will deal with it as such. A quick trip to the "Soundfile Setup" screen will allow you to convert any mono sample into stereo, although until edited both channels will contain the same information. The program displays stereo samples in two strips, with the left channel on top and the right on the bottom. You can edit the two halves independently or, if you click or drag the mouse on the line between the two channels, you can edit them simultaneously.

Alchemy seems perfectly suited to instruments like the EPS or S900, which can play samples in stereo but can only record in mono. By separately sampling both halves of a stereo sample, you can combine them within Alchemy and send them back to the machine for true stereo playback. The program will take care of quite a bit of the sampler's internal setup when it sends the two channels back out. Alchemy sends each channel separately, assigning them both to the same key range (which you select when sending a sample), and places them in the appropriate memory configuration for the selected sampler.

While on the subject of files and memory and such, I should mention that Alchemy requires *lots* of memory – especially when performing some of the fancier manipulations like resynthesis. The manual highly recommends 2Mbyte of memory and a hard disk. I have a 1Mbyte Mac SE, and met with quite a few "insufficient memory" notices. Memory greed is fairly common when dealing with samplers, but be forewarned that you may need to fork out some more money for a Mac upgrade.

EDITING

Alchemy contains quite a formidable list of functions, most of which appear as icons, readily available and in clear sight. Many of these editing functions appear in other sample editing packages, but Alchemy's layout strikes me as

particularly intuitive. I like having the tools right where I can see them.

All the basic Macintosh Edit menu stuff is here, with some necessary additions. Clicking the mouse over a point in a waveform selects that point for insertion. Clicking and dragging the cursor selects a region of a sample. Along with the standard Cut, Copy and Paste, Alchemy provides Mix, Insert, Extract and Clear options. Cut removes the selection into the Clipboard and slides the remaining portions of the waveform together, while the Clear command removes selected regions of a waveform without saving them to the Clipboard, thereby preserving the last copy or cut. Unlike Cut, Clear does not close the gaps left in the original waveform.

The Paste command replaces the selected portion of a waveform with the contents of the Clipboard. If the selected portion is larger than the Clipboard, Alchemy shrinks the selection to fit the Clipboard. If the selection is smaller, the Clipboard portion will be truncated to fit it. (You can choose to make this happen from the beginning or end of the selection.) The Mix selection works much like Paste, but mixes the scrapbook selection with whatever waveform is selected. The Insert command inserts the Clipboard contents at a selected point, increasing the size of the sample as it does so. If you paste, mix or insert a waveform into both halves of a stereo sample, a window pops up asking for the percentages of left-right panning . . . very straightforward.

The program's most used commands appear as icons in the on-screen tool palette. The tools break down into seven categories: icons for Mode, Display, Process, Waveform View and Cursor Location; View Memories, and a numeric display. I'll deal with these a bit out of order.

The various view and display icons combine to form a very flexible graphic editing environment.

No matter how flexible the display, you can sometimes waste a lot of time searching for just the right region to edit. With this in mind, the designers of Alchemy provided eight view memories. Once you manage to find what you need, you can save your selection or insertion point, with the waveform view and magnification depth, to any of these eight view memories, which will then get stored with that sample (but only the sample is saved in the Audio IFF format).

Some of the six Display Icons do more than just change what you see on the screen. Clicking on the Speaker icon plays the selected wave on the Mac's sound chip, as does pressing the space bar. To hear loop points, just keep pressing the mouse, or hold down the space bar. The sound plays until you lift up. Two of the Display Icons actually set up parameters for processing the sample. The Loop Cursors icon switches on the loop function and places the loop boundaries at the end of the sample. You can then move the loop points around with the cursor, which changes into arrows when over the loop boundaries. Lastly, the Threshold Bars icon sets up amplitude limit markers, which set the levels for the Scale function discussed later among the Processing icons.

The Mode Icons show which one of three modes Alchemy is in: Selection, Waveform Draw or Loop Splice. Selection Mode provides for the cut-and-paste editing, processing and other basic waveform manipulations. The program defaults to this mode upon starting up. Waveform Draw mode provides a pencil tool for hand-drawing waveforms. Clicking on the Loop Splice Mode icon will open a window showing two sections of waveforms, the end loop point on the left and the start point on the right, with scroll bars underneath them. This display shows what the waveform looks like as it jumps from the end to the beginning of the loop – a fairly good indication of how good the loop will sound. Clicking in the scroll bars will now tell Alchemy to look for zero crossings (points where the wave reaches zero amplitude). Just keep clicking until you find some points that sound good. It would be great if Loop Splice Mode could find more than just zero crossings, as they are not always the best loop points, but what this mode does provide is quite useful.

If you can't find a good loop, Alchemy also gives you a Crossfade function, which blurs the loop's transition boundaries. Once the loop has been tweaked as best it can be, you simply choose the XFade Loop item from the Process menu. Alchemy greets you with a window allowing you to adjust the percentage of the loop you want blurred. The slope of the crossfade can be adjusted from another menu selection called Fade Options, which sets the fade rates for all of Alchemy's Fade commands (see below).

The nine Process Icons actually mess with the sample data. Herein lies much of Alchemy's magic muscle. Three Fade Icons do just what their names imply. Fade Out takes the selected portion of a waveform and fades it out to zero, with the fade rate selected in Fade Options. Fade In does the opposite. The Crossfade Icon takes whatever is in the Clipboard and fades it in with the selected sample (this is different from the Crossfade Loop.) Other functions under the Processing section include: Invert, which flips the waveform upside down (180 degree phase shift); Scale, which scales the amplitude of the sample to that marked by the Threshold Bars mentioned earlier; Reverse, which makes the sample play backwards (useful for creating mirrored loops); and Replicate, which echoes the sample (what a great way to use up memory!) Then, of course, there are those Analyze and Resynthesize icons. I'll deal with them momentarily.

In its efforts to provide a unified sample storage environment for different samplers, Blank fitted Alchemy with a very capable resampling function. Resampling simply plays a sample at one rate, and records it at a different one. You need to do this in order to play the same sample at the same pitch on different samplers, which tend to have different sample rates – thereby shifting the playback frequency of the original sound. Another benefit to resampling is that you can store samples on the Mac at their highest possible resolution, then configure them individually to the requirements of different samplers. Alchemy seems to be able to resample a waveform with very little signal degradation – I couldn't hear any change, even after multiple resamples, except of course when I resampled at a much lower bandwidth. Alchemy apparently uses a non-linear 16-bit conversion format, which results in very clean processing.

Also deserving some mention is Alchemy's rather workable digital EQ – not very flashy, but very useful. You can select between low pass, high pass and notch filters, with controls over center frequency, boost or cut amount (in dB), and width for the notch filter. Of course, if these EQ controls aren't sufficient, you can always use resynthesis . . .

Editing *"Many (but not all) of Alchemy's editing functions appear in other sample editing packages, but this program's layout strikes me as particularly intuitive."*

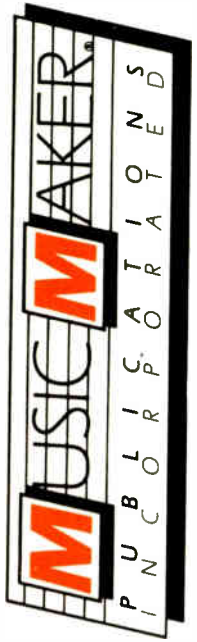
Resynthesis *"The creators of the program didn't really intend for the resynthesis function to be much more than a very specific digital filter – for now, anyway."*

Not only can you view and edit multiple samples on the screen at once (provided you have enough memory), but with a click on the appropriate menu command the program will automatically arrange the various windows into strips, layers or tiles. Several screen icons provide for convenient navigation within a waveform window. The Overview icon splits the window into two strips, the upper strip showing the entire sample, the lower one showing the current view of it. The Snapshot Icon puts your current waveform view into the upper of these two strips. You can zoom in or zoom out of the current view with two magnification icons. Cursor Locator icons automatically center the waveform view to selected portions, and the numeric display tells you exactly where the cursor is.

RESYNTHESIS

Well, I saved this one for last. As I mentioned at the start, Alchemy can perform Fourier analysis upon any selected region of a sample (up to 32,768 sample points), allowing you to edit the resulting harmonic display. Alchemy can then convert this frequency domain data back into a waveform.

This is the one feature of Alchemy that doesn't quite live up to expectations, but then I suppose that depends upon what you expect from it. To be fair, the creators of the program didn't really intend for the resynthesis function to be much more than a very specific digital



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filter – for now, anyway. Despite its limitations, it can come in handy at times.

Once a waveform has been analyzed, Alchemy greets you with a two-dimensional graph showing the amplitude for each of 16,000 or more frequency bands. This enormously high resolution means that you won't hear any signal degradation upon resynthesizing the sample, but it also makes the display a real pain to edit. Adding to the editing difficulties is the fact that, though you can select multiple frequency bands for editing, you can't select more than one window's range of them at once. You cannot keep a selection as you scroll up or down the range of frequencies. This fact alone makes applications like comb filtering a real pain. I would love to be able to convert mono samples into stereo by splitting overtones into left and right channels, but I guess I'll have to wait.

When Alchemy analyzes a sample, it averages the envelope information over the range of frequency channels. (This is a characteristic of the algorithm used, which is an FFT – or Fast Fourier Transform. To distinguish and edit separate envelopes for each frequency band requires a Phase Vocoder algorithm, a much more complicated affair.) This averaging has severe implications if you try to boost a single frequency band. The result is a very audible sine wave which dominates the resulting resynthesized waveform, basically ignoring the previous envelope for that frequency channel. This sort of problem is a built-in characteristic of the chosen algorithm.

OK, OK . . . I'll stop complaining. Alchemy's resynthesis does have uses. If a sample has aliasing problems (a low frequency "ghost tone" due to insufficient sampling bandwidth) you can remove the offending tone easily. The resynthesis feature really comes in handy for this sort of narrow-band notch filtering. For example, you can tweak those loops in which one or two overtones change pitch while everything else remains stable. The deviant overtones should appear as a cluster of adjacent frequency channels. Just find and remove the offending frequencies – no easy task, but the tool is there if you need it.

Once you resynthesize an edited portion of a sample, you will find that a discontinuity appears between the edited waveform and anything immediately adjacent to it. A crossfade between the two portions of sample will remove this glitch. By crossfading multiple segments of waveforms created in the frequency domain, you can create synthetic sounds whose structure resembles those of wavetable synths like the Prophet VS, ESQI, etc. It's not easy, but it provides hours of entertainment.

Alchemy's analysis/resynthesis feature shows, if nothing else, that its creators are really looking ahead. There's a lot of potential here, but I can't help but feel mildly frustrated by how tantalizingly close this comes to being truly useful. The engine is there, but the whole vehicle hasn't quite been finished. I guess the rest of Alchemy is good enough that I'm willing to forgive it these few shortcomings.

CONCLUSIONS

Alchemy is quite an impressive program, deserving of the attention it has attracted. With its networking features, convenient and powerful editing, stereo capability and digital signal processing, it makes sample editing a real delight. If you work with a large collection of samplers, Alchemy may just be that miracle you were waiting for. Considering the number of musicians and recording studios that do rely heavily on samplers, Alchemy's ability to act as the central node in a network will probably be its biggest selling point.

I am really looking forward to seeing what happens with this program. Though Alchemy's resynthesis function won't challenge the mainframes quite yet, Blank plans to improve it with future revisions. We can also expect more samplers to be added to the compatibility list. Even without these improvements, though, Alchemy is the most capable sample editing program I've ever seen for a small computer. ■

PRICE $495

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

Special thanks to Carter Scholz for his help during this review.

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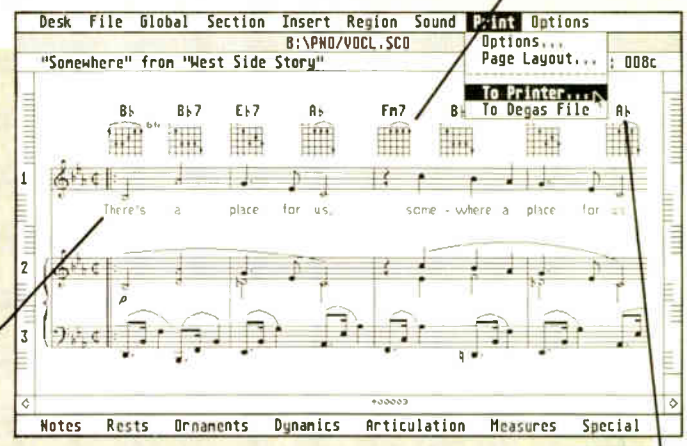

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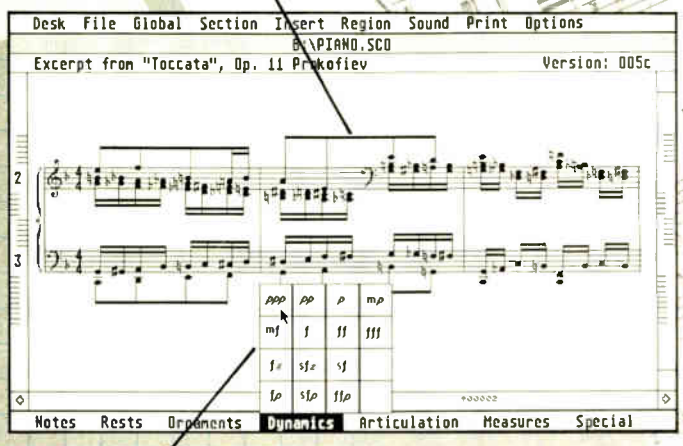

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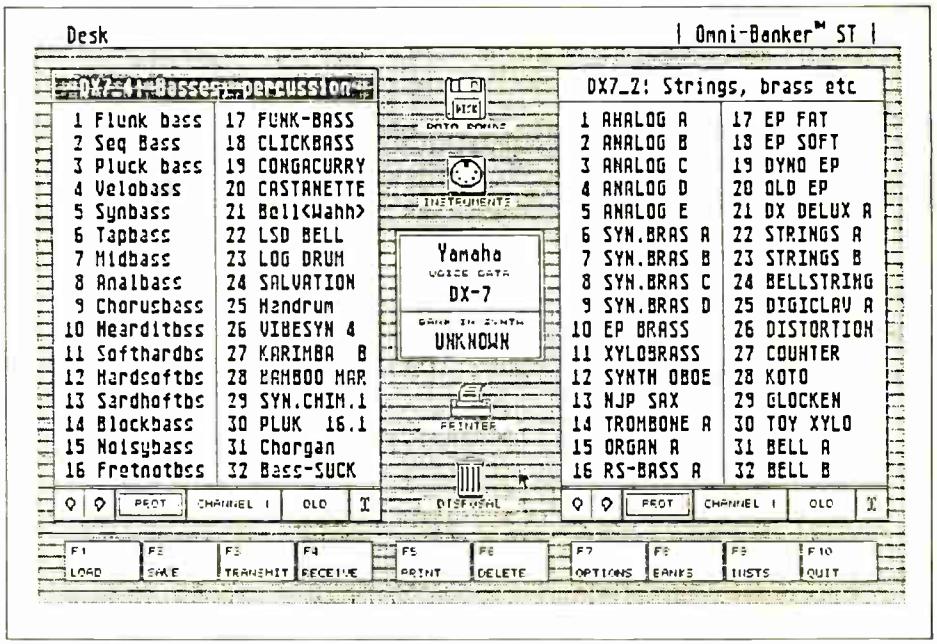
Paradigm Omni-Banker

A desk accessory for the Atari ST that lets you store a variety of synths' programs. *Review by Chris Jenkins.*



IT'S A FACT: modern synth technology creates almost as many problems as it solves. One of the major headaches of the multi-instrumental MIDI studio is the storage and retrieval of sound patches. While most modern synths have reasonable onboard patch-storage facilities, they're not normally sufficient to build up a sizeable library of sounds. On top of that there are those occasions when you want to transfer patches from one synth to another. You're facing the familiar problems of unreliable tape storage, expensive cartridges or fragile RAM cards. But, happily, there's now an alternative solution.

Paradigm Software's Omni-Banker is a patch librarian designed to run on the Atari ST family of computers. It's supplied on a single unprotected disk, and registered users are entitled to updates every quarter.

Unlike most software patch librarians, Omni-Banker is not limited to use with one synth. At the moment, it will store patches for the Ensoniq ESQ, Yamaha DXs, TXs and FB01 synths and RX drum machines, and Casio CZ synths. Later versions are intended to cope with Roland, Sequential and Korg instruments too. Obviously, this involves a saving on both money and time because you'll only need to buy and operate one program.

Another boon is that Omni-Banker works as a desk accessory on the ST. Once installed, you can load, say, a sequencer program while keeping Omni-Banker tucked away ready for use at any time. You can then change patches on your synths and return to the sequencer without having to reload it. There *is* a "but" here, as any desk accessory necessarily uses up some of the memory otherwise available to the main program. However, it's not a problem I ran into while using Omni-Banker.

The program is GEM-based and operated using a mouse, icons and pop-up windows, and runs on hi-res mono or medium-res color monitors. For traditionalists there's the option of using the ST's function keys or, indeed, sensibly-chosen alphanumeric keys.

The main display features two bank windows, each of which will display up to 128 patches received from the synth. Thirty-two of these are visible at a time, and you can use the scroll bars to examine the remainder. Each patch can be named, even if the synth does not normally support naming. You can also give a disk file name and a short description to each bank, which is automatically assigned a suffix for disk storage. For example: "DX71; Basses, horns, effects.X7V."

Patch lists can then be printed out, and individual patches can be deleted, swapped around, copied to another window or moved to another position in the same window. In this way you can build up custom banks from, say, a collection of cartridges, name the banks and save them to disk. Since you can store something like 80 banks of 32 DX7 sounds on one disk, life suddenly becomes so much more simple.

The Inst and Option functions open windows which allow you to select the type of instrument currently in use, and to define the operation of the program. The status window on the main display shows the current instrument type, model, data type (voices or rhythms) and the current bank in the instrument. The Options panel lets you program Omni-Banker to warn you before it accepts radical changes such as overwriting or deleting a whole bank of patches. You can also change the default operation of the Drag mode (Swap, Copy or Move); make Omni-Banker send a patch change message to the synth each time you select a new patch on the screen; audition each newly-selected patch by having the synth play a series of notes; and auto-transmit a bank to the synth whenever it is loaded from disk.

Omni-Banker also includes a simple MIDI test utility which sends note patterns on any chosen channel. This allows you to check the connection of your system quickly and easily.

Bear in mind that, while Omni-Banker makes storage of patches much easier, it does not allow you to edit them; for that you'll still need infinite patience or an editor program for each synth. So, while Omni-Banker is an invaluable saver of time and money, it has a major rival in Hybrid Arts' GenPatch (which is more powerful, but also admittedly more expensive).

Omni-Banker is fully supported by a free user question service and comes with a 30-day money-back guarantee. At this price I personally believe it will repay your investment many times over.

PRICE $55; $5 shipping and handling.
MORE FROM Paradigm Software, 1369 Concord Place, Suite 3-B, Kalamazoo, Michigan 49008. Tel: (616) 372-5972.

Music Quest MSSI MIDI Starter System

IBM PC and compatible owners can enter the MIDI maze here with this all-in-one hardware/software package designed specifically for beginners. *Review by Harvey Newquist III.*

MOST PEOPLE FIND that when it comes time to get MIDI into their lives, it requires getting hold of two MIDI instruments, a computer of some sort, some MIDI cables, and a MIDI computer interface. Once you have all this diverse stuff, you're ready to enjoy the benefits of MIDI in all its grime and glory. Sort of.

If you're a novice, learning MIDI also usually means poring over keyboard or drum machine instruction manuals to try and glean some sense of what goes on in the world of musical instrument digital interfaces. Software also helps to get you into MIDI, but when you get a computer involved, you pretty much have to know what you want before you shell out money for particular packages. This all takes lots of research.

A new package from Music Quest hopes to change all of this. Called the MIDI Starter System (MSSI), this package includes a half-card interface for the IBM PC (which is upwardly compatible with the fabled MPU401) and software that includes a sequencer, a DX Editor/Librarian, a CZ Editor/Librarian, and an interesting feature called the MIDI Trace Utility, which allows you to watch what's actually happening to all of that information racing around your MIDI instruments and cables. All of this for a low, low price.

THE GOODS

The half-card co-processor Interface has a variety of configurable switches for setting to specific PC architectures (PC, XT, AT, 3270 PC). The software is quick to alert you if you haven't configured the switches properly, so you've got a built-in failsafe. The card has a five-pin connector port, into which you plug a Y-connector that has one side as a MIDI Out and the other as a MIDI In. These two ends dangle out of the back of your PC. It would have been a lot nicer had they been housed in some sort of casing – not necessarily as complex as an MPU401, but perhaps something along the lines of Apple's MIDI interface casing. There is also a primitive metronome jack which can be connected to any amplifier in order to generate timing clicks.

Next we come to the actual MSSI software. Unlike a lot of basic IBM PC software, this one actually does a pretty good job of emulating the Macintosh. It has menu bars, a clipboard, Mac-like menu functions, and supports the use of a mouse. This latter device is optional; every function can be controlled from the keyboard. If you have a color monitor, you can adjust the various field colors to your taste, including both screen and window attributes (without proper thought, your screen could look like a lava-lamp exploded on it).

Even though other MPU401 software will work with their MIDI card, the MSSI software doesn't run on the MPU401, which is Music Quest's way of protecting its software.

Back to software features. You use menu bar names or their first letters to activate given environments, much as you would when using PC software such as Lotus 1-2-3. Function keys are used to start the operation of functions, which is also similar to most PC packages. The heavy use of windows and these other basic features are common to the programs found within the Music Quest starter set. Also, its on-line help is accessible and just an Alt-H keystroke away at all stages – something that more advanced sequencers could learn from.

THE SOFTWARE

Easy8, its 8-track sequencer, is reminiscent of Roland's old MPS sequencer in function, if not form. The sequencer features a Track-Status-Name Box, a Conductor Box, and a File Notes Box. The T-S-N box does just what it's supposed to: maintains control over the recording and playback of tracks. Track gives you the number of the track being worked on, Status tells you whether that track is in play mode, record mode, or simply disabled. Name lets you type in your individual track identifier.

More important is the Conductor Box. Within this frame is control of Tempo, Time Signature, Measure/Beat/Time, and also two places for Measure marking and locating. All of these functions are determined simply by typing in the desired value. The Measure/Beat/Time field monitors your actual recording or playback by indicating where you are in that process. It is updated as the sequence is run.

The Files Note Box, while used for nothing more than cursory notes about certain sequences, comes in handier than you might

```
                          Easy-8 Sequencer
                 Copyright (c) 1987 by Music Quest, Inc.
FLASH3
File       Conductor      TrackEdit      MIDIFilter      Accessories       Program
                                FLASHDANCE
-Track--Status--Name-----------------------  ----------------Conductor-----------
   1    Play    Strings
   2    Play    Lead (Synth/Mtl Guitar)       Tempo      100    Measure      6
   3    Play    Accoustic guitar or harp      Signature  4/4    Beat         1
   4    Play    Bass
   5    Play    Synth brass                   Mark 1            Time     00:12
   6    Off                                   Mark 2            Tics     12
   7    Off
   8    Off                                   Paused....
-File Notes-----------------------------------------------------------------
 As recorded by Bob Carreras.
 Adapted and orchestrated by Music Quest, Inc.

                           Enter a character string.
F1=Start    F2=Continue    F3=Locate                      Alt-H=Help   Esc=Menu
```

```
                              RandomiCZer (tm)
        CZ Series Editor/Librarian - Copyright (c) 1987 by Music Quest, Inc.
                            View                                        Program

 |        DCO Waveforms        |       | Envelope | Rate  | Level |
 |   1st  |  2nd  |  1st | 2nd |       | DCO      | 0 | 0 | 0 | 0 |
 | 1 | 5  | 1 | 8 | 1 | 5 | 1 | 8 |    | DCW      | 0 |99 | 0 |99 |
                                       | DCA      |60 |99 |60 |99 |
 |         Detune        |
 | +/- | Octaves | Notes | Fine |      |           Vibrato            |
 | +/- |  0 | 3  | 0 | 0 | 0 | 12 |    | Wave | Delay | Rate | Depth |
                                       | 1 | 1 | 0 | 99 | 45 | 55 | 0 | 18 |
 | Lines | Modulation | Octave |
 |   2   |     No     | -1 | 1 |
                         Enter a numeric value                       Esc=Menu
```

think. How many times have you recorded a sequence, left it for a few weeks, and then tried to remember what it was for, what sound module you ran it with, and what piece of music it ultimately belonged to? This takes care of such memory loss. A few messages jotted in the Notes box and you can forget about having to write everything down on paper notes that you know you're going to lose anyway.

As in other PC sequencers, the Function Keys control Start, Stop, Continue, Pause, etc. Easy enough. From here there is a whole new set of window information regarding your MIDI data and track programming. They include basics like Track Edit (Track Merge, Copy Track, Transpose, Erase, and Quantize), MIDI Filter (Remap, MIDI Echo, After Touch, etc), another Conductor window (Tempo, Metronome, Count In, etc – to be applied after the track is recorded), Accessory (leads you into other parts of the software like the patch librarians), and Program (gets you out of the program and into DOS – a window that is used in all MSSI programs). Everything is easily gotten to with cursor keys, and all of Easy8 is very easy to get comfortable with.

To be honest, the editor/librarians are spooky. Each has an awful lot of screens that have an awful lot of numbers with an awful lot of information that might not make a lot of sense to someone just starting out with librarians. There are three Editor/Librarians included in the software: a CZ, a DX21/27/100 and a DX7 editor/librarian. Each program has a menu bar which activates window fields: File (Open, New, Save, etc), Data (Parameters, Initialize, etc), View (Patch, Voice, Set Up), MIDI (Upload, Download, SysEx, etc), Envelope (for the CZ) and Operator (for the DX) which control Copy and Import, and then the ubiquitous Program window.

The editor/librarians depart from the idea of "starter" in that they assume some level of programming knowledge by the user about the individual instruments (for instance, a thorough understanding of the various parameters in the DX operators, or the various steps in the DCAs, DCWs, and DCOs of the CZ – hence, the spookiness). However, if the user is intimate with the machine (and I mean to the point of being romantically so) the patch editors should pose no problem. Because of this, they serve less as any kind of tutor for MIDI functions (since this presumes knowledge of controllers and parameters) than as an example of MIDI uploading and downloading. They are complete, though, and if you know patch editing, then there's not much else you could ask for. If you don't know patch editing, you could ask for something less formidable. Like a Sherman Tank.

Finally, there is the MIDI Trace Utility. While not really functional, it does provide a rather interesting glimpse at MIDI data streams. Composed of only two specific menu fields, Format and Output, the utility lets you "watch" MIDI info being received by the PC. In the Format mode, you can watch Interpreted Data, which signals the particular event and its pertinent data (such as channel, key, velocity, etc) coming through the MIDI In port for all MIDI events.

Switch to the Hex section of Format, and you get to see all the unintelligible 1s and 0s of MIDI's binary code (puzzling that they used that, instead of hex) come screaming onto your screen. Of course, not even the most hardened hacker can keep up with all this information to tell you what is transpiring. The Output menu field lets you either watch the data on the screen, or to store it to a file for future observation.

The MSSI product manual, while being fairly complete, is tough to wade through in that there is no index or comprehensive Table of Contents. The manual's typeface is small and incredibly difficult to read, with print about half the size of the words that you are reading now. There are some good screen diagrams, but they literally get lost in the text, since it all looks the same with the same type size, no borders, and no different typestyles. This makes the manual look no different than the technical specifications for repairing internal fuel lines on 747's. For a starter kit, this should all have been printed in *large* type with more clearly defined illustrations. Plenty of the MIDI vendors and publishers have come up with enlightening and informative drawings to show what's going on with all those transmitted bits and bytes.

The manual is explanatory, and not very descriptive. While it is good at explaining what certain functions *do*, it doesn't really tell you *why* you might want to use these functions. Imagine being put into an airplane cockpit for the first time and seeing altimeters, fuel gauges, horizon indicators, and all the other blinking and moving lights and dials that make up an aircraft control panel. You might point to one light and ask, "What's that?" The answer might be, "Oh, that's the flap position indicator." Being a novice, you might be tempted to ask, "What the heck is a flap and why do I need it?" The MSSI manual isn't going to tell you. To top it off, it includes chapters of no real use to MIDI users such as "How Mouse Actions Are Interpreted" – an explanation of MIDI itself would have been more useful.

THE VERDICT

In light of the low price tag for a MIDI interface card, a fairly complete eight-track sequencer, three librarians, and an unusual trace utility, the complaints about the manual may seem minor to some. Plus, the company assures me that an improved, "more introductory" version is on the way.

Music Quest has done an admirable job with its starter kit, and at $199, it gives many novices the equivalent of five MIDI hardware/software components that might normally cost upwards of $500. At this price, you get more than you pay for. Even if you have to shell out $50 for a decent pair of reading glasses. ■

PRICE $199

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

COMPUTER

DIRECT TO HARD DISK RECORDING

The future of recording is here. We present an overview of what it's all about, and what's currently available.

Text by Christopher Yavelow.

USING YOUR COMPUTER as a recorder is not an option that many people have given very serious thought to. We are all familiar with sequencing programs which "record" MIDI data, but that's a whole different ballgame from the kind of recording you do with a 4- or 8-track. Thanks to developments in digital audio signal processing technology as well as the continued drop in memory prices, however, computer-based audio recording is becoming a very real and viable alternative to magnetic tape.

The benefits are obvious: no signal degradation occurs once the sound has been recorded, so that you can overdub as many times as you would like without adding noise; and greatly increased editing capability, particularly in conjunction with a computer-based editing program, makes minute changes of the variety previously only available with sequencers not only possible, but relatively easy.

Cost is another reason to investigate digital recording onto hard disks. With fully functional systems beginning to appear in the $7,000 range, it is no wonder that people about to upgrade their analog tape recorders are following these developments closely. For those who didn't read the rapid acceptance of CDs as writing on the wall foretelling the end of the analog era, R-DATs have arrived to drive the message home.

Synclavier Direct-to-Disk system in operation.

THE PLAYERS

I managed to locate 17 systems either currently available or in the final stages of development (there are certainly others). Systems fall into three large sub-categories. The first and lowest cost sub-category includes cards and rack-mounted peripherals designed to be used in conjunction with a host computer: ADAP (Hybrid Arts, Atari-based peripheral), AudioFrame (WaveFrame, IBM-based peripheral), Dyaxis (Integrated Media Systems, Macintosh-based peripheral), Digisound (Design Science, IBM-based card set and peripheral), DSP 1500 (Compusonics, Macintosh-based peripheral), MaxAudio (Southworth Systems, Macintosh-based card set, essentially an OEM product being made available to third party developers), Lynex (Audio & Design Recording (UK), Atari-based peripheral), and SDI (Ariel, IBM-based card). The second group includes expansion options for available synthesizers and samplers: Fairlight Series III 5.4 software release (MKB or MFX), Optical Transfer Station (Polyphonics, Akai S900/IBM-based), and Synclavier (New England Digital). The final category (five- to six-figure price range) consists of turnkey digital audio workstations dedicated to direct-to-hard-disk recording: Audiofile (Advanced Music Systems), Digitor (Soundcraft Electronics), Opus (Lexicon), Sirius 100 (For-A Corporation), Soundstation II (Digital Audio Research), Solid State Logic (SSL), and Direct-to-Disk (New England Digital).

Of these 17 companies, a few were unable to respond to my barrage of questions for reasons ranging from early development stage confidentiality to the fact that the techies who could have addressed such questions were swamped in last minute or ongoing R&D, and their exclusion here certainly isn't meant to close the book on them.

THE ISSUES

A feature table from eight responding manufacturers information – most of the host computer systems and the Fairlight and Synclavier – is presented in this article. The first three sections of the table deal with IO (Input/Output) formats and specs. The next two items deal with sampling specs, storage medium, and their interrelationship. Next looked at was synchronization features and sampler emulation. Available edit operations are detailed and finally support, physical hardware specs, configurations, options, and costs are discussed. The buzzword expressing the minimum requirements is "CD-quality" and all the systems were up to spec on this matter.

INPUT AND OUTPUT

Analog IO is available across the board, but digital IO is considered as an option by many developers. It is felt that a large body of users will never need to input from or output to the digital domain, even though digital audio tape is vastly less expensive than hard disk storage and one will inevitably desire to clear off one's hard disk(s) for the next project. At present, the best way to accomplish this archival process is the direct digital transfer to R-DAT or to a Sony F1 or PCM 1610/1630 system. When digital IO is available, the AES/EBU standard is assumed and many systems also support PCM 1610 and/or PCM 1630. Some provide more esoteric digital IO formats: EIAJ (Sony F1), Sony 701, SDIF, SPDIF, MADI, Sony-Mitsubishi, and ProDigi (PD).

After the issue of analog and digital IO is addressed, the next considerations are the number of Ins and Outs, their impact on the internal organization of the hard disk, and whether they can be used simultaneously. With the exception of Fairlight's monophonic system, stereo is taken for granted, and expanding the number of Ins and Outs is achieved by adding additional hard disks, cards, or modules – which inevitably boils down to a question of financial resources.

SAMPLE RESOLUTION AND STORAGE

Sampling rates of 44.1kHz and, to a somewhat lesser extent, 48kHz, go without saying. The same holds for 16-bit resolution. Some systems provide other lower or higher semi-standard rates as well as accommodating 18-, 20-, and 24-bit samples. 24-bit resolution is often used internally in conjunction with certain DSP chips and for communication to external DSP

Illustration Colin Cantwell © 1988 Crystal Chip Inc.

peripherals. Southworth's MaxAudio card includes 192K (4×48K) as the practical upward limit.

The size of your hard disk will ultimately determine the maximum amount of track minutes. 300 to 380megabyte hard disks are popular as a storage medium and many systems bundle the disks with their packages. Although one could theoretically use any SCSI hard drive with many of these products (doing so will void your warranty with the Soundstation II), proprietary formatting and disk I/O protocols often require relying on the system's manufacturer for storage disks. For people on tight budgets, the best case is a system which allows partitioning for other types of data such as MIDI sequences, but most systems do not offer this possibility. Alternatively, Compusonics offers inexpensive 20megabyte removable "Bernoulli" style cartridges, but the trade-off is the fact that these store only about five track-minutes of stereo audio.

When looking at the chart, the track-minutes item may seem a bit confusing – track minutes are given with respect to the bundled hard disk of the unexpanded base system and hard disks of the same size sometimes result in different figures in the track-minutes totals. This is typically due to memory-hungry error correction schemes employed by some systems which are not required by others.

Two further aspects to hard disk management which transfer from the computer world to the digital audio world are backup and fragmentation. When you finally do start recording on your hard disk, backing it up will become a necessary habit. Some companies offer streaming tape backup systems for this purpose, but if your system is configured with R-DAT compatible digital outputs, this could be your best backup solution. Fragmentation is another problem: if you start erasing files at random areas on the disk, the disk can become fragmented in such a way that, while you may have a lot of empty space, this space is not available in a contiguous block of any substantial size. Hard disk optimization and defragmentation utilities, some automatic and invisible to the end user, are provided by many manufacturers, but these should be closely scrutinized when considering a purchase. At least one developer I spoke to warned me that it was extremely difficult to erase a file of digital audio with their system and that the only method of defragmentation was to dump the data off onto tape and then erase the whole disk and reload the data – a tedious and time-wasting process.

SYNCHRONIZATION AND SAMPLING

With many of these systems targeted at film and video applications, synchronization features are of paramount importance. Because of this, SMPTE triggering is available on all systems except Ariel's SDI. The combination of digital audio tracks with MIDI sequence tracks would seem to provide the best of both worlds, but many of the developers don't see it this way – the obvious exception being systems designed as expansion options to existing synthesizers, sampling keyboards or modules, and host computers. By looping a soundfile and triggering this from a MIDI controller, some of these systems can be made to emulate a traditional sampler. On the other hand, onboard synthesis features are not popular except in systems designed as expansions to existing devices which already include such options.

EDITING AND LEARNING CURVE

There is universal agreement with respect to many of the operations available in the editing domain – non-destructive cut, copy, paste, splice, fade, crossfade, and time alignment features are essentially trivial in such systems ▶

	ADAP	AudioFrame	DSP 1500
INPUT AND OUTPUT FORMATS			
Digital: AES/EBU; PCM 1610/16130	yes; planned	yes; yes; SDIF;MADI	PCM1610 only
Analog	yes	yes	yes
Dynamic range	90	106+	88
CHANNEL SPECS			
Number of simultaneous Inputs or Outputs	2	4 to 64 (in groups of 8)	2
Number of internal channels/tracks/soundfiles	2 (realtime)	4 to 64 (in groups of 8)	2
Output with simultaneous Input? If so, number of channels?	1 In 1 Out	total < or = 8	no
SAMPLING SPECS			
Fixed rate or variable rate	fixed	fixed	variable
Rates	31.250, 32, 44.1, 48,	44.1 (32 & 50 planned)	2, 4, 8, 16, 32, 44.1
Resolutions (internal and external where different)	16-bit	16-bit external, 24-bit internal	16-bit
STORAGE MEDIUM INFO			
RAM in megabytes and expandability	1, 2, or 4 Megs	6 to 30 Megs per 8 tracks	512 Kilobytes
Bundled hard disk (size in Megabytes)	Any	two 300 Meg HDs	20 Meg cartridges
Third party expandable? SCSI? Dedicated or partionable?	yes, yes, either	no, yes, dedicated	no, yes, dedicated
Number of track-minutes (rate, size of disk)	44 min (44.1K/300 Meg HD)	120 min (44.1K/2x300 Meg HD)	5 min (44.1K per 20 Meg cart.)
Compact or defragment disk? Backup utilities?	yes, no	yes, yes	no, no
SYNCHRONIZATION			
SMPTE triggering all frame rates? VITC? JamSync?	yes, no, no	yes, yes, yes	yes, no, no
MIDI triggering? On board sequencer? (if so, number of tracks)	yes, no	yes, yes (64 - 200)	yes, no
EDITING			
Analog mixer emulation? Rock & roll (scrubwheel) editing? EQ?	yes, yes, no	yes, yes, 4 bands	no, yes, no
Visual editing system? Edit precision? Maximum edit duration?	yes, sample, disk	yes, sample, RAM	yes, 7ms, disk
Number of events edited/mixed simultaneously	2	8 / 64 w/DSP	(sequential edits only)
User Interface: Mouse, PC Kbd, dedicated controller	yes, yes, no	yes, yes, yes	yes, yes, dumb terminal
Tweak samples, Reverse, Fade/Crossfade	yes, yes, yes	no, yes, yes	no, no, planned
Nondestructive cut, copy, paste, splice	yes	yes	yes
Time dilation/compression, Time alignment	no, yes	planned, yes	no, no
Number of Input sources per mix or merge	undetermined	64 w/DSP	(requires 2 units)
Output level control	yes	yes	yes
On-board DSP features (other than time compress)	(via ADAP software)	reverb, echo, chorus, flange	none
Display SMPTE? Samples? Feet? Time? dB? Other?	yes, yes, ?, yes, yes, no	yes, yes, no, yes, yes, %total	no, no, no, yes, no, cue tones
Printing utilities for event / cue lists / EDL	yes	yes	no
Third-party software compatibility	coming	anything under Windows	no
LEARNING CURVE AND SUPPORT			
Learning curve	easy	easy	half day
Online help, seminars, on-site training, help-line, telecommunications	no, some, no, yes, own BBS	some, yes, yes (inc.), yes, PAN	yes, demos, no, yes, no
PHYSICAL HARDWARE SPECS			
Hardware Engine	TMS320-C25	Proprietary	Proprietary
Dimensions: Main unit (Control console, or Interface)	1 rackspace	10 rackspaces	2 rackspaces
Dimensions: Other electronics (Processor, Disk etc.)	17" x 13" x 1"	(Hard disk varies)	—
Host computer if any? Multi-tasking?	Ataria ST, no	PCAT comp, yes	(Mac not req), no
COSTS, OPTIONS, AVAILABILITY			
Cost for base system	$2,995	$43,000	$7,000
Base system configuration	digital box, analog box, software	4 track recording	DA Cart recorder, Mac software
Cost for required peripheral devices	Ataria ST=$1,000		Mac+ = $1,300
	150 Meg HD = $2,600		
Cost per track minute (44.1 KHz)	$300	$716	$830
Available add-on modules	software	add $18,000 to convert	20 Meg cartridges = $30
	more HDs	16 voice AudioFrame to	380 Meg HD = $4,000 (up to 7)
	more RAM	8 track recording capabilities	expand to 1.1 Gigabyte (5 hours)
		expandable to 32 tracks (6 hours)	
Available when / Delivery turn-around	3rd quarter, 1988 / immediate	4th quarter, 1988 / 30 days	now / 30-60 days

COMPUTER

► designed around the principles of random access. Because edit lists, EDLs, or cue lists are merely references to specific disk locations, nothing need ever be truly modified or even erased. With random access to your audio data time, alignment of tracks is child's play. Conversely, time dilation/compression is not an easy trick and this highly sought-after feature is currently found only in the pricier dedicated work stations.

Many systems offer unique features which will outweigh other factors, if you happen to need them. For example, Digital Audio Research's Sound Station II is about to be upgraded to include a Word Fit option. This intelligently synchronizes overdubbed dialog to original location sound recordings. It is not necessary to lip sync in the overdub – the Sound Station II accomplishes this automatically by comparing the location recording with the subsequent overdub, stretching and shrinking the spaces between the words (or the words themselves) as required.

The editing interface to direct-to-hard-disk digital audio systems will be crucial to many people making the transition from the analog world. "Rock 'n' Roll" or "Scrub/Shuttle" style editing is highly desirable. Many systems include custom control consoles, but the one I saw which closely emulated an analog mixer was Lexicon's Opus: with 12 hardware faders (accessing eight disk-based tracks and four additional digital or analog inputs, for effects such as a Lexicon 480L Signal Processor), solo/mute buttons, scrub wheel, and planned EQ controls – all functioning entirely in the digital domain – this high-end workstation stays as close as possible to the analog engineer's traditional environment.

A video screen with a PC keyboard and optional mouse is far more prevalent than an actual hardware emulation of an analog console, probably because developing a CRT interface is much easier and less costly than a custom digital control console. Furthermore, such an interface is already in place for the greater number of systems which run on top of a host computer. Rock 'n' roll editing is still available in these

Dyaxis	MaxAudio	SDI	Series III MFX	Synclavier Direct to Disk
yes; yes; SPDIF	w/optional SMPTE/EBU card		AES/EBU is planned	yes; yes; Sony-Mitsu.
yes	yes	yes	yes	yes
96	120	87	108	96
2	2 (4 with 2 cards)	2	1 (2 planned)	4, 8, 12, or 16
50 stereo pair	3rd party software	2048/drive	disk	200 edit segs
no	<= 2 (or 4 with 2 cards)	no	yes	<= 4, 18, 12, or 16 (ie. to total)
both	variable	variable	fixed	variable
32, 44.05, 44.1, 48 (& 200 user def)	44.1,48,192	< 1K to 50K	48K	1 to 100
16-bit	16-bit, 18-bit, 20-bit	16-bit	16-bit	16-bit external, 24-bit internal
1 Meg	3/4, 3, or 12 Megs	512 K (expandable to 2 Megs)	2 to 28 Megs	planned
102 Meg (expand to 1.6 Gigabyte)	(140 Meg recommended)	Any	190 to 380 Meg	300 Meg
no, yes, either	yes, yes, either	yes, yes, dedicated	no, yes, either	yes, yes, dedicated
20 min (44.1K/102 Meg HD)	3rd party software dependent	50 min (50K/300 Meg HD)	22 min (48K/190Meg HD)	12.5 min (100K/300Meg HD)
via DiskExpress, via 3rd party	yes, no	yes, yes (streaming tape)	no, yes	manual, tape cartridge
yes, external reader, yes	optional SMPTE/EBU card	no, no, no	yes, no, no	yes, no, planned
via SMPTE, no	yes, yes	no, no	yes, yes (16)	yes, yes (200)
no, yes, no	planned, planned, DSP card	no, yes, no	yes, no, yes	planned, yes, yes
yes, sample, disk	yes, sample, disk	yes, sample, 4 billion samples	yes, sample, disk	via Mac II, 5ms, disk
50	Unlimited	up to 256	1,008	up to number of drives
yes, yes, no	yes, yes, no	yes, yes, no	no, custom, graphics pad	yes, yes, no
yes, yes, yes	via DSP Card: yes, yes, yes	no, no, yes	yes, yes, yes	no, no, yes
yes	yes	yes	yes	yes
planned, yes	yes, yes	no, no	no, no	yes, yes
50	no limit	not available	1,008	not available
yes	some	yes	yes	yes
interpolation, smoothing	DSP card 3rd party dependent	none	phase, flange, delay, chor, pitch	none
yes, yes, yes, yes, yes, no	yes, yes, yes, yes, yes, beats/meas	no, yes, no, yes, yes, no	yes, yes, no, no, yes, MIDI vel.	yes, yes, yes, yes, yes, beats/meas
not yet	—	yes	yes	yes
Alchemy, Cue Sheet AV	mainly 3rd party OEM product	not yet	(MIDI Sequencers)	planned
day	NA	easy	week to 3 months	medium
no, yes, planned, yes, PAN	NA, NA, NA, NA, PAN	yes, no, no, no, own BBS	no, yes, yes, yes, ESI	w/MacII, yes, yes, yes, PAN
Proprietary	DSP 56001 (Motorola)	TMS320-C25	Proprietary	NED Proprietary
1 rackspace	standard Mac II cards	standard IBM card	same as Fairlight	41 x 25 x 61
3 rackspaces			rackmountable	
Mac+, SE, II, no	Mac II, (soon)	IBM PC comp, yes	Own, yes	Own, no
$7,000	$1,400	$5,000	$27,500	$65,000
Analog IO box, 102 Meg HD	Analog card for stereo IO, software	IBM card, 50 Meg HD, software	2 voices, 2Meg RAM, 190Meg HD	4 tracks, 600 Megs HD, w/backup
Mac+ = $1,300	Mac II = $4,000	IBM PC = $500 to $5,000		
	140 Meg HD = $3,000			
$415	$525	$529	$1,250	$573
Digital IO = $2,000	Digital IO-SMPTE/EBU card=$1,000	external chassis = $400	Waveform Supervisor = $5,000	Hard disks = $50,000 / 4 tracks
TimeCode sync box = $2,000	DSP card = $3,900 (8 voices)		$1,255 / Meg RAM	expand up to 16 tracks
$2,695 per 102 Megs HD	expand to second Analog card		$4,200 / int190 Meg HD	
$8,195 per 320 Meg HD			$7,000 / MFX control console	
An.IO=now, Dig IO=7/88 / 3-4 wks	4th quarter, 1988 / ?	now / 2 weeks	Options: July, 1988 / 2-4 weeks	now / varies per configuration

configurations - Waveframe's AudioFrame provides an innovative and highly effective approach to using the MIDI keyboard's bender control for this purpose. One should not forget that a CRT interface to digital audio editing is only as good as the software driving it. IMS's MacMix software for their Dyaxis system upholds the highest standards of the Macintosh's acclaimed user-friendly interface and for those of us coming from the digital world, it is as naturally intuitive as Lexicon's hardware interface is to those coming from the analog camp. With this in mind, both the learning curve and edit efficiency should be considered in relation to an individual's background.

The final portion of the table includes costs for various configurations starting at the base system and, where applicable, illustrating the upgrade path to the full-blown system. Add-ons, and options are included where appropriate. If a host computer is required, this is figured into the price in calculating the cost per track-minute. The reader should be warned not to take the cost per track-minute as an empirical measure of value per dollar. The situation is not identical to purchasing a hard disk for computer data storage, where one might seriously consider the cost per megabyte to be a decisive factor, other items such as access time being equal. There are many additional variables which drive up the cost per track-minute. These include DSP features, number of Ins and Outs (and whether they are digital, analog, or both), size of hard disk in the base system, custom interface, and just about everything else we've covered on the chart. Finally, take a moment to figure the cost per track-minute on your analog machine - yes, you can buy new tape much cheaper than a new hard disk, but you can also dump your hard disk off to digital audio tape, erase the disk, and then re-use it over and over again; which is something you can't do very many times with a reel of analog recording tape.

It may not seem obvious now, but that little computer over in the corner may just become the centerplace of your studio.

Ah, technology . . . ■

AFTERTOUCH

OFFICIAL NEWS FROM THE YAMAHA USERS GROUP

DX11 Synthesizer brings new sounds to its price class.

YAMAHA HAS JUST GIVEN KEYBOARD players good reason to expect more for their money—with the introduction of the DX11 FM Synthesizer.

It's an 8-algorithm, 4-operator synthesizer that lets you use 8 different waveforms to create complex sounds. And, with a polytimbral mode, it actually lets you play up to 8 voices at the same time.

The DX11 has a 61-note keyboard with velocity and aftertouch. It comes with 128 preset voices, all fully editable, and room to store 32 custom voices in its internal memory. A RAM4 cartridge gives you 64 more, for a total of 224 available voices. All voices are stored with a complete set of function parameters: everything from pitch bend, LFO and transposition settings to a new Reverb feature.

YAMAHA DX11 FM SYNTHESIZER.

It has stereo outputs and a Pan effect, which allows you to control stereo imaging by LFO, velocity or by keyboard split. Other effects are built in, too, such as a transposable repeated delay and a Chord Set function that lets you play up to 4 notes by pressing a single key.

The DX11 gives you the same microtuning function that's found in the DX7II, with 11 preprogrammed microtonal scales plus memory for 2 of your own. And it's completely compatible with voices used in the TX81Z tone module and DX21/27/100 synthesizers.

Of course, the DX11 has an easy-to-read backlit LCD. As well as full MIDI implementation—so its eight voices can be driven remotely by a sequencer, computer, master keyboard or drum machine.

With a suggested USA retail price of $995.00, you can be sure the DX11 is going to be generating a lot of interest. See it for yourself at an authorized Yamaha Digital Musical Instrument Dealer.

E! now available for DX7II series.

A company called Grey Matter Response has just released an expansion kit for DX7IIFD, DX7IID and DX7s synthesizers. It goes by the name of "*E!*," and gives you access to an impressive host of new features.

For starters, *E!* lets you play your DX7II in Octal Mode for 8-voice multi-timbral sound, with full control over individual voice volume and octal stereo pan.

It provides a built-in sequencer that can store 220,000 events on the DX7IIFD (22,000 events on the "D" and "s" models). So you can record in real- or step-time on 16 tracks and 16 MIDI channels, and call up your sequences right at your keyboard.

You also get the *E!* engine—a 16-track MIDI mapper, velocity processor and more.

And for added versatility, *E!* increases your on-board storage to 256 single voices and 128 performances. Each performance includes Octal Mode and sequencer information in addition to normal DX7II performance parameters.

E! also provides increased capacity in the FD disk drive, letting you save files as large as 128K. And it has "E-Ram," which loads—as one bulk file—all your voices, sequences, MIDI map and other data.

For more information on *E!* and where you can find it, contact Grey Matter Response at 312-349-1889. The kit's suggested USA list price is only $399.00.

E!

AFTERTOUCH is a monthly newsletter filled with the latest on Yamaha products. Get a year's subscription free by writing to: AFTERTOUCH, P.O. Box 7938, Northridge, CA 91327-7938.

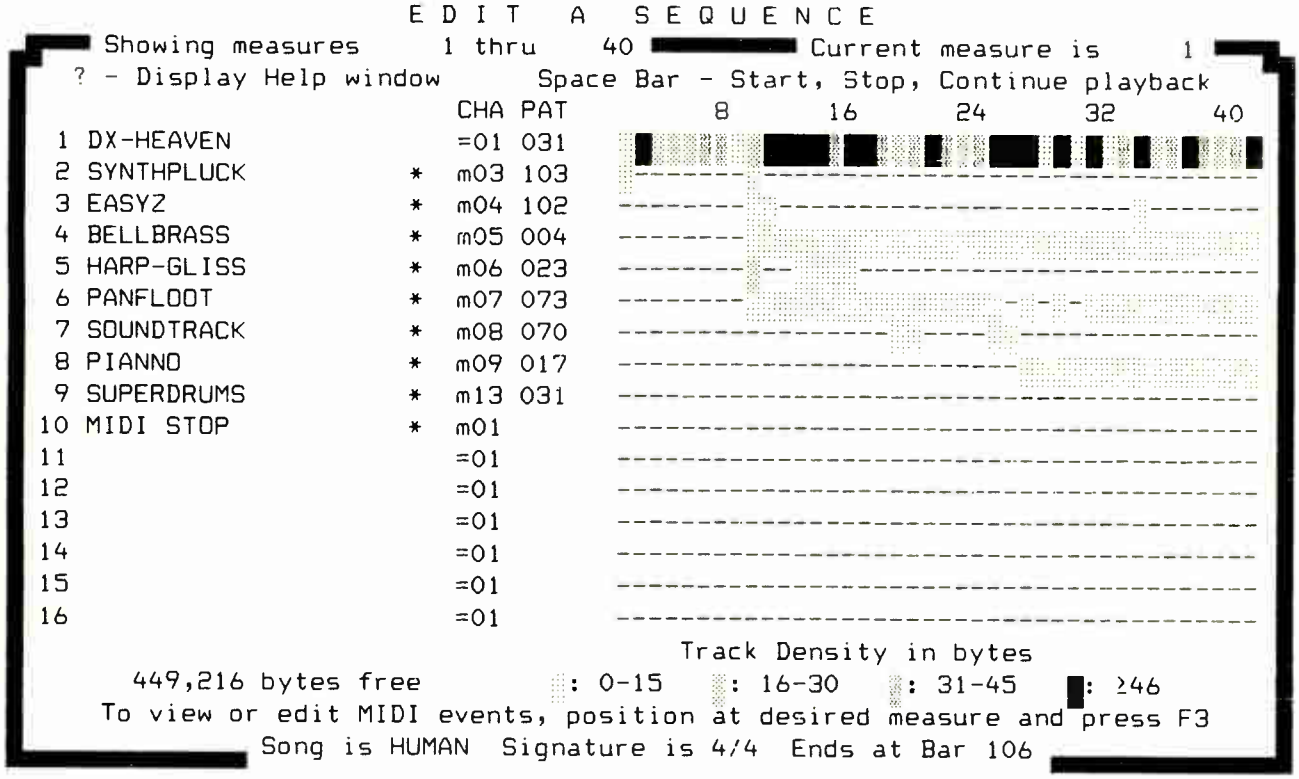
YAMAHA

Yamaha Music Corporation, USA, Digital Musical Instrument Division, P.O. Box 6600, Buena Park, CA 90622.

Concepts:One

Sequencing Software for the IBM

The bold first entry from a new company offers features, features, features, but questions remain about how well they fit into a single package. *Review by Matt Isaacson.*



Phrase Editor - Showing a "road map" of 16 tracks

THE SEQUENCER WARS, it seems, have gotten out of hand. More and more the feature list seems to be the thing that sells the sequencer - leave out the Flavor of the Month in editing (plus all the previous Flavors), and you're doomed. Too often overlooked in this headlong rush is how easy the package is to *use*. The story of Concepts:One is a saga of a sequencer that has it all, but doesn't freely give it away.

LEARNING THE LANGUAGE

To begin with, one should not attempt to approach this program without the user's manual in hand unless prepared to: 1) Go through some rough times getting started, and 2) Remain ignorant of a large number of useful capabilities which Concepts:One offers. Expect to spend some time with the manual at your side before you get to the point of not needing it.

While Concepts:One requires a fully-loaded machine in terms of memory, it does not require you to have any special type of monitor - standard monochrome is fine, although color is also supported. The very design of the user interface fairly precludes any possibility of using a mouse, so you need not worry about that, either.

Like many other PC-based sequencers, Concepts:One allows you to have one sequence present in memory at any time. Recording is done on any one of the 32 tracks at a time, in real time with a resolution of either 144 or 192 clocks per quarter-note. Each track can hold data for any combination of MIDI channels. The tracks are bound together in time like tracks on tape - although a looping feature is present, there is no ability for separate looping of tracks in a sequence (something which, in fact, few sequencers of any type are capable of).

The function keys F1-F10 are used for jumping from one screen to another. The bottom line of all screens is dedicated to a display of the function key definitions. While these are always the same for a given key, there is some variation as far as which functions are available at a given point, as reflected in this display. In most but not all screens, the "?" key is used to call up the associated Keystroke Help menu.

Concepts:One is mode-oriented. Most functions are available only in certain screens. In addition to necessitating a large amount of screen flipping - often less than instantaneous as the screen displays are regenerated from sequence data - this also means that you will have to remember not just one but a few function definitions for each key on the keyboard. For example, in the record and playback screens, the backslash key is used to reset the elapsed time display, whereas in the phrase editor screen, the same key is used to replace a section of a track with the current contents of the edit buffer.

Beyond remembering multiple definitions of keys, it'll also be necessary to remember the particular screens in which particular definitions apply. For example, to copy or delete a particular section of a track, you go into the phrase editor screen (itself described in more detail later). On the other hand, to delete an entire track or copy it to another track, you must head for the sequence utilities screen. Topping this all off, some frequently-used keys are similarly defined in all screens but are ▶

► subject to slight but irritating variations in behavior from one context to the next. Concepts:One misses many easy opportunities to use the screen effectively to reduce manual-reading and memorization.

RECORDING

From the word go, Concepts:One presents things in a non-intuitive manner. The record track is selected by hitting the ";" key and entering the track number. Obscure, yes, but this one you come to remember pretty quickly. Others, such as "V" to solo a track or "," to set new punch-in and punch-out points, will take longer to memorize. Until you memorize such things, you'll make frequent reference to the Keystroke Help menus, which fill half or all of the screen with the *complete* list of single keystrokes which are available to activate some option or initiate a command at a given point. There are cases where a displayed option is not in fact available (eg. selecting a record track while in the live playback screen), or where available options are not displayed despite the apparent exhaustiveness of the list.

Annoyingly, it is necessary to restate the record track prior to each and every recording take. Upon stopping and rewinding, or upon manual or automatic punch-out, the record track number is immediately forgotten (the only apparent exception to this is in loop mode – more on that later). In light of this fact, it's a bit surprising that the Record screen allows you, without protest, to go into record mode without a record track selected, in which case it will naturally not record what you play. A safety feature? Perhaps. I'd prefer to live a little more dangerously.

The track status window at the left of the record screen, which shows status for all tracks at once by way of displaying their numbers in two vertical columns, will reverse-highlight the track selected for recording at any time. This is fine if you're paying attention, but not sufficiently distinctive from the method used to indicate muted tracks (an empty black box over the place where the track number usually appears), and much less noticeable than the constant blinking on and off of *all* numbers in the window at all times. This occurs even in the live playback screen where the track status window also appears, apparently signifying nothing in particular (a missed opportunity, I'd call it), and therefore distracting at best.

Automated punch-in and punch-out points can optionally be used to record and re-record very specific sections of a track without affecting the sections before and after it, and without any need to erase bad takes by hand each time. Alternatively, there is also the ability to punch in and out manually, once per take. Data is normally recorded with MIDI channel info intact and played back exactly as it was received, but as an option it can be recorded with MIDI channel numbers stripped out. The playback MIDI channel for channel-stripped events is determined by the playback channel setting which is in effect for that track.

The record screen, in addition to the already-discussed track status display, contains a relatively comfortable and uncluttered display of assorted other features and their relevant status: current position within the sequence, current end of sequence, current punch-in and punch-out points, remaining sequence memory available for recording (in kbytes as opposed to number of events), the MIDI channels currently recognized on input (which can be all channels or any one channel, but not arbitrary combinations of channels – this setting also determines which MIDI channels are echoed through from the input to the output), the track (*if* any!) currently selected for recording on as well as whether or not the MIDI channel information is to be saved or stripped. Other displayed data includes the elapsed real time from the start of the sequence in hours, minutes, seconds and, apparently, eightieths of a second (albeit only in response to actual running time, not updated in response to scrolling through a sequence), the current tempo in whole-number beats per minute, plus current looping status (active or inactive) and punch-in mode (manual or automatic). All displays relating to sequence locations are rendered in [bar.beat.1/8th-beat] format.

PLAYBACK

At the top of the live playback screen is a compressed selection of the relevant data from the record screen (punch-in/out and record track settings are not included). The track status

window is here as well, side by side with a track parameters window which takes up the bulk of the screen and displays various track-specific information for tracks 1-16 or tracks 17-32, owing to limitations of the screen. The parameter info includes names (if any) for each track, as well as a global overview of contents and settings per track: presence or absence of a bulk dump recorded for this track which should be sent out prior to playback, presence or absence of other recorded MIDI data, default MIDI channel setting for the track (applies only to channel-stripped MIDI data), track delay or advance of +/−99 clocks, velocity and note-number offset values which affect all data on a track and can be used to shift the dynamics or transpose a track, plus initial MIDI patch number and volume settings per track. Most of this stuff is actually manipulated in the sequence utilities screen.

The one feature which is unique to the live playback screen is that of sequence cueing, which is of great value to anyone using the sequencer onstage (no doubt this is why it is called the *live* playback screen). This feature lets you compose, for any sequence, an ordered list of up to 32 other sequences, referenced by their disk filenames, which are automatically loaded into the sequencer one at a time as soon as playback of the preceding sequence in the list is finished. Naturally, there is some delay involved in this, so the auto-cueing feature does not actually constitute a song-mode sequence *chaining* facility. Assuming you have a hard disk, however, the delay is fairly small.

Neither the record nor the playback screens offer a key dedicated to rewinding directly to the start of the sequence. The space bar is used as a start/stop/continue control, and auto-rewind to the start of a sequence occurs *only* if playback has been allowed to proceed up to the end of the sequence (which can never happen in record mode, since letting the sequencer run in this mode has the effect of pushing out the end of the sequence accordingly). The lack of a rewind-to-start key is compensated for by the ability to define eight cue points, any of which can be reached via two single keystrokes. While using Concepts:One, I always maintained at least one cue point set to the start of the sequence, which worked just fine (and a good deal better than the scroll keys).

EDITING

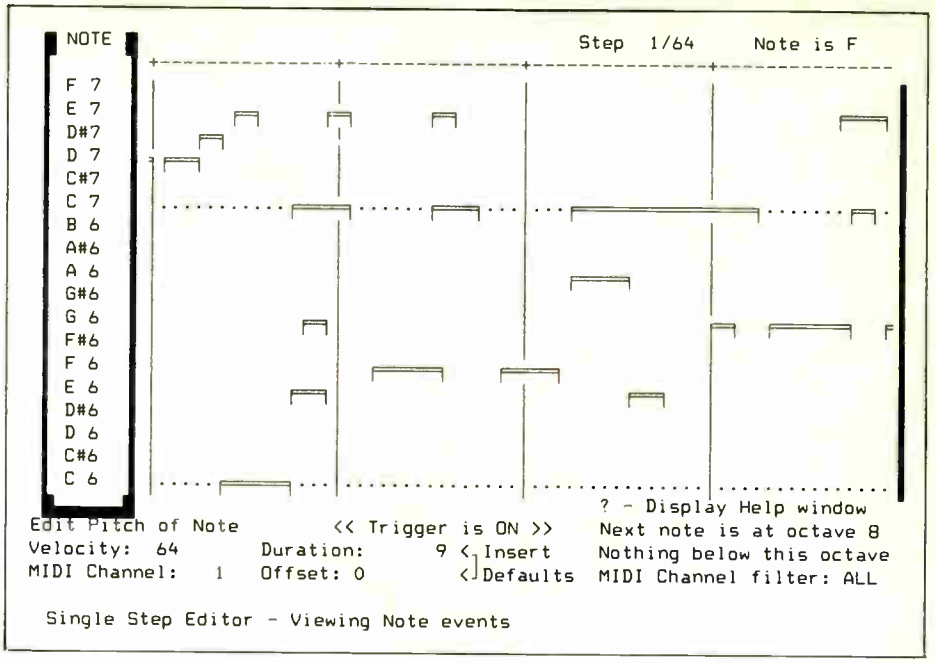
The sequence utilities screen offers a half-dozen function pages. The track parameters page is the one which gives you access to the parameter settings. Three other pages allow you to record, verify and give names to system exclusive bulk dumps which can be held in sixteen separate dedicated buffers (they can comprise more than one message, and are each roughly 16K in size). Another page lets you give names to each of the tracks of your sequence, and the remaining page is the one for access to whole-track editing functions which include track-to-track copying, erasing of a whole track, transferring single tracks to and from disk (very nice!), splitting one track onto several tracks by MIDI channel, and merging of tracks.

The merging function is less than stellar: no more than four tracks can be merged at any one time, and the destination track cannot be included as one of the source tracks, so the process of, say, merging 12 tracks down to one is a bit tedious. I also repeatedly crashed the program in the course of attempting to perform track merges (*not* very nice!), although as far as I got into Concepts:One, this was the only such trouble spot I encountered.

The phrase edit screen is my favorite operating screen, in no small part because it works much more smoothly than the record and playback screens. Here the sequence is represented in the form of a data-density plot, 16 tracks and 50 bars at a glance (or, if you can forego the display of track names, you can see 72 bars at once!). This lets you see very quickly where things are in the sequence. There's a row of dots for each of the displayed tracks, one dot per displayed bar. The dots are replaced by squares of varying brightness (or color, if a color monitor is used) which indicate the amount of data recorded in each bar of a track. A hyphen is used instead of a box for any bar within the defined extent of the sequence (ie. before the currently-defined end of sequence) which contains no data. If you use your tracks wisely, this display makes it a snap to keep track of isolated individual events such as program changes.

Playback can be initiated from this screen,▶

COMPUTER



with a vertical highlight stripe providing a visual indication of the current playback position, although without access to the track muting functions provided by the record and playback screens. The cursor movement keys move the cursor around within the sequence plot to select bars and tracks for the editing functions available under the phrase editor. These include the full expected assortment of options such as cut, extract, replace, copy (including repetitive copying), quantize, channelize, transpose and time-shift. All such operations are delimited by one of sixteen user-settable pairs of edit markers. Any pair of markers which you define as part of an edit operation is stored in the list and can be referred to again in later operations by number. The markers can be set with resolution of a 1/64th-note (one-sixteenth of a quarter note).

While complete, the phrase editing utilities are not without their problems. First, there seem to be few which are capable of operating upon more than one track at a time. Those which can – the "block" operations – seem to be able to operate only on all tracks at once, not selected tracks. If true, this is a big drawback of the phrase editor which ought to be corrected Real Soon (as should the absence of block-oriented versions of copy, cut and paste). Imagine, in this day and age, having to duplicate all thirty-two tracks of a selected portion of a sequence one track at a time! I eventually loaded individual tracks separately from disk into an empty track of the current sequence, and then copied them where they needed to go. Fortunately it is not necessary to save the tracks individually in order to be able to load them one-by-one, but it *is* necessary (as always) for you to remember exactly which track you're after, because you select the track number first, and then the sequence from which to load it – you don't get a chance to view the list of track names in a sequence and choose from it (which is sort of disappointing, since the selection of the sequence itself is done in exactly that fashion).

Beyond those problems, many of the utilities exhibit strange behavior. For example, extracting a phrase from a track can leave stuck notes in the track if the starting edit marker cuts through the middle of a note. In all cases where this is possible, the manual kindly offers a warning to this effect (although quite frankly, I am unimpressed by this gesture – it simply shouldn't be possible to inadvertently create stuck notes in the normal course of using the editing functions). A similar problem can occur when using the quantize function on a string of staccato notes – if the option to correct only note-ons is used, it is actually possible that the quantize function will place note-ons *after* their associated note-offs.

From the phrase edit screen it is possible to jump off into the step edit screen. Sequence events from a single selected track are displayed one bar at a time in the form of horizontal lines whose positions indicate the note location in time and whose lengths indicate the duration of the note. The note number determines the line upon which the note symbol appears, with one-and-a-half octaves visible at any one point and corresponding note names or numbers displayed along the left edge of the screen (although there is an annoying propensity for this screen to come up empty when you call it up, rather than finding an octave which has some data recorded in it).

A separate sub-mode is available for editing of non-note events. In either case, events are selected (and optionally transmitted over MIDI) by moving the cursor over them, and detailed information about the event upon which the cursor rests is shown at the bottom of the screen. Alternatively, by moving the cursor into empty spaces you can step-enter any desired MIDI event, *including* system exclusive messages up to sixteen bytes in length. The step-editing/entry facilities of Concepts:One are as precise and unrestrained as almost any dedicated MIDI

hacker is liable to want, although certain aspects of its use are rather awkward.

BREEZING THROUGH THE REST

A system parameters screen lets you set global sorts of things like sync modes, metronome functions, count-in, initial tempo, time signature, record input data filtering, enable/disable transmission of bulk dumps before playback, song list autoload, auto-increment recording, and so forth. Finally, there is a screen dedicated to the creation of a text file which can contain any notes, lyrics, shopping lists, etc, that you care to type in.

A sequence looping facility is provided which allows you to roll repeatedly through a selected portion of a sequence during record or playback. The loop end point can be set only while the sequencer is running, by hitting a key at the desired loop end point (the loop start point is the point at which playback/record was last started prior to hitting the loop end key). This same key also enables and disables loop mode, which means that once you use it to disable your loop, you've also in effect lost your loop point setting, since the next time you go to enable looping again, you'll be setting a new loop end point as well. The loop point can't be set by directly specifying it, which makes it nearly impossible to loop exactly at the end of a sequence, since of course playback stops at that point, and then the loop enable key is no longer effective.

Among other functions, the sequence utilities screen of course reiterates the track parameter information, because this is where it can be adjusted, adding a per-track display of memory usage. The track-edit page also offers a feature which ought to be standard on all sequencers – namely, the ability to protect individual tracks of a sequence against inadvertent editing or recording damage (actually this can be controlled from a number of screens).

PUNCHING OUT

What more is there to say about Concepts:One? In fact, quite a bit – the detailed list of features which I haven't even mentioned here is sizeable, as is the list of specific annoying idiosyncracies of various functions.

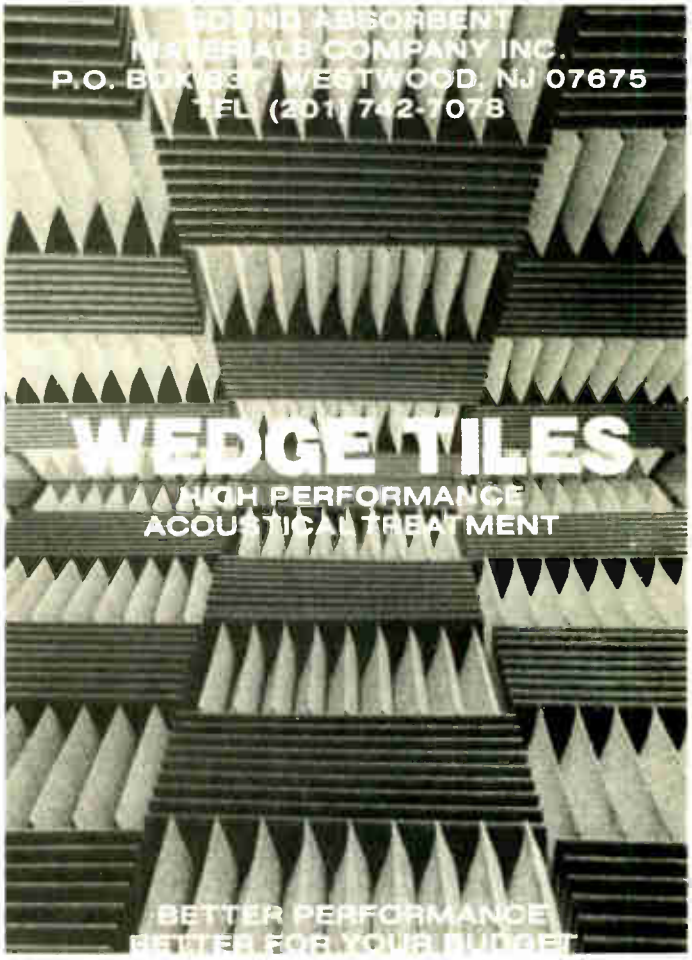
Concepts:One is an object lesson in how a MIDI sequencer (or any other product of technology) can look great on paper, but fall short of greatness in the reality of its use, even when, technically speaking, it works as advertised. All the features are there: 32 tracks, resolution of 192 clocks per quarter note, loop-mode record and playback, full editing functions in track, block, and single-event modes, multiple cue points, system exclusive bulk dump management, automatic cueing of sequence chains, track muting/soloing, and much more. By and large, everything does what it's supposed to. The shortfall? Points lost in the style department, which (as we have seen) is much more important than it might at first seem.

The program itself is relatively tight-lipped about how things work – no signs of context-sensitive help here. An initial suspicion is that this is intentional – in the unlikely event that the rather unyielding copy protection scheme is cracked, many of the subtleties of this program will remain unknown to those that have not also copied the manual. Of course, the legitimate user must also pay the price of a program which refuses to allow itself to appear to be holding the user's hand. However, over the course of time spent with the program, the notion begins to emerge that this is as much a consequence of the overall approach of the program's creator. According to the people at MIDIConcepts, a tutorial and other updates (all of which will be free to registered owners) are in the works, though, so this should help.

There is a rather long list of things, large and small, which could have been done a little differently or perhaps developed more fully, to make the process of working with Concepts:One more productive and more *fun*. Maybe I'm just spoiled – but if so, it's because I *have* seen it done right, both in sequencers and in unrelated types of PC software. Despite this, it should be reiterated that this criticism is not a condemnation of Concepts:One – I'm certain that a lot of good music can and will be created using this program – but simply one person's evaluation of what keeps it from being a *great* program. ■

PRICE $495

MORE FROM MIDIConcepts, 7657 Winnetka, #327, Canoga Park, CA 91306. Tel: (818) 342-0409



MUSIC

On Circuit

BRIAN BROMBERG

Bon Apetit, Westwood, California

Photography *Rosemarie Rousseville*

This month's *On Circuit* features a bass player so technical, there ain't no guitarist. Hopefully, you'll find something in this setup that you'll be able to use for your own club performance. Want to see your band featured here? It's possible – write for a copy of the guidelines to: Music Editor, MUSIC TECHNOLOGY, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.

Review by Chris Meyer.

I'LL ADMIT TO my occasional minimalist phase, but having two guitars on stage with neither of them sporting over four strings initially catches me as a bit strange. But that's the case with the jazz fusion band of Brian Bromberg, with BB himself on MIDI'd, fretless, nylon, piccolo, and the occasional normal bass; Bruce Stone on the other bass; Mark Hugenberger on keys; Joel Taylor bashing skins; and Ernie Watts on sax.

Brian's about to release his second album, *Bases Loaded*, making the jump from a private label to a biggie-sponsored one (Intima, which is part of Enigma, which is part of Capitol). His (and Stone's) basses are custom-made, each one being an experiment with pickups and stringing. They have an incredible 26-fret reach, and the body style is about to be released by Gibson. More fascinating is his work with the folks at Gibson and Photon on MIDIing his bass. Having only part of his rig there, he was driving a Roland GR700 brain modified for MIDI input, an Oberheim Matrix 6R, and a Yamaha TX81Z (a Keytek CTS-2000 normally fills out the rig). Footpedals on the floor allow mixing and fading of the synths with the straight bass. The floor-mounted Roland makes patch switching easier, along with the Photon's footpedal system (which he left at home this night, for lack of floor space). A floor-mounted Ibanez multi-effects unit rounds out what he does with his feet to keep his hands and ears happy. Brian also likes preset effects devices for live – "Of course, in the studio, I'm going to be using an AMS, but with 99 presets available, you're going to find *something* you like . . ."

Both Brian and Bruce have custom-designed speaker cabinets by Neil Lindsay at Bold Concepts that feature nine 4½" drivers and a sole 18" for occurrences below 100Hz. These were chosen for full-range sound and a good volume level (remember last month's *On Stage* with Alan Holdsworth, where he settled on a pair of Roland JC120's with some extra bass cabinets as a "compromise"). Other members needed little amplification, given

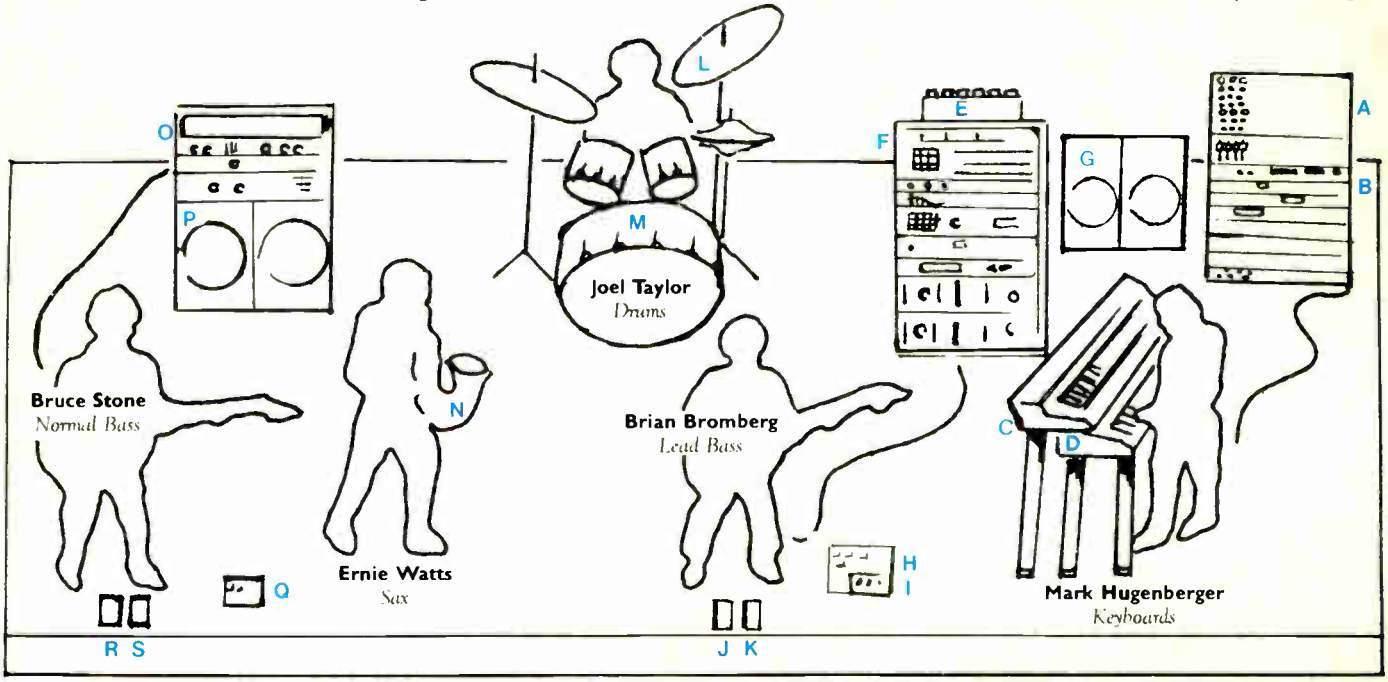


Illustration *Lisa Minka*

the small size of Bon Apetit. Mark survived with a simple TOA system, and the microphones visible were for talking to the audience (the band is all instrumental) and the sax (Bon tapes the concerts for a syndicated radio show).

How did it sound? Like a lot of fun. Ernie, the sax player, looked a bit out of place physically compared to the other fresh-faced members, but blew very finely indeed. Bruce on normal bass was great, and could play in any band – this was certainly not just a "supporting role." Mark on keys went to the breath controller often for a lot of *nice* expression. Joel Taylor on drums was fast and competent, but seemed a little stiff (perhaps the trade-off for precison and energy, I guess). Unlike most leaders, Brian was in fact very quiet in volume. Most of the time, he sounded like a solid, sparse rhythm guitar, and the MIDI bass leads were like speed monophonic runs by a keyboardist. The occasion when he took a solo was devastating – those fingers are not of *this* earth. His speed could rival Stanley Clark, except Brian has more feeling. The band cooked overall, alternating between "pretty" instrumentals and some cool covers. And the sound was fine – in contrast to all the technology, the minimalistic sound system did it all justice. ■

KEY TO INSTRUMENTS

- **A** Hill Multimix
- **B** **Rack includes:**
  - Lexicon PCM60
  - Yamaha SPX90
  - Yamaha DI500
  - Yamaha MEP4
  - Korg EX8000
  - Roland MKS20
  - Roland D550
  - Yamaha TX816
- **C** Yamaha KX76
- **D** Yamaha KX88
- **E** Boss 800 mixer
- **F** **Rack includes:**
  - Oberheim Matrix 6R
  - Biamp crossover
  - DOD stereo graphic eq
  - Photon MIDI converter
  - ART Proverb
  - Yamaha TX81Z
  - 2 Peavey Decca amps (stereo, biamped)
- **G** Bold Concepts monitors
- **H** Roland GR700 brain
- **I** Ibanez Multi-effects
- **J** Boss stereo volume pedal (TX81Z)
- **K** Boss stereo volume pedal (Oberheim, Roland)
- **L** Paiste hi-hats, Zildjian cymbals (all crashes)
- **M** Pearl drums, Yamaha floor tom
- **N** Yamaha saxes
- **O** **Rack includes:**
  - Peavey Probass 1000
  - dbx 163 compressor
  - BGW Professional Series amp
- **P** Bold Concepts monitors
- **Q** Ibanez Multi-effects
- **R** Boss delay
- **S** Ibanez chorus

PATCH WORK

PROGRAMMING

This is the page where MT's editorial team invites you, the readers, to demonstrate your own synthesizer programs. Send us your favorite sounds on a photocopy of an owner's manual chart (coupled with a blank one for artwork purposes), and include a short demo tape. Please include a description of each sound and write your full name and address on each chart. If we publish your patch, you'll be rewarded with a *complimentary one year's subscription* to MUSIC TECHNOLOGY. Interested? Then get twiddling and get scribbling!

The address to send patches to is: *Patchwork, MUSIC TECHNOLOGY, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.*

Roland D50

Ebony Whistler

Will Brady, Laguna Beach, CA

'Ebony Whistler' can be used as a pad or for a full keyboard performance setup, combining an organ-ish, DX7-ish piano sound with an electric flute for more melodic intervention. This one could be really useful, particularly for pop tunes. Thanks, Will! ■

Key Mode	DUAL
Sprit Point	C4
Tone Balance	21

L-Key Shift	00
U-Key Shift	00
L- Fine Tune	00
U-Fine Tune	00

Bender Range	02
After(Pitch Bender)	00
Portamento Time	00
Portamento Mode	UL
Hold Mode	UL

Output Mode	01
Reverb Type	10
Reverb Balance	50
Total Volume	92

Chase Mode	ULU
Chase Level	50
Chase Time	50

MIDI TxCH	B
MIDI SepCH	OFF

Used Tone

Upper ELEC FLUTE

Lower DARK SIXTH

Tone Name DARK SIXTH Used Patch No ____

[Common Parameters]

Structure No	01
Partial Mute	

Pitch ENV

Velocity	00
KF(Time)	00
Lo	00
T1	20
L1	00
T2	20
L2	00
T3	20
SusL	00
T4	20
EndL	00

LFO

	1	2	3
Wave	TRI	TRI	TRI
Rate	75	00	00
Delay	00	00	00
Sync	OFF	OFF	OFF

Pitch Modulation

LFO Depth	00
Lever Mod	26
After Mod	26

EQ

Lf	350
Lg	+09
Hf	3.4
HQ	2.0
Hg	+04

Chorus

Type	01
Rate	45
Depth	65
Balance	100

[Partial Parameters 1/2]

WG		1	2
WG Pitch	Coarse	C3	A6
	Fine	-12	+38
	KF(Pitch)	s1	s1
WG Modulation	LFO Mode	+	+
	P-ENV Mode	OFF	OFF
	Bender Mode	KF	KF
WG Wave Form	Wave Form	SAW	SAW
	PCM No	01	01
WG Pulse Width	PW	91	91
	Velocity	00	00
	After Touch	00	00
	LFO Select	+1	+1
	LFO Depth	00	00

TVF		1	2
TVF	Frequency	28	07
	Resonance	00	26
	KF(Freq)	1	1
	Bias Point/ Bias Direction	<A1	<B2
	Bias Level	00	-07
TVF ENV	Depth	100	100
	Velocity	08	09
	KF(Depth)	00	00
	KF(Time)	00	00
TVF ENV	T1	00	00
	T2	33	11
	T3	55	73
	T4	82	78
	T5	100	100
TVF ENV	L1	100	100
	L2	85	83
	L3	71	55
	SusL	69	32
	EndL	00	00
TVF Modulation	LFO Select	+1	+1
	LFO Depth	00	00
	After Touch	00	00

TVA		1	2
TVA	Level	100	100
	Velocity	+11	+11
	Bias Point/ Bias Direction	>C4	>C4
	Bias Level	00	00
TVA ENV	Velocity (T1)	00	00
	KF(Time)	02	02
TVA ENV	T1	00	00
	T2	76	13
	T3	86	40
	T4	100	66
	T5	55	55
TVA ENV	L1	100	100
	L2	00	100
	L3	00	96
	SusL	00	74
	EndL	00	00
TVA Modulation	LFO Select	+1	+1
	LFO Depth	00	00
	After Touch	00	00

Tone Name ELEC FLUTE Used Patch No ____

[Common Parameters]

Structure No	01
Partial Mute	

Pitch ENV

Velocity	00
KF(Time)	00
Lo	00
T1	20
L1	00
T2	20
L2	00
T3	20
SusL	00
T4	20
EndL	00

LFO

	1	2	3
Wave	TRI	TRI	TRI
Rate	74	00	00
Delay	00	00	00
Sync	OFF	OFF	OFF

Pitch Modulation

LFO Depth	00
Lever Mod	20
After Mod	20

EQ

Lf	125
Lg	+05
Hf	250
HQ	0.3
Hg	+02

Chorus

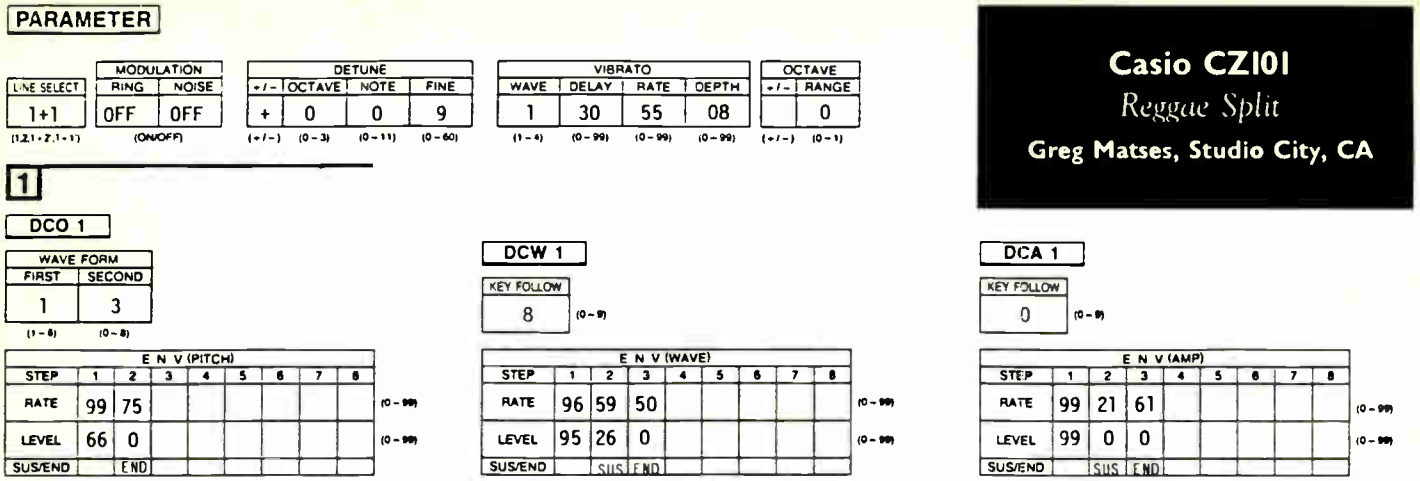
Type	01
Rate	41
Depth	94
Balance	35

[Partial Parameters 1/2]

WG		1	2
WG Pitch	Coarse	C4	C4
	Fine	+09	-08
	KF(Pitch)	1	1
WG Modulation	LFO Mode	OFF	+
	P-ENV Mode	OFF	OFF
	Bender Mode	KF	KF
WG Wave Form	Wave Form	SQU	SQU
	PCM No	01	01
WG Pulse Width	PW	00	00
	Velocity	00	00
	After Touch	00	00
	LFO Select	+2	+2
	LFO Depth	00	00

TVF		1	2
TVF	Frequency	29	29
	Resonance	00	00
	KF(Freq)	1	1
	Bias Point/ Bias Direction	C5	C5
	Bias Level	-01	-01
TVF ENV	Depth	90	90
	Velocity	20	20
	KF(Depth)	00	00
	KF(Time)	04	04
TVF ENV	T1	00	00
	T2	45	45
	T3	100	100
	T4	00	00
	T5	82	82
TVF ENV	L1	100	100
	L2	53	53
	L3	00	00
	SusL	00	00
	EndL	00	00
TVF Modulation	LFO Select	+2	+2
	LFO Depth	00	00
	After Touch	+02	+02

TVA		1	2
TVA	Level		
	Velocity		
	Bias Point/ Bias Direction		
	Bias Level		
TVA ENV	Velocity (T1)	00	00
	KF(Time)	01	01
TVA ENV	T1	35	35
	T2	25	25
	T3	91	97
	T4	93	91
	T5	44	44
TVA ENV	L1	100	100
	L2	100	100
	L3	100	100
	SusL	100	100
	EndL	00	00
TVA Modulation	LFO Select	+1	+1
	LFO Depth	00	00
	After Touch	00	00



Looking for a reggae-sounding patch to add some bounce to your beat? Here's a little number that you're bound to love: a nice, warm, responsive bass with a surprisingly clean organ sound in the mid to upper range. The bass alone is worth the tweaking. Nice job, Greg. ■

P R O G R A M M I N G

PATCH WARE

NEWS: If you're looking for patches for a number of older synths, **Deep Magic Music** has something for you. The company specializes in producing patches for classic analog synths and some newer Korg gear, including the **Moog Source, Sequential Prophet 600, Korg Poly 61, Polysix, Poly 800, DW6000 and DW8000**. All the company's packages feature a variety of traditional and more exotic sounds. The patches are stored on data cassettes and are nicely packaged with excellent documentation.

Prices for the various packages are as follows: 320 DW/EX8000 sounds, $49.95; 320 DW6000 sounds, $49.95; 64 Poly 800/EX800 sounds with 30 demo sequences, $25; 64 Poly 61/61M sounds, $25; 640 Polysix sounds, $49.95; 100 Prophet 600 sounds with sequences, $25; 64 Moog Source sounds with sequences and arpeggios, $25. For more info, contact *Deep Magic Music, 217 E. 85th St, Suite 298, New York, NY 10028. Tel: (212) 534-0728.*

Angel City Audio is at it again, with a new volume for the DW8000 (see MT March '88 for review of previous offerings) and a new package for the TX81Z. **DW8000 Library Volume 8** sells for $30, or you can buy all eight volumes for $85. **TX81Z Library Volume 2** is $30, or you can buy both volumes for $45. The DW cassette promises "non-imitative" sounds; ie. patches producing sounds unique to the DW8000. The TX81Z sounds are described as "sound environments." For more information on the sounds, contact *Angel City Audio, Two Liberty Place, Middletown, CT 06457. Tel: (203) 347-5166.*

Emax owners take note! **Softworx MIDI Systems** has **139 disks available for the Emax**, ranging from acoustic and ethnic instruments to electronics, and from sound effects/special effects to orchestra hits. The samples have been edited on Sound Designer software. Each disk lists for a surprisingly low $9.95, and discounts are available for large purchases. For a list of the disks available, contact: *Softworx MIDI Systems, 8402 Clover Hill Loop, Bayonet Point, FL 34667. Tel: (813) 862-6032.*

REVIEW: The **ProSonus Sound Library** is a set of instrument sounds on CD (akin to the McGill University Library reviewed last month) for personal sampling. The first three CDs are 'Brass 1' (Trombone and Bass Trombone), 'Percussion 2' and 'Electronic 1'. Obviously, ProSonus plans on coming out with a lot more when one CD is entirely devoted to one orchestral instrument: the Trombone. Of course, the other factor is getting their library on the market as quickly as possible. I'm pointing this out because there's really only approximately 15 minutes of trombone samples; there's plenty of room on these CD's for other instruments. You wonder whether this was a marketing decision (one instrument per disk) or whether they just didn't have other samples ready for the CD and wanted to get it out the door. Whichever, it doesn't seem quite fair when you compare the amount of instruments you get on other CD libraries.

When buying a CD sample library, one of the main things you expect as a minimum is good clean samples. The brass samples came out pretty good, but I can't say the same for the percussion samples. You can hear a slow gate on the end of 75% of the percussion samples, and it gets very annoying after awhile. Of course, most of the percussion included on this volume will be used mixed in with a track, and few people will hear the end decay of these samples. But as long as you're going to go to the trouble of digitally recording instruments and creating and marketing a CD sample library, why not get perfect samples from the attack to the decay? The electronic volume contains a variety of synth combinations which, for the most part, are all right.

The next thing you look for in a CD library like this is a wide selection of notes to choose from. Again, there is some corner-cutting with this offering: the electronic CD provides tones in fourths, as does most of the brass volume. For some unknown reason, only the swells and wah-wah mute are given for every note in the trombone category; everything else is in the aforementioned fourths. Even the percussion disk, when providing things like glock or marimba, doesn't give the whole scale, only predetermined intervals. Now you may not want to sample every note in the scale for your sampler's use, but you should at least have the freedom to choose which note you want to use, and not be forced to sample notes a fourth away from each other.

The other main factor when sampling acoustic instruments is the continuity of timbre and multiple choices of tones. Unfortunately, you'll only get one choice on the brass and electronic disks, and having multiple choices on the percussion disk doesn't mean as much as with instruments with tonality. On synths, you don't have to worry so much about timbre changes, as all sound is produced by steady waveforms electronically (and are open candidates for further filtering). But if a timbre doesn't match on a trombone sample, and the next choice is now another fourth higher, you've got problems.

The ProSonus Sound Library leaves something to be desired. Although there are useful sounds included, you'd do better to check out all the available CD libraries – or be prepared for a trade-off when it comes to sampling. Price is $89.95 per CD. Contact *ProSonus Sound Library, 1616 Vista Del Mar Avenue, Los Angeles, CA 90028. Tel: (213) 463-6191.* ■ Chris Many

Photography *Elizabeth J Annas*

LOST & FOUND

His talent was recognized early by Mark Isham, Frank Zappa, and Missing Persons. But after some serious soul searching, Patrick O'Hearn has found himself solidly ensconced in the realm of progressive instrumental music. *Interview by Lee Branst and Ed Dorobek.*

"I'M JUST ONE of many people cloistered away in a bedroom or a garage, trying to come up with some music that hopefully people will respond to in a positive way."

A bit modest, perhaps, for someone who has played with the likes of Frank Zappa, Tony Williams, Mark Isham, Missing Persons, Rod Stewart, and Duran Duran's Roger Taylor. Yet that's just the way Patrick O'Hearn is. And now that he is involved in his own brand of music, he realizes that he is once again trying to make his musical mark in a crowded field.

O'Hearn creates his very personal music from the homey confines of his *Now You Sim, Now You Don't* studio, which is actually located in Simi Valley, California. In fact, it's a true garage studio, situated in the attached garage of his typical California ranch-style house.

On the other hand, it's not every garage musician that has his own 32-track mixing board in the garage – part of his label deal

with Private Music Records. The bad news is that O'Hearn has to pay the $28,000 cost of the mixing board from the profits of his soon-to-be-released, as-yet-untitled third album. Private Music agreed to the deal on the basis of O'Hearn's relative success with his first two efforts, *Ancient Dreams*, released in 1985, and 1987's *Between Two Worlds*, which was nominated for a Grammy award. But success is obviously a relative term. When he was with Missing Persons, success meant nothing less than gold or platinum albums. Now that he is performing his own brand of idiosyncratic music, success is measured in far less inflated figures.

O'Hearn says that he and Private Music were both ecstatic with the sales figures for *Ancient Dreams*, about 50,000 copies during the months following the album's release. He says that with the release of *Between Two Worlds*, the sales of his first album have continued steadily, if unspectacularly. Both albums are now approaching the 100,000 mark.

So things are moving along fairly well for Patrick O'Hearn. He has full control over making his music his way, and the results are gaining acceptance.

O'Hearn's interest in music came naturally enough, since both his parents were professional musicians. His father played tenor sax, and his mother played piano in a night club combo that covered pop, jazz, and show tunes in the 1960s. He began his musical training at an early age, trying his hand at cello, violin, and flute. "But I always seemed to drift back to the bass, which was fine with my parents because they needed to supplement their rhythm section. They had a cocktail drummer, but they needed a bass player, so I started playing nightclub jobs with them around the age of nine."

O'Hearn continued playing in his parents' group around Los Angeles until the family moved to Oregon. After graduating from high school, he studied music at The Corner School in Seattle, then moved to Las Vegas. An aunt who was a casino comedienne introduced him to the various casino bandleaders. "There was actually a thriving jazz scene in the early '70s in Las Vegas, and I got to sit in with people like Louie Bellson and Jimmy Smith."

In 1973, O'Hearn moved to San Francisco. "That's where I met Mark Isham, Terry Bozzio and Peter Maunu. We became an itinerant band that played in whatever garage or living room we could find. We played what was called progressive jazz at that time. It was rooted in traditional jazz, but it also had a lot of electronic elements in it. Synthesizers were just coming into play. Mark had an ARP Odyssey at the time." Several years later, that foursome became the foundation for the band Group 87.

The Frank Zappa connection began in 1976, the year drummer George Duke left Zappa's band. When Zappa asked Duke to suggest a replacement, Duke told him to check out Terry Bozzio. When Zappa needed a bass player later that year, Bozzio in turn suggested O'Hearn.

O'Hearn became part of such Zappa projects as 'Sheik Yerbouti,' 'Live In New York,' 'Navel Aviation,' 'The Ocean is the Ultimate Solution,' and 'Joe's Garage: Part 1.' "I pop up on various albums from time to time because Frank has this incredible collection of material. He never erases anything."

O'Hearn says his two-and-one-half-year stint with Zappa was the most fun he ever had performing. "We were the Barnum and Bailey of rock 'n' roll. Whatever you wanted to do on stage was totally acceptable. The more hysterically funny, the more you wanted to express yourself with humor, the more Frank craved it.

"He really enjoyed seeing the musicians go through these tremendous personal changes. That was especially the case with Terry Bozzio. When I first met Terry, he was very staid, shy, soft-spoken, and conservative. When he first joined Frank's band, he was prone to wearing baggie trousers, a nice shirt, and a three-quarter-length wool overcoat. He looked very San Francisco. Within a year, Terry's stage outfit consisted of a leather g-string with studs. He went from shopping at Brooks Brothers to shopping at the Pleasure Chest S & M merchants. I think Frank really enjoyed that."

In 1978, O'Hearn and Bozzio left Zappa's group simultaneously. "At the time, Mark Isham was trying to get a record deal with CBS," O'Hearn says. "He had an ally there in producer Bobby Colomby, who was really a fan of our music. So Colomby said, 'Look, Mark, why don't you get Patrick, Terry, Peter Maunu, and (keyboardist) Peter Wolf together, pay them something, rehearse, and put out a dazzling display for CBS. I'm sure they'll give you a deal.'

"So, we said, 'OK, let's get Mark a deal.' We practiced a couple of days, learned three or four of the songs, and set up in a conference room at CBS records. After we played, they had a little conference. Then Colomby came over and said 'Well, they're willing to give Mark a deal, but they're willing to increase the deal if you play together as a band. So how about becoming a band, and we'll give you a record trip.' " The deal resulted in the release of the group's eponymous debut album in 1980, featuring Isham, O'Hearn, Maunu, Bozzio, and Wolf.

The timing of the album was perfect – for failure. O'Hearn points out that this was when the entire recording industry was in the financial doldrums. In addition, the whole punk-inspired spontaneous trend was being ballyhooed. You were in big trouble if you actually admitted you could read music. So the new album ended up in the cutout bin in short order.

The trio of O'Hearn, Isham, and Maunu tried to keep Group 87 together, even playing a series of live dates and developing a local following in the San Francisco area. Unfortunately, however, there were too many problems and internal conflicts, and the band faded away. Isham and O'Hearn moved to London briefly to see if they could continue the band there.

By this time, however, Terry Bozzio was well along in forming Missing Persons. He had hired Chuck Wilde to play keyboards, using his left hand for the bass runs. But Bozzio decided he really wanted to have a bass player and insisted on using O'Hearn. So O'Hearn moved from London to Los Angeles and became a Moog bassist with Missing Persons. That stint lasted from 1981 until the band finally broke up in 1986.

In 1984, he was asked by Dan Siegel, a grade school chum, to play double bass on Siegel's upcoming album, *Another Time, Another Place*. "For throwing in my lot with Dan, he let me record three of my own songs. This was a fortuitous circumstance because basically I used those three songs as a demo to introduce myself to Private Music."

Private Music decided to sign O'Hearn. "The album was actually recorded before there was a record company," he explains. "The album wasn't released until the fall of 1985 with Private Music's logo on it. Until that time, they had just been trying to organize the record company.

"We had to sell a lot of records just to break even because Peter Baumann demanded that every record be digitally recorded. Now in 1985, with enough pre-production work done, you could actually record an esoteric analog album for about $10,000. It wouldn't be easy, but you could do it. But to record something digitally was, and still is, much more expensive. I remember we were spending close to $2000 a day, because the studio overhead and the machine rental was very steep. It cost us $1000 a day to rent a 24-track studio, which we really didn't need; about $800 on a deal to rent a 3M 32-track digital machine; and the engineer's salary. Of course, this isn't so expensive if you're ▶

"The PPG 2.2 really is the backbone of the sound. I've tried to wrench a lot out of the instrument, but I still feel that I've only really just scratched the surface."

► cutting a new Michael Jackson track, but if you're doing something a little off-beat, it's brutal."

To make things worse from O'Hearn's point of view, the recording costs were basically an advance against any profits from the album. "So, the longer I worked at the studio, the less chance there was of me realizing any profits from the sale of the album, just because it was so expensive to record. But that brings up the point of the longevity of these types of records. *Ancient Dreams* still sells about 1000 to 2000 copies per month, on the average. A Missing Person's album sold very strongly for three or four months, then dropped off to almost zero." It also can be argued that the continued sales of O'Hearn's earlier albums are a function of his widening popularity. As new listeners hear his newest works, there is always the probability that they will go back and purchase the older material in his catalog, thus continuing the sales of those albums.

O'Hearn decided that his next album would not be recorded in the studio if at all possible. The expense was just too great. He would try everything in his power to have the album recorded in his own home studio. "Peter Baumann and I agreed, that since we were hiring out a tape recorder anyway, we might just as well hire out the board as well, and transform a room in the house into a studio. That way we could cut out that extra thousand dollars a day in overhead." Plus it would also allow O'Hearn to record without constantly watching the clock, worrying about how much money he was losing.

For *Between Two Worlds*, O'Hearn converted the master bedroom in his home into his recording studio. This time he used a 32-track Mitsubishi digital recording system to record the tracks of the album. The album was then mixed in seven days at

"On my first album, I'd work on a program, and I would just be inspired by the beauty of the sound. That then would lead to a chord progression and a composition would be built around it."

a professional studio in New York. That method was still too expensive.

So for his latest album, he decided he would do all of the recording and mixing at his home, thus saving the maximum amount of money. O'Hearn also has the capabilities to master the recording to digital audio tape, so that one small package will be all that is taken into the mastering process.

O'HEARN'S TRANSITION FROM bass player to electronic music specialist was a somewhat lengthy process. "Mark got me interested, and Frank actually introduced me to the instruments. When we were playing together, Mark used to get some of the most incredible sounds out of his ARP Odyssey. When he got the ARP 2600, I was really impressed. The ultimate was in 1975, when he got the Oberheim Four-Voice. Of course as a bass player, I was always interested in the latest technological developments. I didn't go too deep, maybe a phase shifter and an Echoplex, but still I tried to keep up. Through my relationship with Mark, I got much more interested.

"When I shifted into Frank's band in 1976, he had all of those new instruments. He had all these Minimoogs and had, and still has, this tremendous E-mu Systems modular synthesizer. To me it was like being a kid in a toy store. Frank told me to play them and have fun. So that was it; I was hooked."

This began the organic growth of O'Hearn's synthesizer collection, which now encompasses a massive number of keyboards and modules. He willingly takes us on a tour of the rig.

"On the top tier we have the Roland MKS70 synthesizer module and, sitting on top of that, is its programmer, the PG800. Next to those is the Akai S900 sampler. The Roland MC500 Microcomposer sequencer and a Boss tuner are on top of that. Also on top of the MKS70 is the PG1000 programmer for the Roland D50, which sits directly below the MKS70. I also use JL Cooper's MIDI Blender to compensate for the lack of a programmer input on the D50.

"Sitting on top of the D50 is the Casio TB1 MIDI thru box," he continues, "which acts as a MIDI patchbay for the system. Directly below the D50 in the third tier sits the PPG Wave 2.2. Over here, reigning supreme, are the old Oberheim SEM modules. And next to those is the Roland TR505 Rhythm Composer. Directly below is Roland's SBX80, a SMPTE-to-MIDI conversion unit. I often do sequencing with SMPTE timecode, which is infinitely easier to work in than regular FSK clock timecode. In many cases with FSK, you have to go back to the top of a composition and run the sequencer from the top to lock up and know where it is. With SMPTE you can punch in anywhere, like a beat before the section you want to work on. Next to that is an Oberheim Xpander.

"On the third tier is my good friend, Mr PPG 2.2, the second. This is a lesson in never giving up the ship if your equipment is stolen," he laughs. "Before we were going to play a Missing Persons gig in 1986, our equipment van was hijacked. To make matters worse, all of it was uninsured. I just got this and some amps back from the police.

"On the bottom is the ARP 2600, which is still in service for those very precious post-Kraftwerk-type sounds. Next to that on the floor is Roland's MPU101, which is a MIDI-to-CV/gate converter. That allows me to play the ARP 2600 and the Oberheim Modules. Last are the Roland Octapads."

O'Hearn grants that many of the orchestral textures on his first two albums are taken from the PPG 2.2. "It really is the backbone of the sound. I've tried to wrench a lot out of the instrument, but I still feel that I've only really just scratched the surface.

"I've always been interested in programming, and that's why my eclectic collection is mostly programmable," O'Hearn explains. "I don't own any synthesizers that you can't program with some unusual routing."

O'Hearn says he doesn't consider himself to be a valid keyboard player. "I'm a bass player that's infinitely interested in electronic keyboards. I can play enough keyboards to do some basic arranging and play my chords and some melodies, but I'm certainly not going to sit down at the piano and sight-read some Mozart. But I've always loved the programming aspect of it. Although it wasn't very democratic, electronic manufacturers singled out the keyboard as the most accessible way to go about creating electronic instruments. So, if you wanted to program and play, you had to become a keyboard player."

IN DESCRIBING HIS music, O'Hearn says the closest he can come is to call it "Progressive Instrumental." "Some of my friends can't understand how a guy can record an album like *Ancient Dreams*, and then play bass with Rod Stewart or Andy Taylor. The Missing Persons experience drove me and motivated me to develop myself as an individual because of the frustration of not being involved in a democracy within the band. It's what led me to do that deal with Dan Siegel, and then really wail on getting that record deal with Private Music. I wanted to focus on trying to establish myself as an individual and not as being part of a zoo with five often-conflicting personalities."

Having said all that about working by himself, O'Hearn is determined to go out on the road with his own combo very soon. Since Peter Manau wants to play the guitar, and Terry Bozzio is interested in playing the drums, it looks like it's Group 87 again. We won't even mention that O'Hearn guests on Mark Isham's recently released solo album.

O'Hearn says there is definitely a progressive pattern that has unfolded through each solo album as far as compositional architecture is concerned. "On *Ancient Dreams*, the inspiration came from the sonic quality of the PPG. I'd be working on a program, not really sure where I was going to go with it, and I would just be inspired by the beauty of the sound. That then would lead to a chord progression and a composition would be built around it. So the album came out sounding kind of airy and spacy.

"On *Between Two Worlds*, there was more of an attempt to write compositions. Instead of coming up with a sound palette, it was more like coming up with a series of chords that felt good and then later tweak the music until it sounded right. It wasn't so much that the programming was the well-spring of where it all came from. That album is all the PPG, the Oberheim Xpander, Oberheim Modules, and the S900.

"On this new record, I dedicated myself to actually writing the music and sonically embellished it well after the fact to try to make it interesting. I wanted to write more tuneful things, but it's not a calculated attempt to write for radio by any means. It was totally inspired composition with no forethought given to commercial grounds."

"Let's face it," O'Hearn says reflectively, "the whole revolution that electronic instruments have undergone in the last few years has made it possible for me, a relatively obscure double bass player, to become a published, recorded, composer. I don't think it would have been possible otherwise." ■

PIANOS To Go

TECHNOLOGY

A real piano in your pocket? Not yet, but our survey points out the current alternatives for those looking for a portable piano sound. *Text by Lorenz Rychner.*

WHAT HAS SHAPELY legs, a heavenly voice, more seductive curves than Venus de Milo, is sensitive to your touch, and inspires desire in nearly everyone? And what spawns more imitators than the Rolling Stones, carries cans of beer and candelabras, makes some musicians famous and sends others to the chiropractor? You guessed it – the Grand Piano. What resilient design, what checkered history. Beethoven played one, even when he couldn't hear it any more; Victorian England covered up its impudent legs, while its music made ladies faint at the hands of European virtuosi and New Orleans bordello professors (although admittedly not for the same reasons). It has survived attacks with chains, bolts and other hardware, and some even more eclectic people took a bow to it, mistaking it for a cello . . .

Claims to the Throne

IN COMMERCIAL MUSIC there was a time when the piano had to give way to electric newcomers from Wurlitzer, Fender Rhodes and Helpinstill. But artists like Carole King, Elton John and others kept the acoustic piano at the top of the charts throughout the electric seventies. The digital eighties have produced a flood of synthesizers with piano patches, none of which seem capable of threatening the real thing. The Grand Piano defies even the most dedicated programmers, whose best efforts bear only superficial similarity. User sampling is no easy task, either. The complexity and range of piano tones and their demands on sampling memory still have us fooled. Some recent samplers come with factory piano samples that are quite realistic, but a solo recital of sensitive classical piano music is still out of the question.

The latest imitations come from the new generation of electric instruments that are painstakingly promoted as digital pianos, mostly based on some kind of digital recording of the real thing. Different manufacturers claim proprietary methods of capturing, processing and reproducing the real sound in their digital instruments, just as each audio engineer has his or her own recording technique. No wonder that the results don't all sound the same. But do they all come close? And compared to what?

Fair Tests and Guidelines

A QUALIFICATION IS in order before I go on. Every acoustic instrument sounds different when amplified – even live, let alone from a recording. When the microphones are turned off in the room, a critical listener hears a change in timbre as well as a change in loudness, no matter how sophisticated the amplification. Direct comparison of a digital replica with the sound of the *unamplified* acoustic original is therefore unfair, since hearing the replica must involve the initial recording as well as the amplified reproduction. This removes the replica from the original by two generations. The best we can do is compare a replica with an *amplified* live version of the original. This is particularly true for the Grand Piano, because even skillful live amplification changes its sound greatly.

Do these distinctions really matter? Not if you're looking for a digital piano to use on a noisy live stage. If there was an acoustic piano present, you would probably need to amplify it, anyway. But the enthusiastic promotion of digital pianos could lead one to believe that they can take the place of an acoustic piano, period. To my ears, this hasn't happened yet. The instruments described hereafter all do a good job of imitating the sound of amplified acoustic pianos. Just as is the case with the real thing, individual preferences for sound colors are a matter of personal taste. And just how you hear them depends largely on your sound system.

What are your choices? The first decision you need to make is this: do you want a replica of the piano sound only, or do you also need the feel and size of a piano keyboard? This becomes important if you practice and perform frequently on a real piano. The neuro-muscular and tactile aspects of piano playing have a lot to do with the notes you'll produce intuitively. A lightweight synthesizer keyboard feeds you different ideas, even if you're accessing one of the most realistic digital piano sounds available. Your next decisions will be based on portability, MIDI features (will you need it as a master keyboard? If so, Aftertouch, Bend Wheels and Local Control are important), and good old price.

Piano Action

LET'S LOOK AT some digital pianos that have a piano-like action, while keeping in mind that not all real Grands (or Uprights for that matter) have the same key feel, either. Several instruments are listed as console models, which would make most

Korg SGXI.

Korg C7000.

gigging musicians shy away from them. They're usually associated with the home market, but you may be missing out on good value. Not only are many of them very MIDI smart, with multitimbral features (subdividing their sound generating brains in many ways to play back your sequencer tracks on several channels at once with a different sound on each channel), but today's consoles are more like elaborate stands. Many times you're able to lift off the keyboard for easy transport. I didn't get to test this with all models (can you see me ripping displays apart all over the NAMM trade show . . .), but where this works, you may only have to buy separate pedals and a collapsible gig stand to be ready to roll. Check them out. One other point which needs to be mentioned is that this article is intended to be a survey of the instruments currently available, not necessarily a review. I have worked with some of them, however, so some subjective comments are included.

The two Sampling Grands by Korg, an 88-key (SGXID) and a 76-key (SGXI) version, both with 12-note polyphony, offer good resistance and weight to the fingers. This is enhanced by the long travel to a firm bottom of the key attack. They are not sampling instruments, but rather their sounds are sampled. And very successfully I might add – I couldn't tell where the sample boundaries are when playing a chromatic scale on an SGID. The X in SGX stands for a recent memory expansion that permitted the inclusion of richer samples than in the SG models – otherwise they're similar. They have two acoustic and two electric piano sounds in ROM and they accept ROM cards for more sounds. Separate Bass, Midrange and Treble tone controls plus a Brilliance control let you shape the tone. Attack sensitivity, Chorus Speed and Depth are adjustable. MIDI is implemented: both models send and receive on any one of 16 channels, including Program Change (1-64), Aftertouch, Pitch-bend and Modulation (they have two wheels), and Damper Pedal. Local Control Off is possible for the whole keyboard or for just a selectable split zone. The models weigh 74lbs and 64lbs plus case, and their average retail prices are $2400 (SGXI) and $3000 (SGXID). A piano expander module (P3, projected price $725) is mentioned later in this article.

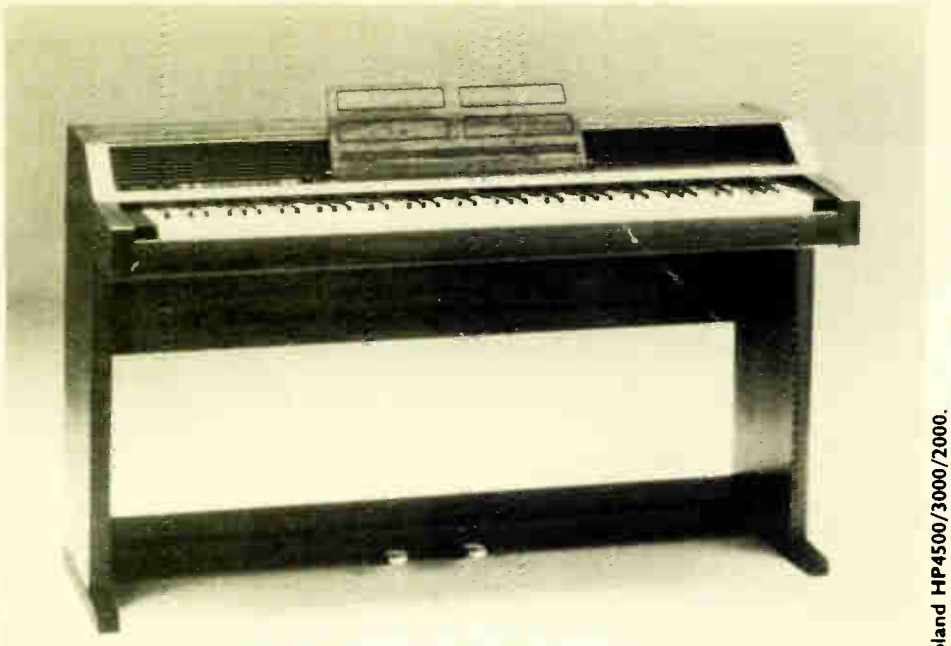
Other Korg models, all with console-type stands, built-in speakers and MIDI, are the Concert Series C2500, C3500, C5000, C7000, and C7100. They are 16-note polyphonic and have MIDI, varying keyboard feels and varying selections of sampled sounds. Average retail prices range from around $1500 to $3400.

Roland has several digital pianos based on the company's proprietary S/A (structured adaptive) synthesis. Their literature doesn't explain the process other than stating that it isn't PCM sampling but "encompasses the use of advanced digital technology." In reality, they hold a large number of sampled "snapshots" of what the piano tone looks like at various velocities and times, with an internal map of how the sound is supposed to progress from one snapshot to another. The RD1000 has 88 weighted and wooden keys, with 16-note polyphony and a choice of four velocity curves. The ROM contains three pianos, harpsichord, clavinet, vibes, and two electric pianos. Fifty-six RAM locations allow storage of edited versions of the ROM sounds, with the following edit parameters: Voice Level, five tone-control/EQ parameters, Chorus Rate and Depth, and Tremolo Rate and Depth. More edits can go to a RAM card. 127 Program Changes can be sent via MIDI, and two pedals can transmit MIDI control data (there are no wheels) on any channel. The RD1000 weighs a hefty 96lbs plus 18 pounds for the pedal unit, plus case, and lists for $4395. A rack-mount version, the MKS20, is mentioned later in this article.

Roland's RD300S (88 keys) and RD250S (76 keys) have a different MIDI implementation from the RD1000, featuring two split zones with separate channels and MIDI On/Off, each sending volume data to slaves, and each with a separate Local On/Off. They weigh around 60lbs and list for $2395 (RD300S) and $1995 (RD250S). The S in the name refers to a new type of weighted-action keyboard being incorporated into these two models.

Roland RD250S.

Still from Roland come eight console models with built-in speakers, also using S/A sound generation: the HP600, 700, 800, 3000, 4500, 5500, 5600, and 6000. These keyboards are designed to interface with other Roland products to form software-based home entertainment and learning environments. They range from $1500 to $5000. ►



Roland HP4500/3000/2000.

► Yamaha's entry into this market is their PF85, which lists for $1995 (the TXIP module is also available). The 85 offers 16-note polyphony for any of five onboard sounds, including acoustic and electric pianos. harpsichord and vibraphone. The instrument uses Advanced Waveform Memory (AWM) technology for its sound generation, which basically processes samples stored in ROM. It has 88 weighted keys, a built-in power amp and two speakers, as well as stereo outs. The MIDI implementation on the PF85 includes the ability to send and receive on different channels and turn Local Control On or Off.

Kurzweil is the company that challenged the music world to direct comparisons of their K250 piano samples with the real thing. It got them the attention they needed for their entry into the market. Since then they have released a number of other products that feature realistic piano (and other instrument) imitations, based on the results of their research. The latest is the piano sound contained in the K1000, a 76-note weighted velocity keyboard with 24-note polyphony, 115 ROM presets (mostly orchestral instrument samples), 11 digital waveforms for synthesis, splits and layers, extensive MIDI implementation with multitimbral mode, and edit functions that let the user do serious reprogramming of the on-board sounds. I found the piano sound to be fairly convincing, but with abrupt changes in timbre around C-C# below and E-F above middle C, giving away the sample boundaries. Was it just my ears? Hear it yourself, it may not bother you. The K1000 weighs 55lbs and retails for $2595. Its rack-mount version is the 1000PX mentioned later in this article.

Kurzweil has also released a portable Ensemble Grande (their spelling) Piano (EGP). with built-in speakers and 100 MIDI features. Available sound edits are tremolo, chorus, vibrato, and transpose. It weighs 55lbs and lists for $2495. The rack-mount version is the 1000EX mentioned later in this article.

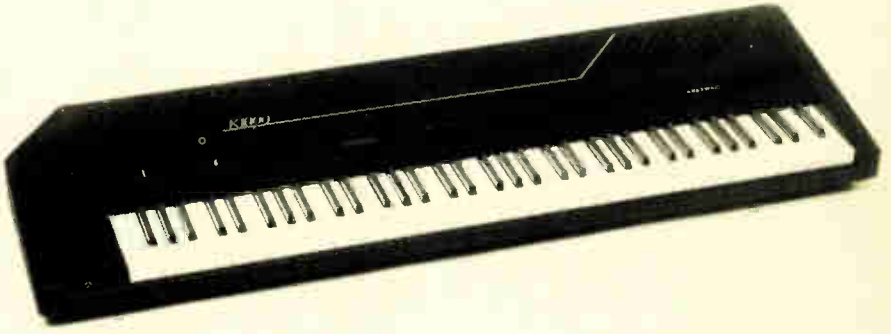
Ensoniq introduced their SDPI Sampled Digital Piano a few years back and the SPMI Sampled Piano Module a year later, but only the Ensoniq Piano is still in production. It features a 76-key weighted keyboard with velocity, 10-note polyphony, and a choice of twelve sounds including variations on acoustic and electric pianos, marimba and clavichord, and acoustic and electric bass. Two stereo outs are available, as well as an individual out for the bass sounds. The MIDI implementation includes the ability to send and receive the bass sound on a separate MIDI channel. It lists for $1395.

Kawai's digital pianos are the 150 at $1495 suggested retail price; the 351 at $1995; the PV10 at $2495; the PV30 at $2795. Their sounds and MIDI features

Kawai PV10.

sampled presets – not only piano sounds but other orchestral and synthesizer waveshape sounds. The 76 keys are weighted and velocity sensitive, with Local Control Off included among its extensive vary. They're multitimbral, and the PV30 has a sequencer with RAM card storage – just the thing for solo gigs.

Technics currently has two models on offer, both with six sounds, detachable



Kurzweil K1000.

stands, weighted keys, and MIDI. The SXPX4 has 76 keys and sells for $1895. The SXPX6 has 88 velocity-sensitive, weighted keys with 16-note polyphony, and sells for $2795. Neither model is as elaborate as their recently discontinued flagship, the SXPX1M, which has a host of additional features that many a pro keyboardist would welcome, although at a weight of over 200lbs you'd better have a resident gig or strong roadies. Look for a successor model by the summer NAMM show.

Casio, the folks who brought us the CZ101 as the David in a world of MIDI Goliaths, displayed advance models of a new generation of digital pianos at the latest NAMM show. By the time you read this, they should have found their way into the stores. I was impressed by the CDP 3300 with its 88-weighted keys, six sounds (four play across the keyboard, or only in the right hand when a split activates one of two bass sounds for the left hand), chorus, delay, tremolo, reverb, MIDI (alas, not multitimbral), velocity, aftertouch, built-in metronome, and two-track mini-sequencer, at $1899.

Denon, famous for their CDs, is a company who knows a thing or two about digital audio. I played a digital piano of theirs, with a surprisingly good sound and touch. The EP383 has 88 keys with simulated hammer action, 16-note polyphony, eight PCM sampled presets, selective velocity on/off, chorus, MIDI, and two speakers built into the stand. It retails for $2499. Other models sell for under $2000.

Keytek is an Italian company that has Gibson in Nashville distribute a digital piano for them. It's the CTS 5000, which employs crosstable sampling, a form of wavetable synthesis that is more memory efficient than reading complete multisamples. The instrument has eight factory presets and eight memory locations for storage of user variations, has very basic MIDI (no aftertouch or pitch-bend transmission, no Local Control Off, only omni mode 1), has a separate audio out for the bass split (fixed for the lowest two octaves of its 72 keys) and stereo outputs for the piano voices. The keys are said to be weighted, but I didn't like them nor the sounds much. It lists for $1499.

Digital Piano Modules

IF YOU ALREADY have a MIDI keyboard that you've gotten used to and that transmits the right velocity values, you may want to add digital piano sounds from an expander. This can work out to be a lot cheaper, as you'll see right now.

Korg is about to release their P3 Piano Module, of which I saw an advance model at the NAMM show. In addition to acoustic and electric piano sounds it'll access other sounds from RAM cards, all sample based. The projected price is $725.

Roland has had their MKS20 Digital Piano Module on the market for a while, which is a rack version of their RD1000 keyboard. It lists for $1995. They are about to release the P330 Digital Piano Sound Module. It also uses Roland's S/A synthesis, offering eight sounds with 16-note polyphony and tremolo, chorus and EQ. It will sell for $1395.

Yamaha TXIP Piano Tone Generator.

Yamaha's TXIP adds transposed delay, and chord functions to the existing features of the PF85. The retail price for it is $895.

Kurzweil offers the 1000PX as the rack version of their K1000, at $2395. The 1000EX is the rack version of their Ensemble Grande Piano; it's priced at $2195.

MIDI in Real Pianos

IF YOU ABSOLUTELY need the real thing and MIDI, too, then you'll have to get in touch with Forte Music and have them install MIDI in your Grand Piano. It costs less than $2000 and it works like a charm. It can't play back your performances on the Grand though, because it doesn't add a MIDI In (not too big a surprise really). As long as you lay a sync track to tape before you record, you can perform on the Grand while recording its sound to tape and its MIDI data to a sequencer. Then you can extract notes for MIDI doublings, or even to replace the acoustic track. At least you'll have played music that was inspired by the real thing.

Another possibility is to buy an acoustic piano with MIDI built-in. Yes, they are a bit rare and a tad on the expensive side, but both Yamaha and Kawai do offer such beasts – the Kawai acoustic piano MIDI, in fact, can be retrofitted to other pianos.

As always, have fun! ■

Twister
Programmable Automation Computer

REVIEW

Cramming eight MIDI-controlled mixing channels into a single rack space is an impressive feat, but this Swedish product's big price may be its downfall. *Review by Chris Many.*

IT WAS ONLY a matter of time until someone brought out a single space, rack-mounted, MIDI-based, high quality console automation system. Of course, when you start jamming that much electronics into a single rack space, you're bound to be faced with some compromises and trade-offs. The trick is to make the appropriate choices as to what to cut corners on and what to retain. If a manufacturer does it right, you can get a remarkable package, for a reasonable price. However, the other side of the coin is that you can also get a redundant product, relatively useless in a marketplace that updates and advances its product line routinely twice a year. Twister, one of the latest entries into the recent proliferation of MIDI automation packages, fits somewhere in between.

Overview

EACH SINGLE SPACE rack unit controls eight audio channels, so initially Twister appears pointed toward the smaller home studio-type of application. However, units can be chained together so that up to 64 channels of audio are placed under Twister's control – more than enough for even major studio applications. Interfacing with a mixing console is done through your board's insert points, in the standard configuration that's developed for these types of automation systems. There are eight stereo jacks on the back of the unit which you use for this purpose, plus an RS232 port (for connection to an external computer) and three MIDI ports (In, Out and Thru). The front panel contains eight buttons to select which channel of audio you're working with, and six other buttons which allow you to choose a variety of other functions (grouping, mutes, etc). Last, but not least, is the Twister equivalent of a fader: a dial and LED lights to determine gain. Are you wondering how you can mix eight tracks of audio using buttons and a dial?

Well, you've already seen major compromise number one for this automation system: no faders and just a single dial to control attenuation. You use channel switching to select the single track of audio you can control at a time. Compromise number two is the fact that Twister is a snapshot-oriented mixing system. Not that it won't do real-time automation – it does – but the first half of the documentation directs the use of Twister as a means of recording and recalling audio levels. For those unfamiliar with this type of system, the snapshot method is just what it sounds like; a "picture" of the current attenuation levels, mute and group statuses is taken, and can be stored in internal memory. Twister has 99 memory locations to store these snapshots, and any one can be recalled at the push of a button or two.

Snapshot Mixing

OPERATION FOR THIS snapshot mode is very straight-ahead: simply select the channel you wish to adjust by pressing one of the eight buttons, and by using the dial ("digi pot", as it's called in the Twister manual), set the desired level. Three sensitivity levels are available which allow you to fine tune your mix: coarse, medium or fine. By cycling through these levels the dial gives a greater flexibility over level settings. By the way, Twister has been optimized as an attenuation only device, so when the volume control is all the way up, the LED bargraph display will show 0dB.

Mutes work just as simply: press the mute toggle button, and mute the channels you wish. Once you've got the snapshot mix set up the way you want it, store it to one of 99 internal memory locations. Grouping is also intuitive – press the set group button and select which channels you want included in the group. Voilà, they now all respond to the movement of the digi pot, all relative to their original levels. They are actually in relationship to the highest level in the group, and if you try and push channel one (which is at –10dB, let's say) up a few notches, while channel 2 is already scaled to 0dB, you'll see some flashing LEDs, informing you of your error. To handle this, you can exit the group mode and return to channel mode, in which case you can adjust the offending channel 2 to its rightful volume.

Of what good is a snapshot mix like this, you ask? Well, live performance situations might be one answer, because you can select memories from your keyboard as patch change numbers. Or maybe preprogrammed levels for effects units in or out of the studio, such as your favorite reverb level mix, or some such thing. But to be honest, it's hard to justify a $1750 expense to store 100 preset volume levels, no matter how inconvenient it is to reach over and manually reset eight faders.

Real-Time Mixing

SO WE COME to real-time mixing applications, which is what most people would want from an automated mixing system. Like another automation system recently reviewed, Twister is dependent on a sequencer for storage of mix moves and playback. There are pluses and minuses to this design choice, and it's time for major compromise number three. The pluses consist of the fact that you probably already own and are familiar with a sequencer, and the degree to which you know the boundaries and limitations of that sequencer will determine how easy or difficult it will be to use Twister within that framework. Some sequencers will function well with this kind of approach, others

barely at all. But you won't have to learn new methods of storage and retrieval, editing and adjustment, because you'll be working with a tool you're (hopefully) familiar with.

Another plus is the cost of a storage medium is not included in this package (although by the time you multiply $1750 times three – to expand to 24 channels – and add in the cost of a computer/sequencer, it's a moot point whether or not it's competitive with other automation systems with a storage solution built in).

The minuses are obvious: here a manufacturer relies on other products outside of their control as a basis upon which a major function of their product depends. Because there are so many different sequencers on the market, it's hard to determine all the little quirks, bugs and other problems one can run into interfacing Twister with a specific MIDI sequencing package. Again, it really depends on the sequencer, but I don't think it's fair for those who own and love a sequencing product that isn't as friendly to use with Twister as some other brand to have to jump through hoops to get it to function. For example, your sequencer must not send information received on the MIDI In channel directly out of the Out port, or must have some method of defeating this. Otherwise, you'll set up a loop of MIDI data going to and from Twister, rendering the operation useless.

Mixing in real time using Twister involves getting used to mixing one channel at a time with a dial on a rack mount unit, not a bank of faders on a console, or a facsimile of faders on a computer screen. One channel at a time isn't bad, but it just felt odd using a dial to mix with. I suppose you can get used to it, but it's something you should be prepared for. Aside from the awkwardness of this setup, however, correcting mix errors, or even adjusting them can be a pain for some sequencers. First of all, you need to remember to save your moves on the sequencer each time you finish (again depending on your sequencer; some require you to select a track before you begin, others after; some will automatically cycle to the next available track while saving the last MIDI information received, etc).

To correct a move, you'll need to set up your sequencer to punch in and out at the appropriate points, or you can also punch a few buttons on the front of the Twister unit. Twister listens to MIDI data coming in over the selected channel, but when you move the dig pot, it will stop listening and only react to the data coming in from its own front panel.

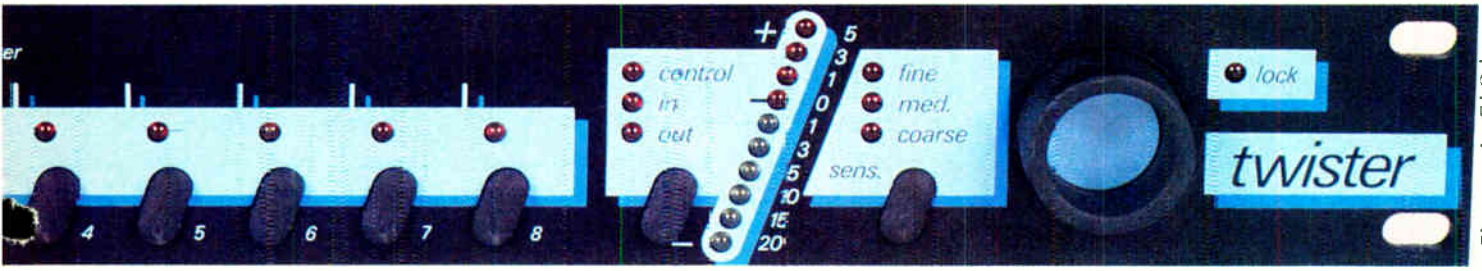
A computer interface program is also available with the package for the Atari ST for Monochrome mode only (although color is apparently forthcoming). This makes control a bit more wieldy, as you have a screen with eight faders, and a duplicate of all of Twister's front panel display. Unfortunately, it does little more than mirror what you can accomplish from the front panel. You would think that at least you could get some additional storage for snapshot settings using the computer program, but even this isn't included as a feature. It's also not something that's really set up to be used while doing real-time mixing, unless you have a second ST/Mac/IBM/C64 or stand-alone sequencer with which you could probably figure out how to set up (the latest documentation shows how to do this). Worth mentioning, however, is that Atari 520 ST's are so cheap that you can think in terms of adding a CRT screen showing what's going on and the ability to move faders with a mouse for *well* under $1000. Also, Digidesign's Q-Sheet package for the Mac (see review MT January '88) will allow automation of the Twister from a computer screen while locked to SMPTE and playing back sequences.

Getting back to the documentation, this set is pretty skimpy (a 34-page manual with only 18 pages used to educate a user as to the operation of the product). There's no index, so you'll find yourself flipping through it to get any questions answered. On the left-hand side of every page, however, is a kind of index: short, two- to three-word descriptions of the information directly to the right, kind of like an info summary (I didn't find it very useful, though).

Conclusions

SO, WHAT DOES this all add up to? Twister is an eight-channel MIDI automation product that requires you mix with a dial or a mouse. It will store 100 snapshots of level, mute and group settings, all recallable from the front of the unit or using an external MIDI device. It allows for real-time mixing but demands storage of this information to the sequencer of your choice. Its audio quality is excellent – the circuit board layout shows extreme care paid to sound quality, and the VCAs used inside it (Aphex) are very transparent and produce no extraneous noise. But in spite of all this, I'm still not sure it's worth its hefty price.

If the price were about half of what it is, I'd recommend this package for budget-minded home studios, or for musicians who play live and want to be able to recall level settings easily. As it is, the compromises that have been made (a dial instead of faders, no onboard storage and mainly a snapshot-oriented system) makes Twister's applications seem limited. I'm sure proponents of this product won't see it that way, but when you add up the figures and make the comparisons with other MIDI automation systems, it just doesn't seem right. Of course, the sequencer package you use may change one of the weak features as I see it, to one of the strong selling points. Also, if your system only consists of a 4- or 8-channel board and you don't see the need for a 16- or 24-track setup in the immediate future, you might consider looking into this product. On the other hand, keep in mind that you'll be mixing with mouse or a dial, one track at a time. If it seems a little strange, I'd suggest you get a hands-on demonstration to determine if it's for you. ■



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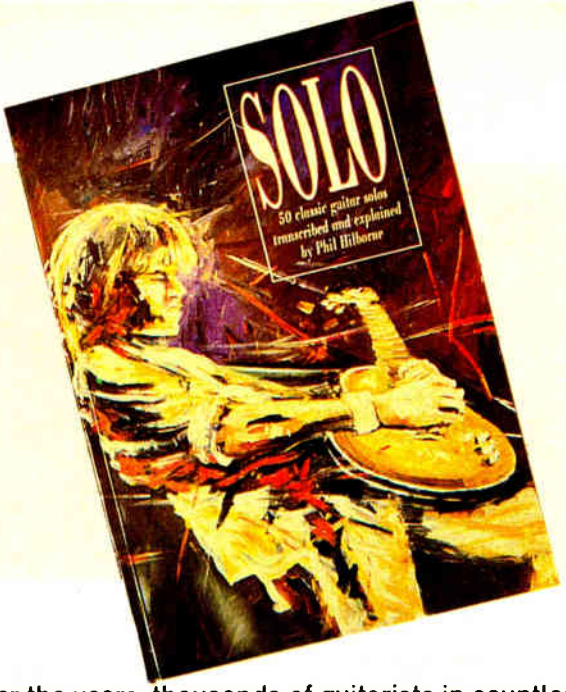

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AKAI S700 sampler with individual 1/4" outputs, $850 obo; SD Curlee Bass gtr, $375 obo; Rickenbacker 4001 bass, mint with case, $450 obo. Tom, Tel: (901) 276-6967.

COMPUMATES MIDI patch brain, 8-in, 8-out MIDI switcher 1 rack space, connects to Atari ST printer port, new, $125. Tel: (717) 586-3917.

JL COOPER MSB1 MIDI thru/switcher 8-in, 10-out, like new, $200. Tel: (615) 824-6391.

JX10, MKS70 OWNERS: Let's swap patches, general info, use patch format from Roland magazine. PO Box 43240, Detroit, MI 48243, Tel: (313) 582-0411.

LINN 9000 excellent condition, 6.42 software update memory expansion sampling with library, flight case, $2600. Steven, Tel: (818) 705-0476.

OBERHEIM 8-VOICE modular synthesizer, $1000; Oberheim OBXa Anvil case, DSX sequencer, $750; Roland GR700 synth, programmer, $425. Tel: (213) 851-1445.

ORIGINAL LM1 LinnDrum computer with 360 System cymbal and auxiliary clock outs, anvil case, $1800; Sequential ProFX rack with Expander 501, 4 4X2 mixers, distortion, transpose sync, 2 paraEQ's, flanger/chorus, DDL, reverb, $2500; Eventide Harmonizer H949, $1800; Prophet 2002, $1200; Emulator I, 8 voice with MIDI and 300 disk library, $1500; Delta Lab DL4 delay and DL2 harmonic computer, ask. Alan, Tel: (818) 244-6011.

ROLAND 2.8 quick disks for S10/MKS family 35 available at $4; Ashley SC50 compressor limiter, mint, $199. Tel: (312) 472-7660.

ROLAND JX8P, $550; Yamaha RX17, $185; Yamaha CS60, $500; Mirage all disks, accessories, $1400; Korg EX8000, $700. Tel: (914) 963-1768.

ROLAND MT32 synth module, $500; Yamaha FB01, $230. Mick, Tel: (916) 265-6379.

SEQUENTIAL CIRCUITS digital programmer model #700 and Korg Poly 61, mint $500 each. Yamaha RX21, $200; Mirage sampler, $800. Tel: (516) 968-8253.

YAMAHA TX416 4-module tone rack, home use only, $2300 obo. Tel: (513) 232-9218 or 598-1288 with some great setups.

WANTED

AKAI S612, X7000, Prophet 2000, DSSI. Let's trade sounds, send your best, I'll send mine! Walter Whitney, 2232 Wengler, Overland, MO 63114.

CASIO CZ101 in good cond with manual; Atari ST software. Andy, Tel: (901) 664-2917 or (901) 423-3032.

JL COOPER MIDI Sync I box wanted. Tel: (305) 753-7121.

KORG MR16 sampled drum slave and ESQ-M. Roman, Tel: (612) 239-4698 or (612) 634-4648.

MC500 SEQUENCERS wanted, your list gets you mine. G-4 Productions, 622 Odell Ave, Yonkers, NY 10710.

TX81Z PERCUSSION PATCHES drums, cymbals, simmons, ethnic – help! Michael Palmieri, 22 Prospect, Apt. D1, East Hartford, CT 06108. ■

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ENLARGING THE WINDOW

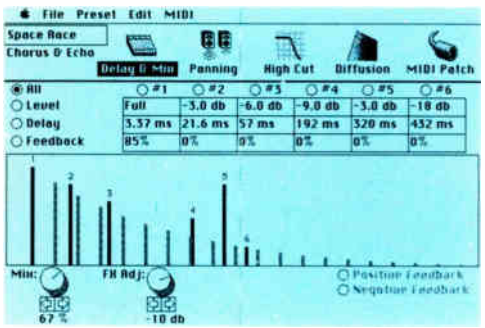
Graphic editing/librarian software for the PCM 70 Digital Effects Processor: a Lexicon applications brief.

Musical technology changes: to keep up, hardware has to support evolving software that will continue to generate new functions and sounds. That's why Lexicon digital processors aren't fixed systems.

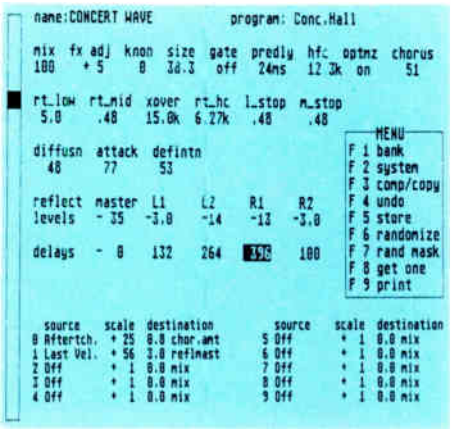
The PCM 70's MIDI implementation illustrates the value of our approach. Lexicon *Dynamic MIDI*™ controls ten PCM 70 parameters from MIDI sources like pitch wheels, pedals or aftertouch. It's already the most complete system of real-time or MIDI-automated parameter control, but that didn't stop us from adding MIDI System Exclusive to Version 2.0 of resident software and the new optional Version 3.01 package.

As soon as software developers got wind of our intentions, they began asking us to release the Sys Ex spec so they could write editors and register librarians. Not that there isn't ample storage space for your own sounds, or the tools to create them using the flourescent display "window" and the soft knob. But a computer does make it easier to fully explore the PCM 70's vast potential.

We released, they wrote, and now even those of you who haven't heard a PCM 70 can see what sets it apart. Just examine these screens from Digidesign's FX Designer™ and the Caged Artist PCM 70 Editor by Dr. T's Music Software. Each expands the PCM 70's window in a different way, revealing the unprecedented intricacy of PCM 70 algorithms. With more parameters than typical effects have programs, these algorithms give you powerful, detailed control over your sound: computer-based editors help you make the most of it.



FX Designer uses Macintosh graphics to amplify the meaning of PCM 70 parameter values with informative displays. Each screen lets you edit several related parameters and shows you what you're doing. As you edit *Delay* values in this **Delay & Mix** screen, the bars move to show time relationships. They grow and shrink as you change the *Level* settings. FX Designer includes over two hundred pre-programmed registers to suggest avenues of exploration, and interfaces with Opcode Systems' PCM 70 librarian so you can store your discoveries.



The Caged Artist PCM 70 Editor widens the window to put all parameters of an algorithm on screen at once. You edit values as fast as you can move and click a button on the Atari ST (or Commodore 64/128 or Apple IIe) mouse. The other mouse button triggers a MIDI sound source so you can hear exactly what you're doing and how the sound relates to the instrument and the music you're writing it for: how chorusing spreads out a synth voice, or how BPM affects the echo delay times. In this patch, echoes and chorusing are panned to the PCM 70's two outputs, for independent mixing and balancing of the two effects.

If you're not sure what all this means, the Randomize function will explore possibilities for you: it varies the parameters you choose in the range you specify to generate new registers. The Compare/Copy function lets you shift *Dynamic MIDI* control patches and other parameters between registers (so Aftertouch could always add more chorusing, as it does in this Chorus & Echo program). The built-in librarian holds 200 registers.

You may think you already know what the PCM 70 sounds like, but these editing programs will surprise you. Faster, more intuitive editing not only lets you tailor reverbs and delay effects faster, it will reveal capabilities you've overlooked until now.

Now that you can write more sounds in the time available, you'll need larger storage space. Computer-based editors let you store complete register banks: librarian programs from Opcode Systems (for the Macintosh), Club MIDI and Voyetra (for IBM PCs and compatibles), or Hybrid Arts (for Atari STs) give you the filing capabilities you need to rearrange your sounds in useful categories.

The PCM 70 lets you design sonic spaces and make them an interactive part of your music. The new graphic editors and librarians give you even greater freedom to explore the potential of this unique instrument. The window to new dimensions is wider now: step through it at your Lexicon dealer.

Graphic Editor/Librarians
Digidesign *FX Designer*
Dr. T's *PCM 70 Editor/Librarian*

Patch Librarians
Voyetra Technologies *Patch Master Plus*
Club MIDI *Prolib*
Hybrid Arts *GenPatch ST*
Opcode Systems *PCM Librarian with Patch Factory*

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Vision Becomes Reality. The M1 Digital Music Workstation

Every once in a while someone comes up with a better product. Less often, a company creates a better product that changes the entire nature of the music industry. The M1, a digital synthesizer/rhythm programmer/sequencer/multi-effects workstation, was conceived as a powerful tool that not only helps creative musicians express their ideas in the most complete form, but also becomes one of the most expressive and versatile performance instruments ever built.

Power To Perform

The M1 brings a new level of power to live performance with 2 megawords of ROM. Every one of the Programs and Combinations (up to 100 of each) is ready to play *instantly*. There's no loading time, because there's no loading. Nothing else gives you sounds this good, this fast.

The 61 note velocity and aftertouch-sensitive keyboard includes extensive parameter voicing that puts literally unlimited performance power in your hands with features like layers, splits and eight way zones across the keyboard.

Power To Produce

The heart of M1's power is 4 megabytes of 16 bit PCM ROM with multisamples of pianos, strings, brass, voices, guitars, attack transients, waveforms and much more.

M1's full-function drum machine has over 42 internal drum and percussion sounds that can be grouped into four user-defined drum kits.

Give extra dimension to your sounds with M1's 33 digital multi-effects including reverbs, stereo delays, panning chorusing, a digital exciter, distortion and more with a choice of four effects per program or combination independently routable to the four polyphonic outs.

Put an entire musical composition or arrangement together with M1's comprehensive 8-track sequencer with song position pointer, phrase and linear based recording, dynamic voice allocation, as well as single event editing.

And M1 power is designed to grow with you: RAM card memory stores extra sequences or programs. And there's an expanding sound library on ROM cards.

Let M1 power turn your ideas into realities. See your authorized Korg Dealer to find out more about the M1 Musical Workstation.

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MUSIC POWER

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