MUSIC
TECHNOLOGY

FRANK
ZAPPA

Talking Tech
with The Great Eccentric

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NEW DEVELOPMENTS

THIS ISSUE MARKS a halfway point of sorts for The Music Technology Magazine, with our second exhibit at a NAMM show, this time in Anaheim.

The NAMM show means many things to many people, of course. For musical instrument manufacturers, this is an ideal time to show the latest fruits of their labors, hopefully resulting in new sales contacts and figures. For music retailers, NAMM is ideal for getting a good look at what the industry has to offer these days, and perhaps pick up a new product line, make some purchase decisions, get a good deal, and so on.

But although NAMM is intended for music manufacturers and retailers, needless to say, outside the gates of NAMM, there are thousands of musicians curious to find out what is coming next. For those who just happen to get passes into the NAMM show, this is a great opportunity to hit Disneyland.

The Music Technology mag crew first appeared at the last NAMM show in Chicago – seven months and six issues ago. Back then we introduced some new writers along with some new technology, specifically the development of the proposed MIDI-SMPTE implementation. Since that time, MIDI Time Code has ceased to be a mystery, and even a few manufacturers are introducing products which take advantage of this protocol, including Digidesign's Q-Sheet program, and the Sequential Studio 440.

The inaugural issue also featured an overview of the New England Digital Synclavier. This issue, we have an interview with NED's David Nichtern, who goes into some detail concerning their new Direct-to-Disk recording system. Meanwhile, Frank Zappa takes the cover story and provides some insight into his work with the Synclavier and about some of the technology he's dealt with throughout his 22-year long musical career.

Something that you're sure to notice about MT lately is the increasing coverage of music software. There are two reasons for this. First of all, there are a lot of new software companies emerging, each with a new view of how computers may be employed to aid musicians. The results are programs like the Intelligent Music Jam Factory, Dr T's Keyboard Controlled Sequencer, and the Virtual Sounds Sample Maker. The second reason is that we have had overwhelming response from readers indicating that you want to read about music software. And if that's what you want, that's what you'll get. Just let us know.

We're continuing our search for new musical applications for computers and technology, and this month we take a closer look at a particularly unique new system announced a couple of issues back: the Mandala, a new performance instrument which uses the interaction between body movements and computer-animated graphics to control MIDI instruments. We've heard of remote keyboards, and even wireless MIDI systems, but the Mandala certainly takes the cake.

What else is new? Try a few new names which make their MT debut this month. Like Chris Many, who runs a recording studio in Burbank, and also happens to be a talented keyboard player. And Jim Burgess, who covers the Jam Factory program and the Mandala this issue, is MT's contact from across the border (Canada, that is). This is not the last you'll be hearing from either of these gentlemen.

A new development here at our Canoga Park offices, and one which this Editor appreciates, is the arrival of MT's Editorial Assistant, Cathrn Baker, who has helped no end in getting this issue happening in a timely manner.

Finally, MT has its readers to thank for all of your support and suggestions. Keep sending in those letters; you'll still be seeing the difference your input can make when the *next* NAMM show comes around. ∎

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MIDI MIXING

Simmons have long been one of the most innovative companies in the musical instrument business, and a new launch from the company look set to further their reputation.

The SPM8:2 is an 8-into-2 MIDI mixer which Simmons have somehow managed to cram into a 1U 19" rack-mount. It's capable of storing 64 mixes (level, EQ, panning and effect send settings for each channel) which can be called up remotely by means of MIDI patch changes. A cross-fade time between one patch and the next is programmable from instantaneous to 10 seconds.

Don't dismiss the SPM8:2 as yet another product for electronic drummers; it is equally valid as a keyboard mixer, and is due to retail below $900. Watch out for a full review shortly.

More from Simmons, 23717 Craftsman Road, Calabasas, CA 71302. ✆ (010) 004 2650.

MAKE YOUR DRUM MACHINE SOUND LIKE A DRUMMER

Sound like something you'd like to do? Alexander Publishing figure the chances are that if you own a drum machine but aren't a drummer, their latest book, *How To Make Your Drum Machine Sound Like a Drummer*, will help you to get the mechanical feel out of your drum patterns. One book deals with the Yamaha RX11/15, and Alexander are also covering the RX21 and Roland TR707 and TR505.

In addition to giving direction in terms of equipment hook-up and use of the instrument's features, it also introduces drum notation to communicate drum patterns and fills before moving on to various playing styles. An audio cassette is included as a guide for readers, verifying that the patterns they create are the same as the ones notated in the book. To cap it off, the final chapters deal with synchronization and MIDI – useful inclusions dealing with areas often treated too lightly in instruction manuals.

Written by Dave Crigger (of 'Drum Drops' fame), these books are certain to appeal to anyone who feels that their drum programming could do with a shot in the arm.

The RX series of programming books retail at $29.95. More from Alexander Publishing, PO Box 2532, Sepulveda, CA 91343. ✆ (818) 891-9831.

NEW IBANEZ DIGITAL REVERB

The Ibanez SDR1000+ is an updated version of the SDR1000 reverb previewed

in the June 1986 MT, and now offers features which are unobtainable on reverbs in the SDR's price range. For a start, the new SDR features 100 factory presets and 100 user-programmable presets, and real-time MIDI control.

The SDR1000+ stands apart from the crowd with its ability to combine any two algorithms. For example, reverb and multi-tapped delay can be used simultaneously. To make this feature all the more useful, Ibanez have included a Cascade function which lets the two channels to be processed separately or in series, as the specific application demands. Considering the number of multi-function (albeit one at a time) digital signal processors which have appeared in the past year, the SDR1000+'s ability to perform two functions simultaneously may very well give it the lead in 1987.

West US inquiries to Chesbro Music Co., 3221 Producer Way, Pomona, CA 91768-3916. ✆ (714) 594-1076. Eastern US inquiries to Hashino, 1726 Winchester Road, Bensalem, PA 19020. ✆ (215) 638-8670.

MIDIMIX AXE CONTROLLER #6 WITH SOFTWARE UPDATE

MIDIMIX have released a software update for their MIDI Merge Systems 8 and 9 which solves the problem caused by moving the Yamaha data slider when Casio instruments receive the corresponding MIDI controller change messages.

It appears that MIDI continuous controller #6 corresponds to the data slider on Yamaha instruments, but it corresponds to the master tune control on

Casio instruments. The new MIDIMIX software (version 901.3) can eliminate controller #6 change messages on all MIDI channels so that Casios can operate in Mode 4 without any voices being affected by Yamaha data slider activity, whether recorded on a sequencer or in live use. Although the MIDIMIX 8 has been discontinued, it does operate on all model 9 software.

The software update costs $20.00 plus $10.00 for the chip carrier, chip puller, and postage. The MIDIMIX 9 currently lists at $279.

More from MIDIMIX, PO Box 161, Ashland, OR 97520. ✆ (503) 488-1023.

SYMETRIX ALL-IN-ONE VOICE PROCESSOR

The Symetrix 528 Voice Processor provides all of the audio processing required to condition microphone signals or raw vocal tracks for professional recording or live applications. Components included in the 528 are: mic pre-amp, compressor/limitor, downward expander, parametric equalizer, and de-esser. LEDs are used to indicate signal level, and compressor and de-esser activity. The parametric EQ provides 12dB boost or 30dB cut over three overlapping frequency ranges. Although the 528's components are connected in series for easy operation, the processing order may be reconfigured using the individual normalized outputs on the 528's back panel. In addition, each component may be individually bypassed using the front panel switches. The 528 will certainly be an attractive prospect for professional recording applications.

The 528 retails at $649.00. More from Symetrix, 4211 24th Avenue West, Seattle, Washington 98199. ✆ (206) 282-2555.

SUNN SHEDS LIGHT ON MIDI

Perhaps your band's on-stage lighting has little to do with how good you sound, but it certainly is integral to your performance. So if you've decided to take control over this aspect of your show, Sunn may have just the tool for you: the PLC 816 programmable lighting controller.

The PLC 816 records 99 scenes, which can then be arranged into songs, just as one would with a drum machine. These transitions can be synchronized to external audio sync, while a tidy MIDI implementation also allows full control by external MIDI controllers or sequencers. For owners of non-Sunn systems, the DE-PLEX 216 will take care of the interface between their dimmer packs and the PLC or any other Sunn lighting controller. The

PLC 816 appears to have the makings of a great performance aid, whether the application happens to be for theater or live bands.

For pricing, contact Fender Musical Instruments Corp., 1130 Columbia Street, Brea, CA 92621. ✆ (714) 990-0909.

THE SOFTWARE PAGE

OPCODE UPDATE

Opcode's latest release, the Sequencer 2.5 for the Macintosh is sure to raise a few eyebrows here and there. This new version of their Sequencer program includes transcription facilities and a new feature called MIDI Files, which enables other Macintosh-based programs to read Opcode-created sequencer files. Both Electronic Arts' Deluxe Music Construction Set and Mark of the Unicorn's Professional Composer programs can now operate on Sequencer 2.5 files. Opcode also offer the 2.5 version as an upgrade for owners of earlier versions of Sequencer.

Opcode are now producing a new MIDI adaptor for the Macintosh, featuring two sets of three MIDI inputs, and two MIDI outputs. The Studio Plus allows two MIDI sources to be recorded simultaneously, while the multiple outputs help avoid congestion while attempting to transmit many channels of MIDI data out of one port, or one of the inputs could be used to record MIDI data while the other receives MIDI clocking information. The Studio Plus is designed to match other Macintosh components, fitting conveniently below the Mac itself.

The Sequencer 2.5 retails at $250. The Studio Plus retails at $225.
MORE FROM Opcode Systems, 707 Urban Lane, Palo Alto, CA 94301. ✆ (415) 321-8977.

SOUND DESIGNER FOR THE S900 AND DSS1

DigiDesign's latest Sound Designer programs are visual-assisted sample and preset editors for the Akai S900 and Korg DSS1 samplers. As with other Sound Designer programs (for the Emulator II, Prophet 2000, and Ensoniq Mirage), the S900 and DSS1 versions allow samples to be displayed on the Mac's high-resolution monochrome screen, then edited using cut and paste, copy, and waveform drawing facilities, using the Mac's mouse for speed and ease of use. Sound Designer can also create 'glitchless' crossfade loops, by recalculating part of the waveform.

Beyond these sample editing functions, Sound Designer provides graphic assistance in assigning samples to MIDI note ranges, digital filtering of sample material, and

Fast Fourier Transform (FFT) analysis of samples. Since all Sound Designer samples are stored in DigiDesign's own 16-bit format, regardless of the specific sampler's data format, samples are easily transferred between different samplers.

Sound Designer runs on the 512 Macintosh with additional disk drive or hard disk, or on the Macintosh Plus, using any of the currently available Macintosh MIDI interfaces.

Sound Designer programs for the S900 or DSS1 each retail for $495.
MORE FROM DigiDesign, 920 Commercial, Palo Alto, CA 94303. ✆ (415) 494-8811.

VIRTUAL SOUNDS FOR SAMPLERS

In case you were getting concerned about the sonic potential of samplers being limited by the quality of the sources sampled, think again. Virtual Sounds have introduced an Atari ST-based program which should get your samples out of the doldrums: the Sample Maker.

Simply put, the Sample Maker program is sort of a software-based modular synthesizer, with a variety of samplers as its output. First, you create the sound with the program, then upload the sound into whichever sampler you happen to be using. At present Sample Maker is designed to work with the Akai S900, Prophet 2000/2002, and Ensoniq Mirage, but the company indicates this list is to be extended.

Although Virtual Sounds is not the first company to create such a program (Digi-Design's SoftSynth program for the Mac beat them to the punch), Sample Maker certainly boasts features which set it apart from any other sampling aid currently available. For a start, the basic voice features 60 operators for your standard FM synthesis simulation. Or at least it would appear standard were it not for the program's ability to route any operator to another and/or to the operator summer. On top of that, there is the fact that each operator can have a distinct oscillator waveform, including square, triangle, sine, or sample fragments. The latter means that short loops of real instrument samples may be used as a waveform. Each operator also has its own pitch and amplitude envelope, three FM and one AM modulation inputs. Since each oper-

ator can be routed to any operator (including itself, for self-modulation), Sample Maker offers a virtually unlimited supply of algorithms. The output of the operator summer then goes through a waveform processor which is reminiscent of the Casio phase distortion system. Already, the program operates in a couple of the most popular synthesis territories known to musicians.

But have Virtual stopped there? Of course not. Sample Maker also incorporates a host of sample editing features of the expected cut and paste variety, as well as visual looping aids which puts the program right up there with any other sample editor program. The difference? Sample Maker costs a mere $250, and runs on the Atari ST computers: which puts the total cost of the system far below the current competition. We'll see how it fares when put under the scrutiny of MT's reviewers in a forthcoming issue.
MORE FROM Virtual Sounds, PO Box 3286, Plymouth, MA 02361. ✆ (617) 747-3397.

DR T INTRODUCE BUDGET MIDI RECORDING STUDIO

Dr T's Music Software, originators of the Keyboard Controlled Sequencer programs for the Commodore, Apple, and most recently for the Atari ST, have announced a scaled-down version of the Atari KCS which should help take the sting out of getting into MIDI recording.

The MIDI Recording Studio operates in much the same way as the ST KCS (reviewed elsewhere in this issue) when operating in Track Mode. The MIDI Recording Studio is limited to eight tracks, whereas the ST KCS has 48 tracks, but considering that many of the standard KCS editing facilities are implemented, this shouldn't hurt much. Also, sequences created on the MIDI Recording Studio are upward compatible with the ST KCS. Since the Atari STs (520 and 1040) both come standard with MIDI, the MIDI Recording Studio could turn out to be one of the least expensive ways to get your synths to talk back to you.

The MIDI Recording Studio retails at $39.
MORE FROM Dr T's Music Software, 66 Louise Road, Chestnut Hill, MA 02167. ✆ (617) 244-6954.

Dear Music Technology,

I'm currently weighing up the pros and cons of the budget samplers available, and so last month's review of the Akai X7000 was of particular interest to me. But can you clear up a small query?

Simon Trask's review bemoaned the fact that separate outputs weren't available on the X7000. So imagine my surprise when later on during the AES Convention Report later on in your (excellent) magazine, you stated that 'Akai will be selling a cable which connects to the keyboard's Voice Out socket to give six separate audio outputs'. OK guys, what's going on?

Jerry Monk
Atlanta, GE

Congratulations on being so alert. We pride ourselves on our reviews being as exclusive and current as possible, but unfortunately, production deadlines sometimes prevent amendments being carried out at the eleventh hour when further information becomes known. So yes, it was our AES report that was correct, not the instrument review: an optional accessory is now available which will provide the X7000 with separate outputs if you need them.

Dear Music Technology,

Weeks ago, I wrote a letter to Symphony Series about a problem with my RAMs for my DX7. Not only did Tim of Symphony call me at home, he sent me two RAMs to copy my existing data on, and a DX7 update for free, and trusted me to return the two cartridges to him. He even talked me through the process of changing the chip in my synthesizer over the phone!

Not all manufacturers are so eager to assist a customer with a problem, even if the problem is no fault of their own – so I would like to take this opportunity to thank Tim and Symphony for their kind assistance. As a working studio musician who has spent a fortune keeping up on all the newest synths and gadgets, I really appreciate the concern and consideration Symphony has extended to me.

Joe Norosavage
Irvington, NJ

Dear Music Technology,

Synthesized Music Enthusiasts of Los Angeles (SMELA) is forming, and now is the time to get involved. If any readers are interested in meeting up with others in the Los Angeles area who share an interest in all kinds of synthesizers, write for more information to: SMELA, 12701 Emelita St., N. Hollywood, CA 91607.

Professionals and amateurs are welcome. One note: Be sure to tell what kind of equipment you use and what your main musical interests are.

Ron Goodman
Los Angeles, CA

Dear Music Technology,

I own a Yamaha DX5 and I'm trying to learn programming, as well as every other aspect of the instrument. But it seems that any books and articles out on that subject all refer to the DX7. I even have the DX Pro software, which is made for the DX7, and it has been frustrating to learn to utilize it for my instrument.

Is there anyone who can help me with this, or give me any advice as to how to approach this situation? I have never worked with electronic equipment before, and find the DX5 manual to be inadequate in practical instructions. (I also have the DX7 manual.)

Barbara Eder
Vadanstar Inc.
Miami, FL

Well, it seems that DX5 owners have been somewhat neglected by the media and software houses. But when you consider that the DX5 is basically the innards of two DX7s plus some additional performance features, you should be able to grasp the principles of FM programming from the various books available for the DX7. And with the larger (and friendlier) liquid crystal display the DX5 provides, you'll have an easier time than most.

Unfortunately, the fact that DX7 owners far outnumber DX5 users makes it unlikely that the present situation will change. But bear in mind that FM programming has never had a reputation for being simple to master, so don't give up right away!

Dear Music Technology,

I read last month's editorial comments with some amusement, particulary the comment 'has the beat box really put thousands of drummers out of work?'

No, I don't believe it has either. In fact, it's closer to the truth to say that the emergence of the drum machine has unleashed a horde of 'frustrated drummers' on the world. By that, I mean drummers in mind but lacking the physical co-ordination.

And isn't it ironic that not only are drummers not being made redundant, but the new technology is arming them with the ammunition to put the keyboard player out of work? Maybe that's a slight exaggeration, but my imagination's running riot after reading Nick Rowland's enlightening review of the Simmons SDE Expander (also in MT Jan). Just think – what if keyboard players get paranoid about drummers stealing all their best melody lines?

Well, I must admit our keysman isn't too worried (I play the sticks, by the way), and is actively encouraging me to expand my modest SDS9 setup to include a synth or sampling expander. So I'm actively picking his brains on all this MIDI stuff, and experimenting with triggering his synths (DX7 and DW8000) from the SDS9 pads. Who knows? Maybe we'll go halves on an S900, as we spend a lot of time in our modest home studio where it's share and share alike.

Now, I realize fascinating products like the SDE don't come along for review every month, but don't forget that there's plenty of ambitious hi-tech drummers (like me) out there, so let's see some features and musician interviews we can really relate to.

As you say, technology also has a tendency for creating new jobs, and the 'melodic drummer' is one that's been vacant for too long. Perhaps I'll soon be giving cues like 'let's take it again from the C♯ minor'...

Miles Weitz
Denver, Colorado
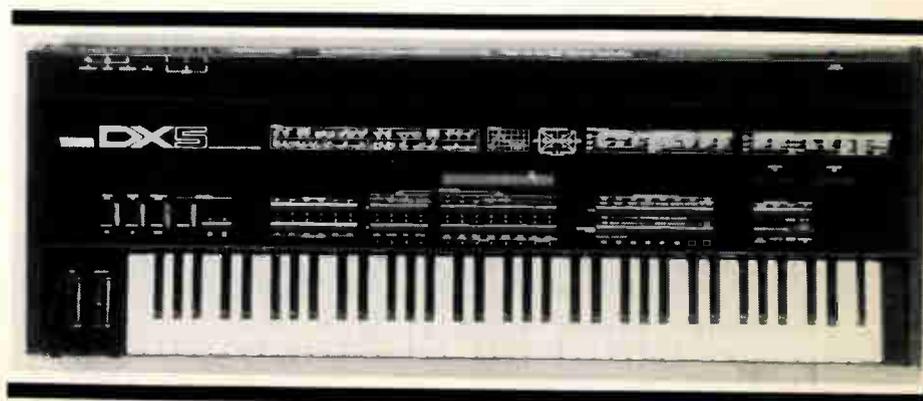
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but eliminates crosstalk. Which means that even if you're a synth player doing sync-to-tape, you can lay down a full seven tracks of music and a sync track without a guardband.

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Oberheim DPX1
Eight-voice Sample Replay Unit

So someone has come up with a machine which just replays samples, to fit in with our preset-dominated musical climate. But the DPX1 has an interesting twist – it works by 'emulating' other samplers to play back their disks. *Review by Paul Wiffen.*

T WAS BOUND TO HAPPEN sooner or later. With so many musicians these days just using their samplers to play library disks, and so much of today's music using the same old tired sounds, some manufacturer was bound to come up with a machine which would do just

that. What wasn't expected, though, was a machine which was able to handle disks made on other samplers.

At the time of its release, the Oberheim DPX1 is able to load and playback Ensoniq Mirage, Prophet 2000 and Emulator II disks, and Oberheim are already planning

software updates to make it compatible with other libraries. Now, you'll probably realize that the DPX1 has to be able to cope with both 3½" and 5¼" disks and sure enough, there is one of each type of drive on the unit.

But as anyone who has tried to load a Mirage disk into a Prophet 2000 will tell you, you need more than mere physical compatability – you need a device which is able to understand the different 'languages' that the various machines employ.

The DPX1 is able to do this by having a larger then average operating system which adapts itself to the different data formats used by Ensoniq, Sequential and

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E-mu. What's more, it does this automatically without you having to tell it which type of disk you're using. When you place a disk in either the 3½" or the 5¼" drive, the DPX1 looks at it, decides which type it is and then displays either 'En' (Mirage disk), 'P2' (Prophet 2000) or 'E2' in the dual seven-segment display.

But being able to load sample data is not the end of the story. Achieving good representations of a complete disk, including all the presets and multisamples (jargon for the way samples are edited and laid out across the keyboard), means that you need to interpret all the program data which holds all the filter, envelope and velocity settings. You also need to have the hardware filters available, and when the DPX1 was first announced, this was the one aspect which aroused suspicions in my cynic reviewer's mind.

It seemed to me that the most difficult thing would be matching all the analog parameters (as the Ensoniq, Prophet and E-mu all do things differently), and *especially* tailoring the filtering on the samples. Because if you're at all familiar with analog synths, you'll know how much difference the filters can make to the sound of an instrument. In fact, I was almost ready to hear that the DPX1 could only play samples one at a time, with limited filtering and enveloping.

Imagine my surprise, then, when I turned up at Oberheim and heard EII factory disks being played back on the DPX1 with exactly the same keyboard assignment and analog parameters as on the original instrument.

This was immediately followed by a demo of K-Muse disks for the Mirage. Instantly, the DPX1 was behaving just like an Ensoniq, even down to the flickering display (some joker must have spent a while programming that in). To complete the effect, I saw a Sequential factory disk load in slightly less time than on a Prophet 2000.

Listening Tests

AS FAR AS the sound quality and character of the DPX1 are concerned, the sounds were immediately identifiable as the original disks, and while neither a Mirage nor an EII was available for direct comparison, I've worked fairly extensively with both machines and the DPX1 sounded pretty faithful to my ears.

Later on, I was able to conduct an A/B test on the same disk played back through a Prophet 2000 and through the DPX1. They sounded identical to me. (And as it turned out, the first time I loaded the disk into the Prophet, one of the samples wasn't read properly from the disk, something I couldn't get the DPX1 to do.) Still, I wasn't prepared to be convinced just on the evidence of a few factory disks, so I checked out the results with some of my own disks, too.

First off, I tried out some disks made on the Mirage, and only one didn't sound the same as what I'd originally set up. But it was pointed out to me that I'd used Oscillator Detune on the Mirage to fatten up the sound. Now, the DXP1 doesn't have two oscillators per voice, but the guys at Oberheim have put a mode on called Dual Oscillator which allows you to play Mirage sounds which use two oscillators by halving the polyphony to four voices (which, funnily enough, is how the EII and the Prophet go about doubling or detuning voices). So you can play any Mirage sound with all the originally set-up parameters, even if you only get four-note polyphony on some.

To my ears, the DPX1 may even sound better than the Mirage, as there's a perceptible smoothing out of the harshness and phase distortion that are present in the original instrument. Then again, some people really like that quality which the Mirage imparts, especially on sounds like guitar. Oh, well.

Another feature of the DPX1 is clearly different from the Mirage. When you put a Mirage disk into the DPX1, it loads all three banks of sounds at once (something the Mirage cannot do because it doesn't have enough sample memory), and you can then instantly switch between these three banks of sounds from the front panel or via MIDI program change numbers 1, 2 and 3 from your master keyboard. So while the load time for Mirage disks is approximately three times as long as on the original machine (18 seconds as opposed to six), once you've loaded your disk you can simply switch between sounds instead of having to wait for additional loading.

The future might see an option allowing you to specify which bank you want to load, even though the current thinking behind the new Oberheim is that it should be as simple as possible to use. I can confirm that it certainly is just that: you put in a suitable disk, press Load, and the DPX1 does the rest.

When I came to try out some Prophet disks, I thought I'd found the DPX1's Achilles heel. At the top end of the range of one of the samples, the DPX1 wasn't able to manage the full octave transposition up from the original pitch (C2) and so was playing the major seventh pitch (B2) when I hit C3. But my triumph was short-lived. It seems Oberheim's engineering

division has already come up with a software revision, and the problem has now been fixed.

Similarly, when I tried to load a disk made on a 512K Prophet, the DPX1 got confused and put some of the samples in the wrong place on the keyboard. Seems the software on the review model was only capable of dealing with disks from a 256K Prophet, though the latest DPX1 software should load all 512K disks perfectly.

Currently, Oberheim's engineering department is trying to get its hands on as many disks as possible from all three machines before they begin shipping, to make sure that you can load literally any disk made on a Mirage, EII or Prophet 2000/2002 (with or without expanded memory).

The only thing the DPX1 won't do on Prophet disks is turn on the Stack Mode, which is a performance parameter. However, with the newer software on the 2000 making it possible to store Stack settings as part of a preset, it wouldn't be surprising if that feature is soon included, too.

As a general rule, the DPX1 doesn't implement original machines' performance features, like sequencers and arpeggiators, and hardware things like individual outputs and computer interfaces.

If you've read my comments in the past about arpeggiators, you'll know just how little I shall miss them. And the sequencers in the Mirage and EII are so inflexible that you'd probably be better off with a computer software package or a dedicated sequencer anyhow.

Some users may justifiably bemoan the lack of separate audio outputs — a blessing both in the studio *and* on stage — regardless of the DPX1's new low price-tag. But then again, bear in mind that by the very nature of the DPX, if you had separate outputs you'd be stuck with the ▶

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128K, so there'll be plenty of space for implementing compatability with other manufacturers' formats.

Sample memory is also generous, with 768K built in. This is more than enough to cover the disks of just about any sampling machine currently on the market, so it won't be in that area that the DPX1 finds it limitations. By the way, this is probably as good a point as any to mention that the 30 megabytes of memory quoted in our original news feature (MT December '86) was the result of a little misunderstanding, so any of you out there who were thinking of using the DPX1 as a hard disk substitute are going to be disappointed.

The back panel of the DPX1 is as minimalist as its front panel, only more so. The audio out, MIDI In, Out and Thru, and that's that.

assignments set up on the host samplers. Which means that as most factory disks don't come with outputs assigned, you wouldn't be able to have those expensive outputs do anything unless you had the original machine pertaining to each disk ...which rather defeats the whole object of the exercise.

Using Tests

AS I'VE ALREADY implied, using the DPX1 really is incredibly easy, though when you think about it, there's no real reason why a playback machine should be anything but straightforward to use.

Apart from the Load button mentioned previously, there are very few other parameters to confuse yourself with. These are cycled through with the Parameter Select button. First is Patch Select: you can use the Up and Down buttons to step through patches 00 to 99, pressing Enter when you get the number you want (though it's quicker to select this via a MIDI program change number).

Next comes MIDI Channel, which you select from 'On' (for Omni On) or Channel 1 to 16. After this is a fine-tune range of plus or minus a quarter-tone (represented by a range of 00-99), with 50 as A440 – always assuming your original samples are in tune, of course.

Things start to get more interesting with Data Dump, which uses the MIDI Universal Sample Dump Standard (another of Chris Meyer's lunchtime brainwaves), though there is talk of implementing other formats in future software revisions.

Then comes MIDI Controllers On/Off, which globally enables or disables the recognition of MIDI pitch-bend, modulation and pressure data, plus any other parameters sent via continuous control-
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lers such as volume, sustain and so forth.

The final option on the cycle is Extended Functions, which currently boasts Filter Limit and Dual Oscillator modes. The former refers to a default setting on the DPX1 where the filters are capped (limited) to just below half the sample rate. This prevents a lot of the problems with imaging which result from aliasing showing up in the samples. But on some machines it's possible to open up the filter above this point, and seeing as some people seem to like the sound of aliasing, Oberheim has made it possible to open up the filters to let all that horrible noise through if you really want to. Maybe this filter limiting is why some of the Mirage disks sounded cleaner on the DPX1...

We've already seen the application of the Dual Oscillator mode in enabling you to get the oscillator detune effect avail-

able on the Mirage. Now, this is currently its only application, but as the operating system is increased to allow the DPX1 to read disks from other samplers, it'll have more and more applications (several of the samplers now available have two oscillators per voice).

And judging by the speed at which the guys at Oberheim seem to write software, I suspect that very shortly there will be a few other Extended Functions to keep the above two company.

On the subject of enlarging the operating system, it currently resides in 128K of memory. This is somewhat on the large side, but there is room to add another

Conclusions

ALL IN ALL, I see the DPX1 having uses outside the most obvious one of a 'one size fits all' sample replay machine. For example, it would be a cheaper way of upgrading a Prophet sampler to a 16-voice system (via MIDI Overflow Mode) and yet also offer the ability to play sounds from other machines. And a second (or third) 'EII in a rack' might well please bands who up to now have had to take four Emulator IIs on tour with them to get live access to the sounds on the album all at the same time.

But the overwhelming demand for the DPX1 is going to come from musicians who know little about sampling, and who don't want to waste music composition and performance time learning any more. For them, this machine represents an

"The DPX1's operating system adapts itself to the different data formats used by Ensoniq, Sequential and E-mu. And it does this without you having to tell it which type of disk you're using."

excellent way to get the sounds they want without all the hassle that goes with sampling.

It *won't* please the purists who think nobody should be allowed to use a sampled sound or synth patch they haven't created themselves, and it may not please the manufacturers whose libraries are compatible with it. But the DPX1 may just be what the majority of musicians out there want.   ∎

PRICE $1995
MORE FROM Oberheim, 11650 W. Olympic Blvd., Los Angeles, CA 90064. ∅ (213) 479-4948

Korg DRV1000 Digital Reverb

It's taken the Japanese a while to catch up with home-based manufacturers in the digital reverb market, but now Korg is leading the Far Eastern invasion. *Review by Dan Goldstein.*

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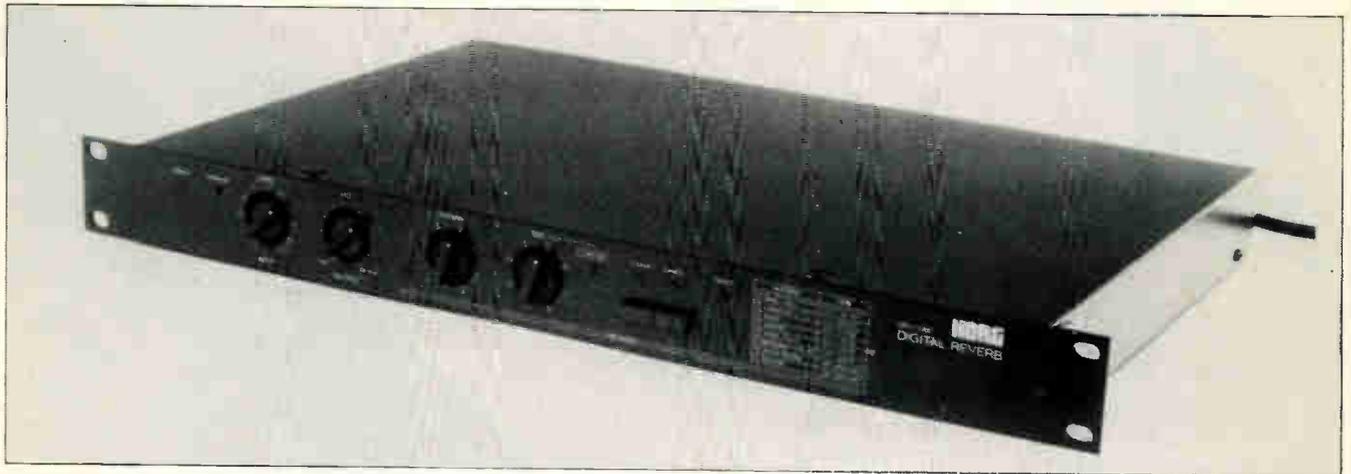
IN MODERN POP and rock, there are two distinct kinds of reverb treatment. The first encompasses normal acoustic spaces like bedrooms, concert halls, and underground palaces; the second covers special effects like gated and reverse reverbs, once the sole province of Phil Collins and Nile Rodgers, but now an overdone and if anything slightly passé way of getting folks onto a dancefloor.

If you're an aspiring musician and you need a low-cost way of getting hold of both these families of treatment, you need a digital reverb unit.

Alesis have paved the way here with the MIDIverb and Microverb, machines which achieve their affordable asking price by dispensing with, among other things, that incredibly useful but ultimately underused quality – programmability.

Korg's DRV1000, with its 16-bit quantization and 20Hz-20kHz frequency response, follows a similar path. There are no continuously variable parameters to fiddle with here, just 64 preset reverb patches which you select with two rotary switches. The first of these offers a choice of eight basic reverb patterns (imitations of Small and Large Halls, Vocal Plates, Garages, and so on), while the second offers eight different reverb times for each.

The longest reverb time the Korg has to offer is 10 seconds (the largest of the Large Halls), so it's not much good for Eno-type sustained ambient treatments. Shortest decay time is 150ms, and it's available – not surprisingly – only in the context of the Gated and Reverse reverb treatments.

Subjectively, the DRV1000 shows itself to be useful in a number of ways, like adding a warm, subtle ambience to vocals (Vocal Plate); thickening up sustained synth noises such as strings (Room); and offering a variation on the gated drum sound (Gated Reverb). I say 'variation' because the Korg won't *quite* reproduce the Collins/Rodgers gated snare sound. What it creates instead is a series of multiple echoes, tightly packed but certainly identifiable as such, which lead to the treatment gaining something of a coarse character.

The distinction between some of the Korg's more general-purpose treatments can become a bit blurred. The Instruments Plate, for instance, is little more than a brighter version of the Vocal Plate, while the Garage pattern is barely distinguishable from either of them.

Still, there's a good selection of rich, detailed and pretty realistic reverb treatments on offer here, and though drums and other transient signals cause the Korg's lack of density to make itself apparent, most synth, guitar and vocal inputs are enough to mask the trait to a large extent.

And there are a couple of ways in which these treatments can be personalized to suit your own musical requirements. For example, a High Damp feature makes the high-frequency content of the reverb signal die away before the low frequencies. Switching this into a room treatment, say, takes you from bright enamel tiles to a few yards of deep-pile Axminster carpet. This is especially handy if you find (as I did) that some of the Korg's longer reverb treatments can be a bit on the bright side when used in combination with a tinkly DX7 patch.

Then there are the two footswitch connections. The first of these is called Long: press the footswitch, and the reverb pattern you've selected is instantly switched to its longest possible reverb decay time – good for turning a small hall into a cavern at the end of a piano solo or poignant vocal line.

The second is called Cancel: this obliterates the treated part of the signal but leaves the untreated (or dry) part intact.

Anything else? Well, the input level LED indicators (green for normal, red for overload) are a bit on the optimistic side, though adjusting the input level to save your signal from clipping soon becomes second nature.

There's a couple of seconds' worth of mute time whenever you switch from one program to another, and two rotary controls are *not* the best way of selecting from 64 options; you have to go through a lot of clicking to get from a three-second Small Hall to a one-second Vocal Plate.

And the lack of MIDI means you can't select programs from a footswitch or from a synthesizer front panel, which is a pity.

Otherwise, a more than competent performance. There are enough treatments here to keep most keyboard players happy, and although the Korg's coarseness may be a worry in demanding recording environments, it's unlikely to be noticed live.

And in any case, if things go on as they are, gated and reversed drum sounds will have died a horrible death by the end of '87, and then we can all go back to listening to *real* acoustic spaces. Or at least, digital replicas of them. ∎

PRICE $479.95
MORE FROM Korg, 7 Frost Street, Westbury, NY 11570. ✆ (516) 333 7100

Yamaha DMP7 Digital Mixer

A small mixing console stole the show at November's AES convention for the first time in years. Now we've had time to reflect on the impact it will have. *Preview by Dan Goldstein.*

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IN THE WORLD OF big-league studio mixing consoles, there have been two major 'innovations' in the field of digital control which no self-respecting design team has been able to ignore with any safety.

The first is automated mixdown, where control settings and changes are stored in a computer's memory and then read out in real time as a mix takes place. The second is processing of the audio signal within the digital domain, which ensures the mixing console is no longer the poor relation of the digital tape recorder in terms of signal-to-noise ratio or frequency response.

Incredibly, both these areas are features of a new small (eight-into-two) mixer, unveiled at the last AES convention amid what can only be described as a puff of subtle – but entirely deserved – publicity.

The mixer in question is the DMP7, the company that makes it is Yamaha, and the price-tag it carries is under $4000.

Now, whether engineers and musicians at this end of the market *want* automated mixdown and all-digital signal processing is beyond doubt. Whether they will want those features as implemented on the DMP7 is the question we'll be addressing in a fuller report, to follow when we've had a production DMP7 in our hands for a decent length of time.

The DMP7's eight input channels each begin with a 16-bit analog-to-digital converter (ADC), since the mixer's design does not allow for any signal to be input in digital form. But since the DMP7 uses a sampling rate of 44.1kHz, it's conceivable that Yamaha may supply an input stage for digital data from other machines (samplers, digital tape recorders and so forth) in the future.

Once a signal has been converted from analog into digital, it goes through what appears initially to be a conventional arrangement of controllers: a three-band EQ section, three FX send controls (switchable pre- and post-fade), a channel on-off switch, a pan control and a level fader.

But these controllers differ from their counterparts on ordinary mixing boards in a number of ways. The first is that, in an extension of the digital parameter access principle now commonplace on synthesizer control panels, Yamaha has made the DMP7 controllable using a system of remote parameter selection and value adjustment.

To boost the mid EQ frequency by 5dB, you can't just turn a rotary pot; you have to hit a dedicated button on the right of the console, and adjust it using a data entry slider similar to that found on DX synths, keeping an eye on an LCD as you go.

That's the bad news. The good news is that, again unlike most mixer controls, *every single one* of these parameter values can be stored per channel as part of what Yamaha term 'scenes' – 32 memories onboard the DMP7, a further 67 on external RAM cartridge.

And what distinguishes the DMP7 even further from most mixing boards is that those FX send controls can be routed to three *internal* signal-processing units. Two of these units have a similar specification to Yamaha's SPX90 outboard processor, and offer 15 basic effects, all of them with a selection of programmable parameters. The third is a slightly scaled-down processor offering five basic treatments, though you can bypass this and route FX send 3 to an external unit of your own choice in the time-honored fashion.

The level sliders for each of the eight inputs are controlled by servo motors, so that in an automated mixdown, they move up and down electronically to their pre-programmed positions. The same is true of the FX return and stereo output sliders.

At the stereo output stage, digital signals are returned to their analog state by twin digital-to-analog converters (DACs). Before this, though, the DMP7's output is sent through a built-in (and user-controllable) digital stereo compressor system, which saves you buying yet another external machine.

The last important string to the DMP7's bow is MIDI. The DMP7 can receive MIDI patch-change data from an external machine, and such events (not surprisingly, Yamaha calls them 'scene-changes') can be programmed to take place in real time from a MIDI sequencer. So you could have, for example, four channels of sequencer-controlled synths being linked to two channels of MIDI drum machine and two channels of stereo tape recorder (linked via a MIDI-SMPTE or tape sync converter, whichever is appropriate), with all settings for all eight inputs changing at points in your piece of music pre-programmed by you.

In its current eight-into-two format, the DMP7 doesn't fit that neatly into the average small-studio setup, despite the increasing significance of MIDI-controlled real-time events in modern music production. It's conceivable, though, that some studio owners will consider cascading two or more DMP7s in parallel (via MIDI System Exclusive data) to give mixing formats suitable for multitrack recording.

But the DMP7 will undoubtedly make an impact as a sub-mixer in studios (where its high sound quality will be of great benefit); as a control center for video and A/V post-production applications (where its automation features will come in especially useful); and on-stage (where keyboard players and other musicians will breathe a sigh of relief at having control over their own sound system, without having to worry about making too many spontaneous alterations).

As a product in its own right, the DMP7 is a step forward of awesome proportions. As an indicator of things to come, its impact could be phenomenal. ■

MORE FROM Yamaha International Corporation, PO Box 6600, Buena Park, CA 90622. ✆ (714) 522-9011

Casio AZ1 Remote Keyboard

Keyboardists who sit frustrated behind their instruments on-stage now have another means of strutting their stuff out-front, thanks to MIDI. *Review by Simon Trask.*
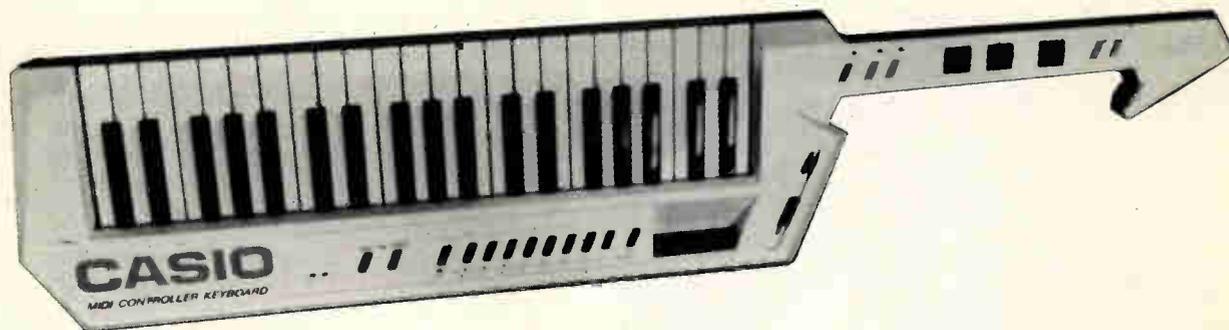
JUST AS NOT EVERY guitarist is a confirmed extrovert, not every keyboard player wants to hide behind a stack of keyboards all the time. Cue the remote keyboard controller, of the sling-it-round-your-neck kind.

Like master keyboards (which you don't sling around your neck unless you're looking for a hernia), the strap-on variety don't make any sounds themselves. What they allow you to do is join your guitarist and singer stage-front and pose with the best of 'em. All you need is a MIDI cable stretching from controller back to keyboards – there's no need for any audio cable.

The latest sling-round-your-neck offering comes from Casio, and a stylish beast it is, too. As befits a strap-on instrument, the AZ1 has been designed as much along guitar lines as a keyboard controller can be. It's slightly heavier than the average guitar, but it shouldn't cause you any back-strain. And crucially, it's a *balanced* instrument to carry around.

The AZ1's 41-note keyboard, which can transmit both attack velocity and channel aftertouch information, has a light action which suits the fact that your fingers don't so much fall on the keys as travel parallel to them. A three-position switch allows you to alter the range of the keyboard up or down an octave, so the total keyboard span is effectively just over five octaves. Cleverly, the AZ1 turns off any existing notes whenever you change octave, so there's no danger of notes being left hanging; it also 'retransmits' existing notes at the new pitch.

On the neck of the AZ1 are a dedicated pitch-bend wheel, two assignable wheels, portamento and sustain buttons, two assignable buttons and a Solo button, while there's an assignable slider on the main body of the instrument. All these controllers are readily accessible, falling easily under the left hand, and a three-digit red LED window displays currently selected values.

When powered up (either with six AA batteries – giving approximately eight hours' life – or an external 9V power supply), the AZ1 automatically sends out various MIDI messages including Omni Off/Poly, sustain off, pitch-bend center value, the last-set program number and the current settings of the assignable continuous controllers.

The effectiveness of the AZ1's controllers depends on what controls are implemented on your slaved instruments. For example, if none of your instruments can respond to the MIDI main volume control, there's not a lot you can do about it.

Initialized definable settings (which can be recalled at any time) are modulation for wheel 1, master volume for wheel 2, portamento time for the slider, modulation on/off for key 1 and glide on/off for key 2. The Solo on/off button changes the AZ1 over to monophonic performance, and sends out an Omni On/Mono instruction on the relevant channel(s) – so that something like a DX7 can be put into its mono performance mode. The portamento and sustain effects are on as long as the buttons are held down – which is no problem as you can only use one hand to play anyway.

As an alternative, the AZ1's definable controllers can be used to send System Exclusive messages. These messages are intended for Casio's CZ series of synths, where they can be used to control such features as tone mix, key transpose, mod wheel depth and amplitude aftertouch range.

So you're at the front of the stage, AZ1 hanging from your neck, MIDI cable snaking back to your stack of gear. Chances are you'll want to (a) use more than one sound, and (b) use more than one instrument.

The former is taken care of by front-panel buttons which allow you to select any of the total 128 program numbers allowed for by MIDI. This is done in a bank/sound format (16×8) which allows selection to be carried out quickly while minimizing the number of buttons required. It's fairly straightforward to select programs with your left hand while playing the AZ's keyboard with your right.

The second option is catered for by giving the AZ1 three MIDI transmit modes: A, B and A+B. These can be cycled round by pressing a 'MIDI channel' button. A and B modes can each be given a separate MIDI transmit channel (1-16), while A+B acts as a sort of 'dual' mode by transmitting on both channels at the same time. Sensibly, the AZ1 doesn't allow you to change transmit mode – and consequently MIDI channels – while any notes are being held down or are still sounding due to the sustain function.

In A and B modes the AZ1 can transmit a maximum of eight notes simultaneously, while in A + B mode, up to eight notes can be transmitted on each of the two channels (which effectively means that you retain eight-note polyphony). You could use A and B as a means of quickly switching from one instrument to another, or you could use A (or B) and A+B as a means of playing one instrument and then suddenly layering another on top. MIDI controller codes are sent on whichever channel(s) you've selected – so you can't, for example, route controllers to one of two instruments when in A+B mode.

But the AZ1 is a well-designed, flexible and ergonomically efficient controller. If you're looking for a chance to step out into the limelight in style, Casio's offering could be just what you need. ∎

PRICE $549

MORE FROM Casio, 15 Gardner Rd, Fairfield, NJ 07006. ∅ (201) 575 7400

STACK ATTACK

combining creative power...

ME10D

Midi digital delay, 0 to 1 second delay time, harmonize octave up, and octave cown, midi thru button, delay on, delay time and level control

ME15F

Midi digital fader parallel box, 1 in, 4-thrus with extension jack to couple multiples, level control for each output, works off velocity, channel separator, allows individual channel thru outputs

ME20A

Midi digital arpeggiator/sequencer, 1096 notes of arpeggiation, sequencer, step write, chord or monophonic, gate control, level control, up, down or sequence patterns

ME25S

Programmable MIDI note separator, allows nonsplit keyboard to act as master keyboard controller with up to 4 split regions, 64 user programmable memories, 1 MIDI in, 2 MIDI out, 1 MIDI thru, programmable parameters split points, program change, octave shift, and modulation wheel/pitch wheel enable

ME30P

Programmable midi patchbay, 15 internal memory banks, 4 midi ins, 8 midi thrus, 1 footswitch for channel select, input channel select, output channel midi assign and program select

S900

8 voice polyphonic digital multipoint sampler, 32 sample points, 40kHz sampling frequency, 1 meg of memory, 1 shot, looping, alternating, ADSR control, velocity crossfade, velocity switch, RS 232 port, midi in/out/thru, external record trigger, mic line inputs, 8 individual voice lineouts, stereo left/right out, mix out, voice output 13 pin jack, 3 EIA rack spaces, built in 3.5" disk drive

VX90

Rack mount midi polyphonic synthesizer, 6 VCO's, stereo chorus, arpeggiator, noise, 2 envelope generators, sampler editing system, 100 user programmable memories, pitch bend and modulation wheels, edit compare switch, LCD display, cassette interface

MPX820

Midi controlled fully programmable 8 channel audio mixing console, 100 internal memory programs for effects sends, pans, auxiliaries, and fade time from 40 milliseconds to 15 seconds, frequency response 20Hz to 20kHz + .5, − .7dB, THD .04%, EIN − 128dB, crosstalk 70dB adjacent channels, 3 band EQ, 8 input channels with XLR mic ¼" line inputs, effects send, monitor send, rack mount package, EIA 7 spaces, faders 100mm with DC control voltages

MG14D/ML14 Multi-Track Recorder

14 track rack mount recorder/rack mount programmable auto location system, multi point auto punch-in and out, multi point auto mute, automatic repeat, defeatable DBX type one, 50Hz to 20kHz, S/N 94dB, 115dB dynamic range, 12 segment LED input metering, auto tape loading systems, +4dB XLR in and out, −10dB phono in/out, remote full function auto location control unit, wow and flutter, .03%, THD .05% at 0 VU, cross-talk, adjacent tracks better than 55dB

AKAI
professional

Creative At Heart.

Roland

Alesis Microverb

Using the same technology that produced the MIDIverb, Alesis has taken things one stage further to bring digital reverb to an even wider audience than before. *Review by Paul White.*

REVERBERATION IS STILL the most important effect used in sound recording. And until recently, one of the main factors separating the sound of a cheap demo studio from that of a professional facility was the quality of the reverb used.

But thanks to machines like the Alesis MIDIverb, the digital reverb revolution is well underway, and plenty of small-studio users are finding it possible to match the kind of reverb quality achieved on records.

And if what the MIDIverb costs is still beyond your grasp, Alesis can now offer you the Microverb. It's a small (about the size of a car radio), black, aluminium-cased device with only three pots, an LED and a rotary selector switch on its front panel. The LED is tri-colored and acts as a basic input level indicator.

There weren't many frills on the original MIDIverb, but what there were have had to go on the new machine: so there's no MIDI control of programs, and only 16 preset effects (no names, just numbers).

Like the MIDIverb, the Microverb has stereo inputs and outputs, though the reverb input is derived from a mix of the left and right input channels in the usual way. This means, though, that you can use the unit with a stereo instrument without having to resort to a separate mixer. The reverb output is stereo whether the input is stereo or not, but there is one further refinement: having a stereo input normally means that a dry signal connected to just one input comes out of only that side while the reverb is working in stereo,

but on the Microverb, one input is configured such that when used on its own, it's routed to both outputs equally.

There are both input and output level controls, and this, combined with a high input impedance, means you can plug virtually anything into the Microverb and be sure of a reasonable match. I tried an electric guitar and the +4dB output from a mixing desk with equally good results. The output level control ensures the level is always right for the next piece of equipment in the chain, so the Microverb is equally at home in the studio or at a local club gig. And especially handy for live use is a rear-panel remote socket, which takes an ordinary footswitch to act as a bypass control.

The MIDIverb's smooth, quiet sound was the benefit of using a 12-bit conversion system, but the Microverb uses 16 bits, which not only produces a smoother reverb sound, but also a staggering 90dB dynamic range: about as quiet as a CD player. The same RISC (Reduced Instruction Set Computer) is used to achieve the high computing speed needed to recreate dense, complex reverb patterns, and the system has the same 10kHz bandwidth as far more expensive machines.

The effects themselves come in four categories: small spaces, large spaces, gated and reverse. The first six ('small') offer a good choice of ambient, room and plate sounds, with the smallest sounding like a coal bunker and the largest like a high-school gym. There's also a couple of

plate-like treatments with fast attacks followed by smooth, bright decays. These work particularly well on drums and can add sparkle to vocals.

The seven 'large' effects start out with something resembling a small mansion and end up with a massive 20-second cavern. In between are long plates and different rooms and halls, including one or two with pronounced, characterful early reflections. The larger halls have a slow build-up to the reverb part of the sound, while the plate and room sounds have a much faster attack.

The single reverse setting has around a half-second of decay, and is certainly pretty spectacular. Lastly, the gates are best described as short and medium, and give the now traditional (boring?) gated drum sound. However, they can also sound effective on guitar and vocals, so don't be put off experimenting.

The Microverb is the cheapest digital reverb currently in production. It doesn't supercede the MIDIverb; it just makes the basics of that machine's appeal available to a wider audience of studio users. In fact, I can see a lot of keyboardists and guitar players going for the Microverb, even if they don't have access to any recording facilities. Using it is simplicity itself; listening to it – especially next to a spring reverb – is a revelation. ∎

PRICE $249
MORE FROM Alesis, PO Box 3700, Los Angeles, CA 70070. ℰ (213) 467 0000

SPACE

the final frontier?

Digital reverberation is a relatively new topic to many people, but at a time when there's a bewildering number of models to choose from, what criteria should you use in comparing performances, and how do digital approximations relate to the real thing? *Text by Paul White.*

TO MANY MUSICIANS — especially those without huge salaries for whom the likes of AMS, Yamaha REV1 and Quantec Room Simulator systems have been nothing but a far-off dream these last few years – digital reverb is something of a new consideration. But now that budget digital reverb systems are here (and in growing numbers), the whole subject of what makes them tick – and what separates one model from another – is receiving a lot of attention for the first time.

Before embarking on a detailed discussion of the intricacies of digital reverb, though, you have to know something about its natural equivalent.

To begin with, imagine that somebody suspended above the ground – and well away from any walls or other solid boundaries – claps their hands. When this happens, the sound waves (usually screams, in this case) travel outwards in a spherical fashion and never return. But seeing as being suspended in mid-air is not normally a tenable position for the human form (due to the intrusion of gravity, among other things), we tend to spend most of our time close to the ground and, when in buildings, close to walls, floors and ceilings.

These walls, floors and ceilings interact with soundwaves, absorbing some of the sound energy and reflecting some, with the reflections being subject to re-reflection when they encounter new boundaries. In a typical room, our handclap would bounce from the walls, causing multiple, closely spaced echoes. And within a very short space of time, the number of echoes would be so great that individual echoes became indistinguishable.

Because of the absorptive qualities of walls and other boundaries, these echoes tend to die away fairly rapidly as the sound energy is converted into heat. Also, high frequencies tend to be absorbed more readily than low ones, so the high frequency part of the sound decays more

rapidly than the low frequency part. And the air itself absorbs high frequencies due to the viscosity of the molecules, so the further the sound travels, the lower its high frequency content.

In a large hall – where the reverberant sound reflections travel hundreds or even thousands of feet before being completely absorbed – the tail end of the decay may contain little or nothing above a couple of kHz. In a smaller room, the reverberation time may well be so short as to be unnoticeable – but a trip to an acoustically dead, soundproof room will soon convince you that a substantial part of the sound you hear in everyday life is in fact reflected, not direct.

Our brains make use of this reflected information to accurately locate sound sources, and also to make judgements

"Artificially generated reverb must be very convincing if our brains aren't going to reject it as an imperfect fraud."

about the size and nature of the environment we're listening in – especially in the dark, where information from our eyes gives no clues as to the nature of the room.

But because we do all this quite subconsciously, every day of our lives, any *artificially* generated reverberation must be very convincing if our brains aren't going to reject it as an imperfect fraud.

From this short analysis, we can break the characteristics of reverberation down into more manageable sections which give us a clue as to what we need to do to synthesize it.

Going back to the handclap-in-a-room situation, the first thing that happens is that after a short delay caused by the time it takes for the sound to travel to the nearest boundary and back, the sound starts to bounce from wall to wall. And because sound travels at around 1100ft. per second, these first or early reflections can be discerned as separate echoes in a large room or hall.

The spacing and magnitude of the early reflections depend on the physical characteristics of the room, but they decay in amplitude and lose high frequencies as time goes on. These reflections then build up into a dense clutter, which is what distinguishes reverb from simple echo. The high frequency content decays further and the overall level decays, ideally in an exponential manner. The rate at which the clutter builds up and decays depends on several things: the size of room, the materials from which it's built, its geometry, and objects within the room such as soft furnishings and people, which cause the decay to be more rapid than when the room is empty.

Research has shown that the brain needs a minimum echo density of between 1000 and 3000 individual echoes per second before it will accept a sound as true, natural reverb. So an unaided multi-tapped delay is hardly a practical method of generating the effect artificially, especially as you need a different tap arrangement for each different reverb type.

Early Research

BACK IN THE 60s, a guy called Schroeder delivered an AES paper on artificial reverberation. He suggested that certain building blocks could be combined to simulate the effect, and that these building blocks could be generated by computer. This work was remarkable, not least because the computers then available were far too slow to generate reverb in real time.

Later on, another fellow by the name of Moorer built on Schroeder's work, and the combined outcome was the definition of a series of different kinds of filter, which could all be used as building blocks to help simulate natural reverberation.

Sound reflections within a room.

LOUDSPEAKER ■

DIRECT SOUND

LISTENER

Sound energy lost
at each reflection
(frequency dependent)
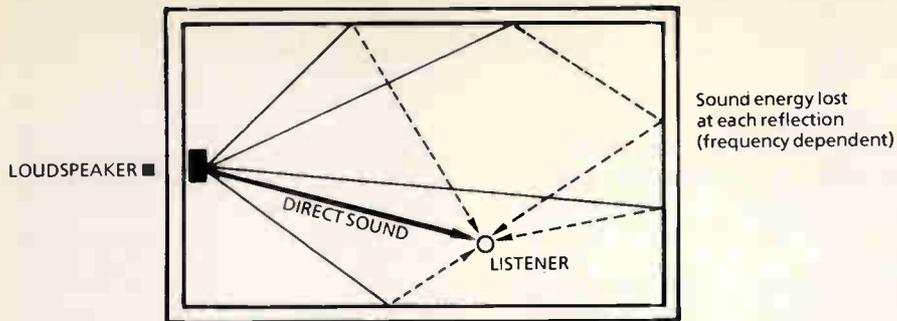
Build up of reverberation.

DIRECT SOUND

EARLY REFLECTIONS

REVERBERATION

INPUT

time delay

OUTPUT

ALL PASS FILTER

OUTPUT

INPUT

time delay

COMB FILTER

Finite impulse response filter.

IN

MULTITAPPED DELAY

1

N

OUT

INPUT

F I R

COMB 1

COMB 2

COMB 3

COMB N

APF

APF

OUTPUT
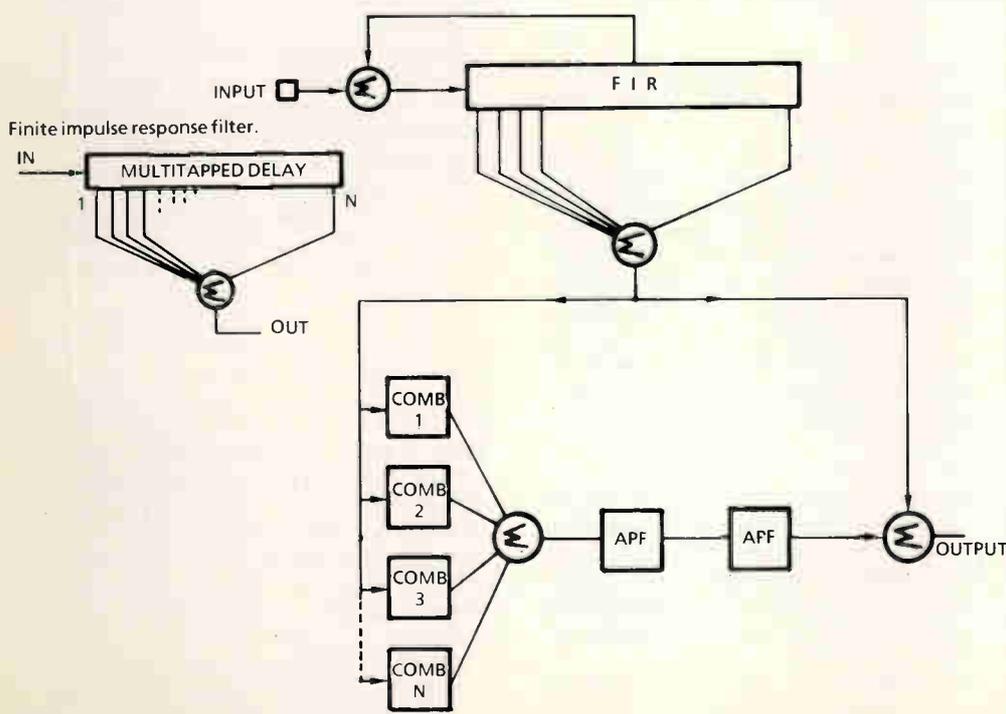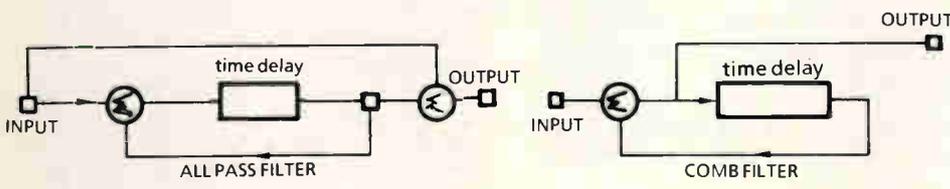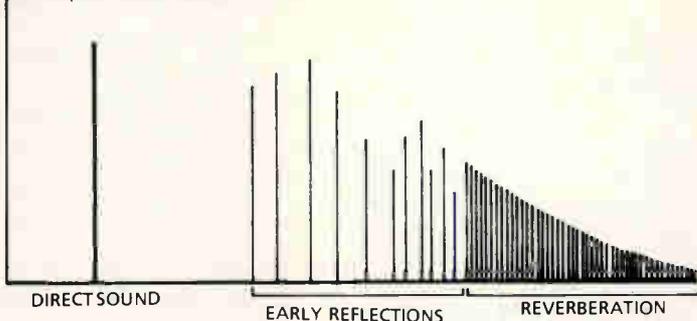
The first of these blocks is called an all-pass filter, used singly or in cascade to generate repeats of a signal without modifying the frequency response, an important factor in creating reverb that is free from unwanted coloration. This is simply a delay block with feedback, plus a feedforward path which makes the block different from a simple comb filter (also used in reverb simulation). Comb filters are used in parallel banks to create the clutter of reflections, while all-pass filters diffuse them further.

Other building blocks include the digital filter, to simulate the more rapid decay of high frequencies, and a multi-tapped delay or finite impulse response (FIR) filter, to simulate the early reflection part of the sound.

Exactly how these blocks are interconnected is a closely guarded secret of all digital reverb manufacturers, but most use Schroeder's and Moorer's research as a starting point. Many designers vary the arrangement and parameters of their building blocks in the left and right channels, so that a mono input can still give a convincing stereo output.

In the case of digital reverb, each of these building blocks exists only in software, so a new program will give a new reverb effect using exactly the same hardware.

The main problem is that to create the density of reflections needed while retaining a respectable audio bandwidth, the digital reverb's computing system needs to be capable of performing very fast calculations.

Top-end digital reverb systems generally offer good bandwidth, well-designed reverb algorithms, user variability of parameters, and user programmability. Also, MIDI patch control is fast becoming a standard, as are special effects such as gated and reverse reverb.

Let's take a closer look at the kind of variable parameters these machines offer. First, the early reflection pattern and spacing is variable because this creates the basic character of the synthetic room or space. A variable pre-delay is also common, as this separates the reverb from the initial sound, to create a sense of space.

Next we come to the clutter section comprising dense reverb, and here we need to be able to vary the decay time and the high frequency decay characteristics. If we can vary these basic parameters, we can simulate anything from a small room to a vast hall. By increasing the high frequency decay time we can make a room sound brighter to simulate, say, a tiled washroom. Conversely, we can damp the high frequencies heavily to simulate rooms filled with soft furnishings.

It shouldn't come as a surprise to learn that as soon as you get below state-of-the-art price levels, you come up against machines that offer slightly less than state-of-the-art performance – though as ▶

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with everything else, each different design team has its own set of compromises which it chooses to adopt.

Now, *all* these compromises incur penalties of one sort or another, and don't let any salesman talk you into believing otherwise. It's really just a question of which compromise makes the smallest impact on your personal requirements.

Current Options

FIRST, YOU CAN opt to use less than 16-bit sampling resolution; this worsens signal quality and noise performance, but you'll find that many low-end reverb units do in fact utilize 12-bit sampling, or less.

Second, you can opt for a machine with

remembering that while a good reverb unit can be made to give you trashy sounds, a poor one can never give you good, natural sounds.

The other approach — limiting the flexibility of the effect by offering only a set number of presets – gives the system's computer a chance to concentrate only on a few specific tasks, so the preset treatments stand a good chance of being high-quality.

On the other hand, losing programmability prevents you from utilizing reverb treatments that are subtly different from everybody else's – and that, in this era of preset digital synthesizer sounds and factory samples, could be important. Plus,

hard-pushed to find a current model of digital reverb that didn't offer them. But the variation in quality of these effects is incredibly wide.

A gated reverb should be dense, solid and exciting...and I've heard some real awful ones that sound more like dried peas being dropped on a steel plate than true gated reverb.

Reverse reverb is less commonplace but still important. It should be clean, intelligible when used with vocals, and give the impression of a sound played in reverse with the start of the sound clearly audible at the end. Of course the sound isn't *really* played backwards – it's just an electronic conjuring trick. But if it doesn't sound authentic, there's no point using it.

"Listen to any good reverb in a darkened room, and you should be able to visualize the environment in which the music is being played."

a slower built-in computer and consequently reduced bandwidth — though in this case, you should look for at least 10kHz bandwidth for serious work so that you can create reverb brighter than you'd find in nature if you want to.

If the machine you're interested in does offer a decent bandwidth, chances are its designers will have ditched all unnecessary demands on the computer's time, such as programmability, fancy parameter adjustment and flashy displays. Alternatively, they may have kept all these but tried to simulate reverb using fewer building blocks, giving a less sophisticated reverb algorithm. Let's look at the consequences of these two main alternatives.

First off, if you decide to keep all the

if you're a studio owner and a client asks if his reverb can have 'just a little bit more' of something, you could well be stuck.

Then again, it wasn't so long ago that top studios used plate reverbs, where the only things you could alter were the overall damping and the EQ. Nobody complained. A reverb offering as few as a dozen presets could give you a set of treatments ranging from a tight live room to a massive hall, in small enough steps so as not to leave you wanting a sound you couldn't get. And you can always add further EQ or experiment with gates to alter the decay shape.

Remember that if the basic sounds are good, you'll be able to live with them more easily than you would with a

Summary

YOU CAN HAVE a digital reverb unit that is both flexible and good sounding — if you're prepared to pay for it. But if you're looking at the very bottom end of the market, you're going to have to lose out in one area or another. The most natural-sounding budget reverbs I've used have offered only a range of presets adequate for live use and for small studio applications.

As a general rule, you need to place sound quality above all else if you're going to be processing drum sounds in the studio. For vocals and keyboards, especially live, you'll probably get away with something that sounds a little less sophisticated.

If you go for an all-singing, all-dancing unit at a bargain price, listen carefully for the sonic problems mentioned above. And don't be fooled by the infinite number of parameter variations you can program; if the basic sound isn't good, there's nothing you can do about it, no matter how many permutations you try.

Remember too that within a mix, the difference between one reverb program and the next one may appear negligible, even though they may sound totally different when tested in isolation with just a single snare drum beat.

"In a mix, the difference between one reverb program and the next may appear negligible, even though they may sound totally different in isolation."

programmable functions and compromise the reverb algorithms to keep the cost down, reverb density is likely to suffer. Instead of a smooth decay, the widely spaced coarse reflections give a grainy texture to the reverb, and the treatment of percussion sounds can produce a sound like ripping cloth as the individual reflections are heard.

Using an insufficient number of building blocks or poorly designed algorithms can also lead to unnatural coloration of the sound, which usually takes on a ringing or metallic characteristic. You may also notice that the final decay of the reverb isn't too smooth. On vocals these problems may not be too noticeable, but on percussion, their effect is quite a bit less pleasing — more than likely, your ears and brain won't be convinced by what's being fed to them, and you'll perceive the result as crude and artificial. Now, this trashy, metallic sound is used to good effect by producers and remix engineers on modern dance records, but it's worth

machine that lets you program 10,000 permutations of reverb, all of which sound unnatural.

So how do you know what is good digital reverb and what isn't? Simply, use your head. Reverb can't be judged on spec alone, and things like naturalness and stereo spread are totally subjective. Choosing a digital reverb is more akin to wine tasting, and the more models you listen to, the more differences you learn to recognize. Rather than using cheese to take the taste away, try washing your ears out with a burst of white noise between models.

If you listen to any good reverb in a darkened room, you should be able to visualize the environment in which the music is being played. A snare drum or handclap sound from a drum machine will soon show up ringing, coarseness and other vices that prevent the reverb from sounding natural.

Gated and reverse sounds are so much a part of modern recording that you'd be

Don't be conned by long reverb times, either; you're unlikely to use anything longer than five seconds in normal music work, and the most widely used settings are shorter than two seconds.

Alternatively, you may be tempted by a unit that offers other treatments such as delay, chorus and flanging. This is fine if the reverb is good to begin with (some units show compromises in all areas), but bear in mind that unless your chosen system allows you access to several effects simultaneously, you'll be stuck if you need to use reverb and flanging together at a concert, say. In the studio this limitation isn't so serious: you can use one effect when you're recording and another when mixing.

Finally, get what you need, not what you think you want. Close your eyes and let your ears decide. ∎

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FATHER

Twenty-two years and fifty-odd albums into his musical carreer, Frank Zappa still finds new ways to astonish the public with his unique brand of music. The man behind the Mothers of Invention, 'Valley Girl,' 'Thing-Fish,' and 'Porn Wars' takes a break to discuss what he's been up to all these years. *Interview by Rick Davies.*

WHEN THE FIRST MOTHERS of Invention album, *Freak Out*, came out in 1966, it was so unlike anything ever to appear on vinyl before, reactions to it were polarized; people either loved it or hated it. Still, the reaction to the album was strong enough to lead to more MOI albums on the Verve label, including *Absolutely Free* and *We're Only In It For the Money*, and led eventually to dozens of albums bearing the mark of Frank Zappa.

The two aforementioned albums exhibited Zappa's ability to rip his songs' targets apart with uncompromising, satirical lyrics and biting delivery which many listeners found hard to take. Zappa pulled no punches, and

everyone, from politicians to high-school drop-outs and hippies (many of which formed part of the MOI audience), was fair game. In that sense, little has changed in Zappa's music.

Frank Zappa Meets the Mothers of Prevention, marked the beginning of Zappa's public opposition to the Parents Music Resource Center (PMRC) and their goals. The 'Porn Wars' track was 12 minutes of digitally-generated music concrète, using recordings of the PMRC senate hearings as source material which Zappa twisted, stretched, and otherwise mutilated using his Synclavier. Since the time of the PMRC hearings, Zappa's face has appeared in television interviews concerning the PMRC,

as well as other topics such as proposed mandatory drug testing of federal government employees.

Zappa's concern with what is going on in the world was made very clear as soon as we met at his home in Hollywood; no sooner had we been introduced, than Frank asked that we hold off on the interview until a CNN news report on the Contra arms deals was over.

'I did another interview this morning for *USA Today*, or somebody who was doing a wrap-up. Every time somebody wants an opposing point of view, they call me up. Unfortunately, they do call to get an opposing point of view, because before I started doing it, there was no opposition. The record companies didn't oppose it at all. I do at least one interview a week on the PMRC, and some weeks five.'

One thing is for certain: Frank Zappa's music has not weakened. Perhaps the eighties' flood of fashion and sound production has made some of his music stand out less than it used to, but his latest album, *Jazz From Hell*, shows that even his sequencer chops are beyond the range of most synth programmers, and recordings such as 'Massaggio Galore' feature some of the most

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challenging music to emerge from his home-based recording studio. Considering the PMRC's warnings of satanic messages in rock music, the album's title seems a bit ironic. Is that, in fact, the case?

'No. You know the expression: If there's somebody in show-business and he's an asshole, he can be referred to as an Entertainer from Hell. It arrived from that type of concept. This is it. If this is Jazz, then it's *Jazz From Hell*.'

A good album it is, and though the cover notes (of the cassette, at least) do little to explain what's going on, it becomes apparent that Frank is getting impressive mileage out of his Synclavier. Melodies are scattered about, often stuttering as timbre changes occur in mid-phrase. Words alone can't do this music justice. It has to be heard to be believed.

Many names appear in the band credits which most Zappa show-goers will recognize: Stevel Vai, Ray White, Tommy Mars, Bobby Martin, Chad Wackerman, to name but a few. But with sampling and sequencing available on his Synclavier (or 'Barking Pumpkin Digital Gratification Consort' as it is credited on *Francesco Zappa*), it becomes hard to tell where impeccable musicianship ends and technology steps in.

'There's only one song that's got a band and a guitar solo. Everything else is on the Synclavier. This is my third Synclavier album. The first was the *Francesco* album, the second was the *Mothers of Prevention*, last year, and this is the third. I just did the CD master for it yesterday; it should be out by February. I did two CD masters; one for EMI for foreign release, and one for Ryco-Disc.'

The new album's live track, 'St. Etienne,' is the only evidence of Frank's guitar playing on the entire album. What has he been doing with his guitar?

'Nothing. I haven't touched it since December 23, 1984. I don't have any reason to play it; I have more guitar solos on tape than anybody could ever stand to listen to, and I figure, I did it. There it is, it's done, it's a good solo. How many times do you have to do the same thing?'

Not even for entering music into the Synclavier?

'The linkage between the Synclavier guitar controller and the system doesn't work for me. Other people use it and are happy with it. I wasn't and so I didn't buy it. There are several ways of inputting information: you can play it on a keyboard, play it in on an Octapad (by Roland), and you can type it in on the G-page in the music printing mode or

a computer line called Script. So there are a lot of different ways to put it in.

'My preferences depend on the piece. If I've got something in my catalog sitting in the other room that I wrote years and years ago and I now decide I want to listen to it, I would take the sheet music, go into the music printing mode and type it in note for note right there. Or, I'd give it to my assistant who types script, and who would type it in. It doesn't make any difference. And then you can edit it in different modes too.'

Is there an instrument Zappa actually enjoys *playing* now, just for ideas?

'No, I just go in there and go to work. Sit down and start typing. I like it.'

As ever, Frank Zappa continues to be one of the most prolific and hard-working composers around. So much so, in fact, that even he seems to have a little trouble calling to mind his current and future plans.

'Before I did those wind quintet pieces for the Aspen Wind Quintet, there was a bunch of material that preceded that. It's been sitting around for years, and I pulled out one of those disks a couple of days ago, put it in and listened to it, got fixated on it, and decided to go back to work on it. That's what I was working on this morning.

There's tons of stuff planned for future recordings. *You Can't Do That On Stage Anymore* is a ten-record box, and there is the sequel to *Lumpy Gravy*, which is done. That's an amazing piece. It's all the missing dialog that will help you understand. If there is anything to understand about *Lumpy Gravy*, this is all the missing components: a single album containing the missing dialog plus new music.

'Then there's another guitar box coming out, there's a three-record box called the Helsinki Concert, which was done in 1974 with George Duke. The London Symphony Volume II will be out shortly. There's plenty of stuff to come out. I've got three albums of Synclavier chamber music. It's done, it's just sitting there. I have to schedule when it's coming out.'

I NTERESTINGLY ENOUGH, EVEN as new recordings are being released, Zappa is releasing the second boxed set of re-mastered albums, Box 2 of *The Old Masters*. Together with Box 1, *The Old Masters* contains all of the Mothers of Invention and Zappa albums from *Freak Out* to *Just Another Band from LA*.

The original releases have become increasingly difficult to locate in record stores – an unfortunate situation, considering that

Zappa's music does not reach its audience as quickly as, say, rock music crafted to please a designated audience. Instead, the early Zappa and Mothers recordings take time to settle in, and the Old Masters present a great opportunity either to become familiar with albums like *We're Only In It For The Money* and *Weasels Ripped My Flesh*, or to replace old, played-to-death pressings. Word has it that new parts have been added to the originals. Is that the case on all of the albums?

'*Ruben and the Jets* and *We're Only In It For The Money*, from Box 1. Those are not only overdubbed, they are remixed.'

And Zappa confirms that these two recordings will also appear in their new form on the Ryco Compact Discs.

'Eventually it will all come out. My deal with Ryco is only for 24 titles, so by the end of the deal they will have released less than half of my catalog. That's 24 titles over three years, three titles a year from the basic catalog, and they have the option of extra projects. Next year they're picking up this project called *You Can't Do That On Stage*. That's a live collection, an album that I've been working on for the last 22 years. I have a huge collection of tapes and stuff, and I've been going through the final examples of strange stuff that happened on stage with all the different bands.'

What are these Mystery Disks that are included in the Old Masters sets?

'The Mystery Disks are items of interest from the area of the era from which the other masters are drawn. For example, the Mystery Disk in Box 2 is really fantastic. It's got one side, about 22 minutes, of an unreleased, never before heard, live concert with the original Mothers of Invention and the members of the BBC orchestra recorded in London in 1968. The members of the band are doing a play, and the orchestra is backing them up. And the play is about why everybody wants to quit the group. It's really funny. On the other side there are odd little things like the origin of the story of Willie the Pimp. There's a cassette recording of an interview that I did with these girls from Coney Island; they're talking about one of the girls' father, calling him Willie the Pimp, from the Lido Hotel. You can see where the song came from.'

Y ET ALTHOUGH THERE'S plenty of live Zappa recordings shortly to be made available for the first time, it has been a while since the man actually toured. As it turns out, this is mainly because of the way his compositions have ▶

changed since he began recording with the Synclavier…

'Let's suppose you go out on the road right this minute to support the album that's out there right now. No human being can play it, while I can take this computer out, hit the start button, and stand back.'

And since Zappa's compositions are now greatly influenced by the Synclavier's unique recording and playback facilities, it seems that composing for musicians becomes more of a hassle than before. Does this mean that the Synclavier is his preferred means of generating new music?

'Yes, because if you look at the ordinary process to write music, you write the dots on a piece of paper, then they have to be inked by somebody to make your handwriting look neat, then that is given to a copyist who copies out the parts for all the instruments. At every stage in the data process, mistakes can be perpetuated.

'Then the musician takes his part and under the baton of the conductor attempts to interpret what you dreamed up in the first place. And this interpretation is subject to such questions as, how much time they have for rehearsal, which is based on how much money they have to lose, and the acoustics of the hall in which the thing is going to be played.

'So basically your chances, as you're a composer writing for human beings, to get your idea accurately performed are really not too good. Not good at all, unless you write very simple music, which I do not. So I said, well, I'll just go on using the Synclavier.

'If you have a band, you can't ask the band to do something it can't do. For example, if you've got a band like the one with Flo and Eddy, you can't get them to do something like 'The Black Page'. It's not their style. So whatever you write for that particular band has to be engineered for their assets and liabilities. You design the show around them as people, and the show is a product of who's available to be in the band at the time, and what their level of competence is at the time the tour takes place. Because the longer the guys stay in the band, the better they get musically, and I doubt there's any question that the people in the band have benefitted from it.'

Faced with a choice between musicians and a machine, Zappa shows no hesitation when he states which he prefers to work with.

'With a machine. No question. No contest. The problem with doing anything with live musicians is that they're entitled to earn a living, so you have to pay them. And it ▶

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gets expensive. When a tour is over, the band is free to go out and do whatever other things they can get in their spare time. I don't keep them on salary all the time, I can't afford them. So the best way to do music is by typing it in, pushing the button and listening to it play back correctly.'

And there's the fact that, if he replaces musicians with a piece of modern technology, Frank Zappa has a door to a completely new world of sound – a door he's opened wide in recent years. A listen to *Jazz From Hell* and *Frank Zappa Meets The Mothers Of Prevention* exposes listeners to sounds they have probably never come across before.

'I use it all. There are all different techniques on my record. There are some other things that have come along since that time. I've got one that I was working on just before you got here. It's not very much like rock 'n' roll, but it's still music.'

Production techniques have always set Frank Zappa's music apart from the rest, and although it really is not fair to lump his music in with rock music, this is precisely what has happened in the past, and will probably will continue to happen as well. On one hand this has worked to Zappa's advantage in that his music has been made visible to a lot of young, often open-minded listeners. On the other hand, much of the music-buying public doesn't understand what he's doing because they're viewing it as a particular style of music.

This is really a pity, for the techniques Zappa has employed throughout his career have always been far beyond those used in the mainstream. The last track on *We're Only In It For The Money*, for example, showcased electronic sound effects in rapid-fire succession as you're not likely to hear anywhere else.

'Oh, 'The Chrome-plated Megaphone of Destiny'? The percussive-type noises, the thing that sounded like little squirts and explosions, was done by using a box that we built at a studio called the Apostolic Vlorch Injector. It was a little box this big,' (Zappa holds an imaginary small box with both hands) 'with three buttons on it. The console at the studio in New York where we used to work, Apostolic, was unique. In the sixties the audio science was growing, and people were trying all kinds of different things, and there was a lot of non-standard equipment around. This particular console didn't have a stereo fader; it had three master faders – a separate fader for the left, the center and the right, so you could fade out the center and leave the left and right, or whatever. So these

three buttons on this box corresponded to inputs to the three master faders, and you could play it rhythmically.

'The input to the box would be any sound source cranked up to the level of gross square-wave distortion. Any noise. You'd crank it up so that if it was printed non-stop on a piece of tape, you couldn't stand to listen to it. It would be trashed distortion. But as short little bits you'd get very complex, technicolor noise. When you hit the button and open up a little window of time, the structure of the distortion was a complex wave form, and
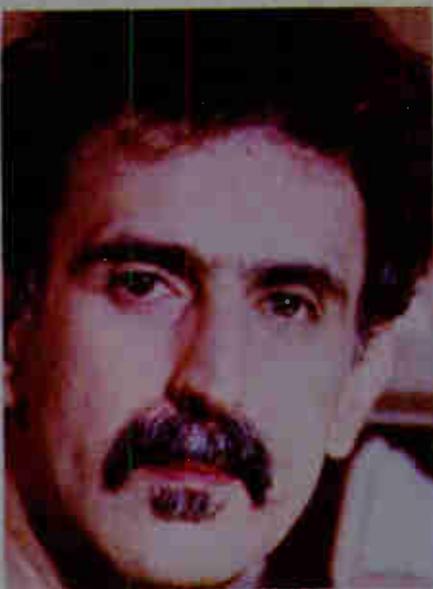
that's where the bumpy, crunchy stuff comes from.

'Then we had some backwards tape and tape slowed down and speeded up with the VSO, and were using parts of recordings of ethnic instruments. There's a tambora in there, a koto in there someplace. Some filtered tapes of industrial noises, horses, all collaged together.

'I started doing that in 1962, before I had a record contract. I just experimented in this little studio they had, so I was well into music concrète techniques before I made a record.'

MANY OF THE sound textures which appear on *Jazz From Hell*, such as the harpsichords and woodwinds, bring Mothers albums like *Burnt Weeny Sandwich* to mind. Are there specific sounds that Zappa goes for?

'It depends on the information. When you listen to a sound, there are a lot of different ways to perceive it. You can perceive it in terms of its physics, which is: What is the waveform? What is the amplitude? The

scientific methods of sound. The other way to listen to it is: What does it feel like? What does it smell like? What does it mean?

'There's one rule of thumb I use in terms of all compositions, whether it's rock 'n' roll or chamber music. It's that timbre rules. The timbre of the piece is the most important thing people hear. The timbre will tell you how to hear the rest of the data, and the best example of that theory is this: You can take Jimi Hendrix playing 'Purple Haze', and take the guitar part. If you listen to the guitar, it's 'Purple Haze'. But if you take exactly that guitar part, note for note, and have it played on an accordion, it's still the same data, but it's not the same information. So the timbre is the thing that tells you what it is you're listening to.'

Zappa applies the same thinking to his own work today, playing back his compositions on the Synclavier with various timbres for each part, then adjusting the parts or timbres as he sees fit.

'The things undergo constant modification, like there's a floppy that had a piece that was typed in five years ago that I hadn't listened to in a long time. It was typed in before I even had the qualifying sampling system, so I put it in and the original timbres were those depressing old FM timbres. Pretty bland-sounding. I replaced all those with samples, and I've virtually got a new piece of music on my hands.

'Every season I buy new stuff for the Synclavier, and reach the RAM capacity, get extra doodads for it as the budget will allow, and every time there's a new module added on, I go back through all my collection of compositions and update them. There are probably 250, maybe 300 compositions on floppies right now, with not more than ten of them completed. They're all in varying stages of being worked on, and I've had them since I got the machine, four or five years ago.'

As synth players with their own sound library already know, keeping track of sounds on floppy disk is just as important as storing them in the first place. And just as synth players find patch charts for all sounds in their libraries an unnecessary and time-consuming endeavor, so does Frank Zappa find keeping printouts of all his compositions, even with the score-printing option on the Synclavier.

'It takes too long to print them out. I had that commission by the Aspen Wind Quintet to write something for them, and I put it on the Synclavier, so I printed out the score and the parts on the Synclavier. I just have a graphics printer. Without a lazer printer, it's ▶

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an interminable, tedious job to print out a score.

'I got a call today from a group in Boston. They wanted me to supply them with something, but I can't do it. I just don't have the time. There is plenty of music I've already written that's sitting on the shelf and never been played. I really don't have any intention of going back to manual labor, after I've been used to this stuff.

'It's always a depressing experience to write something and know what it should sound like, and then give it to some human beings and then start hearing all the mistakes, and the audience doesn't know. In the last year there have been a lot of times where people have played various chamber pieces of mine, in different places all over the country – "Oh, won't you come to the concert?" – No, no way, I don't want to hear it. I already know what it sounds like, I don't want to know what you do to it.'

IT'S HARD TO think of a time when Zappa has performed with musicians who were not amazing improvisors, but how does he combine improvisation with set compositions?

'It fits into a hole. There's the arrangement, and then there's a blank space in the arrangement and it says, "solo goes here." That's where the improvisation goes, and the arrangements are absolutely nailed down. They have to play them exactly the way they're supposed to be played.

'We had this thing called meltdown, where, depending on what's in the news that day, or what happened in the audience during the show, I'll start talking in a singsong tone of voice and then Tommy Mars would comp changes behind it. Now that's very freeform, kind of like the 'Dangerous Kitchen' or 'Jazz Discharge Party Hats'; those are both meltdown events. In the case of 'Dangerous Kitchen,' it's a fixed set of lyrics that has variable pitches and variable

rhythms. In the case of the 'Jazz Discharge Party Hats,' it was completely spontaneous, 100% improvised by me and the band. It ended up right on the spot in this concert in Illinois.

'So that type of rampant behavior is good as a contrast, but I think that for today's audience you can't go out and do a whole evening of random behavior. They're not going to tolerate it; they want to see a structured show. It's been my experience that most people want to have any band go on stage as a human jukebox and just puke out whatever it was they put on a record.

'Which in a way is good, and in a way is bad. If you can actually play it, then you've accomplished something monumental, considering how complex today's record production techniques are. And some groups' people go to a great deal of time and trouble to make their stage performance sound just like a record. But on the other hand, those same groups that have drilled themselves to sound just like a record often have psychological problems in the band and the crew because they have to do exactly the same thing night after night. We avoid that by having some random elements in the show and by having a book that is large enough that you can vary the show every night.

'The other thing it works against is the ideas of ten years ago, when I would go out and do a whole tour based on new material, and throw in a few songs off albums. I would develop the material on the road. I stopped doing that because people usually booed it, and they'd have it out in the market before I'd even have an album out. Now if I do it, there is very little unreleased material included in the show. It takes the fun out of it for me, but I'm not going to make life any easier for bootleggers.

'I've had an independent label since 1968. First it was called Bizarre, then it was Discrete, then Zappa Records, then Barking Pumpkin. Each one had a different major

label as a distributor. Capitol is the current distributor.'

WHILE DISCUSSING USING the Synclavier on *Mothers of Prevention*, I mention 'Revolution 9.'
'What's revolution 9?' responds Zappa. 'I never heard it. I didn't like the Beatles. They sang about love and stuff - not my *style*.'

So what *does* Frank Zappa listen to, other than his own compositions?

'I have little or no recreational listening time. Given the choice between listening to a record and watching the news, I'm going to watch the news.

'I've got a good record collection, and sometimes I miss listening to it, but if I've got a spare minute, it seems I'd feel guilty if I didn't pay attention to what's going on in the news. Because next day, somebody's going to call me on the phone and ask my opinion on something.

'…I won't say I've heard it all, but I've heard all the stuff I like. There may be some other little surprises lurking out there, but I haven't been too assiduous in tracking them down.

'I like Bulgarian music, I like Indian music, I like Arab and Tibetan and French Renaissance dance music. I like recordings of lute music, and most of the early 20th Century composers, until economics took over, and we wound up with minimalism. I'm not too fond of that. I'm not enthusiastic about cowboy music. Early heavy metal I like – early Black Sabbath and rhythm 'n' blues. I even like some disco music, when it's clever and the production is fantastic. I'm not crazy about the stuff they have on MTV; it's not much to listen to. But some of the pictures are nice.'

Well, if Frank Zappa's plans to put out a clay animation video for one of the tracks from *Jazz From Hell* materialize, there will be *plenty* to listen to. ■

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Intelligent Music
Jam Factory

Software for Apple Macintosh

You think everything that's going to be done with music software has already been done? Think again. Intelligent Music's software opens more compositional and performance doors than many thought possible. *Review by Jim Burgess.*
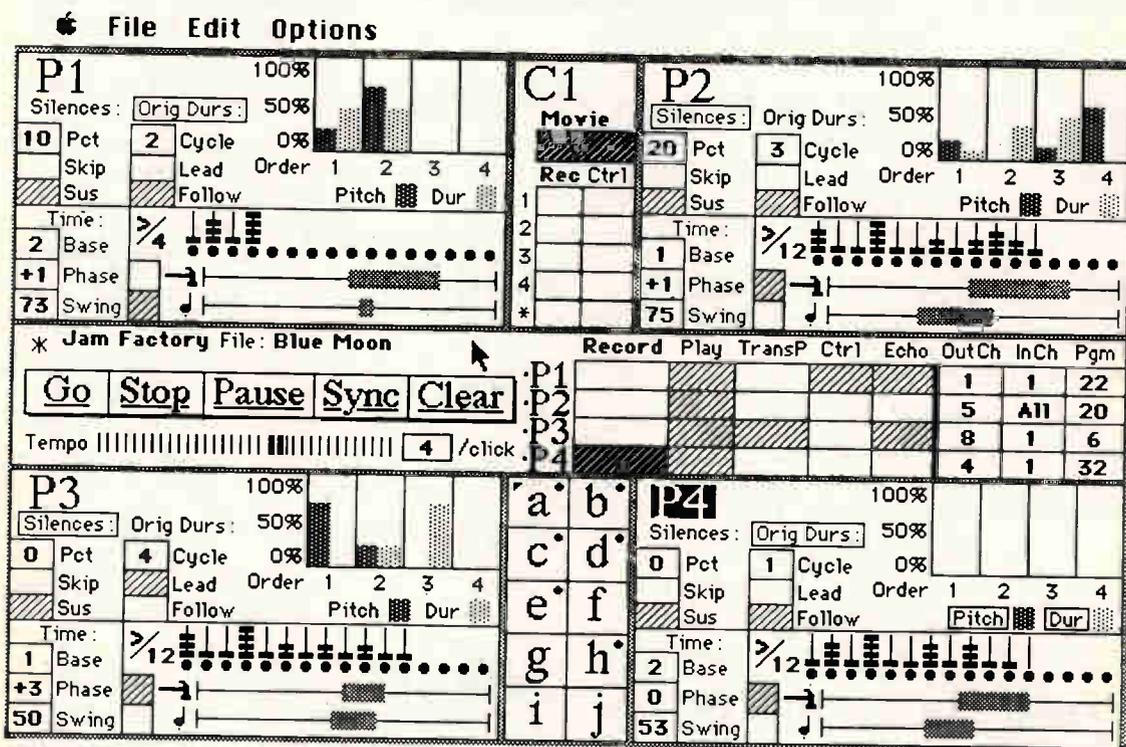
I N A CROWDED music software market where hundreds of companies compete for the consumer's dollar, sheer originality scores big points. After all, how much does the world need yet another sequencer program? The chances of a new program's success are all that much better if it offers something so revolutionary that it simply cannot be compared to anything else in existence.

Case in point: Intelligent Music of Albany, New York. A fitting name indeed for a company that produces a new breed of music software: composition programs designed not only to record musical performances, but to permit the user to manipulate, control and interact with the performance of a composition in real time.

Although Intelligent Music is a new company, its programming talent consists of a collection of music software veterans. Intelligent Music's first two offerings

are formidable. Jam Factory, reviewed here, is an improvisation-oriented performance program. Next month we'll take a look at their second program, M, which is a music processor that accepts input from a variety of sources and permits the real-time manipulation of the performance of a composition by means of controlling a wide range of musical variables.

Both programs are written exclusively for the Apple Macintosh and take full advantage of the type of graphic control capabilities that have made the Mac such a favorite among music software users.

Jam Factory uses four 'Players' to analyze what you play and then creates 'intelligent improvisations' consisting of likely variations on what you originally played. While Jam Factory is playing, you can alter the performance of each individual Player in a number of ways.

You 'teach' Jam Factory's four Players

how and what to play by recording MIDI data into them from any MIDI source. Their improvisations are based on the musical material you give them to work with; so the less you give them, the more predictable the results.

The basic musical material that you give the Players is placed in what are known as Transition Tables. These are designed to keep. track of the transitions between notes in such a way that each Player can perform intelligent improvisations based on the data that's entered into it.

Precise real-time control is offered over the performance nuances of each Player with a full range of control functions that include the ability to alter the timebase, accent and duration patterns, swing factor and even the percentage of silence.

All performance parameters may be altered while Jam Factory is playing, either directly on the screen or with the program's unique Input Control System

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that lets you use any MIDI controller to access Jam Factory's functions via MIDI note commands.

Combinations of Player settings may be stored as a Preset, and you can switch from one Preset to another without stopping the program. This way you can create countless performance variations for the Players and switch between them to 'arrange' a Jam Factory performance.

Finally, you can store an entire Jam Factory performance as a 'Movie', and recall it later or convert it into a MIDI file compatible with other music software.

Factory Features

THE MAIN SCREEN consists of the four Players; a master Control Strip where most of the overall functions of the program are located; a Preset window that is used to store settings for the Players to enable quick changes during performance; and a Conductor window that's used to store Movies of Jam Factory performances. In addition, there are a number of other windows that are accessed from pull-down menus when you need them.

Getting around Jam Factory's screen is easy, thanks to some great graphics and the use of familiar Mac-type controls like buttons and toggles. Users of Opcode's DX Editor (also written by Jam Factory author David Zicarelli) may recognize the familiar Up and Down arrows that can be used to swiftly increase or decrease numerical values with the mouse.

The Control Strip is where most of Jam Factory's master controls are located. Tape recorder-style buttons are provided for functions like Go, Stop, Pause, Sync and Clear. Below these are overall tempo and metronome click values.

The Assignment Matrix is where the general state of each Player is defined. Here the functions Record, Play, Transpose, Control and Echo are available for each of the four Players, and you can alter the status of a particular Player at any time during its performance.

The Record function on the Control Strip window is used to record incoming MIDI notes or program changes into that particular Player. Any combination of Players may be set to Record at the same time, and you can switch Players in and out of Record while Jam Factory is playing.

Entering Record on a Player that has already been recorded on allows you to add new musical information to that Player. If you want to start over again, you can clear a Player's memory and start from scratch.

Jam Factory has an Input Note Limit feature that you can use to tell a Player not to record incoming notes that do not fall within a specified range. This is a great feature if you're using a synth or sampler with multi-split capability, because it lets you set each of Jam Factory's Players to

respond only to a specific range that matches a certain sound.

By the way, each of Jam Factory's Players can be set to recognize incoming MIDI data on a specific MIDI channel only (the default is 'All'). That way, you can have several people 'jam' at once, each with their own MIDI controller. Another handy application of this feature is 'bouncing' MIDI data from an external sequencer into Jam Factory – so you can record separate sequencer tracks into the four Players simultaneously.

Now, you can record one Player while you play others, but one unusual effect is using a Player in both Record and Play modes at the same time. As you record new notes and chords to the Player's existing data, you can hear the effect of doing so immediately in the playback of that Player.

If you make a mistake when you're entering musical information into a Player, you can correct it with Jam Factory's Input Editor. This is a pop-out window that lets you step backwards and forwards through the musical data relevant to the selected Player. The Input Editor can also be utilized as a step-time entry system.

Parameters can be copied from one Player to another using standard Mac editing commands like Cut, Copy and Paste. It's possible to edit specific Pitches, Durations and Player Settings independently, so you can combine the pitches of one Player with the durations of another.

Each Player can be assigned a specific MIDI output channel, and you can change the output channel as Jam Factory plays, to allow any Player's performance to be routed to different sound sources. Jam Factory can also send program changes for each Player.

There's an Echo function available for each Player, designed to send incoming MIDI data to the appropriate output channel – a welcome feature for those using systems with a master controller and a number of slave sound sources. And the Echo function works whether or not Jam Factory is playing.

The Transpose feature is designed to permit real-time transposing of any combination of Players during a performance. Middle C represents the original pitch you recorded at, and selecting any other note on your MIDI controller will cause that Player to transpose by the appropriate amount. One interesting use

Scale Distortion | Done | **Apply on Transpose**

Map	1	2	3	4	5	6	7	8		
C	C	C	C	C	C#	C	C	C	C	None
C#	C#	C	C#	C	C#	C#	C#	C·	C#	Map1
D	D	D	D#	D	D#	D	C#	F#	D	None
D#	D#	D	D#	D#	D#	D#	D#	A	D#	Map3
E	E	E	E	F	F	D#	E	G	E	Map4
F	F	E	F#	F	F	F	F	G	F	None
F#	F#	G	F#	F#	F#	F#	F#	F#	F#	Map5
G	G	G	F#	G#	F#	G	F#	A#	G	None
G#	G#	A	A	G#	G#	G#	G#	C#	G#	Map6
A	A	A	A#	A#	G#	A	G#	C	A	Map7
A#	A#	B	A#	A#	A#	A	A#	C·	A#	Map8
B	B	C·	B	C·	A#	B	B	C·	B	Map2

P3 Input Editor

▨ **Pitches** Total | 11 | ▨ **Durations**

Edit Counter | 4 |

Contents:

G#3	C#3	A#2	E3				
1	2	3	4	5	6	7	8

9	10	11	12	13	14	15	16

Total | 11 |
Edit Counter | 4 |
Duration | 2 |
▨ Sustain entry

MIDI In: Insert Mode   Replace Mode ▶

| Rewind ◀◀ | Step Back ◀1 | Delete ✂ | Step Ahead 1▶ | Fast Fwd ▶▶ | RePlay ▶ | Cancel Edit ⊘ | OK ✓ |

▶ of this feature is to transpose a Player assigned to a sampler using some percussive sounds; the rhythm remains intact but the samples being triggered change, often creating an unexpected and usable variation in a performance.

Finally, the Input Control System may be enabled for each individual Player, permitting the user to access Jam Factory's various controls and functions from any MIDI source. This unique interactive feature lets you do things like start and stop the program, turn Players on and off, set the tempo and even change Presets – all without leaving your MIDI controller.

Playing Players

EACH JAM FACTORY Player can have its own unique identity if you utilize the many graphic control functions available in the Player's Control Window. Here the nuances of any Player's performance may be altered by the user, permitting some very sophisticated ways of interacting with a performance.

The Player's relationship to overall tempo may be controlled by changing the Time Base value. Changing from 1 to 2 would cause a particular Player to play in half time relative to the other Players, for example. You can also change the phase of a Player's timing, to offset a Player's performance by a certain amount of ticks or clock pulses. Experimenting with both of these parameters can yield some very unusual rhythmic patterns.

There's also a Swing parameter available to set up shuffle-type rhythms in much the same way as a drum machine does. The Swing factor is a variable percentage from 50 to 90, with 50% (or no swing) being the default.

Jam Factory uses a unique graphic display for altering the dynamic accents and phrasing of a performance. An Accent Pattern can contain anywhere between one and 16 steps. You can use the mouse to set up five different Accent Levels, where zero equals no value and five equals full value. The Accent Pattern can be assigned to either Velocity or Legato/Staccato (phrasing).

Exactly how much of an effect the Accent Pattern has on these two parameters is determined by the Range Bar settings. By dragging the mouse over the desired range, you set the high and low values for both velocity and phrasing. You may also choose to use a random value rather than the Accent Pattern to determine actual range values.

This is a very powerful system. By assigning Accent Patterns to velocity you can dramatically alter the 'feel' of a Player's performance. A value of zero can be used to create a 'rest' in the Accent Pattern that will result in no note being played at that point in the cycle. And by setting up several Players with Accent Patterns of different lengths, you can create rhythmic cycles that play off of

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each other in a constantly changing manner.

Jam Factory's Silence Algorithm provides the user with total control over the amount of randomly inserted silence in a Player's performance. You may vary the percentage of Silence anywhere between 1 and 100. The Skip control is used to determine whether a silent section will cause the notes that Player would otherwise be playing to be skipped over during the silent section. If Skip is off, those notes will simply be delayed and the Player will carry on playing from where it stopped after the silence is over. You can also enable Sustain, which will cause the note immediately preceding the silent section to be sustained over it. Otherwise, all notes are silenced at the beginning of the silent section.

The bar graph located in the upper right corner of each Player's window is used to control the improvisational ability of each Player. The 'bars' control the Transition Tables discussed earlier, and allow the user to specify a percentage of mix between first, second, third and fourth order. Essentially, the Transition Tables control the degree to which the program will mimic the original musical input. Using the principles of statistic probability, you control how much previously played musical information the program takes into account when deciding what note to play next. First Order will take a lesser amount of events in context than Fourth Order, for example. By the way, you can defeat the Transition Tables altogether and have the program play back exactly what you played into it.

You can also use the Transition Tables to calculate the durations of the notes Jam Factory plays. Cyclic duration patterns may be created, and you may instruct the Player to either Lead or Follow pitch-changes to decide whether the rhythm determines the melody or the melody creates the rhythm.

Another unique feature of Jam Factory is known as Scale Distortion. It's designed to let you create unusual transposition patterns of a diatonic nature. By setting up a series of Scale Distortion Maps, you can define certain keys to trigger specific Maps and thereby create a melodic variation for any combination of Players.

Jam Factory's Player controls are really designed to let you give each Player a unique identity and style. However, you may want to create quick changes in those parameters during a performance. That's what the Presets are for.

Storing a Preset is just like taking a picture of Jam Factory's screen. You recall a stored Preset just by clicking on it. Selecting a Preset during a performance can initiate a total re-configuration of all of Jam Factory's settings, creating dramatic musical changes if desired. You can use Jam Factory's Movie feature to store a complete Jam Factory performance, including Preset changes.

Applications

THOSE GREAT JAMS that go down wouldn't be much use if you couldn't save them. Fortunately, Jam Factory lets you save your files so you can repeat them and work on them at a later date.

By the way, Jam Factory can be synced to MIDI Clock either as a master or as a slave, so running it in sync with a sequencer, drum machine or other sync device is no problem.

If you set up some of the Players to respond to the Input Control System described previously, you can use an external MIDI sequencer to 'automate' Jam Factory's controls, turning Players on and off, controlling the Step Advance feature, changing Presets, and just about anything else you might want to do. This way, Jam Factory can be 'cued' in and out of a sequence when desired.

Furthermore, Jam Factory provides a means of converting a jam into a sequence file with the inclusion of the new MIDI File format. When you save a Movie, Jam Factory creates a MIDI File. You can open a MIDI File directly into another program such as M or Opcode's Sequencer 2.5, allowing you to take improvisations created on Jam Factory and edit or manipulate them with other software.

That means you can combine a Jam Factory improvisation with a pre-defined MIDI sequence. Or you could use a sequencer to provide a more advanced means of structuring and arranging music generated by Jam Factory. You can even go the other way, taking an existing sequence and feeding it into Jam Factory for some jammin' fun.

I've had lots of time to get to know this program, having used a copy for several months and created over 30 pieces of music. Each piece is unique and has its own identity. Generally speaking, I've found that the program works best when you give each Player a rather limited amount of musical input. But as with most things, the more you use Jam Factory, the more you understand how to get what you want out of it quickly.

The purists may claim that what Jam Factory produces is 'not real music', but if they do, they'll be missing the point. Using Jam Factory is fun! It makes it easier than ever for non-players to create music, but equally, the program is only capable of manipulating the input you provide it with, so some people will get great results while others create noise.

Programs like Jam Factory move the MIDI revolution forward in leaps and bounds. It's a musical tool more powerful than anything we've had in the past, and is capable of adding new inspiration to the music-making process. ∎
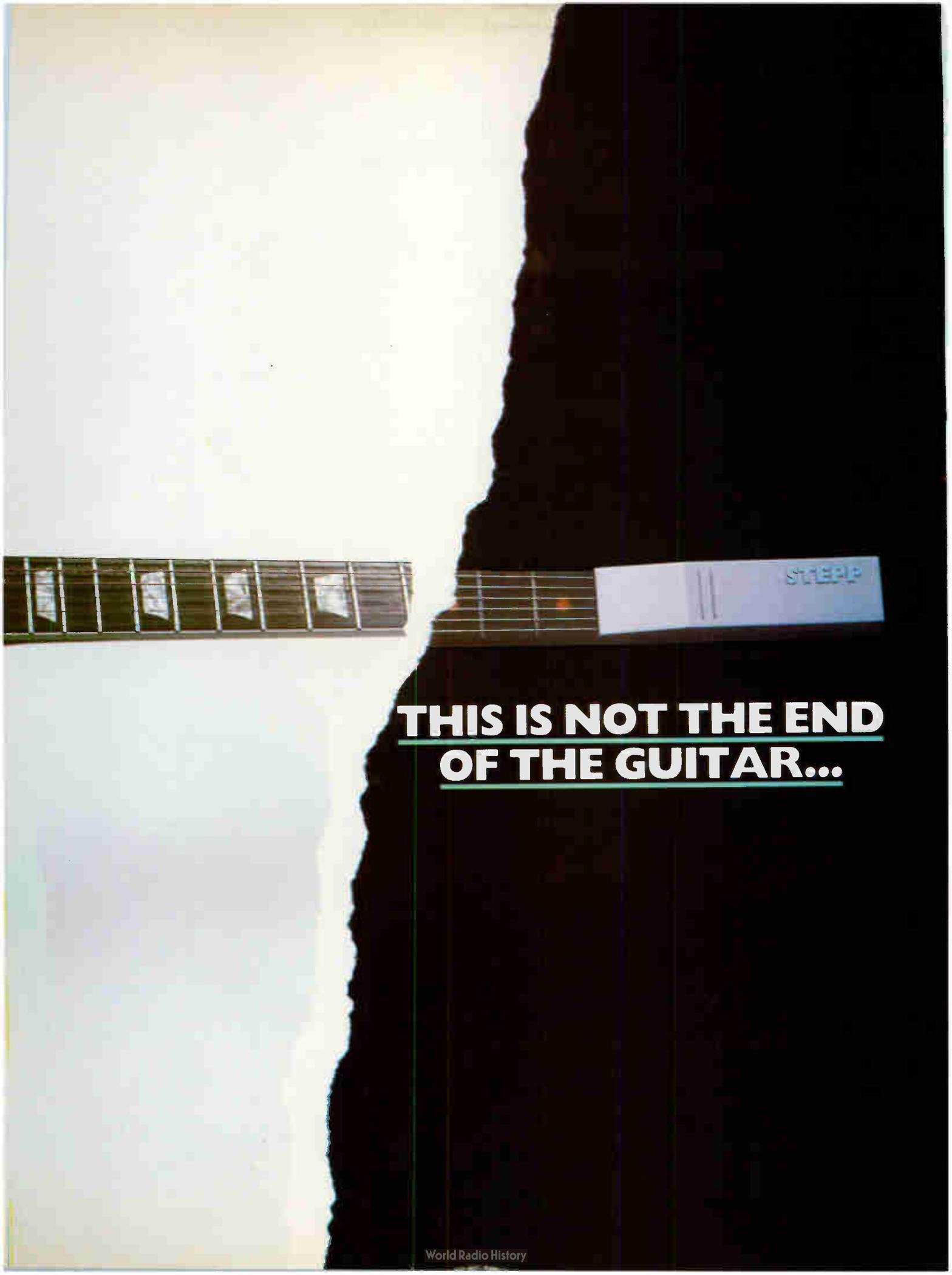
THIS IS NOT THE END
OF THE GUITAR...

The electric guitar hasn't changed much since the 50's. Music has.

Synthesizers and digital technology have revolutionized popular music with the result that guitarists have to some extent been left behind. Quite a few have taken to the keyboard synthesizer only to sound like every other guitarist turned synth player.

Guitar synthesizers have been around for a while but they have been shunned by guitarists because they are basically keyboard synthesizers you can plug a guitar into.

No one has built a guitar-dedicated system.

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The STEPP DGI is the first digital guitar designed totally and solely for the guitarist – the only other thing you need to plug into is your amp or mixing desk. It comes as a complete unit, giving you the control essential for dramatic guitar performance.

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Previously so called guitar synthesizers and MIDI guitars failed because they were locked into a keyboard language far too limiting for the enormous range of expression and subtlety of the guitar.

The DGI is capable of instantly analysing every chord, solo or strum, and via its dedicated synthesizer section can translate every nuance into a whole new palette of sounds. These can be stored in 100 memory locations on the guitar itself.

THIS IS JUST THE BEGINNING

In addition every new guitar sound can be modelled in performance by the way you play.

STEPP'S unique open architecture and active performance software (APS) allows parameters to be routed to 'real-time' controls such as the wang bar, frets or strum area.

To take one example you can wang volume, bend resonance and strum filter cut-off, or just stick to the traditional parameters such as bending pitch.

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And with MIDI-IN you can use a sequencer to record and playback your last solo or play bass while playing rhythm and drums.

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THE STEPP DGI
YOU'RE A GUITARIST – SO PLAY THE GUITAR

KEEP IN TIME
with the times

You're a rock 'n' roll drummer. You've looked at new musical technology and been scared off. How can you overcome your fear, put new gear to good musical use, and convince the rest of the band you're not about to put them out of a job? *Text by Trevor Gilchrist.*

I T'S NOW WELL ACCEPTED that the creation of rhythm is no longer the sole right or privilege of drummers. The responsibility for its conception and general welfare is now a shared responsibility, and the ability to control The Beat is no longer one of a musician's optional skills.

But the ageing fear that machines would one day remove all drummers from their stools has been proved groundless. Certainly there are fewer real live human drummers about, but as a rule, those who are getting regular work are better for the competition that machines have been providing. Most of them are still sitting pretty, not 'by the grace of God', but because they've been forced to *think* about how they must adapt and re-

educate themselves in order to keep time with the times.

The way things are going at the moment, electronics (for want of a more descriptive term), and 'the future' (ditto) are intrinsically linked. Many drummers fortunate enough to have the spare cash to play the field have worked this out for themselves, and now reap the benefits that modern technology lays before them.

The ways in which they do this are not always clear, though. Many of them, despite MTV appearances that often indicate otherwise, have not sold their souls to Mr Simmons: there are many subtler ways of introducing technology into the accepted, or 'traditional' drumming environment.

Have you noticed, for example, how as

technology advances, it's actually gearing itself towards integration with acoustic gear (you remember, chrome and wood and all that), creating a sort of acoustic-friendly electronic regime through what is known as 'triggering'?

As opposed to merely distancing and separating itself from the acoustic drummer as we know him (yes, or her), the Beast we call Technology has actually approached us and said: 'Before I go off on my own and explore new areas, is there anything that we can do for each other? Is there any way that I can *enhance* what you're doing?'

Many drummers, frightened of the Beast, turn their backs and hope it will go away. The wiser among them climb enthusiastically onto its back, certain in the knowledge that they have everything to gain by the experience.

So, how much do you actually know about all this non-acoustic gear? Let's look upon the face of the Beast.

There are really two areas to be considered. First, there's the way that technology can affect the sound of

acoustic percussion instruments – by applying reverberation, for example.

But let's concentrate on the second area, that of triggering percussion voice units. Exploiting the power of MIDI, your very own acoustic kit can be made to 'trigger' the voices of any drum machine, or other voice generators like the Simmons SDE percussion expander. Fixing tiny piezo transducers (or 'bugs') to each of your drums turns them into an arrangement of messengers – you hit them and they send a message down the line to say that a particular voice from a particular voice generator is to be played. The result? You play your normal kit, but the sound your audience hears can be whatever you've pre-arranged it to be.

Slot in a mixing board, and you can vary the mix between your own acoustic sound and the sound your drum is triggering. For example, you might have your normal snare drum being mixed with a huge Phil Collins-like gated snare sound and one of your toms mixed with handclaps. The variations are endless, and are only really limited by the sound producing equipment you can afford, and oh, by your imagination – but you don't need a lot of either to get started.

Now, triggering from acoustic drums isn't the only option open to you. You can also introduce extra playing surfaces to your existing kit setup.

Roland's Octapad is a unit which combines eight small pads with a MIDI interface to make up a very flexible and useful sound triggering unit. Let's imagine that you've secured an Octapad (it's about the size of a small briefcase) to a stand above your hi-hats and that you've connected it via its MIDI cable to a drum machine and an SDE percussion expander. Assigning four of its pads to each machine (the easiest of tasks), would enable you to play, say, handclaps, tambourine, cowbell and another snare on pads 1-4, and a kettle drum, marimba, gong and orchestral stab on pads 5-8.

Should you want to switch from this setup to another one that's completely different, you don't have to stop the band and re-program the machines. The MIDI channel and note settings for each pad on the Octapad can be stored in up to four patches, which can be recalled instantly from the front panel or stepped through using a footswitch. Hey presto! You move from playing vibes on your SDE to playing kit sounds on an RX21 drum machine, then to steel drums on the SDE again. Or maybe you'd keep the same sound and just change the pitches to coincide with a key change. After all, you'd look a bit pathetic playing your SDE's vibes in F♯ major while the rest of the band is playing in A minor.

So, we've seen that you always need something to hit that will send the trigger message, and the choice of controllers to consider includes pads (even if it's only one to start with) or your own 'bugged'

acoustic kit, together with something to convert that message into a form that a MIDI voice generator will understand – a trigger-to-MIDI converter like Simmons' TMI will accept up to eight trigger inputs and should do the trick. The Roland Octapad already mentioned is the other alternative.

And talking about pads (those unexciting slabs of plastic and rubber that we see so many of these days), these actually do the very same job as the smaller surfaces of an Octapad, except that they can obviously be mounted in the more usual kit configuration and added to your acoustic kit to provide a more practical playing surface. Each pad sends triggers to something like the Simmons TMI, which then converts the triggering information – which pad you've hit and how hard you've hit it – into MIDI data. From then on, the story is the same as before: the MIDI data can then be channeled into a drum machine, or a percussion, synth or sampling expander (or the equivalent keyboard version).

And as for the instruments to use to actually produce the sounds you want, a MIDI drum machine and Simmons' SDE percussion expander are good starting points because they provide the sort of sounds which are immediately useful to drummers – handclaps, cowbells, tympani, bass synth presets, that kinda thing. And as you're probably already aware, the possibilities provided by samplers and synthesizers open up areas of experimentation you could write a book about.

Another exciting area worth exploring is the idea of playing tunes from behind your kit. Now, the majority of drum machines only allow you to play each of their sounds at their preset pitches, but when you're playing 'tuned' percussion (the vibes on the SDE, for example), or even the sounds generated on a MIDI synthesizer, you're able to assign a different pitch of the same instrument to each pad. And all of a sudden, your role as drummer in the band takes on a different meaning: you can become involved in the melody, in the basslines, and in the special effects department normally reserved for synth players and guitarists.

At a stroke, you've increased your potential for being a contributing member of a team at the cost of taking on added responsibility. Just as 'keeping the beat' is no longer the sole right of drummers, so now melody itself is no longer the sole preserve of your fellow musicians.

'But hang on a minute', I hear you say. 'None of this bears any relation to what I do. I'm in a band, I play drums, I play them pretty well. I've got no money to spend on fancy technology and anyway, even if I had, no one else would appreciate the difference it makes or the effort I've made. It's just not worth it.'

Obviously, that's a difficult argument to counter. Short of going into your local music store and making a real pig-nuisance

of yourself, there's no way of experimenting with these instruments and effects without spending money. And we know how hard that makes it. But to a great extent, actually using these things is the second step. First off, you have to grasp the essence of what each system does, and to realize why it's at all worthy of consideration in the first place.

Looking into the potential of all this gear won't steer you away from drumming in the traditional sense of the word. It's designed to enhance and add to your ability, not stifle it.

By the same token, I'm not asking you to renounce or abandon all that you believe in, just to accommodate a group of strange, perhaps alien concepts. And I'm not preaching the idea of forsaking conventional drums – merely suggesting that there are other systems around that might equally allow you to express yourself in a rhythmic way.

Returning to the point that 'no one else would appreciate the difference or the effort' – how do you know? If you're still reading this article, it's probably because there are some areas that you don't really understand but which intrigue you.

Gain first-hand experience of them, and I reckon you'll be impressed. How can you reckon that the same isn't true for the other members of your band?

Likewise, your audience. The majority of them have no desire to know how you make a particular sound. They just want to be entertained. Of course they're not going to shout from the front row: 'Yeah, play that trigger-MIDI interface!' Yet their listening pleasure (and therefore your chances of success and satisfaction in what you do) may be substantially increased as a result of using that interface.

The crux of the matter is that these things might just make a more imaginative drummer out of you. They may perhaps help you to become a more complete and capable musician, so what grounds do you have for ignoring them? Any drummer who would like to maintain or increase the enjoyment that playing currently provides, owes it to themselves to find out what this equipment can do. Things have come a long way since the Syndrum. The idea that all new technology is gimmick-orientated, fun-motivated, non-serious stuff...is wrong. Very wrong.

You've got to have the courage to take hold of the term 'technology' and redefine it. And the only way you're going to do that is by treating the equipment it encompasses as 'New Percussion Equipment'; that way, you'll be starting off on the right foot.

If, on the other hand, things electronic still fill you with anger or resentment and cause you to run to the sanctuary of your good ol' acoustic gear, then I suggest you down a good stiff drink, take a hot bath and then read this article again.

Look upon the face of the Beast. See it smile. ■

WOULD YOUR MOTHER
recognize you on the radio?

John Porter is one of the producers behind rock's grass-roots revival. So what is an R&B guitar player doing with a Yamaha CX5 computer and a LinnDrum? *Interview by Paul Tingen.*

O N COLLEGE RADIO STATIONS throughout the US, a single by a four-piece band from Manchester, England has been receiving a mass of airplay over the last two to three months – on demand from the stations' audiences. The band is The Smiths, the single is 'Ask', and its success proves there is still a market for simple, melodic, guitar-based songs. In fact, The Smiths are just one of several bands whose huge impact with a guitar, bass, drums and vocals line-up *outside* the heavy metal field has brought about a renaissance in rock music's most familiar (and ancient) form of song arrangement.

Producer John Porter is obviously pleased. A tall, thin man with a slightly hawkish look, Porter is somebody to whom the revival of

guitar-based rock and pop holds special significance, even though his views on musical technology put him far outside the image of the stereotyped Luddite musician, living in dread fear of being replaced by a computer.

Porter has worked with The Smiths from early on in the band's career, producing their first two albums (both of which made high Billboard LP chart positions) and, after stepping back to let them do *The Queen is Dead* all by themselves, moving into the frontline again with their latest singles. He also produced Billy Bragg's commercially and artistically successful *Talking With The Taxman About Poetry*, another cult hit on the college circuit, and a project on which he left a strong imprint by introducing bass,

mandolin, piano and trumpet – instrumentally a new development in Bragg's career.

So, what can one expect a producer, seemingly so far away from the electronic field, to say on the subject of music technology? Porter delves far into the past to answer that question...

'You remember Les Paul? He designed the Les Paul guitar, but he also invented multitracking and close-miking. One day somebody came up to him and asked: "What are your criteria for recognizing a good guitar player or a good musician?" Les Paul had only one reply: "Can your mother recognize you on the radio?" I think that sums it all up. It doesn't matter what you're doing, or what noise you're making, if your mother can

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recognize it, then you must have something that's really yours.

'It's pretty hard for synth players to be that recognizable, especially if they're working with sequencers. Personality or "feel" comes from somebody playing, not from a machine playing. I mean, get 25 people to program the same notes into a sequencer and the result will sound exactly the same. But have 25 guitarists or pianists play those notes and all those 25 versions will have slightly different

Set, One The Juggler, Sandie Shaw, Makin' Time, Killing Joke, and The Opposition.

His roots as a guitar player explain his interest in guitar-orientated music. But what about his involvement with all those young bands? Porter leans forward to explain.

'I like working with young musicians. I found the first time I went into the studio real difficult. I – and the other musicians with me – was never allowed in the control room. You'd just hear this impersonal voice over the

bit. You can't tell a young, inexperienced musician in the same way you can tell a dyed-in-the-wool session musician: "That's crap, try something else".'

> ## "A lot of young, guitar-orientated bands don't like to use the new technology because they think it's a cop-out. I don't agree."

inflexions and touches. It's harder to retain individuality on machines – unless you're a brilliant programmer.

'Take Billy Bragg. He's instantly recognizable. No way could you hear Billy and not know that it's him. Whereas you could hear OMD and you wouldn't be able to figure out who it is.'

Now, before you all start to turn over the page in disgust, don't get the wrong impression. Porter is not advocating a prohibition of synthesizers, sequencers and music computers. Far from it. In fact, he actually owns a Yamaha CX5, a LinnDrum, and "a couple of sync boxes". He's also worked with the Fairlight and the Synclavier, and favors a pragmatic approach.

'Usually when I start working with a band, we discuss how we want to use music technology. Do they want to use drum samples, roll in a Fairlight, or whatever. A lot of young guitar-orientated bands don't like to use the technology because they think it's a cop-out. I don't agree. In my mind, whatever it takes to get the best result is OK, and I don't care what it is.'

A S A GUITAR player himself, Porter started out a long time ago, playing with Bryan Ferry in a local band. Later he joined Roxy Music for their second album, *For Your Pleasure*, on which he played bass, and produced Ferry's first solo album *These Foolish Things*.

After that he started a career as a session player, playing bass, guitar, mandolin and slide, teaming up with, among others, Eric Clapton and Ronnie Lane. In 1980, he became a contract producer for the British Broadcasting Corporation.

'That was good for me', he muses, 'because the punk thing was just happening and as a guitar player it wasn't much fun for me at that point. I am a very blues and R&B orientated musician, and people didn't really want to know about that kind of playing. So I decided to concentrate on producing. In my time with the BBC, which lasted about one-and-a-half years, I must have seen about 350 bands. Which was great, because I got quite a good picture of what was going on.'

Since his time with the BBC, Porter continued to work as a freelance producer, working with the likes of the Monochrome

talkback saying: "Take 25, that's no good, do it again". There was no explanation *why* it was no good, or suggestions as to how to do it better. That puts you right on the spot and it wasn't a nice experience. So, having worked as a musician means that I see things from a musician's point of view, and in that, I especially sympathize with young musicians.'

Which in turn means that Porter goes into producing with a caring, sympathetic attitude, spending a great deal of time putting musicians at ease.

'Producing is a very fluctuating thing. Every situation is different and demands a different kind of method. Sometimes I might have to virtually write the song, arrange it and play bits of it as well. At other times it is just about finding the right place and the right time to do it and maybe making a few cups of coffee and that's enough to make things happen.

'I try to create a situation where the musicians feel relaxed. That's all-important. That's 90% of being a producer. To make

> ## "A tape-recorder is the biggest mute audience in the world. You know it's going to catch every nuance of what you do, but it doesn't give you any feedback."

musicians feel that they can do what they want to do.

'A recording studio is not the ideal place to make music. A tape-recorder is the biggest mute audience in the world. You know that it's going to catch every nuance of what you're doing, but at the same time it doesn't give you any feedback. It's an unnatural situation. It can be pretty daunting for musicians who've not been in the studio before to do their very best there.'

On a similar note, Porter explains some of the tactics he employs during what he calls the 'getting to know each other' period.

'When you start to work with somebody, you have to give them the benefit of the doubt. Often, when they feel strongly that they have something to offer, at first you can't pin it down, yet at the same time, you don't want to stifle it. You have to let musicians express themselves to the full in order to pick up the flow of things and get into a groove. Then you can start steering a

I T WAS WITH this attitude as one of his main assets that Porter got a call, in 1983, from Geoff Travis of Rough Trade Records in London. Travis had heard a tape of the first Smiths album and didn't like it, so he asked Porter for a second opinion. The producer agreed, and ended up being asked to re-record the whole thing. This he proceeded to do (on an incredibly low budget), and the result was *The Smiths* – a beautifully crisp, clear document of the Manchester band's early playing and songwriting.

Since then, Porter has developed a close working relationship with The Smiths which is characterized by methods that rely as much on spontaneity as they do on professionalism.

'They usually come in with a tune or a couple of tunes. We'll run through them without the singer, Morrissey. I'll make suggestions for, say, the bass and drums, weed out something in the bass drum part or something. The basis is very important; if it's OK, then half of the song is OK.

'Next we'll work out the riff, a middle eight, a bridge or a stop, but we don't actually know where they're going to go, because Morrissey is very secretive about his melodies and lyrics. At the moment we start working on a song, I might barely know the title. Of course, Johnny Marr (guitarist) and Morrissey do sit together beforehand and work out the melody and the chord-changes, but basically it's quite hair-raising to work with The Smiths, because I often really don't

know what's going to happen. They rarely use demos. So when Morrissey comes in, we have all the options there and he'll start singing over it, while we arrange the song as we go with it, shortening bits which are too long, expanding the middle eight, whatever needs to happen.

'I also know that Morrissey will only want to sing the song a maximum of seven or eight times, because then he'll lose his spontaneity. So there's that tension. It all has to happen in that hour. That's the time I've got to get it how I would like it to be, to get it how I think the song works better.

'It's a hit-and-miss attitude, but what you get is a very spontaneous thing. It's a bit like a performance. I usually record bass, drums and guitar together in one take and Morrissey's vocals go down in one go. We might patch up a couple of words here and there, or Andy Rourke might redo a bassline when he suddenly gets a new idea, but that's all.'

All this sounds remarkably simple, and in ▶

fact it is – though Porter and Johnny Marr *do* continue working on a few tricks after the initial recording stage, sometimes elaborating the guitar part to 15 overdubs.

'I initially use the LinnDrum, though that never gets on the album. But we then use the Linn for guitar effects. I'll write a pattern on the Linn, link the guitar to a stereo noise gate, and trigger that off the Linn, which is linked to the timecode again. Johnny and I like working on that kind of effect.'

The use of a triggered noise gate on the guitar is about the only similarity between recording The Smiths and arranging Billy Bragg's *Talking With The Taxman About*

a pencil and paper and I was kind of winding him up and playing him chords and saying: "What do you think of this?" I wasn't really co-writing, I was just *available*. It was like, do you want me to be a bass player, or do you want me to make a cup of tea, or do you want me to play a couple of nice chords? And that was really all it took to get him the result he wanted.'

Still, under Porter's seemingly altruistic attitude lay a desire to get Bragg into doing things he hadn't done before, and was reluctant to do now.

'I wanted to use a drummer and a band on some tracks', the producer admits. 'But Billy

didn't use any synths on the Bragg album and hardly any – 'we have been known to do the odd note' – on the Smiths albums, is that he feels he can do infinitely more with a good old-fashioned guitar, *aided* by new technology.

'You can get almost any sound you want out of a guitar nowadays. Synth triggering, MIDI, guitar synths – you can do it all. And the bands in this case didn't have a keyboard player, so it was more logical to do it with guitar, rather than hire a keyboard player. Still, I do like synths and sequencers. If someone would ask me to make a record saying, "there's no band, but here is the song and you can use whatever it takes to do it", then I'd probably use a lot of the hi-tech stuff.'

So why, in John Porter's view, is so much of modern, computer-based rock music stale and predictable?

> "*People buy an instrument, plug it in, use the presets, and after three months buy another one… but you can spend six years really learning an instrument.*"

Poetry. Porter explains how he helped Bragg get his album together.

'When we started, I think he had three songs that he was happy with. So it was a lot of coaxing it out of him. We knew that rather than him coming with a load of demos and then recording it, it was more a question of making the feeling right so that he could come up with the songs while we were recording.

'A lot of the time, Billy sat at the desk with

kept saying: "We'll do that next time". In the end I played some guitar, bass and mandolin, and we also had a piano, a trumpet and a flugelhorn. I tried to be discreet (laughs). Billy is so strong, so much a one-man band, that the album sounds to me like a logical extension of his previous work, but other people say it is a lot different. It's certainly more polished, but it's essentially still Billy and his guitar.'

Porter adds that one of the reasons he

'It's lack of imagination. It's partly because technology happens so quickly. People buy instruments, which are nowadays very sophisticated, plug them in, use the presets and after three months buy another one, whereas you can spend five to six years really *learning* an instrument. The Prophets are wonderful instruments, but you don't see them around a lot anymore. Very few people explore those instruments to the full.

'It all has a sort of novelty value. You hear a new sound, but after some time you begin to

recognize it and it loses its attraction. Take the DX7s. You get sick of hearing the same preset sounds, but six months ago you thought: "Wow, that's fantastic".

'In the long run, there's only one way in which music can extend itself and that's by re-exploring its roots. Basically it all comes down to a tune and some chord changes. That's what counts, and I do think it will go back to that, otherwise it'll just get stale.'

Porter's hope is that pop music will start looking back into R&B and blues again, after what he sees as a ten-year long denial of its own past. For John Porter, the punk movement and the hi-tech movement, each in its own way, have tried to re-invent the wheel. They've served their purpose, he says, and now it's time to take the best of both worlds and move on.

'Rock 'n' roll comes from R&B and blues. Those roots will never change. I hardly dare to say this, because a lot of young musicians don't have any knowledge of it, and if they do, it's something they reject because they think it's something from the 70s. But it will help to bring individuality back to computer pop. That's the challenge which technology puts to us – that we should be able to use it, and that we should retain our individuality when we use it. So far, we haven't even scratched the surface.'

Author's note: If you're not too sure about all this, ask your mother. ∎
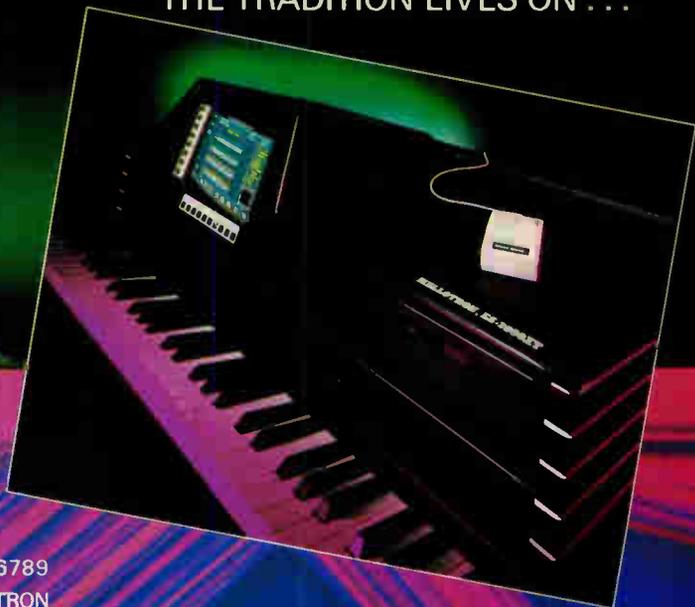
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DDD-1

Roland RD300
SAS Electronic Piano

If you've marveled at the sounds of Roland's RD1000 piano but couldn't justify the asking price, this new, scaled-down version may answer your prayers. *Review by Simon Trask.*

WHEN A COMPANY produces a cheaper version of an existing instrument, the inevitable question is: what sacrifices have been made in pursuance of the lower price tag? Roland has come up with a version of their RD1000 SAS (Structured/Adaptive Synthesis) electronic piano – the RD300 – for significantly less than the original instrument's asking price. There's also an RD200 on its way: a little cheaper than the 300 and offering 12 fewer keys, but that's all we know at present.

The RD300 is neither as heavy nor as rugged as the RD1000, but still has that bulky look which seems to be pretty much par for the course when it comes to electronic pianos these days. Good news is that you still get an 88-note keyboard for your money, and of course it's velocity-sensitive. The wooden keys have been replaced by plastic versions, but you still get a weighted action; if anything, the 50

300's keyboard has a heavier action than that of the 1000, which may or may not be to your taste.

Like the 1000, the RD300 has eight sounds onboard: three grand pianos (two acoustic and one electric), one harpsichord, one clavi, one vibraphone and two electric pianos. All these sounds are generated using SAS, a digital resynthesis system which allows analysis of timbral change through pitch and velocity down to a very fine level, and then stores all that data for access within a computer-controlled instrument.

The RD300 also retains the 1000's 16-voice polyphony, but only for its piano and vibraphone sounds; mysteriously, the harpsichord, clavi and electric pianos are now each 10-note polyphonic.

But unlike the RD1000, the new piano has no memories for storing edited versions of its sounds, while the options for editing the existing sounds have been

reduced. The RD1000's three-band EQ has been replaced by a single Brilliance control, and while the 300 retains both chorus and tremolo effects, it loses chorus rate and depth controls in favor of a simple on/off switch. However, the 300 has the virtue of front-panel sliders for tremolo rate and depth, so alterations to this effect can be made very quickly. Chorus and tremolo on/off settings are programmable for each of the 300's eight sounds, but settings are only stored while the instrument is powered up.

Also lacking from the 300 is the choice of four keyboard touch-response scales that the 1000 featured. In practise this is no major disadvantage – and of course no disadvantage at all if you're playing the harpsichord sound – though by comparison with a real piano, the lightest of touches on the RD300's keyboard produces a sound that is a little on the loud side.

What is more useful is the inclusion of a sostenuto function (something lacking on the RD1000) along with the more familiar sustain. A single pedal input can be used as either a soft pedal or a sostenuto, the choice being made by holding (or not holding) down the pedal while switching on the instrument. A further alternative use for this pedal is as a remote switch for

selecting such features as key transpose, split, chorus and tremolo.

MIDI channel, patch change and transposition settings are made by pressing the relevant button and then playing a key on the 300's keyboard. This procedure is made necessary because the RD300 has no LED display. Not an ideal situation, perhaps, but not one which causes any great difficulties, either – particularly as the relevant keys all have their functions clearly marked.

The only major disappointment with the RD1000 was its poor showing on the MIDI front. However, Roland has seen fit to *improve* the new RD's lot as a MIDI controller by giving it two keyboard zones, each of which can be given its own MIDI transmit channel (1-16). Other parameters assignable to each zone are MIDI transmit on/off and internal sound on/off, while the splitpoint can be set at any point on the keyboard.

These features do *not* mean that you can have two of the RD's sounds on the keyboard at once. However, you do have the flexibility to decide, for each keyboard zone, whether you want to layer RD300 and slave sounds, play an RD300 sound alone, or play a slave sound alone – and each zone can have its own layered sound. What is a shame is that, unlike the 1000, the 300 can't be put into MIDI Local Off mode – an irritation when using the keyboard as a master for sequencing. And there's still no means of transmitting aftertouch information to other MIDI instruments – as far as electronic pianos go, only Korg's new SG1D has this ability.

Roland has also provided two front-panel sliders (one for each zone) for controlling the volume of slaved MIDI instruments, while tremolo, chorus, sostenuto and sustain on/off settings can all be sent over MIDI.

The RD300's sounds are identical to those on the 1000. The acoustic grands are rich, vibrant, and very full, though there is a buzziness apparent when you sustain notes, especially in the bass register where it becomes more of a modulation effect. Higher up the sound is bright and clear and never thin, though there are signs that the SAS system is overcompensating on the hammer strike element, because it's more a white-noise 'chiff' than anything else, and it can be irritating.

One point worth noting here – and one that isn't immediately obvious until you compare an electronic piano right alongside the real thing – is that the software inside a machine like the RD300 doesn't allow for the fact that, when you strike a key on an acoustic piano, the action affects all the other strings inside the instrument. Now, I'm not saying this kind of interaction is impossible to simulate

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realistically, but it'll take a quantum leap in software engineering before we get to that stage.

The Roland's harpsichord sound captures the characteristic high-frequency 'gliss' of a harpsichord attack admirably, and though the buzziness of the piano sounds is also evident here, it's less obtrusive because it's more appropriate. The clavi is competent, but to these ears lacks a little of that funky bite and warmth.

Not surprisingly, the electric piano sounds are a much easier nut for Roland's SAS system to crack than their acoustic counterparts. Roland has opted for a

tinkling Rhodes-type sound and a much harder sound which is nearer to a Wurlitzer. The chorus and tremolo can also be put to good use on the vibes sound, which has a wonderful shimmer and warmth to it.

So, the RD300 makes its sacrifices in the area of programming, while losing none of the sonic quality of its more expensive brother, and actually improving its lot as a MIDI controller. Indisputably, an excellent buy. ∎

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The second part of our overview on hard-disk recording technology focuses attention on New England Digital's system for the Synclavier, and an interview with one of the system's most enthusiastic advocates. *Report by Rick Davies; Interview by Elizabeth Rose & Leslie Fradkin.*

OF ALL THE COMPANIES currently in the process of launching tapeless recording systems, New England Digital are the first to market with their Direct-to-Disk recording option for the Synclavier Digital Audio System (DAS). Designed to take the place of a multitrack tape recorder, the Direct-to-Disk system is the most straightforward hard disk-based system announced so far.

The option is available in four-, eight-, and 16-track versions, and is an add-on to the Synclavier DAS — already considered by many to be the last word in high-

quality digital sampling, digitizing audio in a 16-bit format at sample rates of 50kHz and 100kHz. Even when operating at the lower sample rate, the Synclavier outperforms Compact Disc quality. As NED points out, the 100kHz sample rate comes in handy when samples are played back at lower rates.

The Direct-to-Disk is designed to behave as much as possible like a conventional recorder, with all the pros that such a system offers, but without too many of the cons. For example, each track has a separate output, and each track can

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record the same amount of audio, in the same way that all tracks of a tape are of the same length. The sound quality of the digital recording depends on sample rate just as that of tape recordings depends on tape speed; the higher the quality, the less recording time there is available.

The basic systems come with one 80Mbyte Winchester hard disk per track, which, for a four-track system, amounts to 13 minutes of stereo recording at 100kHz sample rate, or 13 minutes of four-channel recording at 50kHz. With the addition of more Winchesters, each track can record nearly one hour of continuous audio. NED take the tape recorder analogy a step further by offering punch in/out, overdubbing, and bounce-down facilities.

Apart from the actual operation of the system itself, the NED approach also differs from the others in that it relies on multiple hard disks for multitrack operation. While this may make the high▶

▶sample rate recording possible, it also adds to the cost of the system. When the hard disks fill up, the material is backed up onto tape cartridges with 160Mbyte capacities, so depending on the system configuration, cartridges may be shared between tracks. To say the least, the tape cartridges will be considerably easier to transport.

The current version of the Direct-to-Disk system uses the Synclavier's Digital Memory Recorder control panel, so current Synclavier owners will already be familiar with many of the system's controls. A set of meters is supplied with the option, allowing signal levels to be monitored. NED also plans to release a stand-alone version of the Direct-to-Disk system, though a release date has yet to be announced.

The Direct-to-Disk system is already being used by artists such as Sting, Pat Metheny, and Paul Hardcastle (who discussed his system's uses in our interview, MT December '86), and it looks as though this new option could leave as great an impression on the music industry as the Synclavier Digital Audio System has done over the past years.

The four-, eight-, and 16-track Direct-to-Disk options retail for $80,000, $125,000, and $220,000 respectively, excluding the Synclavier Digital Audio System itself.

But so much for the facts. To get a more human perspective on what is a slightly awesome piece of modern science, we spoke to David Nichtern of New England Digital.

Nichtern has been with NED for six years – the first three as owner of the New York franchise, the last three as Director of Sales. He has extensive experience in the music biz, being most famous for penning the words and music to 'Midnight at the Oasis', for Maria Muldaur. In addition to Muldaur, he's worked as a producer, guitar player and composer with Patty Lu Pone, Stevie Wonder, Olivia Newton-John and Chaka Khan. He's brought his Synclavier to sessions with Paul Simon, Bob James and Khan, and has scored several features including *White Line Fever* and the 'Johnny Appleseed' segment of Showtime's *Fairie Tale Theatre*.

We asked David Nichtern a variety of questions about the innovative sampling and recording technology contained within NED's Direct-to-Disk system. Several of the questions reflect the fact that we are currently upgrading our own MIDI studio to include a Synclavier, 24-track recording (against our desire to be a tapeless studio), and with luck, a Direct-to-Disk system in the near future...

MT: Why are you introducing this technology, and what does it mean to the recording industry to have it?

DN: Let's call the whole area 'Random Access Recording Technology'. The major innovation is that you're taking audio recording off of a linear medium, tape (and what I mean by a linear medium is that you have to find a physical location,

move your medium ahead to that point in time, on its location, to spit back that portion of audio), and moving it to a random access storage form, like a hard disk or an optical disk, where any moment of time is equally accessible on the medium. That's really the innovation.

So there are three reasons for making this innovation. The first one is speed. If you can work more quickly that's an obvious advantage. To demonstrate that part of it, random access says that if we want to punch in on the third chorus of your song – you know you have a great singer there, a Chaka Khan or a Lionel Richie, and they say 'I got a great idea for the third chorus...' – you can go boom, and be there instantaneously. Then they say, 'now I want to sing a lick at the front end of the tune', and then they go 'that's a great idea, let me put it on the fade'... you can be there instantaneously.

This creative speed is very, very innovative. You just have to go into the studio and fool with this. It's the same as with a sequencer; the fact that you can sort of do that with your musical composition brings the same speed to live recording. So the first one is speed.

The second reason in our scheme is audio fidelity or quality – why do people want to move from analog tape to digital tape? With analog tape, the signal-to-noise relationship is not really good enough and when you start getting into copies the quality of the signal degenerates. So, each step of the way you're losing signal on the tape when you make copies. Let the tape sit on the shelf and the sound degenerates.   The obvious advantage of digital tape is that it has better recording fidelity and non-degeneration of the signal as it's recorded. That's the argument for digital tape or for digital recording. But digital tape as a medium does not offer the random access and high speed and flexibility that a random access or disk-based system would offer. It's a slower transport system than even analog tape, for example.

MT: According to NED advertisements, there seems to be error detection...

DN: Well, OK, that's another element. Now getting into the the fidelity, the Compact Disc is sort of forever (or for the time being, let's say) set at a sampling rate of 48.1 or 44.1kHz. The different digital formats have gravitated to somewhere between 44 and 50kHz sampling rate. Now, a lot of people feel that is not high enough as a sampling rate to truly render the higher frequencies in the sound. Let me explain why that is. If you took a 15kHz sine wave and you digitized it at 50kHz, you'd see three dots and it would actually square off the wave form and you'd get a square wave. In other words, if you simply sampled in a 15kHz sine wave at 50K and listened to it back, it won't sound the same as it did when it went in.

It's very complex, but what some people are hearing that they're not liking in

digital recording is a kind of scratchiness or brittleness in the high end on things like cymbal crashes...

MT: High harmonics being distorted?

DN: Yes. Now that's arguable: you know this is all in the realm of what you hear is what you get. Also things like reverbs disappearing due to lack of resolution when the amplitude becomes low, at the tail end. You know reverb is a very low-amplitude signal so you're getting less resolution on that end of the signal.

There's a specific recording engineer who won't use digital recording because he feels it ruins the finesse that he has achieved on his mix. And it is very interesting with the Direct-to-Disk because of the fidelity aspect, the potential increase in fidelity. So we have up to 100kHz sampling rate on our system. That's one innovation.

Another is that we have some innovative approaches toward boosting the waveform when it's down at its low end: increasing the amplification of the waveform from the point of view of the computer so that you get a higher bit resolution on those reverbs.

So there are two innovations in terms of quality. One amounts to really a potential for up to a 28-bit type of resolution scheme, and one is 100kHz sampling.

The first reason is speed. The second is high fidelity. The third is software control. And let's call this advanced editing techniques in the random access software-controlled environment. An example is the stuff you saw with the mouse. An unbelievable way of editing audio tracks.

MT: Other lower-end market samplers do allow for cutting and pasting of samples.

DN: But nothing like the way you can just roll this across the screen. You can reverse the sound file, cut and paste, extract portions...do anything you want to it.

MT: Could we take a different sound file and construct a whole new piece of dialog from what was actually said?

DN: To sum it up, this actually revolutionizes dialog and vocal editing. You can tune the vocal, fly it back in. That's what's called software control, and it's just the beginning – in a sense, you're looking at a Synclavier I all over again in terms of the evolution of the software. We'll be able to develop software that begins to go into the signal processing domain, into the whole context of editing and changing the sample completely. It's not restricted to a little hardware scheme for simple archiving and retrieval of sound. A tape recorder, analog or digital, can do that. With this, you're sending the signal into a dense software medium that can modify the sound.

That's three innovations: speed of operation, audio quality, and flexibility of editing and manipulating the sound once it's recorded. Those are the three reasons for doing a disk-based system.

MT: What about compatibility with situations that have not yet adapted to this medium? People keep harping on the

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need of the tape recorder so that someone can come in from outside with material done elsewhere, drop it on, and then leave with whatever modifications were made.

DN: That's an understandable point. If you're going to be hopping from studio to studio, you need a format that is consistent with both studios you're working in. Now digital tape, unfortunately, doesn't offer that. The formats for the Sony, Mitsubishi and 3M are not compatable.

MT: Digital tape hasn't become as popular as originally thought, has it?

DN: There has been a certain amount of penetration; it's now generally acknowledged that digital tape is superior to analog recording in terms of the quality of the signal-to-noise relationship and the non-degeneration of sound. The masters are safe, once you have them. But digital tape is an expensive format. It's somewhere between $100,000 and $175,000 just to buy a digital tape recorder.

Now our system is even more expensive than that, but it's also more innovative in terms of the three areas I've mentioned. So looking at the life of the digital tape recorder, it's expense and incompatibility with other formats, I would say it *presents* three obstacles to someone who was thinking of buying one.

And right behind it looms this new technology of disk-based systems, with demonstrably superior capabilities. So you have to say, in two or three years my digital tape recorder might well be obsolete — if it's not already — and can I make my investment back on this or not?

MT: Does your Direct-to-Disk system stand alone?

DN: Our system was originally designed with this thought in mind: it is the future of recording technology. There is no question in anybody's mind that the future is some kind of random access storage and recording system. The people at Mitsubishi and Sony would say: 'Somewhere off in the future, absolutely, that will be the case.' They just disagree on the time frame.

MT: What is their prediction?

DN: 1990.

MT: But you've already got this system, now!

DN: They're having a hard time with that. But our original thought about Direct-to-Disk as a stand-alone system was this: Here's this marvelous Synclavier system that can produce an entire track for a record, and it's a shame you have to lock it up with a tape recorder to lay down vocal and sax solos and the rhythm guitar parts, and have to leave this wonderful random access medium that works so fast and so easily, and move it to a tape recorder with patch cords.

MT: Every time it's time to leave the MIDI sequencer and go to the tape recorder I start screaming in pain, because I have unparalleled editing available to me to manipulate sound and do the cutting and pasting I want at a speed that makes a tape recorder look like a dinosaur... And here I am having to go backwards simply because the random access system is incapable of delivering the rest of the nine yards.

DN: You've covered reasons three, editing, and one, speed. The only thing you didn't say is that you didn't like the sound of the tape recorder.

MT: I detest it. Primarily because it's noisy... But a lot of people like the sound of tape. Digital has a 'cold' rap, right?

DN: ...When you look at it, you could say, Leslie Fradkin, operator of a studio in Manhattan, gave us our full justification for developing the Direct-to-Disk recording system. Why? Because he's working in a computer-based sequencing system like the Synclavier to develop his track material. Then he wants to go on and add a couple of vocals and a lead guitar part and a sax section and so forth. Our first incarnation of the Direct-to-Disk system adds four, eight or 16 tracks of continuous live recording to our hard disk. And accommodates Leslie so he can now bring a singer on and keep working the same way.

MT: So what you're saying is that your beginning system offers the sample ▶

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▶equivalent of four tracks of tape, and then depending on the amount of memory you provide in the hard disk, you can record continuously. What is your minimum starting system?

DN: The book small system is to add on to a basic Synclavier system like yours, four channels, four tracks, 13 1/2 minutes per track at 50kHz. You can increase the sample rate to 100kHz, but you cut your recording time in half if you do that.

MT: I ask again, does this system stand alone?

DN: At this point the system is configured in such a way that it obviously needs the Synclavier's computer – it needs that control panel on the keyboard, it needs all the memory and central processing hardware. So it can't stand alone in the strictest sense of the word, but you could get a stripped-down Synclavier with no voices, no outputs and no features and use it as a controller for the Direct-to-Disk system.

The first stage is to add four, eight or 16 tracks to a live Synclavier environment. The second stage, which will happen within the next year, is to design a stand-

alone version of the system. And probably within the next two years to go beyond the 16-track concept and get into a really serious multitrack scheme.

MT: PPG is attempting to deliver a direct-to-disk recording system for 16,200 in their HDU, which delivers on 10 tracks 12 minutes of recording. Divided up, that's 72 seconds per track. Of course, they allow dynamic allocation of memory in whatever way you need, and give you four audio outputs. So theoretically, you can have three minutes each of four tracks, sample rate 44.68kHz, 16-bit resolution, MIDI song position pointers. Care to comment?

DN: Sounds great. It's a little guy compared to what we're doing, obviously. I think that module is going to be an obvious add-on to somebody's home recording system – a MIDI setup where someone wants a digital random access.

I think you'll notice the same thing happening with random access recording systems as has been the case with linear media. There will be stratification in terms of the marketplace. You'll have your pro stuff at the high end, and you'll

have your super high-quality pro stuff up at the very high end.

Let's make an analogy with linear tape recording. If I want to buy a tape recorder I can buy a Mitsubishi 32-track, a Sony 24-track or a Studer analog machine. I can come down and buy an Otari 24-track or a couple of notches further down buy a Tascam 16, right down to a Portastudio. It shows there's life in them there hills.

You'll begin to see all kinds of variations on this theme coming out. And you can come to grips with evaluating them – whether they're at the high end, low end or the middle. It will be hardware *and* software. Period. With a linear machine, you're only evaluating hardware – there is no software. When you get into the digital domain, you have to evaluate value, you have to evaluate hardware and software composite.

MT: When you're talking about your Direct-to-Disk system, you're saying that as software updates come up, you can stick a card into someone's machine and expand.

DN: Same as a Synclavier. You have to look at what development there's going to be, what kind of support, because it's a very innovative field. It's more than theoretically possible to include signal processing in that package as advanced number crunching.

If you look at what a studio is up to now, what you have is an audio chain. There is analog audio passing from one element of the chain to another: from the tape recorder to the console to the signal-processing device back to the tape recorder or to a microphone. It's an analog chain, and as such they are are made to be able to interface, to receive that analog input, process it and spit it out at the other end.

When you put a digital chain together, as you will in the upcoming studio, there's one additional complication in passing bits from one machine to another. The software control element of one system may have a hard time talking to the software control element of another system. Even a simple thing, such as the sampling rate was to begin with, is complicated when you add the fact that the Sony and the Mitsubishi won't talk to each other.

There's going to be increasing argument – in the Greek sense of the word – for an integrated hardware and software environment where the entire componentry is produced by one manufacturer. There is definitely going to be data integration possibilities, and everybody in the chain is going to talk to one another. The sequencer is going to talk to the recording system, and it's going to talk to the signal-processing module. The more data-intensive the whole process becomes, and the more it moves towards automation, the more complicated the problem of a modular system becomes.

MT: In our MIDI studio we've constructed this huge monolith of modules, many

sequencers, none of which completely fill the bill. There's always some defect in one of them, and when you erase the defect using another sequencer, other holes open up. So I've found myself, at least for the last year, wishing that I could have one workstation, as you did at AES. There's a tendency with MIDI to keep buying little pieces and stick them together, putting a bandaid on a problem that never really goes away...

DN: The nature of the problem has to do with the fact that there's tremendous data manipulation going on, which is a new aspect of the recording studio. It used to be just sound, being transmitted from one box to the next. Now you have information that also wants to go through.

Even with a great system like MIDI, it's still an eight-bit serial interface; all that data is travelling down a narrow highway. As you get more complex the delays are going to add up, as well as just the language problems. The analogy of use for people is quite simple: MIDI is a situation like the world is now – some people speak French, some speak English. It's possible to develop all kinds of translations as you go along, but it's still not that easy to communicate across those language barriers.

MT: What about the future?

DN: I would look forward to unbelievable advances in technology in relation to recording music. It's going to become

possible for the process of music recording to become very transparent and simple to use. This will invite live musicians back into the picture to play, to be able to walk into a studio and just say 'on', and not have the level of complexity that it takes now to record.

MT: Do you think Direct-to-Disk will encourage musicians to play together directly into a system, and yet still enjoy the same editing advantages a MIDI operator would have?

DN: Let me give you an example of some of the advantages Direct-to-Disk opens up. You can take somebody like Oscar Peterson, put him on a real grand piano with an interface on it that translates into MIDI data. You can simultaneously record his performance and all the MIDI data on to the Direct-to-Disk in one pass. And then he could orchestrate the whole thing later on.

You'd actually have captured the real performance acoustically on the piano, at the same time you had, for example, somebody playing drum pads into your Synclavier, somebody else playing a DX7, and somebody else playing a rhythm guitar. All that could be going into one system.

MT: So here again you have live interaction. But as it is now, two musicians can't play together into one sequencer at one time.

DN: The element of being able to play

sequenced music live together is something we've been thinking about. What if you could record on four or five tracks at once through a number of different interfaces? One musician on drum pads, one on keyboard, one on the guitar interface, but it's all going as sequencer information into different channels. That's a great idea. That's the next step in all of this: the ability to play a number of performers live into one sequencer.

You could sample sections of live performance and create a patch with it, edit it or fix something, move something over. You could take the keyboard sounds and say: 'We won't worry about the sounds, we'll fix that later on.' It becomes a moving tableau to fool around with.

MT: As Frank Zappa said, why shouldn't a musician have the same real-time interaction with a canvas that a painter does? A painter can paint what he wants without assistance from another person and see what he sees...

DN: There's no painters' union... In other words, a painter is very similar to a composer – except the painter has direct access to his medium and the composer doesn't. If you look at this not from the player's point of view, but from the composer's point of view, this system represents complete liberation. ■

MORE FROM New England Digital, 49 North Main Street, White River Junction, VT 05001. ✆ (802) 295-5800

MORE POWER
to the plant

One of Los Angeles' best-known recording studios, Record Plant, has just transformed part of Paramount Pictures' film lot into a comprehensive computer music studio for audio-visual work. *Report by David Gordon.*

I F YOU DIED and then awoke in a synthesizer heaven, it might look something like the Record Plant's new Studio 'L'. The Los Angeles studio has been operating the mammoth Studio 'M' scoring stage on the Paramount Pictures film lot for the past five years, and recently transformed the former ADR/Foley Stage 'L' (for "looping") into a synth center dedicated to the most sophisticated applications for film, video and records.

The people behind the transformation are president Chris Stone, scoring director Joel Moss, and player/programmer Rick Marvin. Their triumvirate comprises marketing, engineering and synth wizardry.

'We built the studio from the ground up with only synthesizers in mind', remarks Moss, a scoring engineer known for such recent projects as *Pretty in Pink* and *The Mosquito Coast*. 'It's like a supermarket with a choice of all the major synth systems available in one place.'

The combo control room/studio is 25' wide, 30' long and 22' tall. An adjoining isolation booth is 12' deep, 25' wide and 14' high – big enough to record live drums, vocals, horn sections and the

studio's acoustic piano with MIDI interface.

The main room houses a Trident 65 console, Synclavier and Fairlight, as well as a complement of analog and digital synthesizers from Yamaha, Roland, Sequential and E-mu Systems. The entire room is MIDIed, and is controllable through a Macintosh power station developed by Julian Music Systems in conjunction with Apple computers. Full 35mm and video projection is available for high-end film and television projects.

'Synthesized sound has become the most popular form of making music in Hollywood today', says Stone. 'And there has been no place equipped to do it on a sophisticated and professional level. We have tools in place and a staff that knows every facet of synthesized sound for records, film and television."

Record Plant chief engineer Bruce Maddocks designed the monitor system for both Studio 'M' and the new studio. Three near-field speaker clusters standing five-feet high provide left, center and right, each comprised of an 18" sub-woofer, 15" extended low frequency driver and a high compression/high frequency horn lens assembly. The bi-amped JBL components are powered by BGW 7500 amps, using White 4001 crossover networks and operate effectively flat from 30-20,000 cycles.

'We are interfaced with Studio 'M' with the first fiberoptic MIDI link, I believe', explains Maddocks. "In addition to our own speaker design, it is one of many features that should put 'L' on the map."

Partner Rick Marvin is widely respected as a player/programmer/composer. In addition to composing and recording network TV scores, he recently contributed to Whoopi Goldberg's *Jumpin' Jack Flash*. Proficient with all of 'L's systems, Marvin will oversee the entire infrastructure of synthesizers, computers, synchronization, programming, and will be available for pre-production planning. The studio also has a full-time synth technician on staff to ensure smooth operation.

Joel Moss, executive director of Record Plant scoring, comments: 'In one room we have the tools that are called for in high-end synthesizer work. Many composers have retreated to their home studios and there has been a sacrifice in quality. Film producers have found that getting five top synth players and their equipment into a studio can end up costing more than hiring a full orchestra. We are providing a cost-effective alternative that fills a basic need in the industry today. Studios 'L' and 'M' can operate separately, or in tandem for a creative flexibility that makes solid economic sense.'

'We have all the "toys"', adds Stone, 'and you only pay for what you need. You need a Fairlight for an hour – you got it. And we have programmers and technicians onboard to make sure the date runs at optimum speed.' ■

JL Cooper
MidiMation

Now that interest in SMPTE synchronization is on the up and up, there's a market for accessories that tie the system in with conventional music recording in a transparent way. We report on two of the latest. *Review by Chris Many.*
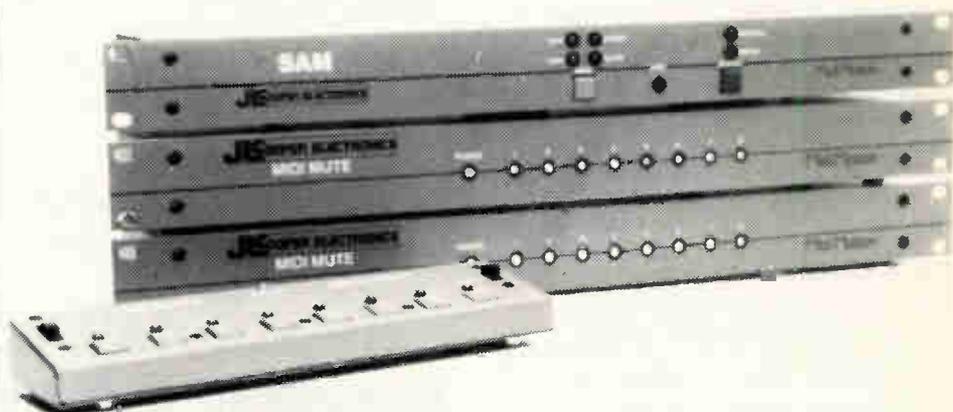
ANY STUDIOS AND INDIVIDUAL musicians have been hopping on the SMPTE bandwagon lately, and with good reason. SMPTE has a number of advantages, not the least of which is that it's an industry standard sync that has been used for years in film and TV, working reliably and without problems. And if you've found yourself trying to get your sequencer to lock up to a wide variety of sync pulses (eg. 96, 48 or 24 ppqn), the promise of a glitch-free synchronizing method with all the features of SMPTE is something to dream about.

For studios who want an automated mixing system without spending the hundreds of thousands of dollars normally quoted for such a refit, a low cost SMPTE-based console automation system has also been a fantasy. The former has been available for some time, using Roland's SBX80 in conjunction with a MIDI sequencer. But only recently have we seen more affordable automated mixing systems become available, and now JL Cooper has introduced its MidiMation Series, a cost-effective effort to automate your mixer, be it eight, 16 or 24 channels.

MIDI MUTE

TWO MODULES FROM the series are currently available, the first being MIDI Mute, a MIDI-controlled muting device for recording, live, and keyboard mixers. It comes with two pieces of hardware: one being your standard rack-mount unit, containing the bulk of the electronics, with eight LEDs to monitor the mute status of separate audio channels on your board; the second being a remote unit controlling the muting functions.

On the rear of the main unit are eight inputs and eight outputs, to which you route the auxiliary ins and outs of your board. The hook-up is really quite simple. Internally, MIDI Mute contains small reed relays that allow your audio signal to either pass or not, depending on instructions from its internal processor. MIDI In and Out ports (no Thru), remote and expansion unit jacks as well as MIDI channel selection round out the connections you'll need.

Once you have the unit hooked up (less than five minutes' work, I might add), you can test out your mutes right away. Just run your tape, press a button on the remote, and the corresponding track is

muted. Press it again and it's unmuted. Pretty simple stuff.

But MIDI Mute is more than external muting. By connecting the unit with your MIDI sequencer, you can record every mute move you make, and by so doing automate your muting.

Whenever a change of status is made by pressing a button, MIDI Mute sends a Note On command out to your sequencer. Press the button again and another command is sent (on and off mutes are recognized by the different velocity values which are sent out, not Note On and Off commands). Your sequencer will record these as MIDI events, and when played back will control the mute mechanisms in the rack unit. Providing your sequencer is synced to tape, your sequencer will now control eight tracks of muting, and with expansion units you can get up to 24 tracks automated this way.

It's pretty eerie, watching the mute LEDs light up and turn off, hearing your tracks mute and unmute all by themselves; but no stranger than watching your sequencer playback your synths with the music you just played into them. It's a new MIDI application, and it works smoothly.

Unfortunately, since MIDI data is only sent when a move is made, MIDI Mute in general has no way of knowing what the status of all of its mutes are until a Note command for each audio channel has been received. Ordinarily, this would mean having to set or reset mute status every time you rewound the tape and/or sequencer, a tedious chore at best. However, the smart folks at JL Cooper have solved this problem, too. A marking command is available, which essentially takes a snapshot of the current mute setup. You can have this done automatically for you so that every few seconds, a mark operation occurs, which is very helpful when mixing and overdubbing parts as you're never very far away from a complete update of your mute mix.

It's easy to update your mute mix: just record it on a different track of your sequencer, edit to taste, and voilà. If you didn't get that mute right on the downbeat when you wanted it, just quantize the track you recorded it on. The beauty of the unit is its simplicity, and that it works in a medium with which musicians and studios are becoming increasingly familiar: MIDI.

The relays are pretty quiet for the most part, but I found there were some audible clicks on tracks that were being muted via the unit. When a number of different tracks were muted in rapid succession, it seemed to be only one or two of the tracks developed 'mute clicks', leading me to believe it was simply a bad relay that was at fault. Obviously though, with a product whose sole feature is to mute tracks, it works as quietly as possible and is invisible to the user.

Which leads one to the final question:

does anyone really need automated muting? MIDI Mute works just as promised and is cleverly, if only simply, implemented. But the fact of the matter is that muting tracks is but one very small part of the mixing process. It can come in handy at times, and for those systems without noise reduction of some kind, it could cause a dramatic drop in tape noise just by muting out those tracks not currently being used.

Economics usually demand the setting of priorities in terms of equipment purchases, and I personally feel that laying out $500 to $1100 (depending on the size of your console) to automate the muting function is just a bit steep.

SAM

ENTER SAM (SMPTE Automation Manager), JL Cooper's second product in its automation series. A RAM-based, transparent controller, SAM basically takes the place of your sequencer and adds the universality of SMPTE timecode for your synchronizing needs.

SAM works with the various types of SMPTE (ie. 24, 25 or 30 frames per second, or Drop frame); and so is compatible with all current points of reference. It also generates SMPTE in any of these formats.

Be warned, however. If you are going to stripe your tape with SMPTE from SAM, be sure you somehow break the audio path that might allow SAM's output signal coming back into its input. You will certainly get erratic results if this occurs, and for some reason JL Cooper leaves it to the user to beware of, and deal with, this idiosyncrasy. It's a simple matter of disconnecting cables or turning down a volume switch, but for a *truly* transparent interface, I think this problem should have been solved in the factory, not mentioned as a 'Very Important' point several times in the documentation.

SAM is very easy to use. Almost too easy, if such a thing is possible. Stripe one track with SMPTE, then use it as your synchronizing track. As SAM is meant to be the brain of the MidiMation Series, connection to MIDI Mute is a given example. Now SAM records and stores all of your mute moves directly. If you need to edit a track, just punch in (there is an enable button on the front panel which allows you to 'record' data). If you are overdubbing moves, mutes to tracks that haven't been accessed are added to the mute mix without erasing any other moves.

As your MIDI information is stored in RAM, you'll want to have some sort of storage device available. You can save to tape, or to a SAM disk (a machine soon to be released as an attachment to the base unit).

Tape storage works much the way all tape storage systems do, but I had problems making it work for me. I tried different tapes, tape decks, and so on, but

just couldn't get it to work. Considering it's a simple operation, I chalked it up to tape gremlins, but it was annoying to have to hassle with such a routine operation. To tell you the truth, I felt that with the prices of disk drives being what they are today, it's an oversight not to have one built into the unit itself, especially since this is the centerpiece of further automated mixing products to come from JL Cooper.

SAM does just what it says it will, but unfortunately that's not very much. It reads and writes SMPTE, but so do several new full-blown sequencing programs, and an SBX80 or an SP12 have had these abilities for some time now.

It records MIDI data and plays it back, too. But still nothing new here, and much, much less than your basic computer-based sequencer. It doesn't have multiple tracks, won't quantize your data, contains less than rudimentary editing functions, and omits just about everything except the recording and storage of MIDI data.

I suppose its plus is that it's rack-mountable, and overall it doesn't get in the way of the recording process. But for $849, you may expect to get a lot more than this.

I guess that's my main complaint about the MidiMation Series; the current modules don't give you the value you expect for the price. To automate 24 tracks will cost you almost $2000 – and that's just so you can mute tracks.

A further product due in this series, MAGI, will provide automated fader movement among other things and will be fully compatible with SAM and MIDI Mute. MAGI will also be expandable from eight to 24 channels, and will make this series of products much more versatile, providing it works as well as the current modules.

As it is now though, you should determine for yourself just how useful MIDI Mute and/or SAM is for your applications, and carefully weigh that against the cost. If you want a system that requires little attention and allows you to operate and record as you normally would, a system that doesn't demand another 50 hours of your time to learn how to use, a system that does what it says it does with no frills, and you are willing to part with at least $1500 to buy it, then MIDI Mute and SAM might just be for you.

However, if you don't mind manually muting your tracks just a while longer, you might prefer to wait until MAGI is released, and see if the scale of features and power versus transparency and ease of use have balanced out just a bit more in the way of value for your money. ∎

PRICES Eight-channel MIDI Mute, $549; eight-channel expander, $395; SAM, $849; SAM Disk, $1000; 16-channel MAGI, $2000. **MORE FROM** JL Cooper Electronics, 1931 Pontius Ave., West Los Angeles, CA 90025. ✆ (213) 473-8771

ON STAGE

Two contrasting approaches to using modern technology live – one by a solo artist, the other by a jazz-funk keyboards player in a four-piece band.

Peter Hammill

The former Van der Graaf Generator frontman has gone through more stylistic transformations than most during his lengthy – and influential – solo career. His latest album (#25!), And Close As This contains eight songs, the instrumentation for which consists of one pass of the hand across a keyboard. On two tracks the keyboard in question is a piano; on the remainder, it's a MIDI controller keyboard connected to a variety of sound sources.

At recent solo concerts, Hammill has adopted a similarly back-to-basics technique, with just a single master keyboard – the new Akai MX73 – being used to control MIDI sound modules. A guitar is his only other instrument.

The modules in question are a Roland MKS20 (the keyboardless version of the RD1000 SAS digital piano); a Roland MKS80 Super Jupiter (for a wide range of analog synth textures); and a Yamaha TX216 (for complex FM sounds in the DX7 vein).

Hammill uses the MX73 not just to select sound textures remotely, but also (with the help of the Akai's four onboard slider controls) to vary the level of each of his sound sources as he plays. Thus he applies technology in a way that supports the humanity of his playing; he is in total control, and the machines serve him, rather than the other way around.

Once Hammill's basic sound balance is
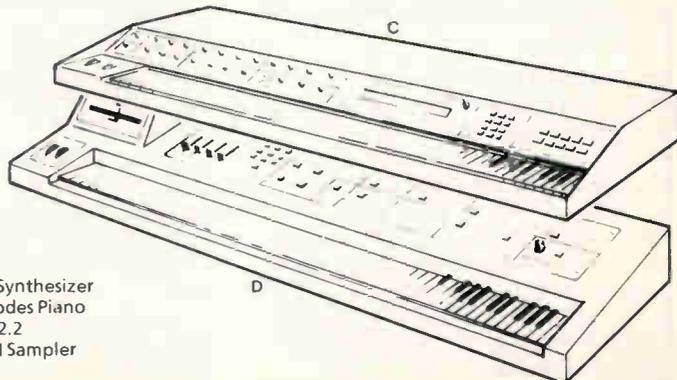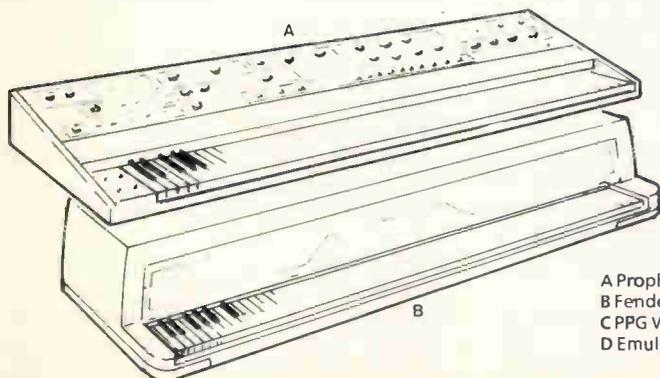
A Prophet 5 Synthesizer
B Fender Rhodes Piano
C PPG Wave 2.2
D Emulator II Sampler

set during the soundcheck, the sound engineer has no need to touch it. Any further changes are made by the performer himself, who thanks to MIDI, now has the power to not only play each song differently each night, but also to make each song *sound* different each time he plays it, with different combinations of sound layers being brought into the action at different times. ■ *Paul Tingen*

A
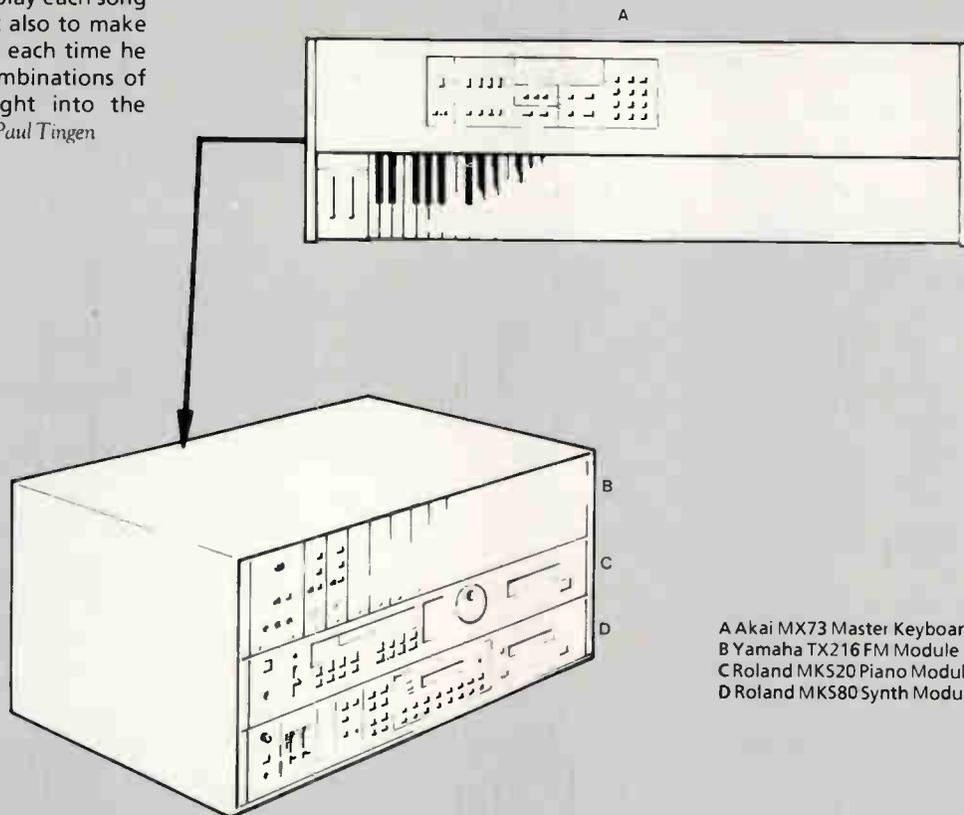
A Akai MX73 Master Keyboard
B Yamaha TX216 FM Module
C Roland MKS20 Piano Module
D Roland MKS80 Synth Module

Level 42

In keeping with Level 42's long-established British jazz-funk sound, the mainstay of Mike Lindup's on-stage setup is still a trusted Fender Rhodes piano. At one time the Rhodes could regularly be seen keeping the company of a Prophet S and a Minimoog. The Prophet remains, but the Minimoog has fallen by the wayside, a PPG Wave 2.2 and Emulator II appearing in its place.

The Emulator is well-cast in its main roles of acoustic piano – where it makes a more than adequate live stand-in for the genuine article – and rich, sampled string textures. The PPG, meantime, is used to replace the multi-layered Synclavier work that appears on Level 42's studio recordings.

Most of Lindup's keyboard work is live off the keys, calling on the assistance of a sequencer only for such numbers as the sequence-based 'Hot Water'. MIDI linking takes place with a little help from an English Quark MIDIlink, racked up along with the other keyboard effects as part of the on-stage keyboard rig. ■ *Tim Goodyer*

PATCHWORK

P R O G R A M M I N G

OBERHEIM MATRIX 6
Lingerie
Douglas Callowhill, Ontario

Guess that title may raise an eyebrow or two. Douglas describes his creation as an 'airy, sensuous patch which is great for solos or single-note backdrop lines. It derives its silkiness from the use of a little FM and the interaction of the circled parameters. A great way to thicken it up is to slightly alter these parameters and lay the new patch over the original in split mode. Also, voice assignment won't be compromised since this is a unison patch. Pedal 2 controls release.' ■

		0	1	2	3	4	5	6	7	8	9
00 DCO1		Freq	Fr/Lf1	Sync	Pw	PW/L12	Wave	Wsel	Levers	Keybd	Click
		27	0	0	--	--	63	OFF	BOTH	KEY	OFF
10 DCO2		Freq	Fr/Lf1	Detune	Pw	PW/L12	Wave	Wsel	Levers	Keybd	Click
		12	30	0	--	--	63	WAVE	BOTH	KEY	OFF
20 VCF/VCA		Mix	Freq	Fr/En1	Fr/Prs	Res	Levers	Keybd	E-VCA	VCA/Vel	VCA/En2
		0	60	0	0	62	OFF	KEY	45	0	63
30 FM/TRCK		FM	FM/En3	FM/Prs	TrackIn	Track1	Track2	Track3	Track4	Track5	
		21	0	0	KEY	63	12	2	2	2	
40 RMP/PRT		R1 Spd	Trigger	R2 Spd	Trigger	Port	Spd/Vel	Mode	Legato	Keymode	
		--	--	--	--	0	0	--	--	UNISON	
50 ENV1		Delay	Attack	Decay	Sustain	Release	Amp	Amp/Vel	Trigger	Mode	Lf1trig
		--	--	--	--	--	0	0	--	--	--
60 ENV 2		Delay	Attack	Decay	Sustain	Release	Amp	Amp/Vel	Trigger	Mode	Lf1trig
		0	0	18	63	63	63	--	SINGLE	NORM	NORM
70 ENV 3		Delay	Attack	Decay	Sustain	Release	Amp	Amp/Vel	Trigger	Mode	Lf1trig
		--	--	--	--	--	0	0	--	--	--
80 LFO 1		Speed	Sp/Prs	Wave	Retrig	Amp	Amp/Rp2	Trigger	Lag	Sample	
		50	0	TRI	0	52	0	OFF	OFF	KEY	
90 LFO2		Speed	Sp/Prs	Wave	Retrig	Amp	Amp/Rp2	Trigger	Lag	Sample	
		58	0	TRI	0	50	0	OFF	OFF	KEY	

Matrix Modulation

	Source	Amount	Destination
0	LFO 2	+52	DCO2W
1	PED 2	-44	E2rel
2	KEY	-50	LFO1spd
3	TRAK	+63	VCA1

YAMAHA DX7
Berlin
Gary Butcher, Cambridge MA

Gary programmed this patch to emulate the bass sound from Berlin's 'Take My Breath Away', and he comes pretty close, too. A surprisingly warm analog-sounding bass patch from the DX7, and the touch of reverb on Gary's demo showed 'Berlin' off to its best. ■

OP	
1	6
0	5
0	4
0	3
2	2
0	1

ALGORITHM	FEEDBACK	WAVE	SPEED	DELAY	PMD	AMD	SYNC	PITCH	AMPLITUDE
5	6	TRI	35	57	25	37	ON	2	
				LFO				MOD. SENSITIVITY	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

	POLY/MONO	PITCH BEND RANGE	STEP	MODE	PORTAMENTO GLISSANDO	TIME

OP	MODE/SYNC	OSC FREQ COARSE	FREQ FINE	DETUNE	EG RATE / LEVEL	OUTPUT LEVEL	PITCH EG	KEY TRANS-POSE	VOICE NAME
6	R	1	00	-6	59 99 99 99 99 99 0	79			
5	Hz	1	072	+3	99 25 35 99 99 94 85 0	99			
4	R (OFF)	1	00	-5	99 3 36 0 99 92 7 0	99		C2	BERLIN
3	Hz	1	950	0	99 25 35 99 99 94 85 0	99			
2	R	1	00	0	57 27 2 99 99 99 99 0	84			
1	R	1	00	+6	99 25 35 99 99 94 85 0	99			

	MODE/SYNC	FREQ. COARSE	FREQ. FINE	DETUNE	1 2 3 4 RATE	1 2 3 4 LEVEL	BREAK POINT	L CURVE R	L DEPTH R	K.BOARD RATE SCALING	OUTPUT LEVEL	VELOCITY SENS.	1 2 3 4 RATE	1 2 3 4 LEVEL	KEY TRANS-POSE	VOICE NAME
		OSCILLATOR			EG		KEYBOARD LEVEL SCALING				OPERATOR		PITCH EG			
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

	MODULATION WHEEL			FOOT CONTROL				BREATH CONTROL				AFTER TOUCH			
	RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS

World Radio History

CASIO CZ101
Honky Keys
R Treadwell, Manchester NH

'Honky Keys' was originally submitted as a more acoustic sounding piano patch (with Fine Detune set to a value of 02), but we preferred the honky tonk effect achieved by setting this parameter to about 10. As with all patches published in these pages, don't be afraid to experiment if a sound isn't quite to your liking. You could be in for a pleasant surprise! ■

KORG MONO/POLY
Trivial Percussion
Robert Palmer, San Diego CA

NICE TO SEE the Korg Mono/Poly getting a look in; we just couldn't resist this oddball selection of bell and percussion sounds. Our favorite was 'Bamboo Chimes', but even the more obscure sounds have some musical use. Robert had this to say about them:

Scaffolding – is a hollow metallic clunk which sounds exactly like builders throwing scaffolding onto the back of a wagon.

Knackered Tubular Bells – are quite realistic, but with something rather unsettling about their harmonic content. They sound even better through a stereo chorus unit.

Talking Milk Bottles – milk bottles used as pan pipes; a breathy puff to start with, followed by a hollow reverberation which continues for a moment after you stop blowing.

Soprano & Bass Woodblocks – very realistic and with many musical uses.

Bronze Bell – is a large and very realistic reverberating bell, and again it sounds good with stereo chorus.

Twanging Rubber Band – starts with a nasty buzzing twang which gives way to a short rubbery note that quickly (and mercifully) dies away.

Bamboo Chimes – the initial clunk of wood striking bamboo, followed by a rich, hollow reverberation.

Tea Cup – a teaspoon strikes Granma's best china... ■

TITLE		Scaffolding	Knackered Tubular Bells	Talking Milk Bottles	Soprano Woodblock	Bronze Bell	Twanging rubber band	Bamboo Chimes	Bass Woodblock	Tea Cup
WAVEFORM	VCO1	∧	∧	∧	∧	∧	∧	∧	∧	∧
OCTAVE		4'	4'	8'	2'	16'	2'	2'	2'	2'
LEVEL		0	0	0	0	4	0	10	0	0
WAVEFORM	VCO2	∧	∧	∧	∧	∧	∧	∧	∧	∧
OCTAVE		4'	4'	8'	2'	4'	2'	8'	4'	2'
LEVEL		0	0	0	0	3	0	0	0	0
WAVEFORM	VCO3	∧	∧	∧	∧	∧	∧	∧	∧	∧
OCTAVE		8'	8'	8'	2'	8'	4'	8'	8'	2'
LEVEL		0	0	0	0	0	0	0	0	0
WAVEFORM	VCO4	∧	∧	∧	∧	∧	∧	∧	∧	∧
OCTAVE		4'	4'	8'	2'	4'	16'	8'	4'	2'
LEVEL		10	10	10	10	10	10	10	10	10
CUT OFF FREQ.		0	0	1½	0	0	0	0	0	3
RESONANCE	VCF	0	2	0	0	1	2	2	4	0
EG INTENSITY		+3	+2½	+2	+4	+2½	+5	+4	+3	+3½
KBD TRACK		0	0	0	0	0	5½	0	0	2
ATTACK	VCF EG	0	0	1	0	0	0	0	0	0
DECAY		2½	3½	4	0	4	1	0	1	1
SUSTAIN		2	5	0	2½	5	3½	3½	2½	2
RELEASE		2½	10	2½	0	10	1½	1½	1	2
ATTACK	VCA EG	0	0	1	0	0	0	0	0	0
DECAY		9	10	4	0	10	2	1	9	1
SUSTAIN		10	5	0	3	5	0	0	10	2
RELEASE		3	10	3	0	10	2	2	3	1
NOISE		0	0	2½	0	0	0	0	0	0
TRIGGER (MULTI)		M	M	M	M	M	M	M	M	M
DETUNE		0	0	0	0	0	0	0	0	0
TRANSPOSE		NOR	NOR	UP	UP	NOR	NOR	NOR	DOWN	UP
EFFECTS	FX	ON	ON	ON	ON	ON	ON	ON	ON	ON
X-MOD		9	8½	9	8½	6	8	8	9	9
FREQUENCY MOD		0	0	0	0	0	0	0	0	0
VCF EG/MG1		–	–	–	–	–	–	–	–	–
SYNC/X-MOD		X-	X-	X-	X-	X	X-	X-	X-	X-
SINGLE/DOUBLE		DBL	DBL	DBL	DBL	DBL	DBL	DBL	DBL	DBL
KEY ASSIGN MODE		UNI	UNI	UNI	UNI	UNI	UNI	UNI	UNI	UNI

LATEST IN THE LINE

Following in the footsteps of Herbie Hancock, Chick Corea and Joe Zawinul isn't exactly an easy task. But a young musician by the name of Robert Irving III is doing exactly that – playing keyboards to Miles Davis' trumpet. *Interview by Tim Goodyer.*

THE NAME MILES DAVIS is really its own introduction. A black jazz trumpeter born in Illinois back in 1926, quoted by many and various musicians as being a seminal influence – and still active and contentious 60 years on.

Davis first began to establish himself as a fairly average trumpet player during the forties. Like many of his contemporaries, he found himself having to develop an

individual playing style to overcome his musical limitations.

In 1948 an album, *Birth of the Cool*, resulted. It featured a nine-strong band and the complex arrangements of Gerry Mulligan and Lee Konitz.

The mid-fifties saw Davis assemble a classic quintet with John Coltrane on tenor sax, Red Garland on piano, bassist Paul Chambers, drummer Philly Joe Jones. It was

with this line-up that Davis began to consolidate his position within the jazz world. The combination went on to produce five albums originally released on the Prestige label with the endearing titles *Round About Midnight*, *Cookin'*, *Relaxin'*, *Workin'* and *Steamin'*.

Excellent as they were, these proved to be only a foretaste of *Milestones*, on which the quintet was augmented by alto saxophonist

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Cannonball Adderly. The album's title-track became the blueprint for a new development in jazz playing – modal improvisation. Drawing heavily on a book by George Russell called *The Lydian Chromatic Concept of Tonal Organisation* (1953), 'Milestones' and the following LP, *Kind of Blue*, demonstrated a new freedom for the soloist. Liberated from the restrictions of a conventional chord structure, the new doctrine adopted notes within scales as its grounding.

Later in the fifties, Davis collaborated with another arranger – Gil Evans. The fruits of these labors were *Miles Ahead*, *Big Stuff* and a version of Gershwin's *Porgy and Bess*, all of which used Evans' arrangements for a big band to complement Davis' solo flugelhorn.

By the late sixties Davis had expanded his activities beyond jazz into the sphere of rock with *Miles in the Sky*, *In a Silent Way* and the classic *Bitches Brew*.

Under the influence of Zawinul's use of the electric piano with Cannonball Adderly, Davis first adopted the instrument himself on 1968's *Miles in the Sky*. This marked the beginning of an association with electronic instruments that was to lead him towards synthesizers, but which was initially confined to an electric piano treated by effects such as the Echoplex.

In a Silent Way also marked the beginning of a series of collaborations with keyboard players whose names have since become commonplace. Names like Herbie Hancock, Keith Jarrett, Chick Corea and Joe Zawinul.

Hancock played acoustic piano with Davis during the mid-sixties and was joined on *In a Silent Way* by Corea and Zawinul. Jarrett made his appearance on the subsequent live albums *Live Evil* and *Live at the Filmore*.

So Miles Davis, in addition to continuously reaffirming his position as perhaps *the* solo modern jazz musician, has also promoted and nurtured the careers of a good many other musicians who might otherwise still be playing twenty-dollar high school gigs.

The latest musician to occupy the revered position of Davis' keyboardsman is Robert Irving III, a young player/composer/arranger with an emerging talent that attracted Davis' attention – though Irving is unsure of the reason.

'He must have heard somethin' special', Irving concedes the morning after a recent sell-out concert. At the time of his meeting with Davis, Irving was an aspiring player and writer looking to further his education at music college.

'I wanted to go back to school', he says. 'But my relationship with Miles has been more than that for me. It's a great relationship, rather like a father and son.

He's been so encouraging and I've learned so much from him. At first I felt I wasn't developed enough as a player so composition was my main involvement, but it's developed from there.'

FIRST FRUIT OF the collaboration was *The Man with the Horn* in 1981. The disc featured some of Irving's writing and showcased his unorthodox harmonic approach to great effect. On its release, one critic was overheard to comment: 'Heard the new Robert Irving LP? It's got Miles Davis on it!'

A live album, *We Want Miles*, followed a year later, and another studio album, *Star People*, in 1983. Although *Star People* marked Davis' successful reunion with Gil Evans, Irving did not contribute to either. However, 1984 saw the release of what is generally considered to be the best example of Davis' current musical direction – *Decoy*. Produced by Davis, *Decoy* saw Irving back on team playing, writing and especially arranging in his own style. And it's on *Decoy* that Irving makes his presence most felt, sharing the production, programming of rhythm patterns, and writing and co-arranging a number of the pieces.

A year later, *You're Under Arrest* also benefitted from Irving's contributions, though the LP made greater concessions to commerciality and lacked the definitive feel of *Decoy*.

Davis' most recent vinyl output is *Tutu*, released to great acclaim from critics the world over, but Irving's name was once again absent from the credits on the sleeve. The reason for his absence on this occasion was his involvement in a film project – scoring and recording the soundtrack to a new movie called *Street Smart*. The feature stars Christopher Reeve, is directed by Jerry Salzberg, and is set for February release.

'It was all recorded in two weeks', recalls a bewildered Irving. 'Miles played on about two-thirds of it but he hadn't heard any of it until he came in to put down his tracks. Musically it embraces quite a wide variety of influences – pop and classical – but mainly it's good old New York jazz. There's a little bit of technology involved in it but mostly it's acoustic stuff, bass and piano work.

'I really wanted it to follow the direction we had set with *Decoy*. That's my personal favorite album and I hoped the next Miles album might go on from there, but instead he changed direction again. This filmscore has allowed me to expand on what we started with *Decoy*. I would have liked to spend more time on it, but then the European tour came up.'

Yet the circumstances surrounding the direction taken by *Tutu* are curious in

themselves, as Irving readily explains.

'Originally Miles wanted to go off in a completely different direction to *You're Under Arrest* – some serious pop and R&B stuff. He'd got Prince, Chaka Khan and Al Jarreau involved but he had second thoughts that it might be too drastic a change.

'George Duke had already submitted one track, 'Backyard Ritual', and everybody liked that so he asked Marcus (Miller) to write some more along the same lines. He ended up with 'Tomaas' and that set the pitch for the rest of the LP. After that he added 'Perfect Way' and 'Full Nelson' and canned the rest.

'The last piece to be cut was Prince's number. He'd recorded all the backing himself and Miles had just done his overdubs. It was in there 'til the last minute, then Prince himself pulled it because it didn't fit in with the rest of the album any longer.'

The sleeve notes put the production of *Tutu* down to a collaboration between Tommy LiPuma and bass player Marcus Miller, but Irving throws a little new light on the situation.

'I think Miles wanted to take control of some of the production too, so Tommy became a bit of an executive producer', he reveals.

Davis' touring band currently features drummer Vince Wilburn jnr, percussionist Steve Thornton, bass player Darryl Jones, guitarist Garth Webber, sax player Bob Berg and keyboardsman Adam Holzman. Add Davis' own occasional excursions onto the ivories, and you get three stacks of keyboards on stage. Davis uses a DX7 and a well-worn Oberheim OBXa; Holzman a DX7, PPG Wave 2.2, a Minimoog and an Oberheim Xpander, and Irving a third DX7, Roland Jupiter 6, Korg Polysix, TX816 rack and Akai S612 sampler.

UNQUESTIONABLY, DAVIS' ACUTE and tireless objectivity has allowed him to accept technology more easily than many of his jazz contemporaries, and has resulted in extensive use of synthesizers on the later studio albums.

'I think technology has really advanced since I joined the band back in '81', says Robert Irving. 'Then it was just starting to develop. I had a very basic setup then but I started using a lot more synthesizer for *Decoy* and *You're Under Arrest* because Miles wanted to try to duplicate the studio sound live. Because of that I started using a sequencer live, too. I've found it allows you to stretch your imagination and realize things that are at the back of your mind.'

The sequencer in question is a Yamaha QX1, which provides the backing to 'Tomaas', 'Human Nature' and 'Perfect ▶

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► Way'. A Yamaha RX11 is also called in to provide a hi-hat pattern for the band to keep time to on-stage.

'I use both the Jupiter and the DX7 for controlling the Akai and the TX816 with a MIDI switch box', Irving explains. 'The Polysix I use mainly for arpeggiator effects'.

While Irving's association with Davis has been established over the last five years,

Holzman is a comparative newcomer to the family, appearing only on *Tutu* where synth textures play a larger role than on any of the preceding albums. On-stage, Irving appears more relaxed than Holzman though the workload is split evenly between them. The former explains the concert chemistry.

'My role in the band is to ensure there's a balance between the instrumentation and to

provide the major textures, color and mood. Adam's role is a lot more angular, he tends to double up on the bass and sax parts. It works nicely between us.

'Miles is still playing some of the same licks he was playing 20, 30 years ago. He's aware of that, of course, and it's important he has a diverse background to work off or it becomes very limiting for him. He's got this great library of things to draw on; possibly some of it's subconscious but it's still the basis of his work.'

One of the many aspects of Davis' character that has brought him such consistent acclaim is, ironically, his inconsistency and unpredictability. In the past this has involved turning his back on his audience – a trick that has now become a trademark – and complete public silences. Is this behavior reflected in a difficulty in writing material for him?

'Miles has to hear something he likes', says Irving. 'A lot of the things we write and think are perfect for him he doesn't like. Other things you might have been working on for yourself he'll happen to overhear and want to work on. You can't write for Miles – you just do what you do.

'When he writes himself or collaborates with anyone, it's usually as a result of an improvisation in a concert. Every time we perform live it's different, so we record it on a Sony 8mm digital recorder. Miles has a copy of that and listens to it after the gig, and the band get a copy between them to listen to.

'Once he finds something he likes he'll have me transcribe it and expand on it. The tunes develop that way. A good example is 'Robot 415' from *Decoy*. That came from a solo Miles played. I transcribed it and he asked me to add a melody in a different key. The original solo was in 6/8 and we superimposed a 4/4 drum beat over the top of it.'

And that's jazz.

It remains to be seen if the name of Robert Irving III will acquire the status of those of Hancock, Jarrett, Zawinul and Corea. Will Irving move on and away from Davis' guidance, and clear the way for the next protégé to take his place? Well, it seems Irving is already working on a solo project.

'I've been writing for about two years for it, but I want to lock in on the direction and instrumentation before I start to record', he says.

Today's cynical critics would probably assert that commercial pressures have closed the avenues previously open to musicians wishing to pursue pure forms of their art. But if that is not the case, time will tell if Miles Davis has spawned yet another keyboards-playing legend. ■

Getting the Most from

MONO MODE
Part 7: More Guitar Controllers
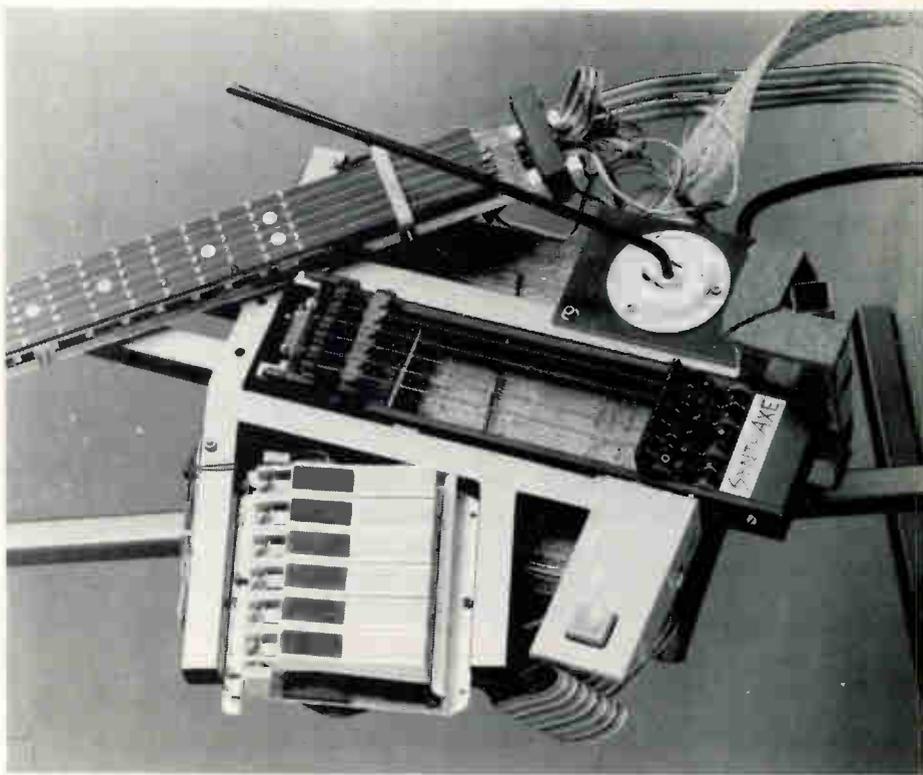
For years, keyboard players have had the benefit of split keyboards to take advantage of a synthesizer's ability to play more than one sound at a time. We look at how guitar synth players can use Mode 4 to do the same, and more. *Text by Rick Davies.*

WHETHER THE GUITAR CONTROLLER you use is of the pitch-to-MIDI variety (such as the Photon MIDI Converter), or a guitar-like controller (such as the SynthAxe or Stepp), when it comes to MIDI, all controllers speak the same language. Some just happen to be more conversant than others, that's all. Still, the quality of sound you derive from your system depends not only on the capabilities of each component in your system, but also on how well you can establish a link between your controller and your synths.

The guitar controller presents new opportunities to get more out of a synthesizer than may be obvious. Although each string has only a 20-odd note range, it generates the same type of MIDI data as a MIDI keyboard. But since a guitar uses six strings to cover its full range of MIDI notes, it can be dealt with as six independent controllers in one. This is where Mode 4 comes in handy.

Patches, presets, programs, voices. Each manufacturer seems to use a different term for the same thing. For simplicity, we'll use the term 'program' since it is used in the MIDI spec. With that matter out of the way, let's consider some of the complication involved in assigning different programs to each string of a guitar controller.

First, we'll consider the ideal situation, in which there are plenty of synths to go around (say six), and each one is to be played by an individual string. Later, we'll consider other, more modest setups. Keep in mind that multi-timbral synths can

usually be regarded as several synths housed in one package. Fortunately, most guitar controllers allow notes played on each string to be transmitted on different MIDI channels, so we'll work with this capability assumed implemented in whichever guitar controller is being used.

If we were to simply set each guitar string to its own MIDI channel, then we'd only need to set each synth to the desired MIDI channel, set each synth to Mode 3, and each string would play the corresponding synth. Although the controller is transmitting over several channels, each synth only needs to receive on one channel for the current setup. All we'd need to do next is select the desired program on each synth, and we could have, for example, three distinct 'string synth' sounds on the first three strings, and brass, clav, and bass guitar sounds on the last three strings.

The advantage to doing things this way is that you can play the same note on different strings and get a different timbre each time, just as you would on a real guitar – though in this case the differences in timbre may be a bit more drastic on a 'real' guitar.

This amounts to a fair deal of setup time. Now suppose you need a different synth arrangement for another tune. If you were to repeat the process described above very often, you'd eventually get fed up. So the idea is to use MIDI program change messages to set up all of the synths simultaneously, under the control of the guitar controller. There are a couple of ways to do this.

Obviously, you'll want to change programs on all six synths, but since each synth is set to a different MIDI channel, you'll need to send out six distinct MIDI program change messages, one over each of the six MIDI channels in use.

The Charvel GTM6 guitar controller gets you going in the right direction by allowing you to transmit three program changes in one go, using a 'parallel chain' feature which allows you to build up three series of program changes which can be stepped through with a footswitch. Since each of the three chains can operate over a different MIDI channel, the GTM6 system will take care of three synths. So if three synths are enough to keep you busy, you could assign *pairs* of strings to the same MIDI channel, and the GTM6 could control the program changes from there. For example, the first two strings could be assigned to channel 3; the third and fourth strings could be assigned to channel 4; and the fifth and sixth strings could be assigned to channel 5. Though this is a compromise of sorts, it is certainly a step in the right direction.

Not all guitar controllers have such a multi-channel program change capability, however. For example, if you happen to use the Ibanez MC1 guitar controller, you can send program changes over any one channel at a time, but you'll need external

SEE US AT NAMM BOOTH #3011

assistance to get the message across to more than one synth. Fortunately, there are devices designed to do this for you. For example, the JL Cooper MIDI Link has one MIDI input and six MIDI outputs. The MIDI Link connects between the guitar controller and the synths, so the controller can be the origin of all program changes. In fact, since the MIDI Link has six MIDI outputs, you can connect each synth directly to one output, rather than rely on chaining the synths together with their MIDI Thru ports.

When the MIDI Link receives a program change message over MIDI, it transmits *any* combination of MIDI program changes over *any* combination of MIDI channels, out of *any* combination of the six MIDI outputs. All you need to do is program your desired program combinations into the MIDI Link, and it will take care of the channel and program assignments. The MIDI Link does this without affecting any other MIDI messages. And with its six MIDI output ports, the MIDI Link is well suited to solve the kind of problems you might come across.

Voyce also has a couple of MIDI accessories which can be used to help rearrange several synth programs simultaneously. Their LX4 and LX9 can handle four and nine channels of MIDI data respectively, so you would have to take into consideration how many synths you are going to use before selecting one of these models. In addition to transmitting multiple MIDI program changes upon receiving one, the Voyce units also handle note transposition and other handy data manipulation.

K-Muse has a MIDI foot controller coming out in early 1987 which connects to the Photon MIDI converter's MIDI input. Upon selecting a program on the foot controller, several program change messages are transmitted over individual MIDI channels. Since this foot controller will also contain other special controls for the Photon, it is certainly a desirable addition to the system. Still, it won't help other guitar controllers to deal with multiple program changes.

So far we have assumed that each synth requires a *distinct* program change. But if you're prepared to do a bit of planning, you can arrange your synth programs so that when each synth receives the same program change message, the desired sounds are selected. For example, program #00 could be a brass patch on one synth, strings on another, bass on yet another synth, and so on. The only thing you'd have to do then is find a way to send program changes over six individual MIDI channels.

An economic solution to this problem is the Alesis MPX MIDI Transmitter, a battery-operated program selector retailing at $99. This device normally transmits program changes over only one channel at a time, but thanks to Alesis' decision to include a 'Channel 0', a single program

selection on the MPX can cause that program change to be transmitted over all 16 channels.

If you choose to use this method, care must be taken not to have any other MIDI instruments connected to the MPX which you do not want to respond to program changes. And even though this method works, and it may appear simpler to have all synths playing the same program numbers at all times, arranging your synth programs into the appropriate memory locations requires some planning, and will probably require you to store copies of some programs in several memory locations, which is not terribly efficient.

On the other hand, if you happen to be using an Oberheim Matrix 6R synth module, you'll find a special 'patch mapping' facility which enables the synth to change to any program upon receiving a different program number over MIDI, so there's no need to copy programs into other memory locations.

At the top end of the guitar controller market, the SynthAxe takes care of all of your worries. Whether you choose to select a program from the controller or step through a series of program changes, multiple program changes are transmitted over as many MIDI channels as is required by your system.

We've assumed that we're dealing with synths capable of playing only one sound at a time so far, whereas there are a large number of instruments with keyboard split, layering, or even multi-sampling capabilities. If you control a split synth from one string, then the split point would be a fret on the corresponding string rather than a key, and each string could play as many programs as the corresponding synth has to offer. On the other hand, if you play your cards right, you could use one synth to take the place of several.

Take the example of a synth with a Split capability. The Matrix 6R has a handy Mode 4 implementation which allows its left and right programs to be played over separate MIDI channels. Since the left and right programs also have programmable 'zones' (note ranges to which they are assigned), a guitar controller can use the Matrix to cover two strings completely separately, or more strings if having only two sounds is acceptable.

As you might have noticed by now, there are still some differences to be sorted out between guitar controllers and the synths they drive, even though several manufacturers have MIDI accessories to fill the gaps.

More recent entries into the guitar controller market appear to have corrected some of the limitations of earlier models, which indicates that designers are doing their best to eliminate the need for additional MIDI accessories. The possibilities are many, and with a bit of planning and patience, a guitar *can* earn its keep in a MIDI system as a master controller. ■

VERY VIVID
MANDALA
Video-MIDI Instrument

Thanks to some Canadian ingenuity, digitized video images can now be used to control MIDI events, and vice versa. The implications for performance art are awesome.

Review by Jim Burgess.

T'S A JUNGLE scene, complete with heavy foliage. A digitized body is in the center of it all. Suddenly, two large birds appear, flying lazily overhead. The body leaps up and grabs them, causing a synthesized squeal to emanate forth as the birds turn into glowing balls. The balls seem to attach themselves like leeches to the hands of the body, following their movement until, in one final motion, the hands wrench themselves away in a snap. The balls promptly explode, sounding a

combination of sound samples as they do. As the fragments of the exploded balls fall to the ground, each one emits a dreamlike, harmonic note as it comes into contact with the jungle floor.

Sound like a scene out of a movie you'd like to see? It's just one of the limitless range of interactive video/music environments you can create with a revolutionary new video-based real-time performance instrument known as Mandala. Very Vivid of Toronto, Mandala's inventors, may

very well have created a new artistic medium in its own right.

Mandala is a totally open-ended computer-based instrument that you can use to integrate video images and music together in a single performance system. The performer plays any combination of MIDI instruments by moving or dancing around a 'musical environment' that can consist of literally any type of video image or 'scene' you can imagine.

The Mandala system revolves around a customized Commodore Amiga and Very Vivid's own video camera/digitizer. Using the Genlock capability of the Amiga, graphic images can be combined with the live video output of the camera. The result is that by moving around in front of the camera, you cause a digitized silhouette of your body to move around 'inside' the graphic images on the screen. By watching the monitor as you move, it's real easy to get a feel for the position of your body inside each graphic scene.

You can create your own video scenes using one of the painting programs supplied with the package or Mandala's own custom image digitizer, which is capable of 'photographing' any existing image from a book, painting, photograph, whatever. The final image will be the backdrop of your musical environment. It might be a landscape, a space scene, or whatever you can imagine.

Once you've got a visual backdrop or scene, the next step is to create a variety of icons for your image. These are graphic 'objects' that could look like just about anything — musical instruments, buildings, projectiles, and so on. When you're satisfied with the icons or objects you've created, you can place them into various positions around the original scene you created. Icons can be

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moved around the screen at will, so you can adjust their positioning within the scene as much as you want.

The next step is to decide what sort of an effect you want those icons to have when you 'play' them by allowing your body image to come into 'contact' with them. By double-clicking on any icon, you can access a menu that is designed to permit any combination of events to occur when that icon is played. These can include instructions for literally any type of MIDI event (including System Exclusive changes), a paint or animation effect, a scene change, a transposition or a total reconfiguration of the other icons on the screen.

This open-ended programming technique is referred to as 'nexting' by Mandala's R&D Director Frank Mac-Donald, the man responsible for designing the instrument's comprehensive user interface. Mandala even lets you create complex animation events. For example, you could say: 'move this object in a straight line from this point

to this other point in five seconds. If the object hits something on the way, trigger a color change and send out a program change and the following notes on MIDI channel 13.'

Possibilities

NOW THE ENDLESS creative possibilities of this instrument should be apparent. Literally any combination of events can be set up and triggered from a specific

body movement. The performance environment of your creation can be set up to cause any combination of actions to happen, depending on where you move your body in relation to the screen.

Here's some examples of some of the performance environments Vincent John Vincent (Very Vivid's Creative

Director) has already created for Mandala:

1) An image of the Toronto skyscape forms the backdrop, complete with skyscraper icons. The performer appears as a Godzilla-like figure towering over them. As he smashes the tops of the buildings, a variety of drum sounds are triggered via MIDI note events.

2) A 'Wall of Sound' is created over an Egyptian backdrop that consists of a

"Ever since computer animation became popular, musicians have looked for ways to tie music and video closer together. Now video animation effects may be generated directly from a composition."

solid horizontal row of small circles. As the performer moves left and right within the screen, complex harmonic scales emanate forth from the MIDI instruments connected to Mandala. One lone icon overhead is triggered occasionally to transpose the instrument to a new scale.

3) The performer is in the middle of ▶

an inter-planetary space scene. Suddenly, some meteorite projectiles come hurling at him in three dimensions. Those that strike him change colors and create a series of complex sound-effects on contact.

4) A series of musical instruments appear on the screen: a vertical keyboard on one side, a harp on the other, two tympani drums in the middle. Each one is pre-configured to a specific scale or series of notes and is sent out on a different MIDI channel. Naturally, each

specific MIDI events can be used to create complex animation changes.

For example, different keyboard velocities might be used to specify color changes on the screen. A certain note might trigger an animation event. Or perhaps aftertouch might be used to move an object back and forth across the screen...

This opens up a whole new world for Mandala. After all, ever since computer animation became popular, musicians have looked for ways to tie music and

"Creating your own videos has never been this easy, and the idea of composing music and visuals at the same time will become a reality. Soon, no MIDI studio will be complete without an animation system."

of the connected sound sources is set up with the sound that corresponds to its icon.

As these examples might indicate, you can do just about whatever you want with this instrument. The applications for live performance are countless. With the advanced types of MIDI control functions Mandala lets you define, you could trigger notes or sound effects, start and stop sequences, control a lighting system or stage effects, control a mixer or signal-processing equipment – all with predetermined body movements.

Furthermore, custom scenes could be projected to the audience with one of the arena-type large-screen projection systems now available. For the first time, performance artists can literally interact live with their own video!

This is clearly the market Very Vivid are positioning the Mandala for. As David Bray (the company's Marketing Director), puts it: 'We want to put Mandala into the hands of creative performance artists. With a system that's this open-ended in terms of what you do with it, no two artists will use it in the same way. Everyone we've showed it to has come up with a new idea of what they could do with it.'

To help artists put the system to work in their show, Very Vivid offer a consulting service on a per project basis. That way, their assistance is available to help program Mandala for the application it's intended for. Naturally a certain amount of customization might be necessary for certain applications, but if anything, that's a challenge that seems to excite the people responsible for creating Mandala.

Opposites

ALL THE APPLICATIONS discussed so far have used video images to control various MIDI events. I was surprised to find out that the system is also capable of working the other way – where

video closer together. Now video animation effects may be generated directly from the composition itself. Already, Very Vivid are talking about an animated drummer that is controlled by a MIDI drum sequence!

MIDI users can now generate advanced computer animation effects for their compositions, using the wide variety of sequencing and MIDI control software available to edit the types of effects that Mandala creates.

Imagine the interactive control you could access with a Mandala and the new breed of interactive MIDI software. Creating your own videos has never been this easy, and the idea of composing music and visuals at the same time will become a reality at last. And maybe soon, no self-respecting MIDI studio will be complete without its own in-house animation system.

Mandala is available now. The package consists of a modified Amiga with a Genlock board, a RAM expander, a custom camera/digitizer, the Mandala software, several Paint programs and Very Vivid's own custom MIDI interface. Price is around $30,000, but the company intends to also market a MIDI-to-visuals-only version of the instrument at a significantly lower price.

Only one question remains: Which major performance artists will be the first to put this revolutionary new instrument to work in their show? ∎

MORE FROM Very Vivid, 1499 Queen St., West Studio 302, Toronto ONT., Canada, M6R-1A3. ✆ (416) 537-7222

JIM BURGESS is a synthesist and composer whose company, Saved By Technology of Toronto, operates a MIDI-based recording studio and retail facility.

COLLEGE DAYS

How does a music college with a reputation for innovation keep pace with modern technology? We talk to Lee Berk and Don Puluse of Berklee College of Music, and find out how their approach is changing as instruments change. *Interview by Rick Davies.*

WHEN IT COMES TO music technology, there is one thing you can be sure of: The more you understand it, the more there is to find out about how you can best use it to your advantage.

For the musician working alone, the process of reading stacks of operation manuals and magazines can be exhausting, and often unrewarding. And even though college courses and independent instruction may shed light on many areas, there is still the matter of hands-on experience and access to equipment hindering the eager student's progress from one area of music technology to the next.

The Berklee College of Music recognizes this situation, and has taken steps to bring technology into their musical development. Several years ago, Berklee began offering a major in Music Production and Engineering. Just about all aspects, from multitrack recording techniques and video synchronization to the legal and financial aspects of music production, are dealt with in courses which students can select according to their own aspirations.

Most recently, though, Berklee have expanded into the area of music synthesis, and now offer a major in this growing field. MIDI has had a lot to do with this, of course, since its acceptance by musical instrument manufacturers has helped popularize and develop many music production techniques, such as sequencing and voice layering.

Now, you may have noticed that there always appear to be more new developments in music technology worth investigating than there is time in a day. MT is just as curious as anyone else to find out how a college goes about developing a curriculum to address this situation, so we met up with Lee Berk, President of Berklee, and Don Puluse, chairman of both the Music Technology Division and the Music Production and Engineering Department, to get a bit of background information and find out how the college views the evolving music technology, and how they keep up with the pace...

LB: Berklee was established in 1945 with a very different emphasis from other schools of music. The impetus for the college was to concentrate primarily on the current professional music of the time, rather than on the European classical music styles which were the almost exclusive emphasis of the other music schools in the country.

Lawrence Berk, my father, was the founder of Berklee. He often recalled the struggle he went through as a contemporary pianist, composer and arranger in obtaining petagological information and instruction, and in being able to learn the skills within any type of a formal setting. The tricks of the trade, so to speak, were all shared through individual gurus, or the musicians of the time

had to study the recorded music, make record copies, and notate the recorded music. They had to try to figure out what was happening with the music and how to further gain the knowledge that was necessary in order for them to gain professional skills. There was no organized, systematic body of information that was readily available. So when Berklee was founded, the idea was to systemize contemporary approaches and make them readily available.

For someone who didn't see himself or herself as a classical performing virtuoso, or a classical contemporary composer, but did want to function in a contemporary manner, it provided the same type of musical and educational opportunity as existed for traditional musicians.

Originally many of the students at the college were servicemen returning from World War II. There was the GI Bill, and many of the servicemen who were in the service bands, or were instrumentalists, were anxious to become more knowledgeable about the idioms, and to function at a more professional level. They came to Berklee, which had the reputation of being an outstanding jazz school. Gradually, as the popular music of the time changed from jazz and related styles to other styles of music, the school changed as well. Throughout the early 40s, 50s and the early 60s, the school was differentiated primarily by musical style, but it was still acoustically based in music, as were the classical institutions.

As music became more influenced by electronics, and then by sophisticated music technology, which opened up creative processes and affected the way we communicated with the public, Berklee continued to incorporate these elements in the educational program.

Today, we are involved in jazz, pop and rock. We're involved in a leadership role in the ways that these are created, both through traditional means and through the very active use of today's music technology. We've become increasingly different, as a result of actively pursuing that, from other schools which are still focussed primarily upon the traditional classical European musical millieur.

We have within the college now a Music Technology division, which Don Puluse heads, and within that division we have a Music Production and Engineering major in which we have approximately 300 students enrolled.

Berklee has a Music Synthesis major, a new major at the college; three advanced synthesis labs for students who are going to utilize synthesis as part of the creative process and involve it in studio use and filmscoring use. We have other areas in the college which very actively use much of today's music technology, such as Filmscoring, where we have three or four filmscoring labs. We have a whole series of home recording labs where Songwriting majors are able to multitrack

and work with their material.

They've set up a computer-assisted instruction in music, which is a growing area of interest at Berklee, which comes from assisting the educational process generally, and in terms of assisting individual students with certain types of training material – ear training, musical theory, and so forth.

We're devoting a lot of time and energy to identifying the *enduring* aspects of music technology, as it's a very fast-changing landscape, and we are integrating them into the curriculum as much as we can, to be reasonably timely and provide access to that technology for our students.

MT: It must be difficult to find the right people to teach that curriculum…

LB: We work hard at it. We have 2700 students, so we're about five times as large as almost any other college of music in the country. This means we have many alumni who are very active in the industry, and they are helpful in referring qualified people. That is a very important network which is helpful to us.

MT: The Music Technology division opened recently?

LB: We have four divisions. We have the Music Technology division, which Don chairs; we have a Professional Writing division, Professional Performance division, and a Professional Education division. Those are the management divisions within the college.

It's not so much a question of just opening, it's rather that the college is a large institution with an enormous breadth and depth of material being offered. Within the last few years, we've organized the college into four divisions for better quality and more attention in terms of membership in different areas.

DP: Music synthesis is obviously fairly new. Music Production and Engineering is a program that started about three-and-a-half years ago.

MT: And now you have all the computers, SMPTE and MIDI technology is becoming more affordable; what steps are you taking to educate people in that area?

LB: Through the use of labs. Berklee is a music college, and you have to come through a year of training in music before you actually declare a major. We don't take technicians, technical people or anything like that. We have six recording studios, three synthesizer labs, two actual labs in operation, plus a computer-aided education room, with computer-aided instruction. Our students have all the opportunities to decide on the programs, decide on the courses and proceed. The bigger lab features Kurzweils, Emulators, Oberheim Xpanders, TX816 Yamaha racks, drum machines, and the systems are operating through Macintosh. So it's quite up to date.

MT: It seems that you want to help create a more technically aware musician, as opposed to a technician who can work in musical

environments. So what's next?

DP: The Music Production area is becoming more involved in digital, more involved in audio-for-video production. We're constantly expanding the program, constantly revising things; we have a brochure which came out last month and has one or two errors already because we're in transition. Synthesis, of course, is an area that can serve the college. As many musicians as possible will have opportunities to get involved in the current techniques, within their departments, and with the new synthesis areas as well.

MT: Is Berklee planning on getting more involved with computer-based music systems?

DP: As they evolve we'll be watching very closely. Because of the tremendous outlay of money, we're trying not to chase fads. We're being very careful. For instance, right now digital recording is something we've very carefully been keeping an eye on. We talked to Sony, Mitsubishi, Studer and Otari, but haven't made major decisions in that area. We aren't going to make them until we feel that whatever investment we make is beneficial, educationally based, to the student.

Someone recently approached me with a multitrack digital machine. I do not feel at this moment that it is an educationally sound investment. So unless the student will benefit from our investment, we're not doing it. But we have the sampling devices, we have the major studio synthesizers, and we constantly are receiving other products to try. We try everything.

LB: To make a point that goes back to something Don was saying, for us, the message is probably more important than the medium. Although the technology is very important at Berklee, it is equally important to recall that the degree we give at Berklee is a music degree, and it is a college for musicians. Our goal and emphasis is training musicians who can put out the best possible musical product, one people are going to be interested in hearing and buying.

Ultimately, although the technology is very important, unless you are working on a foundation of musical creativity, there is not going to be a product people will want to buy or listen to. So in the broader context of the goals and purposes of the college, we are trying to integrate technology to provide new creative options and control for musicians to bring out a more appealing, attractive and better crafted musical product that broader segments of people will be attracted to and interested in.

DP: We're very steeped in the tradition of music. We don't want students to have in four years an education based on learning particular items. We're trying to develop a foundation, and when we do get into technology, it's so that *that* foundation can be built on, whatever happens with the rest of their lives as musicians. ∎

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Beetle

PR7 Programmer

If you're a keen synthesizer programmer and you're looking for ways of making your work more hassle-free, a small Californian company may have the medicine you need. *Review by Chris Many.*

SOUNDS. STORAGE. TWO MAJOR areas of concern for many musicians today. There are a variety of ways third party hardware and software manufacturers have approached these subjects, each attempting to find a niche within a highly competitive market. Beetle has come up with two such products: a programmer for Yamaha TX units (TX7, TX816 or TX216) and a disk-based storage system that functions like a cartridge.

PR7 PROGRAMMER

THE PR7 IS an external programmer laid out in an almost identical fashion to the DX7's front panel. If you've ever programmed a DX you'll feel right at home on the PR7, and you'll actually find a few extra touches that make your programming efforts that much easier.

A backlit LCD is provided, with adjustable intensity for use under any number of lighting conditions and viewing angles. So for those of us tired of squinting at the DX7's LCD, this is a sight for sore eyes.

When editing voices on a TX816, a handy feature allows you to tune your editing channel to a specific MIDI channel, rather than just channel 1. You can then tune each of your TF1 modules to a different MIDI channel and edit each one separately, an advantage when tweaking one or two sounds across all eight modules to create a convincing string or horn section, for example.

Another feature unavailable on the DX7 is the ability to store patches with function parameters for each voice. Although most good librarian programs available can do this, it's nice to see such a useful feature included with the PR7.

Aside from a larger data entry slider, the rest of the PR7's appearance is virtually identical to the DX7. It's a sturdy unit which can also be rack-mounted (right above your TX216 or 816, if that's what you would like), and functions exactly like a DX7 control panel. There were no glitches in the unit I worked with, and it performed as promised.

Now, most people I know who own a TX216/816 also own a DX7. But I'm sure there are some TX7 owners who don't yet have a DX, and if they have a burning desire to learn to program FM synthesis in the tried and true method of DX7 panel operation, then the PR7 is perfect for them.

However, there are plenty of good, solid software packages available for novice and professional programmers alike, that allow you to visually monitor all your parameters at a glance and observe the way your envelopes look as you modify them, each containing a wide assortment of other features that can't be matched with a stand-alone programmer.

It's hard to justify a $545 price-tag to the TX module owner who may have little experience in programming FM. And harder still to justify it to a DX7 owner for the luxury of a backlit LCD and function parameter storage.

So, although this unit performs just fine, it may have some trouble finding its place on the racks of your average musician. But who knows? Maybe there is a wide audience for just such a product and Beetle has wisely tapped into it. We'll just have to wait and see.

QR1 RAM DISK

A MORE DIVERSIFIED product is the excellent QR1. A completely different approach to servicing a number of synths that use cartridges as a means of sound storage and retrieval, the QR1 is a rugged little unit that attaches via computer ribbon and interfaces directly to the cartridge port of your DX, RX, CZ, JX or MKS.

Because it plugs right into your synth's cartridge port, it functions exactly like a cartridge; there are no new access codes to learn or special keys to press. It's just like having a massive cartridge attached to your favorite synths.

Unfortunately, it introduces us to yet another disk type, the 'Quick Disk', a 2.8" disk developed by Maxell. According to Beetle, their reason for choosing this disk drive and type (as used by the Akai S612 and Roland S10 samplers) over the 3½" (as used by most other samplers) was primarily

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and QR1 RAM Disk

economic. The quality and reliability of the mechanisms were said to be just as high as conventional disks, yet costs were considerably lower: savings that could be passed on to the consumer.

I must admit to being skeptical at first, but it functions just fine. The disks aren't that hard to find and as a storage medium they seem to be perfectly reliable; at least, they stored everything I fed them and loaded back in glitch free.

How much storage? Thirty banks of 32 sounds for each disk; some fast calculation works that out to 960 patches per disk. Keep in mind, this works exactly like a cartridge, although not quite as fast (it took me nine seconds to load in a bank of 32 sounds from the Quick Disk to the QR1's memory). That's plenty of sounds to have available at any one given moment.

Another advantage is that because the sounds are stored within the QR1's memory and accessed via the cartridge port, you can maintain your normal internal sounds and load new banks into the 'cartridge' without changing or losing your current sound setup.

It's nice to see a disk backup feature as well, so it isn't a pain to make safety backups of your entire sound library.

A solid unit, the QR1 fits nicely on the end of your synth. It weights only 6lbs, with the dimensions being 5.3"W × 8"D × 2.3"H. You can load your library of sounds (if you have that many) on one disk in a half-hour, plus make a backup or two. From then on, instead of using 10-20 cartridges, your entire sound library is always available to you.

Currently the QR1 only interfaces with Yamaha's DX/RX cartridge format. But other types of cartridge connectors will be available in the near future as an attachment to the cartridge plug on the QR1.

Comparatively, the value is good. Retailing at $395, the QR1's not cheap as a storage medium; but check out the prices for those maxi cartridges. It will cost you $300 for a cartridge that stores 512 sounds, and that's just for one synthesizer brand. For $100 more you can get almost twice as much storage on one disk, and double that amount on your next $5 disk. Plus, you'll be able to store sounds from other synths as well. (Granted, Beetle plans to sell the additional connectors at $90 a pop – a bit steep after laying out $400 for the unit itself.)

Overall, the QR1 is a marvelous idea. You don't need a whole computer to store your sounds, or a box full of cartridges to plug in and out when you need a new bank. As with a cartridge, you have to keep track of which sounds are on which bank (if only they had included an LCD readout of all the sounds currently stored in the QR1's RAM...), but that chore is one you're already familiar with.

If you need an excellent storage device and are prepared to pay the price, the QR1 is a great little product. ■ ∘

PRICES PR7 $545; QR1 $395
MORE FROM Beetle Inc., 130 N. Victory Blvd., #101 Burbank, CA 91502. ✆ (818) 841-9922

SILENCE
is
GOLDEN

His name will be familiar only to avid readers
of sleeve credits, but Seigén Ono
is one of Japan's leading composers,
arrangers and studio wizards.

Interview by Tim Goodyer.

THE MARKETING PEOPLE would call it 'New Age'. Seigén Ono calls it Ambient, though even that is a title that doesn't describe his first and as yet only solo album release, *Seigén*. The LP was released on a little-recognized Japanese label called Pan East, and is available here only on import – though negotiations are currently going on with a couple of US labels to ensure it's soon released properly. It's a record of instrumental introspection, in which Ono acts as much as musical director as featured musician.

One solo album hardly suggests a frantic musical career, but a glance at Ono's production and engineering history indicates *Seigén* is only the tip of the iceberg. A list of credits that includes David Sylvian, King Crimson, Ryuichi Sakamoto, Moraz & Bruford, the Lounge Lizards and the Golden Palaminos creates a larger-than-life impression for such an unfamiliar name.

Yet the physical reality of Seigén Ono is far removed from this, for seated on the other side of a coffee table at Pan East's HQ is the most diminutive of Japanese men – even by diminutive Japanese standards.

By my standards his English is very good – certainly better than my Japanese – but the communication of abstract ideas presents both of us with problems, as do the names of some of the fellow countrymen involved in Ono's hectic schedule.

'In May I was touring with Toshinori Kondo and Bill Laswell', the little man enthuses. For those not in the know, Kondo is one of Japan's foremost trumpet players and Laswell is the enigmatic freeform jazz bass player whose latest unlikely success is the production of Motorhead's *Orgasmatron* LP.

'After that I took a recording project from Japan to Paris – because the studios are very cheap and the food is very good. Then I joined the tour with the Golden Palaminos – with drummer Anton Fier and bass player Jack Bruce – as their live sound engineer for the Montreux Jazz Festival. Now I'm promoting my album and the Dip in the Pool album.'

While Ono's solo venture is decidedly classical in its overtones, his latest project, a Japanese band called Dip in the Pool, is wider ranging in its influences. Theirs is a fusion of western pop, inventive rhythms and oriental intrigue. Inspired by the Cocteau Twins, synth player Tatuji Kimura teamed his musical endeavors with those of top Japanese fashion model Miyako Koda around two years ago, and the two of them approached Ono with a demo of their ideas. A name was stolen from a short story by Roald Dahl, and Masahide Sakuma joined as co-arranger to complete the line-up.

Ono picks up the story. '... Then we played live. They have many ideas for stage and films; the concerts were great, not only the sound but the visuals too.'

Ono's attitude to music and musicians is perfectly objective. He drops names like Moraz and Bruford with proud abandon, but unschooled players are just as welcome and just as highly valued.

'I didn't use any professional musicians on the Dip in the Pool album; I used only friends who liked the music. That way, amateur musicians get a chance to work. If they have an affinity for sound it works for everything. Musicians and sounds must have personality. I think they are a new generation of musician because they don't have good musical techniques – they rely on their feel for sounds and music.

'I didn't originally decide to make records with them; we just started writing and recording some songs in my studio. I gave them ideas for the arrangements and structuring of their songs: taking one part from one song and putting it together with another part from another song. It took maybe six months to a year to record eight tracks, then we decided to make a record and licence it to a record company in Japan.

'I don't talk to the record company before I start recordings because I don't like to make commercial music. I have no ideas for Top Ten numbers. I prefer to make music that comes naturally to me. I think of the whole world as the audience. Good quality and good taste work for everybody, like good food.'

The collaboration resulted in two Dip in the Pool mini-LPs released only in Japan. But soon a third and full-length album, *Silence*, should be available in the US. Songs vary from decidedly quirky ditties reminiscent of Eno's early work, to mesmerizing sequences of changing sound textures and colors. The one constant is Koda's voice: compelling yet never taxing or demanding, it floats gently above the music, evoking images of her native land.

'Dip in the Pool have an original sound, so many journalists have found it very strange', Ono admits. 'But fashion designers and people working for advertising companies and TV showed a lot of interest. I think that's because it's unusual and appeals to people working in art. Miyako Koda is a very famous model in Japan, so images blend easily with the music. I like to pick up good bands like Dip in the Pool and give away to them what I know. I'm working on the next Dip in the Pool album now, but I can't say when it's coming out.'

IN TRADITIONAL JAPANESE fashion, Ono's attitude toward his music is deeply philosophical, based around the personalities of the musicians and the sounds that go to produce it. And as part of this philosophical outlook, he regards the recording studio as more than merely a place to commit ideas to tape.

'I spend many hours, many days in the studio – it's my home. I don't like to go there only to work, it's easier that way but I don't like it. I like to spend time there because it leads to good sounds and good songs. All the studios are the same in the world, all the equipment is the same and the recording techniques are the same. I can work in any studio in the world because of my knowledge of the studios in Japan.'

Does Ono think all studios are the same because all cities are the same?

'Tokyo, New York, London, Paris... all the big cities are very similar in culture. There are bigger differences between the people in London and the countryside of England. I have some friends in New York and London and they all have similar ideas about music. If an important record is released in New York you can get the same record in Tokyo in two days – there's very little delay. In Japan since the second war, in only 40 years, I've seen much western culture around me. I often don't know if it's western or Japanese, if I like it...'

But with such an affinity for the recording facilities and cultures outside Japan, it seems odd that Ono should opt to remain tucked away in a far corner of the globe.

'I have to stay in Tokyo because I want to change the music scene and the Japanese record company system', he explains. 'My company is an independent company so it is possible to make unusual music like Dip in the Pool and my own project, where I can control everything. It means we're free; we can do anything we like, and that's very important for an artist.

'I don't like control from a record company. That's why I like to do production work – each production is quite different in personality. I discuss with the band what they want to do, then, if I like them and they trust me, we can work together. I like to see people and talk to them; I like to hear what they're thinking about. Good talking makes good records.'

But it takes more than talking to produce the delicate layers of sound that are to be found on *Silence*, and where better to be than the home of much of today's (and tomorrow's) technological trickery, Japan?

'I've used the Akai S612 sampler a lot and now I have an S900 as well. My studio is a small one so electronic instruments help me make the most of the space – especially samplers. Almost all the percussion and drum sounds I use are samples.

'One day I booked a studio with a friend who is a drummer. We made many different samples by changing the tuning, microphone techniques and sound treatments of the drums. But I can make drum sounds just by flicking a piece of paper. That way it's possible to make sounds that no-one can identify. On my record I did all the drum sounds like that.

'Conventional percussion is very easy to use but the studio and sampling offer many more possibilities. I haven't used traditional percussion instruments for Dip in the Pool; I've used my samples of Chinese percussion. I like to create new sounds just for one song. I

don't like to keep using the same sounds again
and again.'

Ono's obvious experience with a variety of
samplers produces a lightning tour of what's
currently available.

'The sound quality on the Akai is very
good, but editing parameters is not so easy.
The Emulator II is much easier to use and
sounds very clean. The Fairlight is very good
and very easy to use, but the Series II has very
poor sound quality. I can make better sounds
with the old Akai! I need 100% or 120%
quality for my method of working so I'd like a
Series III Fairlight, but it's too expensive for
me at the moment. It offers many possibilities
– it's a tape recorder, a sampler and a
computer together.'

And sequencing?

'I like the Yamaha QX1 a lot, but I also still
work a lot from the Roland MC4 at the
moment. We also have a Macintosh
computer but there's a problem with delays in
sequencing. Much of the music I prepare on
computer, but some parts must be played
manually because that provides the
dynamics.'

The modern Japanese cultural trait of
developing other peoples' ideas – often to a
far greater extent than the originators

themselves are capable – has let them down
in one important area: pop music. One
possible explanation for this is the apparent
absence of western rhythms from traditional
Japanese music – Ono offers his opinion.

'I think that is because Japan is a small
island. In Korea and China they have
percussion instruments that look like
traditional Japanese instruments, but they
have more rhythmic music. Japanese players
use many traditional rhythm patterns and
sometimes they are very similar to Korean
and Asian rhythms. I think it's very natural
to discover rhythm, but our rhythms tend to
have more space. They are very simple and
good for traditional dancing.'

The final question is the usual 'What
next?' But Ono is uncertain of his next move,
even though another solo project is
imminent.

'I want to start some more work soon.
Perhaps I will compose some of the tracks
with Anton Fier.'

Hmm... A meeting of orientally derived
rhythms, obscure sampled percussion sounds
and convoluted western rhythms hammered
out on an acoustic kit could hold some
surprises – for all concerned. ∎

Photo by: Tim Goodyer

THE PERFECT REPEAT

Sampling is one way of placing grand piano sounds under computer control. Now Bosendorfer has come up with a different solution that uses a real piano to exactly recreate a musician's performance. *Report by Simon Croft.*

ONE OF THE FUNDAMENTAL limitations of sequencing is that it can only be used with electronic instruments, right? Wrong. Bosendorfer, one of *the* great piano manufacturers of all time, has developed a computer-based recording system that is capable of recreating a performance by 'playing' a piano exactly as if it were being played by a musician.

The system is known as the Bosendorfer 290SE. At the moment, it exists as a full-size (9ft.6), 97-note grand piano, identical in most respects to its conventional counterparts, except that it can be put under computer control. Not only does the system allow a performance to be recorded, edited and reproduced, but there is no quality loss because the computer is linked to a series of linear motors in the piano itself – these are what are used to 'play' the piano exactly as a musician would. Among Bosendorfer's

plans for the future are alternate models based around 9ft. and 7ft.4 grand pianos.

Bosendorfer claim that the 290SE is 'the world's first perfect repeat performance' for piano. A lot to claim, whichever way you look at it. But it soon becomes clear that the 290SE is no electronic pianola; it's a bold step forward that could have important implications for computer-based music systems, scorewriting and education.

Before we go any further, it's important to remember that the great majority of Bosendorfer's clients are not involved in contemporary music. Hence right from the beginning, the system simply *had* to be transparent as far as the player was concerned, capable of being operated with complete confidence by computer illiterates, and of withstanding the most critical listening tests – something a sample-based system could never do.

It's also important to bear in mind that

this system is very much an integral part of the piano, and that a retrofit is not considered feasible. In fact, Bosendorfer's traditional handbuilding techniques mean that there are minute differences between each piano anyway. In order to ensure the greatest degree of accuracy between recording and playback, as well as between one piano and another, there are self-diagnostic calibration programs built into the software.

The System

HERE'S HOW THE piano works. Every key and hammer on the 290SE is fitted with an optical sensor, as are the sostenuto, sustain and soft pedals. Every sensor is scanned at 1.25µs intervals, and the information digitally stored. By noting both key movement and hammer velocity,

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a precise record of the player's technique can be recorded. Even light key depressions, which result in no hammer strike, are stored.

The optical sensors have no effect on the piano action, and this is also true of the linear motor pistons that are used for replay. These are located the other side of the pivot point on each key. During a recording, the pistons are a fraction away from the keys, while during replay they press upwards to imitate the original depressions of the player.

That, and a few PCBs, describes the difference between the 290SE and a normal Bosendorfer grand piano. In order to understand the true potential of the system, we must turn our attention to the computer.

Initially, Bosendorfer's design team opted to use a dedicated computer with four custom boards, though a later version based around the IBM PC has proved to be quicker in use. The four custom boards are keyboard interface, activator or playback interface, disk drive interface and CPU. Connections on the back of the computer allow the information from the piano to be dumped to 8" dual disk drives or to another medium, such as normal magnetic tape. Depending on the density of information stored, a single side, double density floppy will hold around an hour of playing – enough for most purposes. Alternatively, storing to normal recording tape is real time. This would obviously be advantageous if the performance information were synchronized to the rest of a soundtrack. For editing purposes, the disk is a far faster loading method and many users will probably choose it as their sole storage medium.

At present, recording to multitrack is the only way of synchronizing, although a SMPTE card will be available later. A MIDI card is also planned, but this involves some compromises. Put simply, the Bosendorfer system stores about ten times more information than MIDI can, so it's inevitable that a lot of subtlety will be lost if MIDI is used to input. Somehow, it's hard to imagine that the feel of the majority of MIDI keyboards would make them a suitable source, either. On the other hand, some players may enjoy the prospect of using a grand piano as their mother keyboard, even if it does mean that control over many of the parameters has to be external to the instrument itself. A grand piano with pitch and mod wheels just *wouldn't* look right.

In terms of hardware, the remainder of the package consists of a standard ASCII keyboard with numeric pad and a 12" monochrome monitor.

On the software side, the Bosendorfer is disappointing on a number of counts, ▶

but especially in the way in which information is presented. Perhaps we're spoilt by some of the clear, friendly and encouraging graphics used by some of the MIDI software around now, but the tabulated information offered by the Bosendorfer is rather bland, being vaguely reminiscent of the Rhodes Chroma/Apple II system of a few years ago. In its defense, it must be said that the main purpose of the software is accurate recording and reproduction, and *not* composing. Clearly, the main effort has gone into making the basic functions as accessible as possible. Any editing functions beyond that may be easily ignored if you're not interested in them.

For editing purposes, there is a five column display. From left to right this shows:

Time in 800/th of a second (1.52μs). This can be changed to a resolution of 100/th of a second for fast editing. Reducing this resolution down to 24ppqn is one compromise that would have to be made for MIDI.

Note Number MIDI convention is used, so middle C equals 60 and so on.

Name ie. Bb, C and so on.

IHV stands for inverse hammer velocity; 10 is a very loud strike, while 1200 is extremely quiet. In the available number of dynamic values, the Bosendorfer system exceeds MIDI by an approximate factor of ten.

Release Time relates to the point at which the key is no longer held down.

Editing is performed by altering values with the computer keyboard. It is not possible to drop-in from the piano keyboard, partly because there is a buffer of around three-quarters of a second. But again, the intended application of the display is to allow a maestro to correct a solitary note, or a student to analyze a performance.

It is possible to add or delete notes, and pedal information can also be displayed.

Now we come to the Merge program, which is basically a cut-and-paste facility, allowing sections of music to be added or deleted. The key can be transposed and the tempo altered; the latter feature, for example, could be useful for film work, where a piece has to fit a predetermined slot. Bosendorfer also envisage applications for the composer, allowing sections to be joined in various permutations.

Obviously concerned with the integrity of performers, Bosendorfer has incorporated a code into the computer. This means that editing can normally be performed only on the system the music was performed on. The company is also concerned with protecting the secrets of its system, hence digital information is masked with white noise and random storage techniques are used.

Perfection?

BECAUSE A PIANO divorces the player from the strings with a series of mechanical levers, and because Bosendorfer has chosen to use very high levels of resolution, the 290SE appears to work impeccably. Whether 'perfect' is the appropriate word is debatable. Is anything perfect? Probably not. But certainly, this system will reproduce music played on a grand piano with greater accuracy than any other medium, digital recording included. Live, it has the advantage of eliminating amplifiers and speakers from the reproduction chain.

There's no end of applications for the 290SE, at least in theory. The maestro could perform a piece in his living room, check the program for accuracy and send the digital information by modem to the recording studio. Let the engineers worry about recording techniques, while the computer plays the studio's Bosendorfer over and over.

In reality, though, this probably won't happen. For one thing, the technique would only be totally suitable for unaccompanied pieces. Can you imagine a 70-piece orchestra trying to perform the perfect interpretation to a computer stored piano part?

For recording purposes, certain facilities are undoubtedly useful – primarily the ability to perfect a piece without drop-ins. For commercial work, the ease with which a piece can be time-compressed is also impressive.

But undoubtedly, the system as it stands should have greatest impact on the educational field. The ability to see as well as hear the notes, plus the way in which a master performance can be repeated, must be of value to any serious music student.

The final category of user will probably be the superstar composer/performer (did anybody mention Oscar Peterson?). For that market, Bosendorfer probably needs to expand the interfacing capabilities of the system, even if it does mean that the full subtleties cannot be transmitted to other instruments. A Synclavier with a Bosendorfer interface would be *some* instrument.

Inevitably, the Bosendorfer system is expensive – around $100,000 for the full-size, dedicated computer version I looked at.

But these are early days. It may be that Bosendorfer, or another company, will eventually produce a similar system that can be retro-fitted to the upright piano. And that, given a more accessible scale of pricing, would be a valuable addition to any computer-based songwriting system. ∎

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Mono Mode on the Akai S900 sampler is supplemented by a guide to looping, the third part of our FM programming series, a guide to sequencing, and a feature on the implications of sampling for the music business.

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Dr T Keyboard Controlled Sequencer
for Atari ST Computer

Featuring new recording facilities and a host of new editing functions, Dr T's new KCS program – their first for the Atari ST series – is much more than a mere adaptation of their previous packages. *Review by Rick Davies.*

EVER SINCE MIDI became a reality for home computer owners, Dr T has been generating some of the most intriguing software on the market. These have included the first Keyboard Controlled Sequencer (KCS) and Algorithmic Composer programs, which gave computer-based musicians the tools with which they could toss MIDI data about as no other program could. These programs made the most of what limited speed and memory the Commodore 64 and Apple II computers had to offer, but the sophisticated features of the software only made the hardware limitations that much more evident.

Since the Apple Macintosh, Atari ST, and Amiga computers have made their presence so well known in recent years, and MIDI-oriented musicians have had time to find out what their specific needs are, the Commodore 64- and Apple II-based systems are not quite the attractive options they once were. For owners of Dr T's original KCS programs, then, there has recently been a time of deliberation: if an Atari or Macintosh is to replace the Commodore 64 or Apple II in my MIDI system, what will replace the Dr T programs? Well, Dr T obviously saw this coming, and at last June's NAMM show in Chicago, they announced the ST-based KCS program. The wait is now over, and shipments of the first KCS-ST have commenced.

Overview

ON THE HARDWARE side of life, the KCS requires no more than an Atari 520 or 1040 ST computer, one or more MIDI-equipped synth(s), and a couple of MIDI cables to get things rolling. Since the Atari has no external clock input, the only means of synchronization is the MIDI In port, which will generally be occupied by the master controller (keyboard, guitar converter, and so forth), so a MIDI merge box (such as the 360 Systems MIDI Merger) is recommended for combining a drum machine's MIDI clock with the MIDI data to be recorded. If a merger isn't available, you can record in sync with the Atari's metronome, and sync to external MIDI clocks for playback only.

Dr T have also included a MIDI echo feature which causes incoming MIDI data to appear at the ST's MIDI Out port, so that synthesizer modules can follow both the master controller and the sequenced events.

Once you've loaded the 3½" disk, the KCS comes up ready to record in Track mode without further ado. Play a note on the master keyboard (or other controller), and the metronome begins. Play any notes you like, then press F10 to stop recording the first track. Unlike many sequencers, which would then force you to select another track and play a game of Twenty Questions before letting you get *on* with it, the KCS immediately starts playing back what you've just recorded (having rounded off the sequence to the nearest measure to ensure that sync is maintained), and records any further playing onto the second track.

Each time the sequence repeats, the KCS moves on to the next available track, unless you haven't played anything, in which case the KCS remains on the current track waiting for you to play something else.

Forty-eight tracks later, your synths are playing something that would normally require a few dozen hands to play. You've taken Track record mode through its paces, and yet the only time the ST demanded attention was when you pressed F10 to set the sequence's length. A pleasant way to get started, and one which is certain to agree with first-time users.

The KCS is divided into three main areas: Track mode, Open mode and Song mode. Track mode operates like a multi-track recorder; Open mode operates similar to the old KCS programs; and Song mode chains sequences together for playback in any order, one at a time.

Each mode has a record (or build) screen, and a corresponding edit screen. Depending on how you prefer to work, you can start recording in Track or Open mode, then switch to another mode to edit, add more tracks, chain sequences into a song, or whatever method best suits your purpose. Each mode has its advantages, and the KCS takes advantage of them all by translating sequences from one mode to another for greater flexibility.

Track Mode

TRACK RECORD MODE is the simplest part of the KCS, yet is extremely powerful. It would be simple enough to record an entire song into a single 48-track sequence using the KCS' punch-in/out, cue, and bounce-down facilities, but there are many advantages to working in the other modes, as we'll see shortly.

The ST's screen is divided into three columns of 16 tracks, numbered 1 through 48, with corresponding dedicated key labels. For example, the '5' key is assigned to track #5, the 'W' key to track #32, and so on. This comes in handy for quick muting and solo monitoring of individual tracks (use the F3 and F8 keys to select the mute/unmute or solo functions respectively). So as the sequence plays, any track can be muted/unmuted or monitored by itself simply by pressing the corresponding track key, and the screen shows the status of each track clearly (Record, Muted, or Play).

A variation on the mute/unmute function is the switch function, which lets you select two mutually-exclusive tracks that you switch between with the Return key. All of these features are useful for monitoring any combination of recorded tracks, so that undesired tracks can be deleted, then perhaps re-recorded.

In Track Edit mode, the left half of the screen lists the events (notes, patch changes, pitch-wheel changes) recorded on one of the recorded tracks. The event listing uses the format introduced by Dr T in earlier KCS programs, and displays the time at which each event occurred (in measures and steps, as well as relative to the previous note), the corresponding MIDI channel, event type, note number, velocity and duration in such a way that any event can be tailored after the fact.

For example, by simply placing a cursor in the desired position in the list, an A# on MIDI channel 5 can easily be turned into a patch change on channel 7. As with Dr T's other KCS programs, this gives you complete control over every single event in your music. And although this demands some patience at first as you familiarize yourself with the Dr T event vocabulary, the rewards gained make this well worth the effort.

The right half of the Track Edit mode screen lists all of your options, so you select the desired function with the mouse, then click the left mouse switch. This method of selecting functions – while much more straightforward than the 'front panel' style displays used in many ST and Mac programs of late – can be a bit unnerving, as there's often no indication of the selected function once you've clicked it on. There are no highlighted characters, and often there aren't even any distinguishing notes in the ST's dialog windows (which often request that you confirm whichever function you've selected). Considering that the Append and Delete functions are next to each other, you'd expect indications to be a bit clearer. But with the system operating as it does, you just have to get your mouse chops in shape.

That gripe aside, the KCS provides enough editing options for just about anything you might need. The event listing can be edited much like a word-processor document, with cut and paste, insert, delete, and copy functions. In Track Edit mode, each track can also be auto-corrected, transposed, inverted (rotated around a 'pivot' note), played at half or double speed or in reverse order.

Among several of the new KCS' more interesting editing features is the Auto Channel Assign function, which allows any one track to be played over a specified number of consecutive MIDI channels.

For example, if a melody is auto-assigned to MIDI channels 3-5, the first note would be played over channel 3, the second over channel 4, the third over channel 5, the fourth over channel 3, and so on. This feature comes in handy when polyphonic tracks recorded on one MIDI channel are to be played by several instruments in Mode 3, or by one instrument in Mode 4. In the first case, the melody can be divided among several instruments, an effect known as hocketting. In the second case, multi-timbral instruments like the Casio CZ's can play one track polyphonically with a few voices (each on a different channel with the same patch), leaving the remaining voices to play other tracks in the same manner. Obscure applications, perhaps, but they show nothing if not great attention to detail.

The main limitation of Track mode is

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that there can only be one set of 48 tracks in the ST's memory at a time. So once you have your tracks just as you want them, you store them to disk, or convert any or all of them into sequences in Open.

Open Mode

THIS SECTION OFFERS 128 sequence locations, and allows any number of these to play back simultaneously, regardless of the individual meter, tempo, and length of each sequence.

This means you can have a short 4/4 sequence play against a 5/8 sequence, and the two sequences will loop independent of each other. Or, a short repeating bass line can loop continuously until a long chord progression ends, at which point another bass line can begin looping while the same chord progression repeats.

There are two ways to do this. You can enter Open playback mode, then start playback of any of the 35 'primary' sequences by pressing the corresponding sequence keys. This method lets you combine various sequences instantly, and is great for trying things out with little preparation.

For more carefully-arranged multiple-sequence playback, you can create 'control' sequences which contain sequence start events. These events can be arranged to start sequences simultaneously or separated by a specified time; to loop endlessly or for a specific number of times; or to start playback when another sequence has finished playing. Control sequences can also contain note events, or non-keyboard events, though it makes more sense to put these into any of the 93 available 'secondary' sequences, and then include those secondary sequences in the control sequences. Sequences can be recorded in Open mode, but it's probably easier to record them in Track mode, then convert them into Open mode sequences.

Open mode also has extensive editing functions which are basically the same as those in Track mode, but operating on individual sequences instead of individual tracks. Again, depending on how deep into your sequences you need to delve, you may prefer to work in Open rather than Track mode. Sequence-to-track and track-to-sequence conversion functions facilitate transfers between modes in either direction.

Song Mode

THE KCS ALSO has a traditional Song mode, in which sequences can be arranged for playback in any order. In many aspects, songs aren't as flexible as control sequences (which allow several parts to play simultaneously), but as a result they are considerably easier to assemble.

Songs are created in Song edit mode by creating a list of sequences in the order you want them to play. Each entry in the song list is referred to as a segment, and

each segment can be delayed relative to the end of the previous segment, transposed, and repeated a number of times before the next segment starts.

Now, there are advantages to the KCS' Song mode. First, any of 16 MIDI channels can be muted during song playback, allowing various combinations of instruments to be isolated. Also, individual program and volume changes on any or all MIDI channels can be inserted between each segment (without affecting any of the sequences themselves).

One major limitation in Song mode is that neither primary nor control sequences may be used as segments. But then, if you've already started working with Open mode, Song mode may not be necessary.

When it comes to keeping in touch with the outside world, the new KCS relies entirely upon MIDI clocks for sync. Considering how many drum machines generate MIDI clocks these days, and the KCS' relatively low price tag ($195), this may not be that big a problem. Oddly enough, the program version (1.0) we had for review did not reset the sequence each time a MIDI Start message was received, as you might expect. On the other hand, the KCS does recognize MIDI Song Pointers, so with the appropriate clocking device (eg. Roland SBX80), the KCS should start playback just about anywhere you need it to, and find a home for itself in MIDI/SMPTE-based studios of all sizes.

Conclusions

THE LONGER I worked with the KCS-ST, the more its potential impressed me. I think that Track mode, in particular, will draw many musicians towards the KCS, and even though I found the controls awkward at times, the new operations soon became second nature. Well worth the time invested, I'd say.

The 1.0 version is already available to the public, and the 1.5 version should be around by the time you read this. Upgrades to 1.5 will be free, but Dr T say they also have plans to release upscale 'level 2' KCS in late February, which will cost more than the current versions. Upgrades for that program will be available to owners of the 1.5 version for the difference in price, though it sounds as if it'll be an entirely new program, rather than simply an enhanced version of the current KCS.

The new Keyboard Controlled Sequencer for the ST is not your standard sequencer, and it's a pleasure to see that Dr T continues to produce programs which leave room for some healthy experimentation, without losing sight of the kind of applications the average musician is interested in. ■

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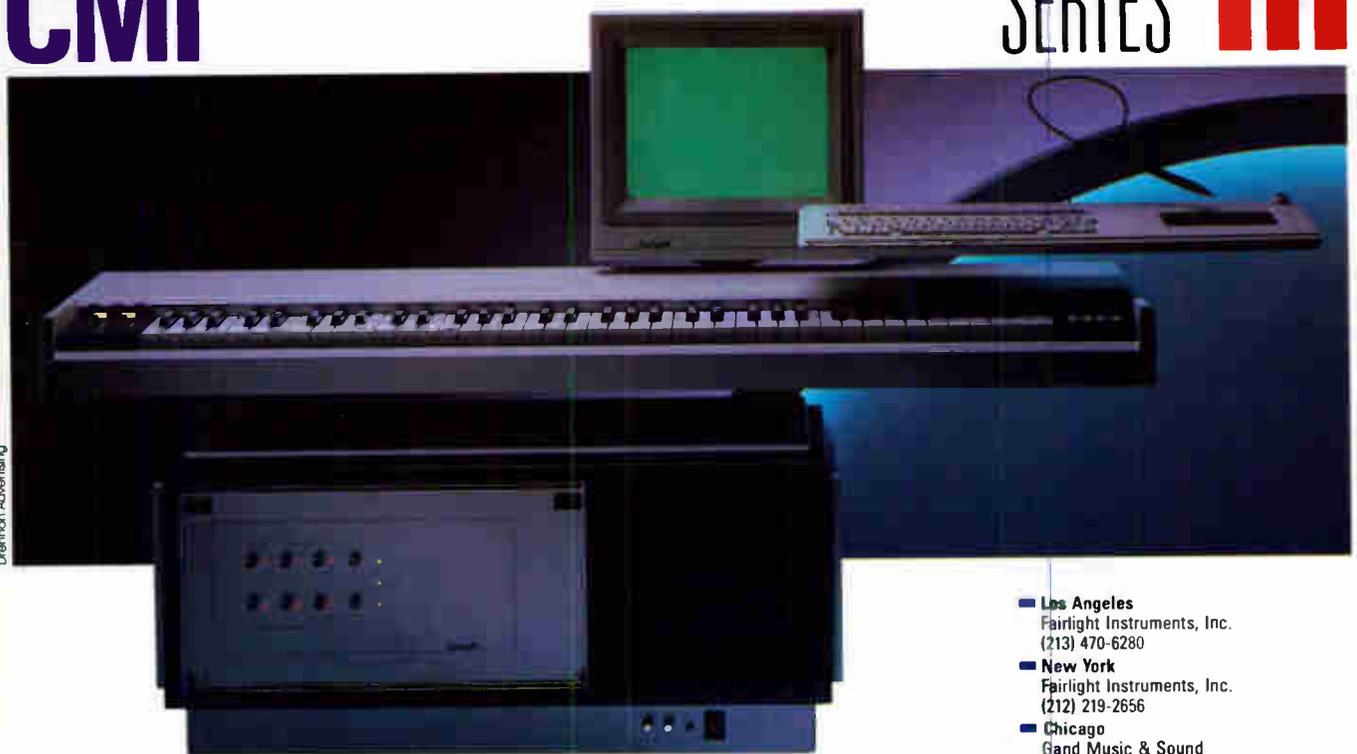
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