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### **RAYMOND KURZWEI** The Mind Behind The Machines

The Mind Benind The Machines

# THE SUPER JUPITER

A Look Back at The MKS-80

**NEW FINGERS** Alternate Fingerings for WX7 & WX11



## CEDAR: RESTORING CLASSIC RECORDINGS

# THOMPSON TWINS Roce 'n' Roll 'n' Reality

#### REVIEWS Korg T1/T2/T3 Dr. T's Hitman Coda MusicProse Cool Shoes Drummer Twelve Tone Systems Calkwalk 3.0

Vorld Radio History

The MIDI LAN\* has Arrived...

> MidiTap... Create the Virtual Studio...

> > MidiTap

LOWEN



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\* MIDI LAN – MIDI Local Area Network

**World Radio History** 

f you've ever wished for a fast, easy way to edit, program or manipulate your MIDI equipment - Wish no more! FaderMaster<sup>™</sup> is an extremely powerful vet easy-to-use remote MIDI Command Controller/Programmer/Editor/Mixer for virtually everything that has MIDI!

When we say easy, we mean it! Simply connect a MIDI cable to your keyboard, tone module or digital effects processor (reverb, delay, EQ, etc.), and gain access to eight different MIDI parameters at once, and in real time! MIDI-sequencing musicians can use FaderMaster to alleviate MIDI frustration.

#### Sequencer Mixing Made Easy

Just imagine how much faster and more effectively you'll be able to "mix" the MIDI volume of your sequenced tracks using eight faders at a time. FaderMaster eliminates the aggravation every sequencing musician experiences when using a mouse or keypad to "mix" or edit MIDI volume. If you blow it and need to punch in, FaderMaster's intelligent design permits easy and seamless re-recording of continuous MIDI data. Any combination of tracks and MIDI channels can be grouped onto one fader, allowing them to act as a subgroup.

#### Create "Human Feel"

Use FaderMaster to delay both MIDI clocks and MIDI note data, Any MIDI note can be assigned to any fader and delayed in real time. For example, use

**FaderMaster** to delay MIDI drum notes and re-record that data onto a new sequencer track. This clever feature is useful for adding that "human feel" to your sequenced drum tracks.

#### **Double the Power of your Digital Effects Processor**

Connect FaderMaster to virtually any MIDI effects processor, and use any or all of the eight faders to control eight different parameters in real time. For example, assign one of the faders to alter reverb time, and another to control delay time, or chorus, pitch change, EQ, or

# **FINALLY A** simple way to double the power of your MIDI gear.

any parameter you like. Using a fader to control these functions eliminates the inconvenience of pushing buttons or scrolling through sub pages to get to the parameter you wish to edit. In addition, you can record this controller/sys-ex information onto your MIDI sequencer for automated effects playback.

#### **Easy Synthesizer Editing**

Use FaderMaster to program, edit or manipulate eight of your synthesizer parameters at a time - without the tedium of all those sub-pages! Whether it's quick convenient access to the attack, decay, and filter settings; or simply volume, fine tune or program change commands, FaderMaster brings all this control to your fingertips.

#### **Simplified Programming**

We've included over twenty presets for

synths from Korg, Kawai, Roland, Emu, Yamaha, Oberheim, Ensoniq and others. We've also included presets for Digital Effects from Alesis, ART, Lexicon, DigiTech and Roland. Of course there's no problem defining setups of your own for all kinds of MIDI equipment; we've made it extremely simple! Each Fader can be individually programmed to send MIDI Volume, MIDI Notes, Program Change, Pitch Bend, After Touch, Continuous Controller Data of all types and even Non-Registered Controllers. Once programmed, your set-up can

be saved for fast easy recall. System Exclusive data can be programmed externally from our optional Macintosh or Atari software disk.

J.L. Cooper takes pride in creating feature packed, easy to use and affordable solutions. And FaderMaster is no exception. Ideal for both live and studio applications, the possibilities are endless. See FaderMaster today at your local J.L. Cooper Dealer. Suggested Retail only \$299.00! Optional software for programming and storage only \$29.95.

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Introducing FaderMaster\*\*

from J.L. Cooper.

The Ultimate MIDI

**Command Controller.** 

Fast, Easy and

**Flexible for** 

only \$299.00!



## BITIN' IT BIG TIME

FOUR YEARS AGO or so, I bought a Lyricon wind synthesizer controller with the JL Cooper MIDI wind driver installed internally for \$1500. At the time, it was the one I preferred out of only two or three generally available woodwind controllers. Being a wind player and not a keyboard player, I was willing (if not eager) to pay the price.

I now play an Akai EWI, so recently I tried to sell the Lyricon. I found that the best (in fact, the only) deal I could make for it was a used DEP-5 and an extra meg of RAM for my computer from a solder jockey who only wanted to cannibalize the Cooper board. Sure, I was glad to have another DEP-5 in my rack and enough memory to run Multifinder on my Mac, so it was a fair deal in the context of current reality. But as far as the Lyricon itself was concerned, I was bitin' it big time.

Actually, MIDI wind controllers seem particularly prone to this severe devaluation. The Yamaha WX7 listed for nearly \$1000 when it first appeared, only to be blown out for under \$200 just two years later. The Akai EWI cost almost \$2000 at first, dropping to \$1300 after a year or two. I recently heard that they were being liquidated at \$399, less than a year later.

Now, I'll admit that MIDI wind controllers are rather limited in their market appeal, but the same type of devaluation affects virtually all hi-tech gadgets. Who among us hasn't seen the price of our favorite synth, sampler, signal processor or other toy drop dramatically not long after its introduction? What are the contributing factors that make musical technology such a poor economic investment?

Part of the problem is the dizzving pace at which new products are developed. These new instruments seem to supersede "older" products every six months (this is also part of the reason that there is a growing call for only one NAMM show per year). This is particularly true in these days of refinement rather than true innovation.

Another factor is the expense of developing a new technology as opposed to applying an existing technology. Yamaha's FM and Roland's S/A and L/A synthesiz-2 **MARCH 1990** 

ers made their initial appearances as rather expensive instruments. Subsequently, however, many inexpensive (and in some cases, better) products using the same technology were introduced, driving the prices of the original instruments sharply downward in the process.

All of this leads to some very unpleasant situations. You might have already experienced the frustration of buying a new piece of gear from your local dealer only to see the same thing on sale a week later for less than half of what you paid for it. I hate when that happens!

Then there are the dealers themselves. How would you like to be the buyer for a retail store who just bought a bunch of units at the normal net cost, only to discover that the manufacturer is now blowing them out at a fraction of what you paid only a week before? Not only that, your competitor down the street is having a big sale on the same units because they were purchased during the manufacturer's blow out! If you try to maintain your profit margin based on what you paid for the units, everyone will go to your competitor for the lower price. On the other hand, if you try to follow suit, you'll be bitin' it big time.

And what about the manufacturers? Whenever a new product is developed, they are often stuck with a sizeable inventory of existing units that are soon to become outdated. Can you blame them for wanting to cut their losses? If you were in their shoes, wouldn't you try to get whatever you could for those units rather than piling them into the dumpster?

The solution to this problem is not at all obvious. One idea that comes to mind is some kind of "blow out insurance." For example, if you buy something from one local consumer electronics retail chain, they'll "pay you the difference if you find a lower price within 30 days," even if that item subsequently goes on sale at their own stores. If manufacturers made a similar offer to their dealers, who then made a similar offer to their customers, no one would be bitin' it big time. Wouldn't that be nice? • Scott Wilkinson

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The U-20 can store 8 chord "sets," each consisting of a different chord assigned to each pitch in the octave.

I-R3: Electric Set 0:0 C#3: I-128 So:C#3 Mu:Off

If you're considering composing, consider this: The U-20 can store four different drum and percussion arrangements, each with its own key assignment, level, panning and tuning.



Each of the 64 sound patches can have its own reverb and chorus parameters, with each part being assignable to just reverb, just chorus, or both.



While any of the 128 preset tones can be assigned to any of the 128 timbre locations, more exotic instruments can be accessed via U-Series ROM cards.

Edit/Sound/Part4/Output Asgn=Rev Lv1=127 Pan=3>

Each of the six parts can have its own effects on/off, level, and pan setting.

#### Edit/Sound/Part2/Timbre Timbre=B35:JP8.Brass

Any internal timbre can be assigned to one of six parts. This keyboard, by the way, is multi-timbral with a 30-voice polyphony, making it ideal for live performances.



Since the U-20 will simultaneously receive on up to six MIDI channels plus a rhythm channel, you can create entire arrangements with an external sequencer, and split or layer up to six sounds on the keyboard.



Each of the 128 user-definable timbres has its own flat and sharp bender range, making things like "whammy bar" solos as easy as the proverbial flick of a wrist.



If we were to tell you that our new U-20 RS-PCM Multi-Timbral keyboard was perfect for any kind of performing, you'd probably mutter something about truth in advertising and go on about your business. So instead of telling you this, we'll let you come to that conclusion all by yourself.

And the reason we expect you to is this: The U-20 possesses an extraordinary diversity of sounds—to the tune of 128 multi-sampled tones, including both acoustic instruments and popular synth sounds, as well as a staggering array of drum and percussion sounds.

And since these sounds are the product of a Re-Synthesized Pulse Code Modulation technology, their quality is remarkable. (Basically, RS-PCM allows sampled sounds, which normally require massive amounts of data, to be re-synthesized so that they deliver great sound quality without taking up a great deal of memory.) And because of a new, high quality signal process-

And because of a new, high quality signed proceed ing, you can be as expressive with the sounds as you wish. The Roland U-20, unlike most sample playback machines, offers attack and spectra sounds that enable you to actually "synthesize" your own sounds.

All of which led one magazine to suggest, "... the only problem you'll probably have with the U-20 is finding enough time to explore everything it has to offer!"

Fortunately, it's so affordable you can start right away.

RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040-3647 213 685-5141



#### MUSIC TECHNOLOGY **VOLUME 4, NUMBER 7 MARCH 1990**



#### **Thompson Twins**

Tom Bailey and Alannah Currie take an excursion into



the bizarre with their latest album, defiantly entitled Big Trash, Dan Rue talks with the New Wave pioneers about dinosaurs. Dr. Seuss. and the Queen of the U.S.A.



#### **Gregory Kramer**

As a musician, product designer and engineer, Gregory Kramer stands on both sides of the music market fence when it comes to applying technology. Steve Ellison talks with Kramer about present and future developments within the world of music technology.

**Raymond Kurzweil** 

Genius prodigy, visionary, and musician Raymond Kurzweil has invented such unimaginable devices as the Kurzweil Reading Machine, which reads any printed text aloud, and the Kurzweil 250, a remarkably refined sample-based instrument which has so far managed to avoid the fate of obsolescence. Leigh Silverman talks with Kurzweil about the secrets of his success and future of the art of sampling.





The folks at CEDAR Audio are restoring classic recordings to (almost) their original, pristine condition.



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#### Square One

Our monthly column for the Fresh Flock is currently enjoying the leisure of a Spring Break. Don't be alarmed, though. We'll be back in two months.

Listening Lab ..... 40 This month, we suggest that you treat your ears to the art of def blonde Deborah Harry, veteran rockers Shooting Star, cool retro disco groovers Coldcut, and a guy named David Rosenboom. More From ..... 55

Readers' Tapes .....

Updates & Upgrades..... 18

#### FEATURES

#### **CEDAR:** Reconstructing 20 **Classic Recordings**

The invention of the compact disc was the answer to many a music lover's dream - super high fidelity in a virtually indestructible medium. But what about the music our grandparents listened to? Just when it seemed that "classic" recordings were about to be lost in a cloud of dust, decay and demagnetization, along comes a small company out of Cambridge, England that uses computers to save the tunes of yesteryear. Gordon Reid reports.

#### **Retrospective: The Super Jupiter** 47

Despite the huge number of instruments developed every year, very few ever become regarded as "classics." One of Roland's last great analog synthesizers, the MKS-80 or "Super Jupiter," is such an instrument. Take a guided tour with Steve Howell through this monstrous, ingenious culmination of the Jupiter legacy.

Roland's Jupiter line of synthesizers found its ultimate expression in the MKS-80 Super Jupiter.

World Radio History

#### TOOLS

#### 12 Korg T1/T2/T3 Korg's newes

Korg's newest line of synths follows in the tradition of their startlingly successful M1, and it's AI brand of wavetable synthesis. Oddly enough, these offspring represent an uncharacteristic up-market move, not only in price, but in power and complexity as well. Simon Trask delivers the review.

#### 32 MicroReviews Our quick loc

Our quick looks this month focus in on Dr. T's Hitman, a nifty little program for the Atari ST that helps to efficiently generate SMPTE hit lists for audio/video work, and Drummer from Cool Shoes, a drum machinesimulation sequencing program for the IBM PCompatibles.

#### 50

The long-awaited smaller sibling of Coda's controversial

**Coda MusicProse** 

mega-software, Finale, has arrived. Lawrence Ullman delivers his review of this Macintosh notation program with a practiced eye and an honest opinion.

#### 64 Twelve Tone Systems Cakewalk 3.0

This IBM sequencing software has established itself as one of the most widely used programs in the country. Carter Scholz takes a look at the substantially new and improved version 3.0 to see if Cakewalk is living up to its name.



Korg's new T-series instruments offer the ability to import samples among many other features.

#### TECHNIQUES

#### 36 More K4 Contortions

This month, Lorenz Rychner takes us further into Kawai's latest synthesizer – focusing in on the Single programs. It's time to get our hands dirty, folks...

#### 62 Alternate WX7/11 Fingerings

A conscientious reader sent us these alternate fingerings for the Yamaha WX7 and WX11 wind controllers. If you're a member of that exclusive circle of wind synth players (like half the staff here at *MT*), you'll find these new fingerings wonderfully useful.





We don't like to do all the talking. If you've got something to say about something we've said, then say it in writing. C'mon, commit yourself, be assertive. Say it, send it, see it in: Readers' Letters, *Music Technology*, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.

#### **Intriguing Interviews**

I must thank you for putting Gary Numan on the cover of the December issue of *MT*. I have been an avid fan of his for seven years, and although his music is not the greatest music made today, it most certainly is my favorite. You should have mentioned that between 1984 and 1987, he released three albums in Britain on his own Numan Records label. Also, the older Beggar's Banquet LPs have been released as import CDs. All are often available at my local Tower Records store.

The Numan interview is one of many well-written interviews with people I want to read about that you have printed over the past few years. Many thanks for providing such informative and interesting reading over the years. I have just enthusiastically renewed my subscription for the third time.

> Gregor Torrence Portland, OR

#### **Another Perspective**

I would like to compliment you for your article on Gary Numan (*MT*, December '89). Most magazines would balk at doing an interview with him, let alone put him on the cover. Many people forget how he paved the way for the acceptance of synthesizers in pop music as a serious instrument, rather than just a noise maker. I wish him luck on his new album.

I also want to comment on the letter from Devin Ossman (December '89). I admire *MT* for printing the letter despite its destructive criticism.

MARCH 1990

He says he noticed the "level of sophistication you seem to be aiming for." I'm sure he never learned anything; he was born a genius. I suppose I am not as brilliant as Mr. Ossman, since I find Square One to be informative and useful. I suppose I should go off and buy another magazine (I'm sure Music Maker would appreciate that!). I'll go subscribe to Teen right now. Devin uses pretty big words (ped-an-tic) at his young age (26). I would like to thank him for pointing out that the article on 'Synchronization Basics' was just that: Basic. I guess that's what titles are for, eh?

Sorry if we waste your time and space, Devin. We lowly peons need to learn the basics before we write our 5th symphony. As for *Music Technology*, keep up the good work.

> Alexander Shields New York, NY

#### **MIT Trivia**

I enjoyed the article about The MIT Media Lab (MT, December '89). Just for the record, however, VALIS stands for Vast Active Living Intelligence System. Your readers might be interested to know that VALIS is presented as a science fiction film in the book. It is a very unusual film in that an information exchange occurs between the audience and the film. The film was produced by a Mr. Mini, an Englishman who was educated at MIT! The information transfer is believed to be due to Mini's Synchronicity Music, a sort of frequency-specific subliminal language which induces a deep theta state. The

characters in the novel claimed to have visions while listening to it.

Hugh T. Atkins San Diego, CA

#### **Dressed for Success**

As a female electronic musician, I am another part of the 2% readership that Ms. Irene Herebia says she is a part of (Readers' Letters, *MT*, December '89). However, I have a completely different opinion about the subject.

She complains about advertisements that use women to attract attention to the product. In a roundabout way, she puts down the women in these ads. She also puts down women that work with mostly male bands, claiming that the women are mere "sex objects." Finally, she implies that women who wear "leather mini skirts" or other sexy apparel are not real musicians, are less talented, less intelligent, and less entertaining musically than she is.

I think that her comments are far more prejudicial than the ads she says that she is offended by. I play keyboards in an all-female band that routinely wears mini skirts and low-cut tops. Therefore, I object to Ms. Herebia judging me by my apparel. I honestly don't feel the length of my skirt is a reflection of my musical skills, or anything else for that matter.

Yes, I wear these clothes during my performances because it attracts a larger audience and increases my income. But much more importantly, I wear these clothes because I *enjoy* wearing them.

No, I am not a sexually exploited woman because I wear sexy clothes. I choose freely to do what I do. I've had blenty of opportunities to do other hings. For example, I served as a sergeant in the United States Army in a combat medical division for nine years, where just one of my duties included being a member of the equal opportunity board for the division. Not exactly a traditional female job.

I also strongly support the women's liberation movement, but I don't think I should have to give up being a woman to be liberated. I like being a woman and I like my body. I don't think I should have to hide my body behind mounds of cloth to prove that I am liberated or to gain respect.

I like the advertisement for Rolls Music Center. It is an attractive, welldone advertisement that catches the eye. The women in the ad don't look abused, unhappy, or sexually exploited. They appear to like what they are doing. I am intelligent enough, as I am sure most readers are, to decide if I want to order from Rolls. The ad is just getting my attention, it is not forcing me to do anything.

Finally, it could be argued that the ad is a fairly accurate reflection of the band I work with. If someone were to photograph our practice sessions, the photographs would show just as much skin. If that photograph appeared in an ad within this magazine, I am sure that Ms. Herebia would object to the sexism. Yet, the photograph in the ad would be the truth.

Some women do dress the way the women in those ads are dressed (I am one of them). We do not want to be ignored or dismissed just because some women object to what we wear. We are women too. Yes, we want respect from men, but we also want to be respected by other women, like Ms. Herebia, who often show us far less respect than we get from men.

Robin A. Stewart Myrtle Beach, SC

#### The Sexism Saga Continues...

I have a slightly different perspective on the sexism-in-advertising debate, as I've been a customer at Rolls Music for over six years. They're local for me, and although only one out of four or five music stores, they're the store I've bought 90% of my equipment from.

I need to say that I agree with anyone who dislikes blatant sexism in ads (including Rolls', which I found surprising and, since I know the guys, funny). A large part of the market is taken up by males, and sex (blatant or subtle) has been an effective marketing tool for as long as it's been used. Personally, I don't see anything wrong in a pretty face. A picture of a girl in a bikini selling auto parts or synths is ridiculous though, no matter what it does to us below the waist.

But I need to assure everyone reading your mag that Rolls' has good, honest, and helpful people working for them. I personally think that the ad was the idea of one person, but the whole staff has to operate under the ad's appearance. Like most stores that I've dealt with, they have their dishonest and greedy share of people. They also have people who I've counted among my friends - people I have a lot of respect for, people who really have your best interest at heart. Many times, Tim Cornish has told me he wouldn't sell me this or that, because he couldn't honestly recommend it. I count on his judgement. I want to tell everyone reading this that they can, too.

> Steven Ray Alexandria, VA

# The Last MIDI Editor You'll Ever Need! GenEdit

#### THE UNIVERSAL EDITOR LIBRARIAN AND CONTROLLER.

With Hybrid Arts' GenEdit<sup>™</sup> you can control, load, save and edit patches from any MIDI device on the market today ... or tomorrow ... all with a single program.

#### WORKS WITH ANY MIDI DEVICE.

If it will read MIDI system exclusive data, GenEdit can control it. And edit it. And store its sounds and settings, ready for instant recall from your computer. GenEdit works with MIDI synths, samplers, mixers, effects processors, drum machines, and more.

#### A MIDI CONSTRUCTION SET.

GenEdit features a built-in Template editor that lets you recreate the front panel of any MIDI device on-screen. Choose a knob, slider, or switch, grab it with the mouse, and place it anywhere on the screen. Hook it up and go!



#### 8522 National Blvd. Los Angeles, CA 90232 Phone: (213) 841-0340 Fax: (213) 841-0348

#### MEGA TO MAC AND BACK.

GenEdit files are compatible. Patches, patch banks, and instrument templates that work on the Atari version will also work on the Macintosh version. GenEdit will even read patches generated by other software librarians, so you can keep all your favorite sounds.

#### ADVANCED EDITING.

With GenEdit you can edit patches, arrange and sort patch banks, Randomize, Distort, Compare, or Average individual patches. And the built-in Macro Editor automates the process.

#### THE ONLY ONE YOU NEED.

GenEdit comes complete with pre-built templates for the hottest MIDI devices, including the D-50, Proteus, LXP-1, and M1. GenEdit is available from your local retailer - just \$249 for the Atari ST version, and \$349 for the Macintosh version.

CenEdit ontains absolutely no fine print. But our lawyers say this ad has to have some. Atari and ST are registered trademarks of Atari Corporation. Apple and Macintosh are registered trademarks of Apple Computer Incorporated. Other brands and product names are trademarks of their respective owners. CenEdit, Hybrid Res (1999) Hybrid Res (1999) Hybrid Arts Incorporated

# NEWS Desk

#### **QUAD NOISE GATE**

Furman Sound's QN-44, an updated version of the QN-4A, is a quadruple noise gate that includes an Attack control for each channel and an improved gain-control element. Each of the Quad Noise Gate's four independent channels can discriminate and suppress lower-level noise from a desired signal whose level is above that set by the Threshold control. Other controls per channel are Release and Depth, each of which allow for more subtle gating effects. The QN-44 (\$399) is available in balanced or unbalanced configurations, and also features Channel On LEDs and Key Input jacks.

MORE FROM: Furman Sound, Inc., 30 Rich St., Greenbrae, CA 94904. Tel: (415) 927-1225.



#### WINTERPARK WONDERLAND

The new Full Sail Center for the Recording Arts recording engineering school is a 23,000 square foot, 6-studio complex in Winterpark, Florida. Facilities include a major multitrack audio studio and a full-service video production and post studio. The complex offers three Synclavier suites, a MIDI studio, and a 48-track

**AUDIOMEDIA FOR** 

MULTIMEDIA

The multimedia market may

be interested in Digidesign's

Audiomedia, a compact disc-

ing and editing system for the

fidelity digital audio record-

Macintosh II. Audiomedia

mobile setup. All equipment is accessible from any studio, lab or classroom thanks to a Central Machine Room. Two new classrooms with a seating capacity of 75 people each, two hands-on teaching labs, two video viewing lounges, a student library/ bookstore, and many other offices and work areas have recently been added to the new Full Sail facility. The old center in Altamonte Springs, Florida is being kept to serve

as additional studios for student training and studio clientele.

Financial aid is available for those students who qualify. For more information regarding Full Sail Center for the Recording Arts or their curriculum, call (407) 679-0100, or (800) 221-2747 (outside Florida).

MORE FROM: Full Sail Center for the Recording Arts, 3300 University Blvd., Winterpark, FL 32792.

playback of high-fidelity sounds. Also included are an Examples and Utilities disk and audio cables. The Audiomedia card conducts AD and DA conversions on-board.

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

#### PEGGY THE ARPEGGIATOR

Triangle Audio has introduced Peggy, an Amiga version of their MIDI Arpeggiator, which takes incoming MIDI note data and arpeggiates any notes currently on. Patterns (up, down, up and down, random, forward, backward, and forward and backward) can be changed with the mouse, keyboard, or via MIDI program changes. The speed can be set with an internal timer or synced to an external MIDI clock. Peggy (\$50) also features a selectable input key range and multiple repeats of each pattern with a programmable transposition.

MORE FROM: Triangle Audio, Inc., P.O. Box 1108, Sterling, VA 22170. Tel: (301) 526-6224.

#### **ERIC'S SOLUTION**

Did you ever wonder how you could improve the quality of your audio and video signals? Eric Data Systems has introduced Physonic Solution, an electrical contact enhancement liquid for improving signal transfer at the contact interface. Made of a computer synthesized polymer material, Physonic Solution fills microscopic pores and gaps between two metallic surfaces to increase the contact area. The dynamic range, clarity, imaging, ambience and detail of audio equipment can be improved, as well as video reception. Physonic Solution is being marketed by Tayo Industries and is available in three sizes (2ml Sample Bottle, \$8.99; 8ml, \$24.95; 10ml, 31.98).

MORE FROM: Tayo Industries, 7510 Sunset Blvd., Suite 537, Hollywood, CA 90046. Tel: (818) 765-0782.

#### **YOUR RIGHT TO ROCK**

If you're concerned about the possibility of powerful people taking away your right to create, buy, or even listen to certain types of music, then you should be interested in allows users to add compact disc quality audio, including voice, music, and sound effects, to their multimedia applications. Each Audiomedia package (\$995) includes a Macintosh II NuBus card, Sound Access, and a Hyper-Card stack for recording and

You've Got a Right to Rock, a

pamphlet that takes a firm

stand against music censor-

of Rock & Roll Confidential,

the pamphlet targets their

ship. Published by the editors

fight against the Parents Music

Resource Center (PMRC) and

other groups that continue to take major steps to censor music throughout the United States. In addition to some shocking examples of abusive censorship, the pamphlet explains how you can become active in the fight against it.

Pamphlets are \$3 per single copy, \$2.25 each for 2–5 copies, \$1.75 each for 6–20 copies, and \$1.50 each for more than 20 copies.

MORE FROM: Rock & Roll Confidential, Box 15052, Long Beach, CA 90815. Tel: (213) 594-6866.

**MARCH 1990** 

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#### **EPS DRUM SOUNDS**

SLT-8 (\$69.95) is a new drum sound library for the Ensoniq EPS. The pack of ten disks features sounds ranging from jazz to modern rap, as well as electronic drum and percussion sounds. Also included in the library is a Bonus Beats Sequence Disk, which provides sequence information to create complete drum tracks for songs with the sounds provided.

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

#### BENEFICIAL BIBLIOGRAPHY

Music and the Personal Computer: An Annotated Bibliography (\$35), compiled by William J. Waters, offers educators many introductory sources, articles on how to evaluate and purchase equipment, and directories of available software. The seven sections of Part I are devoted to information regarding a specific computer, while Part II includes articles written about two or more popular computers or models not covered elsewhere. Part III of *Music and the Personal Computer* covers music education, while Part IV lists and annotates significant books.

MORE FROM: Greenwood Press, Inc., 88 Post Road West, P.O. Box 5007, Westport, CT 06881. Tel: (203) 226-3571.



#### **MICRO SEQUENCER**

Kurzweil Music Systems' MS-1 MicroSequencer (\$500 estimated retail price), a digital data recorder that works with any MIDI-equipped keyboard, allows the user to record, edit, and play back up to four different tracks. The user can play in one part at a time or listen to one part while recording the next. The MS-1's editing capabilities include track merge, track loop, patch thru, volume adjust, play all songs, and track channel adjustment.

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

#### COMPLIMENTS OF COOPER

The "Nexus" line of MIDI switchers and MIDI interfaces from JL Cooper includes Nexus, Nexus Plus, and Nexus M. Nexus is a 3 input by 8 output MIDI switcher, while Nexus Plus is a 2×8 MIDI switcher that includes selectable merging, transposition, and zoning. Other features include channel filtering, auto-thinning of MIDI controller data, and a panic button. Nexus M. a MIDI interface for the Macintosh, features one Macintosh serial port connector, one MIDI input and three MIDI outputs, and activity LEDs.

JL Cooper has also released Synapse, a fully programmable 16×20 MIDI Switcher and Processor that comes with a program mapping system. Its features include three independently programmable MIDI processors, velocity scaling and MIDI merging.

The MAGI IIi is JL Cooper's internal retrofit console automation system, which can be installed into any audio mixing console. MAGI IIi consists of internally mounted dbx VCAs, the rack-mount MAGI IIi Controller Unit, the MR-4 Remote Muting Unit, and software for the Macintosh or Atari.

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

#### **BARTLEBY'S BELS/27**

Bartleby Software has released BELS/27, an editor/librarian for the Yamaha DX21, DX27, and DX100 synthesizers. The software, which runs on IBM PC/XT/AT or compatibles with a Roland MPU-401 or compatible MIDI interface, features "Lotus style" menus, hot-keys, and contextsensitive help for every field and function. Voices can be edited, stored as individual voices or in banks, and moved between banks. BELS/27 (\$39.95), which is not copy protected, runs with any display adapter, requires two

#### LOGIQ OBJECT

PC ObjectMover+, Sound Logiq's first MIDI software product, allows PC compatible owners to store, organize, modify, and view all of the data in their Kurzweil 1000 series instruments. PC ObjectMover+ (\$95) allows fifteen moveable and resizable windows to be open simultaneously, and can accommodate several Kurzweil modules at once. In addition to eliminating copy protection and replacing it with user registration, Sound Logiq also provides a 30-day money back guarantee.

MORE FROM: Sound Logiq, 23 Alprilla Farm Road, Hopkinton, MA 01748. Tel: (508) 435-1993.

#### **MIXERS AND MORE**

Kawai has introduced the 16channel MX8SR (\$595) and the 8-channel MX8BR (\$425) keyboard mixers. Inputs are 1/4" phone jacks, while stereo outputs are provided for both 1/4" and XLR connectors. There are two Effects Sends, one of which sends in stereo.

Also from Kawai is the PHm Synthesizer Module, a modular version of the Kawai PH50. This small half rack space unit has built-in MIDI ports, as well as multitimbral capabilities. PHm's 200-voice sound library includes traditional instrumental sounds (piano, flute, strings, and brass), PCM percussion, and 10 M



synthesized effects. Sounds can be used individually, layered in combination patches, or split across a keyboard. The PHm (\$449) has a preset drum machine with 30 contemporary rhythms and fills.

MORE FROM: Kawai America Corp., 2055 East University Drive, Compton, CA 90224. Tel: (213) 631-1771. floppy drives, 350K of free memory, DOS 2.1 or greater, and includes over ten banks of voices.

A free demo version is available from CompuServe, or the OMNI-NET BBS at (214) 328-6909. If you don't have access to a modem, Bartleby Software is offering a demo disk for \$5, refundable with purchase. Bartleby also supplies an editor/librarian for the Yamaha TX81Z, which retails for \$49.95.

MORE FROM: Bartleby Software, P.O. Box 671112, Dallas, Texas 75367. Tel: (214) 363-2967.

#### **NEW VS**

Korg has introduced the WS Wavestation Synthesizer, which incorporates 32-voice, 16-bit Digital Vector Synthesis (originally developed by Sequential Circuits for the Prophet VS). In addition to over 500 multi-sampled waveforms and sounds, the WS also features dual programmable stereo multieffects, 240×64 pixel graphic LCD, and RAM and ROM card ports. Also included are



joystick and wheel controllers, as well as a 61-key, velocityand pressure-sensitive keyboard.

Also new from Korg is the MT-1200, a professional tuner with eight preset scales, including equal temperament, pure major, pure minor, and others. The MT-1200 also features two user-programmable memory locations and an 88note tuning range, as well as instrument jack inputs (mic or line) and mini jack outputs. Calibration for the tuner is from 392.0 Hz to 466.2 Hz by 0.1 Hz/step increments. Prices for both products are to be announced.

MORE FROM: Korg USA, Inc., 89 Frost St., Westbury, NY 11590. Tel: (516) 333-9100.

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# Korg T1/T2/T3 Advanced Integrated Synthesizers

Korg takes the Advanced Integrated synthesis of the M1 upmarket with three new "mega" synths. But are they out of this world or simply out of reach? *Review by Simon Trask.* 

**P OR MANY YEARS, the \$1000–** 2000 price bracket has been the starting point for new synthesizers, with subsequent synths in ranges progressively descending the price scale. To some extent, Korg has conformed to this pattern by following their M1 with the M1R and then the M3R rack-mount expanders. But the new T-series synths – the T1, 12 MARCH 1990

T2 and T3 – represent a more unusual move upmarket (into somewhat rarified financial heights in the T1's case).

The chief difference between the three new synths lies with the keyboard: the T3 has 61 keys, the T2 has 76, and the T1 has 88. Only the T1's keyboard is of the wooden weighted variety, and it's very nice too, sitting comfortably between synth and pianostyle action. In fact, its feel and range are spoiling me rotten – how can I ever go back to a five-octave plastic synthstyle keyboard?

alalala

All three keyboards are responsive to attack velocity and channel aftertouch. Increased keyboard span also means increased casing size and increased weight. At 77 lbs., the T1 certainly scores no points for portability. The T1 is also the only one of the three synths to have a control-wheel option (the others come fitted with the familiar Korg joystick). Also unique to the Tseries is the ability to import your own samples into RAM. This facility, about which you'll read more in a moment, is standard on the T1 and optional on the T2 and T3.

But in every other respect (synthesis capability, effects processing, sequencing power) the three T-series synths are identical. My primary aim in this review is to point out the differences between the "M" and "T" series instruments. If you're not already familiar with the M1, the original review in MT July '88 is probably a good starting point.

#### **The Basics**

Returning to considerations of size and weight for a moment, the T3 not only has the same keyboard span as the M1, it's damn near the same size and weight, so there are no benefits (or disadvantages) in portability between the two instruments. The most obvious physical differences between the M1 and T3 are the latter's larger backlit LCD window (64×240 dot), altered front-panel layout and the addition of an onboard disk drive (using highdensity double-sided 3.5" floppies only).

The two card slots for PCM ROM sample cards and RAM Program/ Sequence data cards have been retained. While Korg put the ROM slot on the rear panel and the RAM slot on the front panel of the M1, they are both on the rear panel of the T3. Wrong move, guys. The T-series synths retain the M1's 1/L, 2/R, 3 and 4 audio outs, headphone jack (carrying the 1 & 2

#### "Unique to the T-series is the ability to import your own samples into RAM."

stereo signal only), sustain pedal jack, two globally-assignable footpedal/ switch jacks and MIDI In and Thru ports. However, four MIDI Out ports, organized as A and B pairs, provide 32-channel MIDI output.

The larger LCD window not only allows more effective parameter grouping on the T-series, it makes possible some neat display tricks. For instance, when you press one of the Bank/Page buttons in the Program and Combination modes, a window pops up to prompt you with a list of the ten Programs or Combinations in that Bank. Whenever you select a VDF or VDA envelope parameter to edit, a graphic display of the envelope appears that changes as you alter the parameter values. And when you're editing the effects placement and output routing of the Programs, a diagram of the relevant configuration pops up in the LCD to help clarify what's going on.

#### **Programs & Combis**

The number of onboard programs has been doubled to 200, while the number of Combinations has remained at 100. Program parameters now include foot controller settings, scale type (equal temperament 1 & 2, pure major, pure minor and user-programmable – the latter within a "master" octave), as well as velocity and aftertouch curves (one of eight types in each case, affecting both onboard sounds and MIDI transmission). However, the synthesis architecture, the 33 effects and the utilization of those effects remain exactly the same as on the M1.

The Oscillator Mode still allows you to choose between Single (16-voice polyphony), Double (8-voice) and Drumkit (16-voice). Four Drumkits can be programmed utilizing the synth's Drum samples. The parameters are the same as those on the M1, with the exception that the number of sounds

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you can include in a Drumkit has been increased from 44 to 85 to accommodate an increase in the number of Drum sounds (see below).

Combination mode (in which combinations of up to eight Programs can be created) no longer includes the Single, Layer, Split and Velocity Split types, leaving only what was previously referred to as the Multi type – a Combination of up to eight Parts (or Timbres, as Korg call them). This isn't unreasonable, since all of the missing types can be created using the velocityrange and note-range window settings of individual Timbres. As on the M1, a single group of effects settings can be programmed for each Combination.

The T-series synths do include some new Combination parameters, however. For each Timbre within a Combination, you can now select separate internal and MIDI transmitted velocity and aftertouch curves as well as MIDI transmitted patch number and volume level. For all Timbres within a Combination, you can set the joystick functions (X, +Y and -Y), foot controller settings and a scale type.

However, the most significant difference between the M1 and the T-series synths is undoubtedly the latter's doubling of the onboard ROM sample memory from four to eight megabytes. In practical terms, this almost doubles the number of Multisounds from 100 to 190 and the number of Drum sounds from 44 to 85. Just to be clear, all of the M1's Multisound and Drum source samples are retained for compatibility purposes.

Added to the Multisounds are a healthy number of "real" instrument samples together with a mixture of tuned and untuned percussion sounds, a few synthy wavesweep sounds, and some more pulse and spectrum waves. The Drum section is augmented by a mixture of kit and Latin sounds in addition to some wayward metallic percussive sounds such as 'Potcover,' 'Techno Zap' and 'Gamelan 1 and 2' (some of which appear to have been derived from the Multisounds). In fact, the Drum section has a wonderfully eclectic range of percussive sounds, ranging from familiar kit sounds to the weird and wonderful, and should suit anyone who likes to be experimental with their rhythm sounds. Personally speaking, I love the T-series' combination of the ethereal and the metallic, the smooth and the spikey, and the overall sound quality of 'ice beauty.'

It's worth pointing out that MIR

owners can upgrade their expander's ROM sample memory to add the same extra sounds as are found in the T-series. If you've yet to buy an M1R, Korg is coming out with the M1R-EX – an M1R with the upgrade already installed. Both of these options mean forking out extra money, of course. [Contrary to initial reports, Korg has stat-

"The most significant difference between the M1 and the T-series synths is the latter's doubling of the onboard ROM sample memory from four to eight megabytes."

ed that M1 owners will be able to get the upgrade – in the form of circuit board replacement that must be installed by a service center. — Tech. Ed.]

Incidentally, the M1 doesn't implement MIDI Overflow mode. This means that if you want to use an M1 and M1R together for 32-voice polyphony, you have to set the M1 to Local Off, the M1R to Overflow On and route the M1R's MIDI Off back to the M1. The T-series synths make life easier by implementing Overflow mode.

#### Sequencing & Storage

The onboard sequencer in the T-series synths still has eight tracks, with each track able to play one of the synths' Programs at a time and dynamic allocation of the synth's 16 voices across all eight tracks. However, the number of Patterns has been doubled from 100 to 200 and the number of Songs from 10 to 20, while sequencer memory has been significantly increased from 4400 notes to a much more respectable 50,000 notes.

The structure and facilities of the sequencer are essentially the same as those of the M1's sequencer, with track and pattern-based recording as well as the ability to insert patterns anywhere in a track and extract a portion of a track into a pattern. Recording in real-time (including punch in/out and, in the case of patterns, loop-in-overdub) and step-time is available, as is event editing (benefiting from the larger LCD window on the T-series synths). The maximum length of a Track has been increased from 250 to 999 bars, while the maximum length

of a Pattern (and therefore the section of a Track that can be extracted) has been increased from eight to 99 bars. Sequencer resolution has been kept at 48ppqn, however.

One of the complaints I have about the M1's sequencer was that, although you can play a Combination via MIDI from an external sequencer, you can't use a Combination with an onboard sequencer track. Korg has rectified this situation with the T-series synths, but not in an entirely satisfactory way. You can now assign note-range and keyrange windows (using top and bottom values) for each sequencer track. Effectively, this means that you can recreate the texture of a Combination within a sequence, playing and recording onto the relevant tracks by setting Multi record. Since each Track can still only play one Program, the more Programs you have in your sequencer "Combination," the fewer sequencer tracks you have left (for playing parts on external MIDI instruments, perhaps).

Other new sequencer features include selectively filtering out types of events from the event edit display, appending one Song onto another to create a new composite Song, and programming foot controller settings, scale type, and velocity and aftertouch curves for a Song.

MIDI SysEx transfer of parameter and sequence data is essential for any MIDI device nowadays, especially when a company needs to maintain some degree of data compatibility between their instruments. T-series Programs, Combinations and Global data can be transmitted over MIDI in T1/T2/T3 or M1/M1R formats, while Sequences and All Data can be dumped to other T-series synths but not to an M1/M1R. Data from an M1/M1R can be loaded into a T-series synth via MIDI, while Korg ROM sample data cards can be read by all M-series and T-series synths and expanders.

M1/M1R Program, Combination, Global and Sequence data stored on a RAM card and preset M1/M1R Program data stored on a ROM card can be loaded into the T-series synths. Tseries Combinations, Programs (Bank A or Bank B) and Global data can be stored to RAM card and loaded into the M1/M1R, but T-series Sequence data cannot be stored or transferred in this way.

The T-series' onboard disk drive makes life a lot easier and a lot cheaper. If you have a T1 or a T2 or T3 with the RAM update installed, there are two

MUSIC TECHNOLOGY

possible disk formats: "Prog/ Combi/ Seq four files" (four files, each containing the complete contents of memory minus the PCM RAM samples) and "PCM/Prog/Combi/Seq" (one file containing the complete contents of memory, including the PCM samples). Memory must be saved to disk in bulk, but you can load Programs, Combinations, Patterns, Songs, Drumkits and samples individually or in bulk.

Korg has also given the T-series synths the ability to act as generic SysEx librarians, receiving and storing to disk SysEx files of up to 64K in length. Like most sequencers which tack on such a facility, it seems a bit half-hearted given the variety of transmission protocols in use (even the manual admits the synths can't handle all SysEx data). For instance, you can't send SysEx requests to instruments which aren't able to initiate their own data dumps.

#### Sampling the T-Series

As mentioned earlier, the T1 comes equipped with a 512Kword EXK-T PCM RAM sample board, while the same board can be installed as an option on the T2 and T3. If the sounds you load into RAM have been sampled at 44.1kHz, this gives you about 11 seconds of duration. The sample board's contents aren't retained on power-down, so you'll need to save any new samples to disk before switching off the instrument.

There are two sources of samples for the RAM board: samples from Korg's own DSM1 sampler (but not their earlier DSS1) and from forthcoming Tseries sample disks, and samples from any other sampler loaded via MIDI. Because the RAM board must convert from the DSM1's 12-bit resolution to 16-bit resolution, a special DSM1 loading routine is used - and then you can go and make the proverbial cup of coffee, because loading is a slow process. However, once you have DSM1 samples in memory, you can save them to another disk as T1 samples, in which case they'll load a good deal more quickly the next time. After trying out a healthy variety of Korg DSM1 sample library disks, I can say that the samples transfer very well to the RAM board, exhibiting clarity and good dynamic range.

But the more flexible option by far is to load samples into the RAM board via MIDI. Korg's synth will accept samples stored in MIDI Sample Dump 16 MARCH 1990 Standard (SDS) format. If your sampler can't transmit samples in this format, you'll need an intermediary stage: generic sample editing and librarian software.

For the purposes of this review, an Akai S900 sampler and Steinberg's Avalon generic sample software for the Atari ST were used in conjunction with a T1. The beauty of this setup is

"I love the T-series' combination of the ethereal and the metallic, the smooth and the spikey, and the overall sound quality of 'ice beauty.'"

that Avalon handles the translation from S900 sample format to SDS format for you. The only adjustment I had to make was to choose 16-bit resolution for the SDS transmission from Avalon, since the S900 is a 12-bit sampler and the RAM board appears to accept samples only in 16-bit format. Note that 12-bit samplers with the current version of the Sample Dump Standard can automatically convert to 16-bit resolution on the fly, eliminating the need for any intermediary device. - Tech. Ed.] By the way, if you're aiming to do a lot of sample transferring, a MIDI patchbay will come in handy - much manual repatching of MIDI cables is the alternative.

It appears that the T1 takes account of the sample rate, since there was no transposition of samples from the S900 to the T1 during my tests. The T1 also takes account of sample loop points, so that any instrumental sounds or rhythm samples using loops can be successfully transferred to the synth.

Once you've loaded some samples into the RAM board via MIDI, how can you use them within the synth? Well, samples are incorporated into the T1's four onboard Drumkits, with or without a selection of the 85 Drum sounds. If you think about it, this makes a lot of sense: a T1 Drumkit requires samples to be mapped across the keyboard, just as you would map samples across the keyboard on a sampler. Since samples can only be transferred individually to the T1, and there is no means of telling the synth how they should be mapped, multisamples from another sampler have to be recreated manually within a T1 Drumkit.

As you might expect, imported samples can be affected by any and all of the parameters that control Drumkits.

So as far as samples transferred via MIDI are concerned, I'd say that the best use of the RAM board is for turning the synth (or at least its Drumkit section) into a sampling drum machine. This allows you to incorporate anything and everything from your local scrapyard favorites to that essential looped breakbeat. Alternatively, some users might find it useful for sound effects.

Unlike SDS samples, it seems that T-series samples and resaved DSM1 samples can be loaded as Multisounds from disk into the Single or Dual oscillator configurations of individual Programs. Their sample maps are stored with the samples themselves in a way that can be read by the T-series synths. This opens up a completely different angle on the use of samples in the T-series, being as well suited to multisampled instruments as to multiple percussion and sound FX samples.

#### Verdict

I opened this review by drawing your attention to the unusual upmarket direction of the T-series synths in relation to the progenitor M1. However, there are precedents – notably Yamaha's DX5, Oberheim's Matrix 12 and Roland's JX10 synths. Each of these instruments is basically two of another instrument combined in a single box: the DX5 is two DX7s, the Matrix 12 is two Xpanders, and the JX10 is two JX8Ps. And each of them could rightly be labeled "megasynth."

The same label springs to mind for the T-series synths – especially for the Tl, given its price. But do the Tl, T2 and T3 also conform to the "two-in-a-box" philosophy of the other instruments? Well, compared to the Ml, a number of things have been doubled, but these don't include the effects processors, audio outputs, Timbres, sequencer tracks or voices (which would be "prohibitively expensive," says Korg).

Still, there's enough that's new on the T-series to warrant looking beyond the M1, particularly with the additional sounds, disk drive and the RAM sample board – a significant component which shouldn't be overlooked.

**PRICES:** T1, \$5669; T2, \$4169; T3, \$3749; EXK-T, \$250 (suggested installed price).

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

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#### upgrades & updates

#### Is your gear out of date? Maybe it's just not up-to-date. Check here regularly for the latest versions and upgrades available for your equipment.

D-50/D-550: Steinberg/Jones has released M.EX, a third party expansion board for the Roland D-50 and D-550 that features five new displays, 20 new parameters, and allows up to eight tones to be generated simultaneously. Each sound, which can be assigned to its own MIDI channel, has its own low and high note range settings. Memory storage is increased to hold up to 128 patches, with the option of adding a third bank for storing up to 192 patches. M•EX also offers the ability to transmit on two separate MIDI channels, to send program changes to individual tones, and a 'Panic Button' (which sends an All Notes Off message to the voices in case of stuck notes).

- Steinberg/Jones, 17700 Raymer Street, Suite 1002, Northridge, CA 91325. Tel: (818) 993-4091. M•EX retails for \$425.

■ Finale: Coda Music Software has upgraded its Finale music notation software to version 2.0. The new software eliminates numerous dialog boxes and replaces them with menudriven options and commands. Finale 2.0's new documentation includes the Finale Start-Up Guide, Learning Finale (series of tutorials), the Finale Encyclopedia (musical situations), and The Finale Reference. Version 2.0 also contains two more disks with libraries, tutorial examples, templates, music samples, and a revised version of Finale's Petrucci font.

- Coda Music Software, 1401 East 79th St., Bloomington, MN 55425-1126. Tel: (612) 854-1288. Updates are \$75 for registered users. Finale 2.0 retails for \$749, while Finale v.1.2.6 retails for \$599.

■ Model 2600 SY: Adams-Smith has introduced Level "K" software for its Model 2600 SY Synchronizer module. New functions include the ability to jog and shuttle VCRs and VTRs, as well as bi-phase-driven transports, using either pushbuttons or motion control knobs. This is supported by a new jog/shuttle cueing routine and "smart cueing," which provides automatic switching



Steinberg/Jones M•EX memory expansion for the D-50. March 1990

between shuttle speed cueing for short cues and wind speed cueing for long cues. A 3-digit code selection of specific transport control parameters from a "transport library" and an expanded Slow Re-lock mode are also included. Level "K" allows non-volatile storage of multiple sets of user-customized constants in memory, and setting of the timecode standard via serial protocols. - Adams-Smith, 34 Tower St.t, Hudson, MA 01749. Tel: (508) 562-3801. Level "K" is available to all System 2600 owners for \$45.

The Note Processor: Thoughtprocessors has released Version 2 of The Note Processor for printing, editing, and storing musical notation for IBM PCs and compatibles. In addition to printing to dot matrix, laser, and inkjet printers, PostScript compatibility is available as well. The musical notation software program is able to read and write standard MIDI Files, and is compatible with almost all MIDI hardware and software. The Note Processor can produce any kind of musical notation, including vocal and piano music, parts and scores, fugues and multiple independent voices on a single staff, figured bass, contemporary and early music, guitar chords, percussion music, and tuplets of any kind.

- Thoughtprocessors, 584 Bergen Street, Brooklyn, NY 11238. Tel: (718) 857-2860. With Version 2, The Note Processor has been reduced from \$595 to \$295.

Timecode Machine: Opcode Systems has lowered the retail price of their Timecode Machine to \$199, effective November, 1989. The Timecode Machine is a hardware device designed to simplify the synchronization of music tracks or sound effects to audio or video tape using SMPTE and MIDI Time Code. It can read and write all formats of SMPTE/EBU timecode, generate the non-standard "direct time lock," and includes software for the Macintosh computer, or optional Atari ST software. When reading SMPTE, the Timecode Machine generates MIDI Time Code from its MIDI port.

– Opcode Systems, Inc., 3641 Haven Drive, Suite A, Menlo Park, CA 94025-1010. Tel: (415) 369-8131.

Manufacturers: If you have software or hardware revisions or upgrades that you'd like MT readers to know about, please send info to: Updates & Upgrades, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311, or FAX: (818) 407-0882.

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# CEDAR : The Music Revival



As recording standards rise and CDs become cheaper and more popular, older recordings are decaying. If they are not to be lost forever, some method of music restoration must be found. Report by Gordon Reid.

ANY OF THE finest musical performances ever heard pre-date the development of modern high-quality recording techniques. Although the reproduction quality of hi-fi systems has vastly improved over the past 20 years, it's been impossible to go back

to the masters of these classic recordings and improve the fidelity of the original source material.

In addition, the quality and longevity of recorded media has improved dramatically in the past few years. Early recordings are consequently marred by frustrating levels of background noise due to the low quality and unavoidable deterioration of older media. This additional noise on the master recording obscures much of the fine detail present in the original performance, and affects all future commercial releases.

#### History

Four years ago, the British Library National Sound Archive decided to transfer their enormous collection of recordings to newer, more stable media. Music stored on records and tapes deteriorates even if stored in ideal conditions. When a shellac record decays, the whole surface of the disk can break up until you're eventually left with nothing at all to play. Even in the early

"The major problem for any restoration system is therefore always the same: how to remove the noise without eating into the music."

stages of decay, fungus eats into the surface causing significant noise and hiss. Tapes don't fare much better – the films become brittle, the oxides decay and, if badly stored, the edges become damaged. And that's before you consider the action of moisture, and the flexing of the materials caused by changes in temperature and pressure. Clearly, you can only store discs or tapes for a limited time before they become useless – and for early 78s in particular, that time is fast approaching.

The advent of digital recording techniques (optical disks as well as CDs and DAT) means that, for the first time, media are available that (in theory) are not going to deteriorate with time. The Archive therefore decided to investigate transferring their collection onto this new media, taking advantage of



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 the opportunity provided by the transfer process to "clean up" the musical material.

Their first step was the purchase of a Neve console with sophisticated digital filtering facilities, including a "scratch reduce" facility – but this was unable to perform more than the most superficial cleaning of the sound. The future lay elsewhere, so the NSA approached the signal processing laboratory at the University of Cambridge. The University convinced them that a computerbased solution was required, although in 1986, there were a number of technological problems still to be overcome.

Since all of the sound material would be processed by computer, it would have to be converted to a digital format, processed, and finally played back as audio. The initial development of a process called CEDAR (Computer Enhanced Digital Audio Restoration) was implemented using 12-bit A/D and D/A processors developed in Cambridge, but it wasn't until the advent of DAT that (relatively) cheap

#### "Since it's impossible to avoid the removal of some of the original signal during this procedure, the trick is to maximize noise reduction and minimize damage to the signal."

16-bit conversion and storage became available. An economical system was also developed to take DAT (or A/D converter) output and transfer it onto the hard disk of a PC by means of a special processor.

Finally, CEDAR required phenomenal computing power - beyond the capabilities of even mini and mainframe computers. This scale of computer installation would have made CEDAR impractical at best - who would pay the processing charges for a system running on a multi-million dollar computer? Early (and rather limited) versions of CEDAR were implemented on 25MHz 80386 PCs with 80387 co-processors. This configuration took a little over ten hours to process one side of a three-minute 78. It wasn't until February 1989 that a suitable microcomputer-based processor capable of handling over 50 million calculations per second became available. This enabled CEDAR to process a track in under one hour - still slow, but fast enough.

In view of these developments,

CEDAR Audio was able to open for business. Initial processing speeds of 13:1 were soon reduced to 5:1 for some operations and CEDAR is now capable of processing both mono and stereo material, with a maximum track length of two hours. A two-hour track requires 1,800,000,000,000 (almost two trillion) individual calculations to process. That's over 250 million calculations per second of material.

#### How It Works

CEDAR restoration is now performed by a subsidiary company based in Cambridge, imaginatively called Cambridge Sound Restoration. The most startling thing about their production office is the lack of heavy-weight computing power. The only machines in evidence are Compaq and Dell PCs, plus a Macintosh network for company administration. The real computing power is hidden safely away inside the PCs. In addition to the computers are banks of audio equipment - Sony DTC1000ES DAT recorders, reference quality amplifiers, as well as Quad Electrostatic and Rogers monitors.

The specification of CEDAR states that it should be able to remove unwanted noise and hiss from a recording, but not interfere with the signal content in any way. Therefore, it's not possible to use conventional filtering techniques, which will always act equally on signal and noise. Somehow CEDAR has to be able to differentiate between the two.

The folks at CEDAR Audio have grouped all of the different manifestations of noise into four broad categories. First a recording is scanned for large disruptions such as gouges or even breaks in a record. Second, the signal content is analyzed to identify extended surface noise. Next the clicks and scratches characteristic of record wear are located. Finally, the hiss (white or "colored" noise) content of the recording is analyzed. The first three of these categories are made up of individual events (fondly known as Snap, Crackle and Pop), but hiss is continuous within the overall signal.

Consequently, CEDAR is constructed from four independent signal processing building blocks, each designed to process one of the specific classes of audio degradation. Within the four main processes are further sub-processes, which become progressively more specific to the elimination of a given type of degradation. This enables the CEDAR operator to apply a "sharp tool" to the degradation, rather than hitting the audio material with the proverbial sledgehammer.

#### Thumps

The large thumps caused by deep gouges in a disc, the peeling away of fragile shellac surfaces, the seam of an early cylinder, or a break in a record, sound like large but discrete scratches. However, if they are treated by simple scratch removal techniques, an annoying "pinging" sound remains. This is caused by the consequences of the thump (such as resonance in the cartridge and tone arm) remaining after the initial event has been removed. Without the context of the thump these resonances are extremely distracting, and it may sound better to leave the recording unrestored.

As a result, both types of degradation must be removed simultaneously. Even with this system, a poorly performed restoration will still leave a lowfrequency "shadow," which is evident in early Cambridge Sound Restoration work. Current versions of CEDAR can remove thumps in most musical material and even in ideal listening conditions, the operation is undetectable. And since no editing takes place, the precise timing of the music is always preserved.

#### **Scratches & Noise**

There have been many attempts in the past to remove clicks and scratches from old recordings. Both mechanical (reading the "cleaner" side of a groove) and electronic (using delay lines and impulse limiters) methods have been employed, and these usually succeed in removing some of the unpleasant effects of scratches.

Unlike thumps, scratches are discrete events in a signal waveform. It would be relatively easy to remove all clicks from material if no genuine signal ever imitated a scratch. Unfortunately, there are many transient waveforms that look similar to scratches when viewed on a computer screen, but are nevertheless important constituents of the music.

To separate signal from noise, CEDAR scans the entire musical passage and then constructs a model of the signal – what events are present, and what reasonable boundary condi-

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 Please allow 6–8 weeks for your first issue. tions can be established for the ranges of these events. Examples of these boundaries are maximum and minimum dynamic range, rise times and frequency responses. The actual signal can then be compared with the model and a decision made regarding unusual events. If an event is determined to be anomalous, it is then straightforward to eliminate it.

However, some scratches last for appreciable lengths of time (up to 150ms) so there must be a means to remove the scratch without causing a total break in the signal and without resulting in time compression. There are a number of ways to maintain a continuous signal after a chunk has been removed. These can be grouped into three broad categories – splicing, re-synthesis, and interpolation.

Splicing, as its name suggests, involves cutting and pasting a section of the signal into the gap caused by the scratch removal. The inserted section can be chosen from a number of sources and, if smoothed, will give a (mostly) glitch-free signal. However, there will often be a loss of high frequencies (due to the smoothing).

Re-synthesis is a better, but more complicated method than splicing, and requires the construction of an artificial signal ("carved" from white noise) to fill the gap. This is real Honors math stuff, so we'll move on to interpolation. This involves looking at either side of a gap in a signal and asking what signal "events" must have happened in the gap for one to have become the other. Simple in principle, interpolation is fiendishly difficult to implement because a musical signal doesn't follow simple mathematical rules (not with an 104-piece orchestra, natural reverb, EQ and studio enhancement it doesn't).

CEDAR's approach to scratch removal is based on using each of these methods, or a combination of them, where most appropriate. To help in this effort, the developers have devised a program that takes a known signal and removes a section from it digitally. The scratch removal process is applied to this material, and the validity of the result can be tested against the original signal. The knowledge gained is then used to update the software. Clever stuff.

CEDAR has to deal with some very

810.9





Figure 2. Detail of original signal.



Figure 3. De-scratched signal



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#### **Roland D110**

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overs multitimbral set-ups, MIDI, tweaking sounds and programming. Divided into two sections: Section One covers basic operations and multi-timbral combinations. You learn hook-up and play, architecture, setting up the internal system, MIDI implementation, timbre edit/performance controls, setting up rhythm sounds, patch edit/custom multi-timbral combinations, multi-timbral recording scenario, tweaking sounds, data management. Section Two includes tone programming and basics of sound. Editing procedures are outlined as well as tone structure, waveforms selection, pitch modulation, timbre parameters/synth waves, amplitude, putting it all together.

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old and badly-degraded material. The maximum number of scratches vet encountered is over 2000 in one second of music. The random nature of the clicks (in time, intensity and duration) creates a sound like bacon frying. (The term "bacon" has become a quality control description - along with globular, glassy, frangy, and threatening.) As the number of scratches and their amplitudes increase, the bacon eventually dominates the output. In theory, there will eventually be very little signal left - other than the noise of the scratches. But even 2000 discrete clicks in a second of material can still leave up to 96% of the signal information intact, and CEDAR can handle this level of degradation very effectively.

#### **Broadband Noise**

The challenges presented by hiss removal are some of the most important areas of current signal processing research. Unlike modern recordings, which can be made with very low noise, an older recording cannot shed its hiss through conventional techniques. It's no good applying Dolby SR or dbx if the recorded material contains its own noise. CEDAR has to attack the noise at its source. After all, if a relatively noise-free digital master can be made from the CEDAR restoration, subsequent copies of the material will only suffer from the noise associated with the modern playing medium - not from hiss recorded in 1940.

Noise is caused by the presence of random frequencies at random amplitudes in addition to the information contained within the musical signal. If high frequencies predominate, you'll hear hiss. Low frequency noise produces rumble. Unfortunately for the restorer, the noise is part of the continuous audio signal and cannot be differentiated in the way that scratches and clicks can. If a hissy signal is viewed on screen, the noise components are indistinguishable from the important contents of the sound.

The major problem for any restoration system is therefore always the same: how to remove the noise without eating into the music. Compression will always occur if the signal is downgraded in any way, and it is impossible to remove 100% of the noise while leaving 100% of the desired sound behind. Consequently, all previous attempts have failed to remove just the unwanted noise and thus suffer from serious amplitude and frequency compression.

One of the innovations of CEDAR is a unique method for determining the amplitude of noise frequencies at any time throughout a recording. Given that CEDAR can accurately track the changing noise characteristics, it can then adapt its reducing processes accordingly. Degradation such as surface noise (which can be inaudible one moment and intolerable the next) can be tracked and the noise reduction dynamically tailored as appropriate. Since it's impossible to avoid the removal of some of the original signal during this procedure, the trick is to maximize noise reduction and minimize damage to the signal. Unfortunately, the actual mechanics of these subtractive processes are covered by worldwide patents and CEDAR Audio is giving away no information regarding them.

However, CEDAR Audio does admit that the final result of processing can only be judged by listening. They've found that some clients require severe noise reduction, even if this leads to 3–4dB of compression, while others prefer to sacrifice noise reduction to ensure that there's no modification of the signal. Consequently, much time is spent matching the restoration parameters to the given requirements.

Tracks may sometimes not be fully restorable because the quality of the

#### "Even 2000 discrete clicks in a second of material can still leave up to 96% of the signal information intact – CEDAR can handle this very effectively."

input material is extremely poor. On these occasions, the client is offered partial restoration, and supplied with a number of differently processed samples. It's then up to the client to decide whether any of the compromises are acceptable.

#### The Acid Test

How good is a CEDAR restoration? The answer is: sometimes good, and sometimes fantastic. Cambridge Sound Restoration produces a demonstration DAT that highlights each of the restoration processes. To hear a broken, scratchy and hissy 78 transformed into a clear, bright recording is astounding. Other demonstrations on the DAT include noise removal on a damaged optical soundtrack, full restoration of a number of other 78s, and hiss removal on a selection of masters from the '40s and '50s. Each restoration is preceded by the original track and it's clear that there's no cheating going on. In fact, each demonstration is taken from work sent in by customers and many have been released, or are scheduled for release, on CD.

Faint modulation effects are audible on some restorations, and are more annoying on some than on others. These are side effects of the hiss reduction processes and never occur during scratch or thump removal. Constant updating of the system is reducing the incidence of these side effects all the time, and the record companies are clearly happy trading high noise levels for occasional "glassiness."

Although CEDAR has many abilities based on sophisticated digital audio filtering and other manipulations, CSR adamantly refuses to make judgments about how a recording should have sounded. The philosophy of CEDAR audio processing is to restore musical material to its original recorded quality. No attempt is made to compensate for effects such as wow and flutter, which may be a consequence of the recording equipment available at the time of performance, or to add modern enhancements such as equalization and artificial ambience. What CSR returns to their clients is a re-creation of how the material actually sounded on the day it was recorded, as accurate as it's currently possible to produce.

CEDAR Audio is currently developing additional processes to remove certain types of distortion and compensate for the frequency limitations of early gramophone recording systems. Early tests on the algorithms have been quite successful, but they say that it will be some time before these services will be available to customers.

Garbage In, Garbage Out is a common phrase in computing circles and it applies to audio restoration as much as to any other field of processing. Many recordings are transcribed poorly, turntables are poorly set up, tape machines have dirty heads, azimuth errors, poor speed stability...and these are the ones in professional studios. CEDAR certainly cannot make a bad recording good, but a good recording buried in noise can be improved to a degree that would have been unthinkable only a few years ago.



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The Thompson Twins return to the world's attention with a ruthless album of sex-tinged, tongue-in-cheek snapshots of reality. Interview by Dan Rue.

F THERE'S A rock 'n' roll reality, then we're the alternate surreality," Tom Bailey announces matter-of-factly. "We don't like to write songs which sound like the kind that 'make me feel good inside, babe,' y'know. We get a little bored with those things, those sort of tried and true traditions." Bailey's manner is unassuming, unpretentious. "You know, hang out in bars and end up in fights and blah, blah, blah. It's too boring is what I'm saying."

Alannah Currie is seated next to him, outrageously dressed in a broadstriped dress, platform shoes and a

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ridiculous black hat. When she had first walked in the door, she resolutely exclaimed, "I really am a Dr. Seuss fan...The Cat In the Hat and all that." Now, she extends a hypothesis: "A lot of those songs have been written by people who have been on the road too long, and actually have no inspiration. That's what happened to us. And that's why we stopped."

As the Thompson Twins, Tom Bailey and Alannah Currie have been turning reality on its ear for 11 years. Their popularity has waxed and waned since the tremendous success of their first album, *Side Kicks*, which was released in the US in 1983. They stormed the dance and pop charts with a drove of hits including 'Lies,' 'Love On Your Side,' 'Into The Gap,' 'Hold Me Now,' 'Don't Mess With Doctor Dream,' and others. Now the Thompson Twins are waxing again with their first self-produced album that arguably contains some of their finest efforts. *Big Trash*, 'Sugar Daddy,' 'Bombers In the Sky,' and a portrait of Deborah Harry entitled 'Queen of The U.S.A.' have already met with a very positive public response.

Bailey and Currie took a break from the music business after their last

album, Close To The Bone, to facilitate the birth of their son Jackson, and experience strange new cultures. "We were in a really remote part of Ireland, and then we went to India, up in the Himalayas," Currie recounts. "And then we came back and lived in the city after those two places. We had no TV, we lost touch with urban living completely. We went back and lived in London, right in the guts of London, and suddenly we got culture shock from our own culture. Suddenly it seemed really bizarre, like people were doing the most bizarre, surreal things." She breaks into a smile, "We just laughed our faces off for about two months after we came back. It was just peculiar and odd, like being really

Currie: "Rock 'n' roll should be looking at the undersides of paintings, and in museums – up dinosaur's noses – I don't know, anywhere. But not at the conventional."

trippy and in a dream. Right after that, we started writing the album."

"It's really healthy to cast the net of reference wider, so that rock 'n' roll isn't just talking about the same old things," Bailey explains. "Rock 'n' roll should be looking at Chinese music-"

"-opera!" Currie interjects, "and not even just music. It should be looking at the undersides of paintings, and in museums – up dinosaur's noses – I don't know, anywhere. But not at the conventional."

Their thought patterns are synchronized as Bailey rejoins, "And too many successful bands refer to other successful bands. Like, y'know, you're at Number Five on the charts and you see who's at Number Four, and you think, well-"

"-Let's be like U2 this week, or let's be like The Church, but more commercial," Currie mocks. With a wave of the hand and a roll of the eyes, she declares, "Who needs it? Just go and do something else new and exciting. That's what rock 'n' roll should be, otherwise it will die."

But rock 'n' roll is not dead, certainly not for the Thompson Twins. Their experiences have served them well. Their broadened creative scope is clearly evident on *Big Trash*, and comparing it to their previous album, their sentiments are strong. "I think it's as different as you can get from the previous one," says Bailey with



an almost disgusted look on his face. "Mostly because I hate that one, and I like this one."

Currie ponders, "I don't know...it's funkier. It's less inward looking." She pauses, then adds, "It's...like...more *bizarre*. It's more out there. It's groovy. It's got crueler sounds on it. And it's quite hard, I think, and *sleazy*. All those things."

Bailey nods in agreement and Currie continues, "We didn't purposely think, 'Ooh, we're going to make it different from the one before. That's how we were feeling at the time, you know. Sort of urban and sleazy...and cruel and hard." She grins mischievously, "It's like sex-tinged around the outside."

HE ADVANTAGES OF a twomember band are many, as Bailey and Currie will testify. Currie writes the lyrics and Bailey writes the music. "There's no competition," Currie explains. "We do what we do separately and well, and so we work together and it makes the two parts, in this case, better than the separate parts."

Bailey agrees, "I truly believe that it keeps things dynamic. See, if two people disagree then you've always got a debate, which is the fascinating thing. And as long as you can agree that it's fine to disagree and have the debate going, then it keeps you moving on. To disagree about something, and then want to prove to each other that some strongly held belief is correct is what brings up the great stuff. It may be partly due to working together for a long time, and partly the fact that we've had a personal life together for a long time, that's allowed us to realize that it's okay to have these blistering arguments, because something always comes out of them." Bailey laughs, then recounts, "People say, 'How can you possibly work and live together? Doesn't it drive you crazy?' But it drives you crazy in a good way. If you do your maintenance, if you look after each others' sanity, then it's great."

For Bailey and Currie, songwriting is very much a process of cross-

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examination, checks and balances. "We often start off just talking about the sorts of things that we could be writing songs about. You know, just ideas," Bailey explains. "Eventually a phrase will come up that we consider to be either a chorus or some sort of hook. Perhaps it has a certain memorability about it, a certain hit-ness maybe, a certain natural rhythm and maybe even a natural melody. When you speak with it, you tend to want to do it in a certain way."

This process has settled well with them, as Bailey will attest. "We have realized that coming up with the hook first is so much more effective because then everything else falls into line with what you do. There's a magical moment when you know what it's going to be about."

Once the cornerstone is in place, they carry on with their respective jobs. "Then we split up," says Bailey, "and I work on the melody and rhythm of that phrase, and from that extract the feel for the basic groove and all the rest. In a different room, meanwhile, Alannah's extrapolating all of the lyrical possibilities."

The grilling then begins. "I must say that it's easier when there's two of you, and you're not only writing but playing everything and then producing it yourself and doing your mixes. Because as soon as a lot of other people are involved it tends to get diluted." Bailey details the process, "You have a vision of the song, and that vision is caught in an attitude. And the best things happen when you can hold that attitude all the way through from the very first moment to the last mix. So we always check the attitude at any given point – 'Remember what we thought when we first...' – that sort of thing. I think that's good. It gives a truth to the process. You know, I'm not talking about a look inside my innermost profound thoughts. Just the truth of the attitude."

AILEY'S PRIMARY WORKING tools are the Fairlight Series III and guitar, but in fact he plays pretty much all of the musical parts. "I'll have a go at anything – the only instruments I can't claim to have any facility with are the brasses. I wouldn't really know what to do with a trombone," he says.

Concerning synthesizers, Bailey's instrument of choice is Oberheim's old analog classic, the OB-Xa, replete with knobs and switches. "I believe people don't do enough synthesis these days. There are a lot of keyboard players who, because they have so many factory sounds now, are spending more time on sequencing and the notes that they're playing, and less on synthesis." Bailey's eyes light up. "The thing that I always thought was great about synthesis was just spending hours creating new little adjustments of sounds. I still use the Oberheim OB-Xa, because it's a big fat thing with great sound, and you do this-" Bailey's hands fine-tweak an array of imaginary knobs and switches, "whereas now you press two numbers and get a great sound and start playing. Honestly, both are good, but I mourn the death of synthesis on a popular level."

With the Fairlight as their primary

working tool, sampling is an important part of the Thompson Twins' sound. In fact, their occasional sampling sprees have proved nothing less than an excellent adventure at times. "We got a chicken once," says Currie, "squeezed it and got a chicken. It was on 'Love Jungle.'"

"On this record," Bailey remarks, "Alannah's car makes quite a big impact."

Currie gazes at the ceiling, thinking aloud, "Did we get a duck fart?" Bailey shakes his head. "I think we just wanted one and we couldn't get one. We thought that would make a good bass drum sound."

"Well, we had crows," Bailey offers as reconciliation. "And we have a great snare, which is a basketball. And a couple of newspaper *fwaps* which became great snare clap type sounds – favorites of mine." He demonstrates with an imaginary paper, "You know, you get a bunch of newspapers and *fwap*." Slipping into an abstract perspective, Bailey reflects, "See, to me they even stop being unusual. They're just more sounds. It's funny the first time you do it, then it becomes part of your normal repertoire of sounds."

"You know, it's fantastic for a percussion player, this whole sampling thing," he continues. As a percussionist, Currie nods her agreement while

Bailey: "I'll have a go at anything – the only instruments I can't claim to have any facility with are the brasses. I wouldn't really know what to do with a trombone."

Bailey illustrates. "You could never actually say, 'Okay, set up ten fire extinguishers and start playing a tune on them.'"

Currie rejoins, "Yeah, it's extraordinary. It's really brilliant. You can actually make whole rhythm tracks out of fire extinguishers with, you know, the up beat of a circus carnival. Or do whole percussion rhythms with smashed bottles, or mix smashed bottles with a snare drum, and stuff like that."

"I think that attitude is pretty healthy," says Bailey to Currie, "because the technology that everyone said was going to kill the art of percussion has actually blown it wide open. So those that are hip to it and actually want to get on the case have even more fun than they had before." Suddenly Bailey remembers a trade secret that he'd been itching to divulge. "Hey, one thing I must tell you about, which is a fantastic discovery," he begins. "People who use drum machines sometimes put the drums through a speaker and then record the room to create a real ambience." He gets that knowing look in his eye. "Well, my theory is that it doesn't work, because what they think they're doing is using the sound of the room to tie their kit together. In other words, the sample of the bass drum, snare,

#### Bailey: "I believe people don't do enough synthesis these days. I mourn the death of synthesis on a popular level."

toms and hi-hats could even have come from different parts of the world and now you're trying to join them together to make a drum kit. They put the drum kit through the speaker and record the room, thinking that it's going to make it sound like the kit's in the room," says Bailey, explaining the practice. "But they're not doing that. What they are doing is using the speaker to join it all together, right?"

Bailey offers dramatic pause. "I came up with this crazy idea that if you really want to use the ambience of the room to join the sounds together then you should put each individual drum to its own speaker." He huddles in as the plot thickens. "Then I thought, 'Well maybe the size and position of the speakers should reflect the nature of the drums.' So we built this kit out of speakers - the biggest speaker for the bass drum, the twelve-inch speaker facing upwards for the snare - then record the room with a pair of stereo overheads. It's the most fantastic sound I have ever-" he shudders with delight, "- y'know, once in a while you discover a sound. Knockout. Absolutely amazing."

HILE BIG TRASH was the first Thompson Twins record produced by Bailey and Currie themselves, they had already put their talents as producers to work with several other artists, most notably on Deborah Harry's latest album, Def, Dumb and Blonde. (For elaborate details on their studio technique, check out the March '90 issue of Home & Studio Recording.) Their experience with Harry led to the creation of their *Big Trash* single, 'Queen of The USA,' and a humorous anecdote to boot.

"You see, we wrote this song for Deborah called 'I Want That Man," Bailey recounts. "One of the lines that Alannah had written in the song was, 'I want to be the queen of the USA.' And while we were recording with her, Debbie did this little impersonation of a bag lady, like a crazy woman saying, 'I'm the queen of the USA!'"

"She's a very, very funny person," laughs Currie. "She used to do these little performances for us. Then that subsequently became 'The Queen of The USA.'"

"So it wasn't written for her, but about her," Bailey explains.

"It was about her," concedes Currie. "Debbie, the bag lady, and also the Virgin Mary."

Without explaining the Holy Mother's contribution to the character, Bailey continues, "Eventually we said, 'You know, when you come over to London next time, we'd like to do a little something on this track, because it's sort of about you.' But she wasn't planning to come over, so it had to be done by phone. And I thought, 'Well, that's great anyway, because that's the

**World Radio History** 

sort of crazy thing that the queen of the USA would do.'"

Recording a telephone conversation in real time to tape also presented its own curious learning experience, as Bailey explains. "I feel it's a bit of recording history, because we were recording in a room in London and she was in New York. We actually had to shift it around a bit because of the delay." Reflecting on the significance of the event, he continues, "I think that we're probably looking at a time in the not-too-distant future when studios in different parts of the world will link up with video and audio tie-lines, and they'll be time corrected. So if the Stones are making an album in the Bahamas and they want Eric Clapton to do a guest appearance from the Palace ... "

The conversation continues as the various permutations of such a trans-global technology are expounded. Would this cosmic stage broaden our perspective as to the nature of reality? Or would it shatter our conceptions of music, warp our conceptions of real time, thrusting them into the realm of surreality? Currie ponders, "I don't know. I just think life's generally quite surreal." ◆



MUSIC TECHNOLOGY

# Dr. T's Hitman

A new companion program to help you better create a hit list. Review by Mihai Manoliu.

HITMAN IS A collection of software tools designed to make life a lot easier for the composer writing music to film or video using SMPTE timecode. Although specifically developed to be used with Dr. T's KCS and a Phantom box within the Multi-Program Environment (MPE), Hitman will work with any sequencer supporting the MIDI File standard. The program can be used in any of the four SMPTE formats, and will run on any Atari ST system. Although somewhat pricey (at \$249), Hitman can be extremely helpful.

Hitman is intended as an aid to efficiently structuring a hit list. By using various types of analyses and calculations, as well as a great graphic display environment, a tempo map can be generated to provide accurate placement of hits and meter changes that coincide with musical flow. A sound effects option allows the user to define specific notes for triggering sound effects. Files are saved in MIDI File format or the KCS TRK format, and then imported into a sequencer. The tempo map then controls the music flow, and sound effects are triggered at the appropriate points. All that remains to be done is the recording of musical sequences.

There are three primary working areas within Hitman: the Main Editing Screen, the Graph display, and the Sound Effects editor. Most of the critical information is displayed in the Main Editing Screen, where a sequential list of the hit points includes SMPTE time, action description, bar/ beat location, time signature, and musical idea description (sound effect, KCS sequence name). At the bottom of the screen is the editing area. Click on a hit in the list and it appears here so you can edit the time or text - beats are calculated automatically. The list can contain up to 99 hit points.

The Graph display is an excellent tool, useful for the creation of the tempo map. Hit points are represent-32 **MARCH 1990** 

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Hitman Main Editing Screen

ed as arrows pointing to a position on a ruler-like graph dividing each beat into twenty-four ticks. Under the ruler are indications of the bar/beat number or the absolute beat number, depending on your display choice. Below that is the elapsed time in minutes and seconds.

Clicking on an arrow displays that point's complete information from the Main screen, and by right-clicking on a new position (to place a meter change at an even bar or beat location, for example) it is possible to "move" the event to that position. Hitman actually recalculates the tempo map so the point occurs at the correct location without changing it's SMPTE time. This extremely powerful feature, when used in conjunction with several other tools, can greatly simplify the structuring of a complex hit list.

The Sound Effects editor provides the ability to integrate sound effects into the musical score. Up to 99 events can be entered into one file that can be saved separately. A name, note, channel, velocity, duration, and program change can be specified for each event. These events are triggered at the indicated time and edited on the Main screen.

Among the other tools in Hitman is the Analyzer, which is used to "finetune" the tempo to within 1/10th of a beat once a general tempo has been determined. The Calculator can find the number of beats between two timings at a desired tempo or the tempo required for a specified number of beats between two timings. The Tempo Map is a list of tempo and meter changes used by Hitman to determine the beat

locations of timings. The Global option can be used to make timing changes when a cue has been re-edited, or to reset the SMPTE offset. A desk accessory that calculates delay times for different tempos is also provided. Finally, the Print option can be used to print the hit list or the Graph (only an Epson-compatible printer works for the Graph).

The program is especially powerful when used within MPE in tandem with a Phantom SMPTE box and KCS or Level II for sequencing. A hit list can be typed into Hitman and the note hits can be transferred directly into a KCS track or sequence. The tempo map can also be transferred into the KCS conductor track. In addition, you can play your hits into a KCS track and then import that as a Hitman list for further editing. By using the Phantom to sync to SMPTE, you can tap your hits right into the list. The Tap Tempo feature can be used to create a tempo map "on the fly."

Hitman is fairly easy to learn, although some experimentation is called for due to small weaknesses in the manual. However, most of the manual is good, and includes a useful Glossary and an Index. If you are planning on writing music for a visual medium, Hitman can be a time-saver and an effective way to structure the creative process.

#### **PRICE: \$249**

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

# Cool Shoes Software Drummer

#### A cool "Auto Fill" feature enhances this drum machine pattern editor for PCompatibles.

*Review by Robert Scott.* 

DRUMMER IS A computer-based drum machine pattern editor for the IBM PC/XT/AT and compatibles from Cool Shoes Software. With it, you can create and edit drum machine patterns and combine those patterns into entire songs.

The program runs on just about any configuration of PClone with at least 512K of memory, but you must have a mouse in order to operate all of its functions. All graphics adaptors (except low-res CGA) are supported. An MPU-401 or compatible MIDI interface is not required, except when you want to play your patterns and songs (or "scores" as they're called). Drummer also runs on the Yamaha C1.

Thankfully, the program is not copyprotected, so installation is a breeze. The program disk includes the program itself, a print screen utility, several preset tables, and a number of screen fonts, each of which are optimized for different display adaptors. The manual is quite clear about **h**ow to use these files to configure the program to your system.

To evaluate the program, I used an AT-compatible computer with EGA graphics, a Microsoft serial mouse, and an MPU-401 in conjunction with an Alesis HR-16 drum machine. After an initial title screen, Drummer displays



the Pattern Page, one of its two working screens. The pull-down menus across the top of the screen reminded me of the Macintosh user interface, which is consistent with the requirement for a mouse.

The majority of the Pattern Page is occupied by a grid that represents one measure (called a "pattern"). The grid consists of 20 rows (or "lines") and a number of columns determined by the user-specified time signature and beat division. Drummer can handle up to eight beats in a measure and can divide each beat into as many as eight parts, so the maximum grid size is 20 lines by 64 columns.

Each line represents a single instrument in your drum machine/sound generator, such as the bass drum or closed hi-hat. Entering notes into the pattern couldn't be easier: simply move the cursor to the intersection of the desired instrument's line and rhythmic position and click the mouse button. The volume of the note is determined by the loudness control on the right side of the screen and indicated by the "fill pattern" within the box that appears at that location in the grid. To remove a note, click on it again.

Each line in the grid is controlled by several parameters including a name for the line, the MIDI channel over which that line's notes will be transmitted, and the MIDI note number sent by that line's notes (allowing Drummer to control any MIDI sound module). There are also two "Auto Fill" parameters that I'll get to in a moment.

This line information can be stored as a separate file (called a "Line Information Table") and loaded into Drummer, although it will apply only to the currently selected pattern (out of a possible 25). Several preset Line Information Tables are included on the disk for devices such as the HR-16 and the Sequential Drumtraks in addition to a table that plays a major scale.

Having entered some notes into a pattern, I tried to play it by clicking on the Play button. But the HR-16 started to play its own internal pattern instead. I discovered that you must disable the drum machine's response to MIDI clocks, which are sent by Drummer. This is one of the few things I was unable to find any mention of in the manual. After making that small correction, everything worked fine.

One of the coolest features of this program is called Auto Fill. With it, you can tell Drummer to randomly insert notes into any line at any unused



rhythmic position. The two Auto Fill line parameters are called Fill and Loudness. The Fill parameter lets you specify how likely it is that a note will be played at any unused rhythmic position. For example, a "5" indicates that a note will be played at any unused rhythmic position in that line 5% of the time. The Loudness parameter lets you specify the volume of any notes played by Auto Fill.

The purpose of Auto Fill is to simulate human variation. A live drummer wouldn't play exactly the same pattern over and over, so this function provides that random element. I must admit that it does help make the pattern sound more interesting, although Fill values must be selected with some care.

Once you have created several patterns, they can be chained together into a score on the Score Page. This page consists of a grid of 25 lines (each representing one of the 25 patterns) by up to 2000 measures. Placing patterns in the score is as easy as placing notes in a pattern – simply point and click.

Drummer can save and load several types of files. In addition to Line Information Tables and files that include all information about the current state of the program (patterns, score, line information, MIDI settings, etc.), the score can be saved separately in Drummer format or as a Standard MIDI File. This allows you to export a score created in Drummer to another sequencer.

Overall, I like Drummer a lot. It's easy to use, and the Auto Fill feature is particularly neat. If you use a PCompatible in your studio and you find it frustrating to program your drum machine, you should definitely check it out.

#### PRICE: \$79.95

MORE FROM: Cool Shoes Software, P.O. Box391, Burlington, MA 01803. Tel: (617) 229-9942.MUSIC TECHNOLOGY33

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PROGRAMMING COMPLEAT



Part 2: The Singles Scene



#### The inner workings of the K4's Single programs are revealed in this month's installment. Don't miss the party! Text by Lorenz Rychner.

AST MONTH, WE looked at the various ways by which you can select and edit drum sounds on the K4, and explored how each drum assignment can be a combination of two sound sources selected from the PCM Drum and Percussion Group (see Figure 1) or from any of the 256 waveforms in the K4 memory. We also walked through the parameters that are used to edit Multi programs.

In addition to the Drum Edit and Multi Edit modes discussed last month, there is a third Edit mode in which you can create "Single" programs. Here 36 MARCH 1990 you'll find that the traditional oscillator/filter/amplifier setup lets you proceed as if you were dealing with a traditional analog instrument (except that the K4 is, of course, totally digital). The pitch remains rock stable, the digital filter with its resonance parameter is smooth and quick to respond to modulation, the sound quality is crisp and clean.

#### Singles Get Together

A Multi program can play up to eight Singles at once. Each of the eight Singles can be played separately by keyboard region, by velocity (hard/ soft attack), or by MIDI channel if played from an outside source rather than the K4 keys. They can also be layered together to create a new, composite sound.

Here's a step-by-step example of how you might create a layered sound, with the following arbitrary scenario in mind. Let's say that you've decided that you're after a Multi program that sounds vaguely orchestral, perhaps for sinister or martial scenes in a movie. But you want to have some synthesized elements in it – you don't want to create yet another poor man's imitation of an orchestra. So you go shopping for sounds. Listen to a bunch of the factory Singles, and make a note about a few of them that you can imagine contributing part of the total sound you're after. After awhile, you select 'A-3 ArcoString,' 'A-7 Voices,' 'A-10 Analog Syn,' 'A-1 OceanWatch.' Take a listen to these Singles. Can you imagine what the total blend might sound like?

Now you need to put these Singles together to create a new Multi. The K4 doesn't have an "initialized" setting to use as a starting point to build new programs. You'll need to start by changing an existing program, so it might as well be a Multi that's already similar to the one you're shooting for. Multi D-14 happens to use four Singles, so it's an ideal candidate. But what will happen to it when you're done building the new Multi?

If you want to keep the new Multi, then you'll have to sacrifice one of the current 64 Multis (it doesn't have to be D-14), unless you have a RAM card with partly unused memory, or a computer for external memory storage. How do you sacrifice an existing program in favor of a new program? Press the Write/Dump button repeatedly and check out the 13 different screens.

Fortunately, there's a safeguard built into the K4 to help you avoid making silly and possibly costly mistakes. Press the Write/Dump button five times and you'll see the 'Internal Protect' screen. If it's value is ON, you can't write anything into the internal memory. Use the Value slider to turn it OFF just before you're ready to write, and turn it back ON soon afterwards. The K4's Memory Protect status is retained while the power is off (some other instruments reset it to ON automatically).

#### **Assigning Singles to Sections**

Once you've selected Multi D-14, press Edit and button 'A.' Use buttons 1-4 to select the Sections (displayed as 1234----) and use the Value slider and the -NO/+YES buttons to assign Singles A-3, A-7, A-10, and A-1. Now play the keyboard. If your K4 still has the factory setup, then you should only hear one sound, Section 1, which plays 'A-3 Arco Strings.' Press button 'C' twice to display the trigger response mode, and set all four Sections to Keyboard or Mix. Now you'll hear all four Sections respond to the keys. (If you don't make this change, Sections 2-4 will respond only to incoming MIDI messages.)

Now press button 'B' three times for each Section to verify that all four Sections are active across the entire range of keys, from C-2 to G8, and that the velocity response is set to ALL. And while you're at it, set the velocity response for Section 3 to LOUD. Now press button 'D' and set the four levels for Sections 1-4 to 60, 70, 100, and 100 respectively. Press button 'D' again and set the transposition for Section 3 to -24 (down two octaves). Play hard, and you'll hear the synthesizer sweep from Section 3 sounding two octaves lower than the other Sections. Play softly, and you won't hear Section 3 at all. That's because its velocity response is now set to LOUD, while the other Sections are set to ALL (playable with loud or soft attacks).

With this setup, you can play up to three notes at once before some voice stealing occurs. But even single-note melodies should be treated with cau-



Figure 1. Each drum sound consists of two Sources that could be different (although they're identical in this example).

tion. The long fade times on the four singles make it impossible to play fast runs without nasty surprises like dropouts and clicking noises. That's because there's a limit to how many sounds the K4 can produce at once. With a four-way layer like our current Multi, we are really asking for more than four sounds. As you'll see in a minute, the Single programs played by the Sections in this Multi are already layered themselves. Let's abandon this Multi (if you want to keep it, name it with the EDIT button, then store it into memory with the WRITE button).

#### **Single Voice Structure**

Select Single 'A-1 OceanWatch' and play it hard and soft, high and low, short and long. There's a lot going on in there, and it definitely consists of a layer of sounds, just like your Multi a moment ago. But isn't it supposed to be a *Single* program? Listen closely and see if you agree with the following analysis.

When you play a key, the first thing you hear is a breathy bell sound playing the normal musical scale pitches from low to high, fading away at the same rate whether you hold down a key or not. You also hear a slightly delayed voice imitation (sort of an "ooh" vowel), pitched an octave lower than whatever key you play, with a fading quality that ends up sustaining at a lower volume if you hold a key down.

The third component you hear is a highly delayed low rumbling noise effect that comes on late and fairly strongly, fades, comes on again even stronger, and a little later fades to a low sustaining volume after which there is no change until you let go of the key. The fourth sound appears quickly and has a "cricket" or "rattlesnake" quality, not following the musical pitches of the keyboard, although it does get higher on higher keys. This timbre only appears in the two highest octaves, where it sustains for a few seconds, then fades away to nothing.

#### **Discovering The Sources**

Press EDIT and button 5 (COMMON). The screen tells you that there are four active sound sources, all 'P' (for PCM waves as opposed to 'C' for Cyclic waves). It also tells you that the four sources are arranged in a "Twin mode," as opposed to Normal or Double modes. Use buttons 9–12 to isolate one Source at a time and verify what you MUSIC TECHNOLOGY 37 just heard a moment ago. To find out what each of the four waveforms are, press button 14 (DCO) and select the Sources with buttons 1–4 (you can select them even when they're muted with buttons 9–12, but then you can't hear them until you unmute them by pressing buttons 9–12 again). Check your K4 Wave List (it came as a separate booklet with your K4 owner's manual).

Source 1 (the first of the four 'P's) is #211 'Pick Bass 2' (a one-shot sample). It sure doesn't sound anything like a picked bass. Press DCA once and raise the level from 28 to 100, press DCA again and change the Attack from 73 to zero. Now that the attack is as fast as it can be, you'll hear the brief percussive pick sound on the lower three octaves, and a crazy loop on higher kevs. Press EFFECT and change Type 16 to 1 to get rid of the repeating echo, then press EFFECT again and change Pre.Delay from 7 to zero. Press DCO three times and change the Coarse tuning from +24 (up two octaves) to -12 (down one octave). Now you have a boring but musically "correct" picked bass sound.

Wave #211 is not the only one-shot wave that has unexpected and looped craziness assigned to rarely used and unrealistically high transpositions. Reset the Coarse tuning to +24, then select wave #212 (or waves #214, 220, 227) and play the top octave. Even

#### "In the Twin and Double modes, the maximum polyphony is eight. In the Normal mode, the polyphony is 16."

the 'Reverse 5' wave (#238) becomes looped (and not reversed) when transposed to +24 and played from the highest keys. As far as I can tell, these loops are not documented. I suspect that this is a sneaky way of accessing the raw wavetable data in the K4 ROM memory. Anyway, if you need the unexpected, there it is!

Let's look at the other Sources. Press button 9 to mute Source 1 and press button 10 to unmute Source 2, then press button 2 to select it. It plays wave #179, a variation of the good ol' "blown bottle." If it's too percussive for you, press DCA twice and change the Attack to a higher number; I like 70 for an ethnic feel. While you're at it, press DCA again and set Decay to 40, Sustain to 70, and Release to 20. This 38 MARCH 1990



Figure 2. The amplitude envelope of the delayed noise is highlighted in the 'OceanWatch' Single program.

gives the sound a different loudness envelope, with a slight attack peak and a quick decay to a somewhat lower sustain level, with a quick fade when you let go of the keys. You may have recognized these parameters from other synthesizers. This is a very traditional arrangement to control the loudness contour of every note from attack to release.

Moving on, mute Source 2, then unmute and select Source 3. Be patient with this one, it's delayed and you have to hold the keys accordingly. The wave is one of the percussion sounds, #127 'Shaker VR' (varied). Why does it sound so different? (See Figure 2) First, let's do away with the delay. Press button 6 S-Common and set Delay to zero. Now press DCO and set the Coarse transposition to zero. Let's look at the loudness envelope. Press DCA and give it a straight or "square" envelope: Attack 0, Sustain 100, Release 0. With Sustain at maximum, you would expect the loudness to remain at that level for as long as you hold a key. But play and listen: the sound almost dies before it comes back up, and it doesn't come back up all the way. Therefore, the filter must be playing tricks.

The K4 has programmable lowpass filters with resonance, just like the old analog synths. Press button 8 (DCF). The Cutoff is set to 100, meaning that the filter is wide open and all of the overtones are allowed through, at least at the beginning of every note. Press button 16 (DCF MOD) to see how the Cutoff changes as you hold the keys down. The Env Depth is set to -27, so we know that the Cutoff doesn't stay at the top value of 100. Change the Env Depth to zero and hold a key. The changes are gone, and the sound remains the same both in volume and in brightness.

Now mute Source 3 and unmute and select Source 4. It plays DCO Wave #233 'Voice 2.' You already knew that this Source is delayed, but not by as much as the noise was. Press button 6 (S-Common) and change the Delay from 48 to zero. You'll hear no changes in brightness, and pressing buttons 8 (DCF) and 16 (DCF Mod) confirms that the Cutoff is at maximum (100) and stays there because the Env Depth is zero. But the loudness changes as you hold down a key. The volume comes on almost instantly, and then fades quickly to a lower level at which it sustains until you release the key. Press button 7 (DCA). Sure enough, the Attack is at 52 (soft but not slow), and Sustain is at 70. The relatively high value of 71 for Release causes the long fade time, helped by the reverb from the Effect section.

#### Source Modes and Polyphony

If the preceding exploration gave you the impression that each Source can have its own filter settings, I'm sorry to report that they can not. In Twin mode, there are two filter settings possible: Sources 1 and 2 share one filter, while Sources 3 and 4 share the other. Press Single and button 1 to re-select 'OceanWatch' from scratch. Now press Edit and button 16 (DCF Mod), then select Sources 1–4. You'll find that Sources 1 and 2 both have an Env Depth of 0, while Sources 3 and 4 both have an Env Depth of –27. Change the Env Depth for Source 4 and the same value will be applied to Source 3.

This is where the name "Twin mode" comes from. It uses 4 Sources in a configuration of two pairs. Each pair has its own filter, while each Source has its own DCA loudness envelope. Double mode also uses four Sources, but in this mode they all share a common filter setting, as if there were no second filter on board. Any change in the filter settings will affect the sound of all 4 Source Waves as long as their individual DCA loudness shapes are keeping them alive.

In the Twin and Double modes, the maximum polyphony is eight. In the third mode, called "Normal," the polyphony is 16. Normal mode only allows for two active Sources, each with its own DCA loudness envelope, but both Sources share the settings of only one filter.

Check out Single 'A-2 Rock Grand.' The DCF Cutoff is 53 for both Sources, with zero Env Depth. Under button 8, change the Cutoff to 100, the Resonance to 7, and the Vel Depth to -50, and you're back to the days of resonant filter sweeps. Or, if you want a brighter rock piano, reset the filter (or select Single A-2 again and press Edit), press button 14 (DCO), select Source 2 and assign Cyclic Wave #75 'EP7' ('Electric Piano 7') to it. Hit button 7 and adjust the DCA Levels for Sources 1 and 2 (I like them both at 100 for maximum bite). See if you like it with Source 2 transposed up to Coarse = 0. Or leave them both at Coarse = -12, but detune them -3 against +3 for a fat honky-tonk sound.

#### Bye For Now...

Now that we've learned how the Sources combine to form Normal, Twin, or Double mode Single programs, and how Single programs combine to make Multi programs, I hope that you'll have a lot of fun analyzing more of the excellent factory sounds that came with your K4. If space permitted me to go on, I could get into the finesse parameters like the various velocity and keyboard scaling screens. But I trust that you have the necessary curiosity to get there on your own. Keep the music coming!

The illustrations are screen dumps from an Atari ST computer running Musicode's K4 Voice Development System software.





# LISTENING

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

**DEBORAH HARRY** 

Def, Dumb & Blonde



#### Pick of the Month

On one episode of *Wiseguy* a few months back, Deborah Harry played a washed-up singer trying to make a comeback. That's when I first heard 'Brite Side,' one of the songs (unfortunately the weakest) on her new album, *Def, Dumb & Blonde*. But it was enough to tell me, and many others, that the "Queen of the USA" was back on track. And the strong material on Harry's third solo album may play an important role in her own life.

The Thompson Twins' *Big Trash* tune, 'Queen Of The USA,' is written about Harry (see the cover story elsewhere in this issue), so it was no surprise to learn that the Twins co-wrote and co-produced a couple of Harry's tracks, which have already scored high 40 MARCH 1990 marks on the charts. Tom Bailey's creative use of the Fairlight is very evident on both 'Kiss It Better' and 'I Want That Man,' (which also includes the witty lyric, 'I want to be the queen of the USA').

There's something for everybody in Def, Dumb & Blonde - punk, rap, new wave - you name it. Cool synths, keyboards, and vibrant drums run rampant throughout. The punkish 'Comic Books,' along with 'He Is So,' 'Bike Boy,' and the very catchy 'Lovelight' (with backing vocals from The Cult's Ian Astbury), all sound very Blondieish. But now it's a much more mature sound, one in which the influence of Mike Chapman (Harry's producer when she was with Blondie) is obvious. Harry also downshifts a bit into sweetly melodic songs like 'Maybe For Sure' and 'Calamarie.'

And so the Blonde One has made a comeback, but this one's in real life. I'm still not too sure about that tiara, though. Oh, by the way, Harry's singing is better than her acting!  $\blacklozenge$  Debbie Greenberg

#### **JEFF BECK**

#### Guitar Shop

Epic

This is a modern update on the guitar power trio. The differences between this year's model and older versions is that this one has a keyboardist (Tony Hymas) instead of a bassist, and studio effects are a bigger part, whereas live energy was the main draw in previous efforts.

Terry Bozzio supplies the drums, but instead of dazzling us with technique and odd sounds (his metals and doubled-up cymbals only seem to peek through on the opener 'Guitar Shop' and the environmental dance tune 'Day in the House'), he has concentrated on supplying a full-featured but unornamented hydraulic beat. A trashy gated reverb (I swear it's a MIDIVerb II) fill out his sound on 'Guitar Shop' and 'Stand On It' (Jeff Beck is a car nut, so the hot rod theme runs throughout). The pitch-transposed Ronco-like salesman on 'Guitar Shop' is also rumored to actually be Bozzio's voice ('Day in the House' is the only other "vocal" number).

The keyboards fill in the low-end (the tube-fuzz bass on 'Big Block' almost fooled me, but those tight bends could only come from a pitch wheel) and backing roles (only getting forceful on the stadium-rock 'Stand On It'). Occasionally, they serve as a goad and foil for Beck's guitar. To Hymas' credit, playing a reggae rhythm guitar backbeat with a pan flute synth patch doesn't seem like it would work on paper, but it flies just fine on 'Savoy.' And to whoever came up with the garbled voices that seem to surge with the beat on 'Day in the House' – good job.

Beck's playing is as gutsy and bluesinfluenced as it is on Wired and Blow by Blow. However, I was surprised at the high number of processed sounds that aren't guitar-hero typical. The simulated torque wrench sounds on 'Guitar Shop' are cute. The sax-like lead (is that an octave divider?) on the same cut catches the attention. The harmonized/ring modulated lead on 'Savoy' will make some synthesists jealous, while the bagpipe and gurgling, Indianlike tones on 'Stand On It' are somewhere between baffling and genius. And for those who wondered what good were all those echo+ambience reverb patches, listen to the intro on 'Where Were You.'

There is such a thing as hi-tech guitar. It can also kick some ass. ◆ *Chris Meyer* 

#### **DAVID ROSENBOOM**

Systems of Judgment

Centaur

David Rosenboom, in addition to being a true pioneer in music technology, is a formidable music theorist. Moreover he's an expert performer, improviser, and orchestrator. Systems of Judgment is rich with ideas, but it's less striking for its intellectuality than for the dense, lush beauty of its sound. Created using a battery of electronics (from homemade feedback circuits to a Kurzweil 250), concrete sounds, and a smattering of live instruments, this six-section, hour-long work is concerned with no less than the evolution of musical form, swerving among dozens of subtitles like 'Dreaming Pathways for Great Journeys,' 'Emerging Syntax,' 'Warping the Initial Field,' 'Counterpoint Module 1A,' 'Jambuwal Returns Again,' and 'The Chants of York.'

The piece fuses elements as diverse as drones, ambient sounds, ethnic percussion, industrial noise, avant-garde classical, free jazz, and stuff from territories without names, but it never seems like a hybrid mix of influences. Instead, it suggests a kind of musical gene pool from which many diverse musics arise.

In Rosenboom's hands, ideas are sensuous. For all of its technical and conceptual sophistication, *Systems of Judgment* has the force, immediacy, and excitement of a live performance. Like nature itself, this music is profligate and surprising, at times overwhelming and chaotic, and of a remorseless beauty.  $\blacklozenge$  *Carter Scholz* 

#### SHOOTING STAR The Best Of Shooting Star

Enigma

After a five-year hiatus from the rock scene, Shooting Star was persuaded by their fans to release *The Best Of Shooting Star*, since all of their albums are out of print. Their first album, *Shooting Star*, was released in 1981 and included such hits as 'Last Chance' and 'Bring It On.' It wasn't until *Hang On For Your Life* in 1982 that Shooting Star received the recognition and airplay they deserved. With their single 'Hollywood,' the album hit the charts and continued upwards. In the following years they released *3 Wishes* and *Silent Scream* before disbanding in 1985.

The Best Of Shooting Star includes old

hits like 'Flesh and Blood,' 'Breakout,' 'Straight Ahead,' and 'Train Rolls On,' as well as two new songs, 'Touch Me Tonight' and 'Christmas Together.' Originally, Virgin Records released only 10,000 copies of this compilation album in Kansas City, and those were sold out in five days. This sparked Enigma's interest in committing the band to a multi-album contract, resulting in the re-pressing and re-release of this successful album.

The most recent lineup includes old members Van McLain, Ron Verlin, and three new members: Rod Lincoln on drums, vocalist Keith Mitchell, and keyboardist Dennis Laffoon. Without the fiddle player, their sound has taken on a slightly heavier edge by placing more emphasis on keyboards and vocals.

Originally recorded in '85, 'Christmas Together' begins with a counter-harmony synth, enhancing the dynamics and giving support to the Unidos choir. 'Touch Me Tonight,' the only song utilizing all of the new members, opens with washes of synths, followed by a powerful drum backbeat. Without over-processing, the Roland D-50 and D-550 are used to complement the duet of McLain and Mitchell.

Having new material on a "best of..." album gives the listener the opportunity to compare the advances of technology. From the straightforward piano sound of 'Last Chance' to the contemporary synth sound of 'Touch Me Tonight,' Shooting Star has effectively demonstrated their continued evolution. It will be interesting to see what their new album, due to be released in April, will bring.  $\blacklozenge$  Stefanie Mann and Dave Ward

#### COLDCUT

#### What's That Noise? Big Life/Tommy Boy

As much as I love House music, I have to admit that it's basically a singleoriented medium. I've personally come to grips with this fact, but it's real hard to find a few cornerstone House *albums* to recommend to newcomers who won't just end up turning them off due to their self-indulgence and inconsistency. Finally, producers Matt Black and Jonathan Moore of Coldcut have turned the quality control level up high enough and long enough to make a quintessential House album.

The lead cut must grab you, and this one – 'People Hold On' – does. The

World Radio History

style is closest to early House, when House was closer to Disco (when Disco was closer to its party-down dance origins than all that Bee Gees crap). Sounds include a 'Shaft'-like wah-wah rhythm guitar, strong female vocals (thanks to Lisa Stansfield) with wails sampled/transposed all over the place in the turnarounds, monophonic analog backing synths, obviously synthetic piano (including a reverse envelope on the turnarounds as well), high string synths, handclaps, lotsa percussion, and an occasional drum machine crush roll on the kick (interesting how the "weaknesses" of instruments have become exploited as positive trademarks).

The very next cut – 'Fat (Party & Bullshit)' – fast-forwards to the present while keeping some of the past, with a Tone Loc/'Wild Thing' intro, lo-fidelity hip-hop drums, and an Acid bass contrasting with shuffling percussion (heavy on the congas), sax hooks, and Detroit-party lyrics. And it works.

Continuing to mix it up, '(I'm) In Deep' raises Acid House to a new level with a sci-fi intro as well as '21st Century Schizoid Man'/power electronics fuzzed vocals over a typical Acid ultra-resonant analog bass, lots of echo, and a minimal beat. On the rest of the album, whenever the synths take a break on bass, we're treated to a rather retro constipated Fender bass sound (yes, a cross between the guitar and the piano) in place of the overused snap/pop funk bass guitar.

My hands-down favorite track is 'Telephone.' The hook here (aside from another strong female vocal) is a short sample of a telephone ringer in place of the usual hi-hat or agogo bell. A House beat combines with the best in Disco rave-up/drama tricks, and a breakdown where the EQ gradually makes the entire track sound like its coming from a telephone (including a gradual return to normalcy) also works well.

Oh yes, there are excesses as well, including two versions of the over-thetop 'Stop This Crazy Thing,' complete with Tarzan yodeling, crickets in the rhythm section, Dixieland breaks, and a sampled title phrase stolen, I'm told, from a Jetsons cartoon. Also approaching excess are the numerous non sequiturs between songs (on the plus side, we get a great remix of the classic 'Doctorin' the House'). Plus, my boss has said that this is the only CD I've played in the office that he can't stand (but hey, he's fifty-three). Ignore all that - this album is a House essential. Chris Meyer

MUSIC TECHNOLOGY

# The Jupiter Legacy

RETROSPEC



It's not often that a sequel surpasses the original, but Roland's sequel to their classic Jupiter 8 certainly lived up to its name – the Super Jupiter. Recollection by Steve Howell.

HAT MAKES A great synth? For that matter, what makes a great instrument? What actually makes a Fender Strat a professional instrument and a cheap copy merely a poor substitute? They're both planks of 42 MARCH 1990 wood with six strings, some electromagnetic pickups, volume and tone controls, a switch for pickup selection and an output jack – so they should both sound the same, right? Obviously not: the copy will have a sound readily identifiable as an electric guitar but it won't have that "quality" that makes the Strat a Strat.

Does the same principle apply to synths? This depends on whether or not a synth can possess a quality that goes beyond its technical specifications – and I believe the answer is "yes."

Let's take an example: an analog synth with two voltage-controlled oscillators (VCOs), one high-pass filter, one voltage-controlled low-pass filter (VCF), two ADSR envelope generators (EGs), one voltage-controlled amplifier (VCA) and two low frequency oscillators (LFOs) in a 19" rack-mount module. The description fits many synths such as the Cheetah MS6, Bit One, and Oberheim Matrix 6 or Matrix 1000, but the sound of each is quite distinct. And, as you've deduced from the header at the top of the page, we're talking about the Roland MKS-80 Super Jupiter analog synth module here.

The Super Jupiter doesn't have an amazing spec sheet when compared with, say, an Oberheim Matrix 12 or Ensoniq ESQ1, and you could be forgiven for assuming that the aforementioned MS6 or Bit One could produce identical sounds. And up to a point you'd be right, if it weren't for that intangible "quality" mentioned earlier.

Like many of the classic synths examined in past issues of *MT*, the MKS-80 Super Jupiter has that certain "something" that can't be easily put into words – although I'm about to try.

The MKS-80, introduced around 1985, was intended to be the rackmount MIDI version of the Jupiter 8 with bits of Jupiter 6 thrown in for good measure. Many Jupiter 8 owners would agree that the MKS-80 succeeds as its replacement, although some JP8 diehards certainly wouldn't. For my money, the Super Jupiter has all of the qualities I associate with the Jupiter series – it's warm, rich, fat, and all of the other usual analog clichés – but it's also detailed and has a clarity characteristic of old Roland synths that other designers failed to capture.

The Super Jupiter has the fast, responsive envelopes Roland is noted for, and its filters are clear and transparent. The oscillators never seem to overload the filter unduly, creating a naturally clean sound, and any "filth" can be carefully controlled using cross modulation between the oscillators. The result is a synth that is full of character, as with the old Prophets and Moogs. But to me at least, the MKS-80 is more versatile.

Being a rack-mount unit, the Super Jupiter doesn't have the same hernia factor as the Memorymoog, OB-Xa or even the JP8. And being rack-mounted, you might expect the expander to lack the control panel immediacy of a "complete" polyphonic synth. Again, up to a point, you'd be right: the MKS-80 does use single-parameter access. But it was also the first Roland synth module to have an optional programmer available for it. This takes the form of the MPG-80 (which is also rack mounted) and gives you all of the knobs and sliders and switches you need for even the most laborious programming session. This gives you the best of both worlds.

#### **Getting Tech**

Let's get down to basics and examine what the MKS-80 offers in more detail. The two oscillators are almost identical. Each offers sawtooth, triangle, square and pulse, with VCO2 offering white noise as well. Each or either VCO can be modulated by LFO1 and/ or EG1 in varying amounts, and these control signals can be inverted at the inputs of either oscillator if required. Pulse width modulation (PWM) is similarly flexible, with LFO1 and/or EG1 being routable to either or both oscillators' pulse wave circuitry. Again, these control signals can be inverted and the net result can provide very rich ensemble sounds indeed.

Key Follow is switchable to affect VCO1 or VCO2, but not simultaneously. Using this control, it is possible to set fractional scaling for the affected VCO. And, although this isn't a facility that you'll use every day, it can be very handy for creating interesting waveshapes that depend on keyboard position when the two oscillators are sync'd together. PWM can also be controlled using keyboard position which, again, opens up many interesting possibilities.

Cross modulation allows VCO2 to be used to modulate VCO1 for "pseudo-FM" and other tonal possibilities. Furthermore, cross modulation amount can be controlled by EG1 for "shaped" FM effects. The oscillators can be sync'd either way (VCO1 to VCO2, or VCO2 to VCO1) which is a curious facility but not without its uses. Both oscillators can also be tuned and detuned in large or small amounts for intervals and chorus effects. All of these facilities add up to a tremendously large palette of textures, tones and waveshapes, and provide a synth that's significantly more advanced than just about any other analog synth you're likely to find these days.

An oscillator mix control balances the two oscillator levels before they continue on to the high-pass filter. This is a static filter (it cannot be dynamically controlled from any modulation source) and its basic task is to remove excessive low frequencies from a patch. It's not something you're going to find yourself using too much when programming, but it can be indispensable when you're trying to separate sounds in a mix.

The VCF offers manual control over cutoff frequency and resonance with modulation from LFO1, EG1 and the keyboard. The MKS-80 follows the Jupiter 8 tradition in that the filter does not oscillate at extreme resonance settings. This is a limitation in my view – there are some things for which oscillating filters are essential, such as those long filter sweeps and acid house rhythm tracks, for example. Envelope modulation is invertable, allowing a far greater range of noises to be made and the filter can be controlled using either envelope.





In addition to the expected control from EG2, the VCA can be modulated using LFO1. This is not a facility found on any of the Super Jupiter's competitors, and it allows a wide range of tremolo effects as well as many special effects to be created.

The two EGs are ADSR in format (attack, decay, sustain level and release) and also offer variable rate scaling and control of dynamics. Both envelopes have a switch for determining whether or not key velocity will affect them, and overall dynamic range (velocity amount) is governed by a non-programmable control in conjunction with a programmable control. In practice, it's best to leave the non-programmable control at full and program everything vourself. Dynamics can also be used to control attack time, and a programmable control is provided to govern this effect exactly. The only limitation in the envelopes is that the Time and Level controls affect both EGs identically. But then again, it's never presented me with any problems.

LFO1 offers the usual sine, sawtooth, square and random waveforms for modulation. You can control the rate and delay; depth is set at the input stages of the VCOs, VCF and VCA. There is another LFO but more on this later.

#### The Tone

All of the parameters described above constitute what Roland called a Tone. A Tone can be stored in any one of 64 locations (eight banks of eight) and a further 128 can be stored in an optional RAM cartridge, the M64C.

You'd think that all of these parameters would be enough for creating good sounds, but there's even more you can do with a Tone once it has been created. There are five play modes on the Super Jupiter: Poly 1, Poly 2, Unison 1, Unison 2 and Solo. Furthermore, you can set splits (with a freely assignable split point) and layers of two sounds on the same or separate MIDI channels. Of the play modes, Unison 1 was designed to kill - all 8 voices are layered on one key. Also associated with the Unison modes is the Unison Detune control, which sweeps from a slight phase shift to all-out nasty. Solo mode turns the MKS-80 into a standard monophonic synth which is useful, as the name implies, for solo lines. Triggering for Unison 1 and Solo can be single or multiple depending on whether the Env Reset button is switched on or off in Tone Edit.

There's also an octave shift from -2 to +2, which is handy for transposing a sound without having to retune the oscillators. Next, there's a glide control for setting portamento. Glide, unlike some synths of this era, is available in all play modes. You also have control over pitch-bend amount on each oscillator and a second LFO can be called upon for vibrato. Unlike LFO1 with its multiple waveforms, LFO2 only outputs a triangle wave which is introduced via the mod wheel or aftertouch. You have control over LFO2's rate and maximum modulation amount which goes to both VCOs simultaneously.

The beauty of having two LFOs is that one can be used for vibrato while

#### "To use the phrase, 'All you'd ever want in an analog MIDI synth module' sounds so passé that I won't use it - but it's true."

the other deals with PWM, filter sweeps, sync sweeps and so on. Roland's decision to make LFO2 a simple one makes sense. A switch labeled VCF does not, as you'd assume, route LFO2 to the filter. Instead, it routes the mod wheel or aftertouch to the filter for real-time control of the cutoff frequency using these two controllers. This can be very effective for brass and other swell effects.

These parameters constitute a Patch in Roland parlance. The beauty of this system is that one Tone can become several other sounds. One Tone could be in a Patch played polyphonically with glide. The same Tone could be used in another Patch, combined with another Tone in a layer or a split. There are lots of possibilities for the creation of sounds in Tone Edit, but even more things are possible in Patch Edit.

#### Remote Control

All of this programming power is available through the MKS-80's parameter access, but getting around the synth with four buttons is not easy. Enter the MPG-80, which effectively endows the Super Jupiter with knobs and faders. To use the MPG, simply connect the MIDI Out of your master keyboard to the MIDI In of the MPG-80 and then take the Programmer Out (using a special Roland cable) from the MPG to the Programmer In on the MKS-80, match up the two units' MIDI channels and away you go.

An interesting possibility is presented by this setup. The information coming from the MPG is echoed by the MKS-80's MIDI Out, and can therefore be recorded as part of a sequence (through a MIDI merger into your sequencer). This allows sound parameters to be modified in real time during a sequence. However, beware of a few things. Watch for MIDI feedback loops and be careful that the amount of SysEx data coming out of the MKS doesn't clog up your sequencer.

The net result? To use the phrase, "All you'd ever want in an analog MIDI synth module" sounds so passé that I won't use it. But it's true. Rich strings and pads, big brass sounds, killer basses and leads (especially in Unison 1), detailed metallic noises and a myriad of special effects are all part of the Super Jupiter's vocabulary. And all from one convenient 19" box.

The optional but highly desirable programmer puts all of this at your fingertips. What's more, unlike many of the MKS-80's contemporaries, it's very reliable and requires only occasional pressing of the Autotune button to keep it in tune.

I speak as a long time admirer of the MKS-80. I wanted one for years but couldn't afford one. Instead, I tried the Bit module, the Cheetah, the Oberheim and other synths, but have never been totally happy. After the instrument was discontinued, those who had them kept them. Recently, however, a chance glance through the classifieds found me penniless but happy. Now, my Super Jupiter has replaced nearly all of my analog synths because it is that versatile. And speaking of prices, you can expect to pay anywhere between \$1000-\$2000 for a used MKS-80 and an MPG-80, making it one of the few old instruments that has really retained its value.

Despite my admiration for the Prophet 5, the Memorymoog, the Oberheims, and other classic analog synths, I have settled with the Super Jupiter and its programmer as the classic analog instrument. Whether you play acid house or heavy rock, funk or cabaret, reggae or new age, there's a place for the MKS-80 in your music. It's a serious instrument, and one that will never be out of date in your rack, whatever musical trends come and go. Is it the ultimate analog synth? I can't account for your personal taste, but I'd say that if any synth is going to win such an accolade, the Super Jupiter does it for me.

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**MUSIC TECHNOLOGY** 

# Processing ART



The Electronic Art Ensemble: (L–R) Russ Dorwart, Stephen Horelich, Gregory Kramer, and Clive Smith. As a performer, composer, producer, engineer, and product designer, Gregory Kramer provides a unique perspective on the future of electronic music. Interview by Steve Ellison.

**T** HE TECHNOLOGICAL revolution continues to affect the way we think about and produce music. At the forefront of this revolution is a group of individuals who bring creative ideas from the studio to the electronic workshop and vice versa. With these individuals, technological development goes hand in hand with music production in a symbiotic relationship. Among this dedicated group of innovators is Gregory Kramer.

Kramer studied piano from an early age and began composing at sixteen. By nineteen, he had received a BFA in composition from the California Institute of the Arts, then composed modern dance scores and several award-winning film scores until his move to New York in 1974. At age twenty-two, he became an Assistant Professor of Composition at New York University, establishing three electronic music studios there from 1975-79, and received an MA in composition in 1977.

During this time, the Electronic Art Ensemble, an all-electronic quartet that Kramer founded and directed, performed throughout North America. EAE released the album *Inquietude* on the Gramavision label in 1980, to critical acclaim. Kramer has also recorded on Erdenklang records. He founded PASS, the Public Access Synthesizer Studio in New York City in 1977, and remains Chairman of PASS's Board of Directors. A National Endowment for the Arts Composition Fellowship was granted to Kramer in 1981 for his work on *Veils of*  *Transformation*, which uses signal processor manipulation to produce seamless timbral transformations.

In addition to all of these activities, Kramer is the president of Clarity Inc., a research and development company involved in signal processing, automation, and human interface design. He is also working with Robert Moog on a keyboard with multi-dimensional touch control surfaces. So the resumé grows...

Within the course of an hour's discussion, Kramer speaks from the point of view of composer, producer, engineer, and product developer because, in fact, he lives these roles from day to day. He brings musical ideas to life in the workshop and recording studio, both of which share the church-like space he built

in Garrison, New York in 1982. It is a beautiful, peaceful space, from which we take in breathtaking views of the Hudson River valley.

**Steve Ellison (MT):** You have experience as a composer and product developer. As a composer, what do you bring to the development of a product?

**Gregory Kramer (GK):** "Composition plays the role in audio applications and research that pure math plays in physics. It brings you to the edges of what's being done, and takes you beyond those edges. It *extends* those edges so that what one discovers in leading edge composition will find an application in a recording studio, a performance environment, or maybe even some component of an ergonomic computer interface, such as a speech synthesizer.

"This is not dissimilar to following an abstract mathematical formula to its conclusion, not knowing why you're doing it, and then finding that it can somehow magically describe a physical phenomenon that you weren't even investigating. To me, that is the most interesting, perhaps the most exotic element that composition brings to the work I do. The more creative your applications are for your own use, the more creative your design will be. And if you're in the real world, that can be useful to other people as well." MT: When you listen to a composition, what essential elements of that composition might intrigue you? What do you listen for in other people's work?

**GK**: "What intrigues me the most is how they treat continuous changes of timbre – most people don't address that question *at all*. So if anyone addresses it even *sideways*, it interests me – even if it's just changing the frequency components of a reverb decay, or the way a saxophone or violin note is held and the timbre changes. There are a lot more possibilities with electronics where you can change timbres in very interesting ways, but most people don't exploit those changes.

"This is reflected in some very conservative decisions being made in musical instrument design about what to provide access to and what not to provide access to for the user. I understand these decisions, and I think that most of them are prudent market decisions, but they're not the ones that are going to lead to the breakthroughs.

"For example, there are a lot of

components of the sound that you just can't control in real time with many commercial synthesizers; maybe you can't control them at all. I would like to be able to reach down into the guts of a sound the way you can with current signal processing. That's going towards more control in a very effective way. But I'd like to see that in synthesis - being able to reach further into the middle of the sound in real time, not just play it from a key, and then let go of the key, and it goes away." MT: Given the state of audio technology today, where do you think the most flexibility lies for real-time control of timbre? **GK:** "Signal processors currently provide the most flexibility in real time. With samplers, once a waveform is written in silicon, it might as well be written in stone. With FM, it always mutes to recalculate, as it does with most digital additive systems. In one of the more powerful signal processors, like a Lexicon 480L, you have all kinds of very exotic parameters shape, spread, and so on. In the 224XL, you have more understandable parameters - diffusion, definition predelay, and so on. Those are all available to manipulate in real time, which is very exciting.

"You can also control signal processor parameters via MIDI in a lot of units now. Using the Clarity XLV with the PCM70 and the 224XL, you have unprecedented control over all of those parameters in real time. There are different needs in a mixdown situation and a performance situation. The PCM70 is a bit more oriented towards performance. Until we designed the MRC, there was no real controller for the PCM70, so it basically had a performance orientation. The XLV, which was designed to work with the Lexicon LARC, was intended to control those parameters in real time, automating them right from the LARC, so that was really more mixdownoriented than performance-oriented." MT: The MRC is certainly a very ergonomic device. Sliders and buttons... GK: "Real hardware."

MT: Real hardware. What was the motivation behind its development? GK: "Well, you're getting more and more devices with less and less of a user interface, and from several different perspectives I saw the need for a device that was a highly definable hardware front end for anything. Lexicon saw a need for it with the PCM70, because you've got this MIDI-





controlled signal processor, but there are no MIDI control sources other than mod wheels. So I saw a need for MIDI faders, and Lexicon saw the same need for the PCM70, but there was a lot more capability that could be included in a box of definable faders and switches. In this case, control over the PCM70, LXP1 and LXP5." MT: And real-time macro control over FM synths?

GK: "Well, right, that's one of the ideas that I'm proudest of in the XLV because of two important concepts. One is the Kramer Synthesis Macro, which basically provides the ability to control many parameters simultaneously to achieve a musically useful result. This is much more intuitive than making the user go to the lowest level and change the amplitude of an **MARCH 1990** 

operator, or envelope rates and so on. Instead, you can just give someone a fader labeled 'Brightness,' and they can change something that's meaningful to them musically without becoming DX7 experts. That's a lot more than just 'FM Made Easy.' The things that you control at once can apply to signal processing, it can apply to different types of synthesis, it can apply to a whole studio environment. The concept of subgroups on a mixing console is not dissimilar, although somewhat more primitive. In this case, you're making a complex timbral change with one fader movement because the software is like an expert system.

"You could apply the same technique to the D-50, or even to various phase vocoding processes if you could do it in real time. If there is an intelligence behind it, any kind of synthesis technique can use the synthesis macro concept. The extent to which it's useful will reflect the experience and intelligence of the designers. So the synthesis macros are one important concept. Another is bi-directional MIDI. In this case, you have a situation in which not only is the MRC controlling the DX7, it knows what's happening inside the DX7. It sends a query, finds out the DX's algorithm and various values, and acts appropriately, and the loop is closed. MIDI is no longer an open loop system, and I'm quite proud to have put the first product in the field that has closedloop MIDI capability. My prediction is that this will be immensely important in a lot of products within five years. If it's not, then many people are really missing the boat.' MT: The XLV is a product that Clarity

designed, manufactures, and now sells to automate signal processors. What was the motivation behind it?

GK: "The XLV came from two places. One - and this was before any MIDI controlled effects devices were available - the need for somewhere to send all of the control data that I was anticipating in the work I was doing with Bob Moog on a keyboard with multidimensional, touch-sensitive plates. I found that I had nowhere to send the huge amounts of control data that this would generate. Synthesizers offer too little in the way of real-time timbral manipulation. So I was looking for processors to control, and my eyes fell on the 224XL. I spoke to Lexicon, and they said, 'Well, sure you could control this thing - let us know how it goes.'

"About a year and a half after that, they came out with the PCM70, and by that time we had finished our research on the XLV. So it came from not only wanting somewhere to ship this control information, but it also came from the more basic aesthetic search for real-time control over as many aspects of the sound as possible. In a mixdown situation, the signal processor is one of the most powerful boxes in a studio. To set it and leave it as many people do was, in my opinion, a waste. And if they were spending so much effort automating sends and returns and mutes and faders, well they certainly should be automating these powerful signal processors. As long as we were automating the 224XL, we decided to use MIDI-tocontrol voltage conversion to automate digital delay lines as well. When

I produce or work with others, I think I bring a real sensitivity to timbre, which I've gained from working with sound at the elementary level." **MT:** Back to music. You've just helped produce an album that has benefited from a whirlwind of signal processor automation and real-time control. How does that make you feel?

GK: "Great! It was so exciting to see the application of these ideas bring so many of the cuts to life. You can be at a trade show, showing people how this stuff works, and they can get excited, and you say, 'Yeah, isn't that great.' But it's still a little bit like salesmanship. You're there and you're showing your product; how creative can you get on the show floor? I guess that's what it comes down to. But there we were, making some music that didn't have those constraints and automating all kinds of signal processor environments. It wasn't just changing the reverb time on the snare track - which we did do - but it was also changing the predelay on the whole percussion track, or changing the chorusing or diffusion during a solo in real time or automated, the way we would automate the console. So it was really exciting."

MT: It certainly provides another way for musicians to extend their vocabulary. GK: "Yes, exactly. It's a whole new area of production technique, and one in which we'll be seeing a lot of activity. I would expect that the more creative engineers and producers will take the time to infuse that kind of detail into their work. If you're just out to kick something out the door quickly, you're not going to bother to automate the reverb. You're just going to set it and leave it. But if you're putting your attention on detail, which is what really sets the better producers apart, I think that you'll find more and more of it." •

prices.

World Radio History

Steve Ellison was born in Attleboro, Massachusetts, in 1962 and attended Brown University, where he received an Sc.B. in Applied Mathematics in 1984. He designed and developed software to control the spatial manipulation of sound in a 16-channel sound system for the Australian new music ensemble Floating Exceptions, and has produced and performed electronic music concerts in Australia as well as the U.S. He currently resides in Dallas, TX, where he writes for and performs Chapman Stick and lead vocals with the band Flash to Bangtime.



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SOUND & CONPUTE

# Coda MusicProse Music Notation Software



An excerpt from Hindemith's Mathis der Maler output from MusicProse to a LaserWriter IINT at 300dpi.

#### Can Finale's baby sibling live up to its claims and satisfy the need for a Macintosh notation program that's powerful yet easy-to-use? Review by Lawrence Ullman.

HE BOX SAYS it's friendly, yet powerful. It makes notating music fast, efficient, and easy, easy, EASY. Sound like a familiar refrain to you? It sure does to me. I've seen hype like this on just about every music notation package ever released. And I believe it about as much as I believe a politician's promises during an election campaign. "Read my lips – it's fast and easy."

While I may have become a skeptic regarding the current state of music notation software, I remain ever hopeful – sort of like Charlie Brown with Lucy holding the football. Maybe this 50 MARCH 1990 time, the claims will be true! Typesetquality music notation without high blood pressure.

Coda Music Software's new Music-Prose Composition and Music Publishing program is the first offspring of Finale, surely the most hyped of all notation products. From day one, Finale astonished users with its raw power ("Come on and kick the ball, Charlie Brown"), while simultaneously enraging them with it's decidedly hostile user interface (Arrgh! THUMP!).

Immediately and quite appropriately dubbed "Baby Finale," MusicProse is based on the same ENIGMA (Environment for Notation Utilizing Intelligent Graphic Music Algorithms) core or "kernel" as Finale, but it lacks many of the latter's high-end music publishing, transcription and MIDI features.

The program turned out to be surprisingly powerful for a "low-end" product, with a few truly wonderful features. However, its user interface falls far short of being "transparent and intuitive" as Coda claims, and several of the most important (and useful) features of the Macintosh user interface are mysteriously missing.

#### **Basic Training**

MusicProse is not copy protected, and it doesn't need to be. Without the manual, you're *never* going to figure it all out. While we're on the subject, the manual, like all Coda literature and



Figure 1. An innocent looking untitled window with the Staff Tool selected.

packaging, looks great. It is well organized and includes an index, but it's sometimes skimpy on details. To get started, I strongly recommend running through the three tutorial sections.

MusicProse can transcribe and produce Standard MIDI Files, so it can be used with any MIDI sequencer. Other file format options include ETF, a Coda proprietary format that allows files to be transported to other platforms (useful whenever Coda finishes the IBM-PC version) and EPS (Encapsulated PostScript) files. EPS files are vital for anyone who wants to export music examples into a page layout program like PageMaker. Unfortunately, Music-Prose only makes complete pages into EPS files, so if you want just a few measures, you will have to cut and paste them into a new document. [As of press time, we were unable to get MusicProse EPS files to print correctly from QuarkXpress 2.12 or Ready Set Go 4.5, though they seem to print fine from PageMaker 3.01 - Ed.]

Booting the program opens an untitled window containing a floating palette of eight tool icons and a single measure of 4/4 time (see Figure 1). Above the window is the Macintosh menu bar. At first, it all seems innocent enough, until you try to find a command.

#### "As I used MusicProse, I was continually taken aback by Coda's seeming disregard for long-established Macintosh procedures."

Right off the bat you run head on into the program's first major deviation from the Macintosh interface. Unlike other Mac programs, the tools rarely let you manipulate anything directly. Instead, they replace the rightmost item on the Macintosh's menu bar with a new, corresponding menu. Coda calls these "Dynamic Menus." To me, they're *hidden* menus. For example, selecting the Measure tool replaces the Staff menu with the Measure menu. Can't remember which menu a particular command is on? Good luck finding it! You'll quickly become dependent on the "MusicProse Quick Reference Guide," a card that shows, among other things, all menus.

#### **Settling The Score**

As an early music performer and director of a Renaissance brass quintet, my notation needs are typical of the examples Coda recommends for Music-Prose. Music of this period rarely consists of more than six staves, so the program's eight-staff limit presents no problem.

I selected a variety of different compositions to test the program, each with its own unique characteristics: a five-part score and a Capriccio for solo bassoon to test the program's page layout capabilities, a complex orchestral excerpt to see how it handles expressions and tuplets, and a short madrigal by Giovanni Gastoldi (Figure 2) to explore the program's lyric capabilities. The Gastoldi is a three part vocal score with keyboard accompaniment, so the first step was to add four additional staves and properly group them together.

Clicking on the Staff tool brings up the Staff menu. With the Staff tool selected (and only then), you can add and move staves, set a staff transposition, and set "Staff Attributes" including a name, clef, and whether or not

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time signatures, rehearsal marks, measure numbers, etc. will be displayed and printed. You can also group staves together, extending the bar line through each staff in the group. Grouped staves can then be bracketed.

So I added the four staves, used Staff Attributes to set the bass clefs, and grouped and bracketed the five staves as you see in Figure 2. At this point, each staff was only one bar long, and no key signature was present. So far, so good.

The Measure tool brings up the ►

### MusicProse Fonts

MusicProse is shipped with two sets of screen fonts. Petrucci is a musical character and symbol set provided in three sizes: 24, 48, and 72 points. Seville is a comprehensive set of guitar chord symbols likewise provided in three sizes: 36, 72, and 108 points. The normal sizes are 24 points for Petrucci and 36 points for Seville, but the larger sizes allow "better quality" printing on an Image-Writer (which reduces the 48/72 point sizes by a factor of two to produce 144dpi resolution) and ImageWriter LQ (which reduces the 72/108 point sizes by a factor of three to produce 216dpi resolution). The larger sizes also improve the screen display quality at 200% and 300% magnification, but won't help you much anywhere in between.

"Downloadable" or printer versions of the Petrucci and Seville fonts, necessary for high resolution printing on a LaserWriter or other PostScript printer, are *not* included with the program. Registered users can buy them direct from Coda for \$89 for the pair.

And for you desktop publishers, note that "Petru" (as well as any other downloadable font) is not automatically downloaded to the printer when printing a MusicProse EPS file that has been imported into page layout software. They must be manually downloaded prior to printing using Apple's "LaserWriter Font Utility" or a DA called "LaserStatus" (Abobe's FontDownloader doesn't work for Coda's fonts).

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Figure 2. LaserWriter output of a three-part madrigal by Gastoldi tests layout and lyrics capabilities.

Measure menu and allows you to manipulate (you guessed it) measures. MusicProse will create new measures automatically as you enter music, or you can specify them ahead of time. I knew that I needed a total of five measures, so I added four more. I also needed to change the key signature to D minor, so I selected the first measure, and used the Change Key dialog box to set the key. With my score set up (and a setup like this can be saved as a template for later use), I was ready to enter some notation.

#### This Is Simple?

MusicProse offers three methods for entering notation: Simple Entry, Speedy Entry, and HyperScribe. A click on the Entry tool brings up the Entry menu, from which you select the method you desire.

Simple Entry is a point and click method using a palette of musical symbols, and should be familiar to anyone who has used other notation software (Figure 3). Before moving on, look closely at the Simple Entry palette. Notice something missing? Where are the rests?

Of all the features in MusicProse, Simple Entry caused me the most grief. I was constantly amazed by the bizarre implementation of even the simplest of musical tasks. Even entering notes is sometimes difficult due to the way in which they're spaced in the measure during entry. Things get *really* difficult when you make a mistake, and mistakes are all too easy to make. The mouse pointer doesn't change shape, and it's easy to enter an 'A' when you wanted a 'G.' Your next impulse would probably be to drag the pointer across the wrong note to select it (after all, in most programs, a cursor shaped like an arrow is used to *select* things). Wrong move! You can't select *anything* in MusicProse using traditional Macintosh objectoriented techniques, but we'll get to that in a bit. Maybe you can "Undo" the entry? No dice, Undo is not implemented anywhere in MusicProse!

Oh well, the Eraser tool should take care of those wrong notes. But clicking directly on a note with the eraser changes the note into a rest! You must click a second time to get rid of the rest. A quick check of the manual shows that the Eraser tool has no less than *five* different functions, depending on where and on what you click. Oh, by the way, to add a rest directly to the page, you choose a note value, then *shift-click* with the mouse.

Beaming is automatic, whether you want it to be or not. Notes are grouped



Figure 3. The Simple Entry tool palette - "Look ma, no rests!"

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according to the time signature. The manual describes a kludgy method to control this, but I suspect that you'll be using the Beam tool often. Once again, the implementation is not what you'd expect. My first impulse was to click on the first note to be beamed, pitch on your MIDI keyboard, then select a duration from the numeric kevpad. This quickly became my favorite entry method - it's fast and accurate and I used it for most of the other examples. However, it is not without some problems.



Figure 4. The Speedy Entry box and cursor.

then on the last. Wrong again! The Beam tool beams and unbeams back to the previous entry. The beam angle is not controllable.

On the other hand, the Tie tool works like you'd expect it to (click on the first note to be tied), but the direction of the tie is automatic and cannot be controlled. The Grace tool makes it possible to turn a normal note into a smaller grace note, but anyone who needs to do this often will need the patience of a saint (and a Valium wouldn't hurt). The Tuplet tool works, but its effect on the spacing of notes is somewhat unpredictable. Be sure to save your file before using it (remember - nothing can be undone).

#### Speeding Ticket

The next entry method is Speedy Entry. After selecting it from the Entry Menu, clicking on a measure causes a box to appear around it, with a vertical cursor indicating the pitch (see Figure 4). Without MIDI, pitches are selected with your left hand on the QWERTY keys of the Mac keyboard. Durations and other symbols are selected with your right hand on the numeric keypad. With MIDI, you play and hold a

When entering notes high in pitch, the beams are often cut off by the top of the Speedy Entry box, so it becomes difficult to know if you entered the correct duration. You can set the entry box to automatically move to the next measure, but the measure you just finished is not redrawn on the screen, so you won't know if you made any mistakes until the next measure is completed. You can cause the screen to redraw manually each time, but this is a tedious process.

Accidentals caused me all kinds of trouble throughout the program. They do not carry through the bar, as is musically correct. For example, after entering an Eb, the next 'E' entered into the measure has a natural sign and must be manually lowered back to Eb, at which point its accidental disappears. Also, I found myself often adjusting the enharmonic equivalents when inputting pitches via MIDI. This situation can be managed with a function that cycles through the enharmonic equivalents of a note.

#### **Hyper Active**

HyperScribe is MusicProse's real-time transcription method. There are two ways to use it: with a "MIDI Click" or

with a "MIDI Tap." MIDI Click lets you select a note number that MusicProse uses as a metronome pitch. You play to the metronome, and MusicProse quantizes your performance based on the value (only up to sixteenth notes) you set in the "HyperScribe Quantization" dialog box.

The MIDI Tap method lets you to tap a sustain pedal to set the beat. This way, you can play in a rubato tempo to your heart's content, and as long as you hit that pedal on each beat, Music-Prose does an excellent job of converting what you play into notes. The program can update the screen as you play, but the screen lags way behind even on my Mac II, so Plus and SE owners would be well advised to turn screen update off.

The MIDI Tap option works better for me than any other real-time transcription process I have seen to date. However, no matter how accurately you play, you're still going to have to go in and edit with Simple and /or Speedy Entry (unless you're entering a piece with no beams, accidentals, ties, etc.).

In my opinion, the time you spend editing the HyperScribe transcription would be better spent entering things correctly the first time using Speedy Entry. But to each his own, and for improvisers, real-time transcription is a must.

#### Lyrics And Chords

One of the program's real strengths is its ability to handle lyrics. Selecting the Lyric tool displays a positioning triangle, which can be dragged to position the lyrics above or below the staff. Lyrics are not typed directly into the score as you might expect. Instead, a dialog box called "Mass Create" is used like a mini word processor to enter all of the lyric syllables for each verse. You must handle the text underlay yourself, breaking each word into syllables and separating them with a hyphen or space. Note that the Keycaps desk accessory cannot be accessed while in Mass Create, so you'd better memorize the Option Key sequences for accents and other foreign language symbols.

Once the lyrics are entered into Mass Create, the Click Assignment window is used to add lyrics to the score by simply clicking on each note in turn. Once entered into the score, each syllable is attached to a note. This lets you change note spacing later on and MUSIC TECHNOLOGY 53

the lyrics will follow. Other nice touches include "word extensions" (the horizontal line indicating that a syllable is to be held through a long note), and a feature that automatically adjusts measure width to avoid overlapping lyrics. Overall, I found working with lyrics to be surprisingly easy, and I was quite pleased with the results.

MusicProse can do some cool things with chords as well. The Chord tool pops up a pair of triangles that are used to position chord symbols and guitar tablature. "Chord Suffix Libraries" (sets of symbols), must be loaded into each document that is to include chords. You can edit the provided libraries or create your own, a rather time consuming but useful feature. Once the library is in place, chord symbols can be added to the score by clicking them from a "Computer Keyboard" window or by playing them on a MIDI instrument. The program will also analyze block chords that appear on one or two staves. These features, combined with the powerful lyric capabilities, make MusicProse particularly well suited for lead sheets.

#### **Express** Yourself

The Expressions tool is another area in which the program's Mac implementation rubs like a badly fitted shoe. The Expressions menu controls four palettes of symbols: Articulations, Dynamics, Shapes, and Text. Adding these symbols is a time consuming process which is not made any easier by MusicProse.

When first added to the score, expressions appear with a little white selection box just to the left of their center. For small entries, such as staccato and tenuto marks, this box obscures the expression, making exact placement difficult. Also, each expression appears slightly offset to the right from the center of the cross-hair cursor. You must go back and readjust almost every entry. In the case of the Luftpause or "breath mark," you must first enter it directly above a note, which is musically incorrect (it should be placed between two notes), then move it.

The Shape palette contains slurs, hairpins (crescendos), and octava markings. Entering a slur is always a challenge for any program, but MusicProse does an excellent job as long as the slur is relatively large. Small slurs, like those between two sixteenth notes, are 54 MARCH 1990 very hard to create. Hairpins are very well implemented, and can be controlled with considerable accuracy.

Text Expressions can be created using any font, and can even incorporate additional symbols present in Petrucci. But this won't really help you if you need to use a lot of alternate note heads, so you percussionists out there are out of luck.

#### **Page Layout**

MusicProse has two main viewing modes: Scroll View and Page View. Scroll View displays the staff system from one end of the screen to the other with no wrap around. Editing is faster in this mode because the screen has much less territory to update (the display does not scroll during playback). Page View displays as many staff systems as will fit on the currently defined page. Pages are created and deleted automatically as needed by the program.

The Page menu includes two of MusicProse's most useful contributions to the art of music notation software: the "Fit Music" command and the "Scale Page Contents" option in the Page Layout dialog box. When laying out a page of music, one of the big challenges is to assure that a certain number of measures fit across the page the way you want them to. With the Fit Music command, you can specify how many measures you want per system globally, or force a group of measures to fit into a single system.

The Scale Page Contents option allows you to reduce or enlarge a single page or all of the pages in your score by a percentage from 5% to 500%. The key word here is "Contents." The margins and page size set in the Page Layout dialog box are retained, but the music is reduced (or enlarged), fitting more (or less) measures into each stave. These two functions are so useful, they will keep you using the program despite its problems.

#### **Deviant Behavior**

As I used MusicProse, I was continually taken aback by Coda's seeming disregard for long-established Macintosh procedures. For example, there are simply too many ways to select objects for editing. Every object that you can manipulate in MusicProse has a selection "handle" that looks like a little white box. The trick lies in figuring out how to make the handle appear so you can move or delete an object.

A good example of this is deleting or moving a lyric. First, you must select the Lyric tool. Then you must Optionclick a measure to make the handles on the lyrics attached to that measure appear. Then you select the handle you want by clicking in its box. Only now can you manipulate it. Expressions, measures, the position of beats within a measure, all have similarly convoluted procedures for selection. The manual has an entire section devoted just to selecting things. In any other program, you would simply drag over an object to highlight or select it, then edit with the usual Macintosh commands.

And speaking of the usual Macintosh commands, you cannot cut and paste anything other than complete measures! You can't copy a complex gesture or shape (such as a slur) that repeats many times in a score and paste it in somewhere else, you must reenter it again and again. It seems unbelievable, but it's true.

#### **The Verdict**

For a so-called "low-end" program, I was pleasantly surprised to find that MusicProse was able to accomplish all of the notational tasks I attempted (something that cannot be said for many of the "high-end" products I have used in the past). Yes, I was able to produce good results, but the program sure didn't make anything easy! The convoluted Simple Entry and selection methods make basic editing chores *much* harder than they should be, and the inability to undo or cutand-paste individual objects is inexcusable in a modern Macintosh program.

Yet, despite its flaws, MusicProse does have some truly great features. If you write lead sheets, the powerful lyrics and chord capabilities will be invaluable. The page layout capabilities are likewise superb. And, once you get used to it, Speedy Entry can be just that.

Perhaps one day, a notation program will come along that lives up to the hype on its box. It will actually be powerful enough to get the job done, yet will be a dream, not a nightmare, to use. And maybe next time, Lucy won't yank that football aside. In the meantime, all we can do is keep on hoping.

# more from

#### Here's a list of just about every piece of equipment mentioned in our magazine, so if you're looking for more information, check it out.

01 Digital Production Centre: Solid State Logic (SSL), Begbroke, Oxford, England OX5 1RU. Tel: (44-86) 584-2300.

160X Compressor/Limiter: dbx, 71 Chapel St., Newton, MA 02195. Tel: (617) 964-3210.

2008, 200 Detta: JBL International (Soundcraft), 8500 Balboa Bl., Northridge, CA 91329. Tel: (818) 893-8411 Ex. 483.

224XL: Lexicon Inc., 100 Beaver St., Waltham, MA 02154. Tel: (617) 891-6790.

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

421, 441: Sennheiser Electronic Corp., P.O. Box 987, 6 Vista Drive, Old Lyme, CT 06371. Tel: (203) 434-9190.

480: Lexicon, see 224XL.

A50, A80: RolandCorp. 7200 Dominion Circle, Los Angeles, CA 90040. Tel: (213) 685-5141

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

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

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

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

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

Cakewalk: Twelve Tone Systems, 11-A Main St., Watertown, MA 02172. Tel: (617) 924-7937.

CMS404: Computer Music Supply, 382 N. Lemon, Walnut, CA 91789. Tel: (714) 594-5051 or (800) 322-MIDI.

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

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

D10, D110, D20, D50, D550: Roland, see A50.

DEP-5: Roland, see A50.

DPR100: Symetrix, 4211 24th Ave. West, Seattle, WA 98199. Tel: (206) 282-2555.

DSM1: Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

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

DTC1000ES: Sony Corp. of America, 9 West 57th St., New York, NY 10019. Tel: (212) 418-9427.

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

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

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

ESQ1/M: Ensoniq, see EPS.

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

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

Fairlight CMI III: Electric Sound and Picture, 30 Bay St., Broadway, NSW Australia, 20007. Tel: 011-61-2-212-6111.

HR16: Alesis Corporation, 3630 Holdrege Avenue, Los

Angeles, CA 90016, Tel: (213) 467-8000.

JP8: Roland, see A50.

Jupiter 6, Jupiter 8: Roland, see A50.

JX3P, JX8P, JX10: Roland, see A50.

KCS Level II: Dr. T's Music Software, Inc., 220 Boylston St. Suite 206, Chestnut Hill, MA 02167. Tel: (617) 244-6954.

Kurzweil 150FS, 250: Kurzweil Music Systems, Inc., 411 Waverley Oaks Road, Waltham, MA 02154. Tel: (617) 893-5900

KX8, KX76, KX88: Yamaha, see C1.

LARC: Lexicon, see 224XL

LXP1, LXP5: Lexicon, see 224XL

M1, M1/R, M3R: Korg, see DSM1.

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

Matrix 6, Matrix 12, Matrix 1000: Oberheim-E.C.C., 2015 Davie Ave., Commerce, CA 90040. Tel: (213) 725-7870.

Memorymoog: formally made by Moog Instruments.

MIDIVerb II: Alesis see HR16

MK76: Akai see EVI.

MKB-1000: Boland see A50

MPC60: Akai, see EVI.

MPG80: Roland see A50

MPU401: Roland, see A50.

MQX32: Music Quest, Inc., 1700 Alma Drive, Suite 260, Plano, TX 75075. Tel: (214) 881-7408.

MBC: Lexicon, see 224XL

MusicProse: Coda Music Software, 1401 E. 79th Street, Bloomington, MN 55425. Tel: (612) 854-1288.

OB-Xa: Oberheim-E.C.C., see Matrix 6.

PCM70: Lexicon, see 224XL.

Personal Composer: Personal Composer, P.O. Box 648, Painted Church Road, Honaunau, HI 96726. Tel: (808) 328-9518.

Phantom: Dr. T's, see KCS Level II.

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

Prophet 5: formerly made by Sequential Circuits Inc.

Quadraverb: Alesis, see HR16.

\$612, \$700, \$900, \$950, \$1000: Akai, see EVI.

Sound Globs: Twelve Tone Systems, see Cakewalk.

Stratocaster, Telecaster: Fender, 1130 Columbia Street, Brea, CA 92621. Tel: (714) 990-0909.

Super Jupiter: Roland, see A50.

TX81Z: Yamaha, see C1.

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

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

WX7, WX11: Yamaha, see C1.

XLV: Clarity, Nelson Lane, Garrison, NY 10524. Tel: (914) 424-4071

Xpander: Oberheim-E.C.C., see Matrix 6.

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MUSIC TECHNOLOGY



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Wisdom by Guy Kawasaki (from the book The Macintosh Way). Reviews by Yung Dragen.

JUST A FEW weeks before Christmas, I received a letter from Henry C. Terry III, Attorney at Law, in Waban, Massachusetts. It went something like this:

"I read with interest your review in the August 1989 issue of *MT* of the album by David Bard, entitled *Solitaire*. Thus far, I have visited several record stores in the Boston area, and none of them has this album. Please provide me with the name and address of the record company which released this album. Thank you in advance for your help."

If this was a perfect corporate world (or even semi-perfect – David Bard lives in Boston, and at least a local label should have picked him up by now), a consumer would be able to go into a dispenser of his or her choice and acquire any concoction available. However, it ain't. If anything, independent labels seem to be having an even harder time staying afloat these days despite the promises of global villages, cottage industries, and the free exchange of information made by Alvin Toffler and his ilk.

So, the question is: *Can* hi-tech further the cause of independent artists? Shouldn't the supposedly falling cost of duplication and distribution of information make their lives easier? We're starting to see these cassette machines 56 MARCH 1990 in record stores that allow the user to browse, select, and custom-compile a tape of his or her own choices. Shouldn't there be a way for independent musicians to get their material into these things? It would certainly make it easier to take a risk with a new artist – even after a glowing review in *Option* (or for that matter, *MT*). Still, it's asking a lot for a major record label to take a financial interest in a new group, and it's asking a lot of *me* to search out a rare recording and risk up to ten bucks on it. So...any ideas?

- Dialogue/Definite Purpose: Duo Scott Guenther-Lee and Robert Reed have crafted an excellent slab of FM (or, as they refer to it, "New Age") rock. The synths give a strong modern feel to the proceedings, with tasty guitar and solid drums (Akai MPC60, UpBeat software) framing the cool/aloof vocals. The only thing that doesn't jive with the end result is the list of musical influences: New Order, Ministry, Front 242, Patrick O'Hearn, Elvis Costello, and Andrew Lloyd Webber. Anyone trying to produce commercial rock with a computer and rack of MIDI gear must check this out.

- Michael E. Daniels/demo: A Pentecostal minister who stretches out on a MIDI rig before mass, at home, and in the music store (his part-time gig). The style is mostly relaxing instrumental music somewhere between good jazz lounge piano and New Age. The drums and recording quality need some work, but overall it's good (and the sermon on "The Rapture" he inadvertently left on side two isn't bad, either).

- Devout Scream/Outcry: I'm a sucker for an upfront bass that thrums on every beat (I missed it on the latest B52s release), mutated guitars, raw synths, and stylized, tortured vocals. This reminds me of my salad days roughly a decade ago when groups like Bauhaus prowled the clubs (Devout Scream is less violent, but more tuneful and psychedelic). Not bad for two buddies (Bill Dressler and John Greschak) that used to work out acoustic guitar duets. Recording is clean but a little sparse -I bet their second release will slav me. - Lorenz Franzen/The Still Point Compositions (1-6): "Thank you for your column, giving us subversives a chance at stardom." Franzen's particular tastes in subversion are a stark/baroque cross between modern classical and New Age. Everything was played from a MIDI guitar into a sequencer and edited there. The monophonic horn parts



seem to lack a bit of expressiveness, but the piano sounds convincing, and like Lorenz himself, I'm amazed that he can play drum parts on guitar at all. The upbeat first movement is the least convincing. The simpler, more Gothic pieces locked me into a catatonic trance. Yeah.

- York Massengale/four-song demo: Symphonic synthesized New Age instrumentals. Although York claims his version of New Age "differs from the conventional view of the genre as meditative and tensionless," this is pretty relaxed, non-threatening stuff. Unlike the conventional implementation of the genre, however, Massengale can actually write a rich melody and fill it out with a complete, meaningful orchestration. Closest references are Alan Parsons' instrumental sections.



- The Ones That Got Away/five-song demo: I can't make up my mind on this one. It's a pretty good cross between "tuff" and "modern" rock with a lot of potential, but it comes across a bit stiff and hollow (and the drum machine programming – complete with those dreaded 16th note hi-hats – doesn't help). More practice and confidence (and a real drummer) should put them over the line. High note: Their cassette art is great.

- Brian Gingrich/Travelog: This is simply one of the best readers' tapes I've heard in the three years I've been reviewing them. Brian's first release, *Prairie Safari*, was real close to a home run, but perhaps leaned a little too much on percussion. *Travelog* features an excellent balance of instruments (synths, all sorts of percussion, bass, found samples and tapes), styles (New Age jazz, ambient, African), and space. The sampled voices on 'Sister Hayward' in particular are a highlight, along with just about everything on 'Road to Mombin.'

- Times, Ltd./Waiting for Midnight: Strong, upbeat, full rock with progressive strains in the music (Styx being a reference – the PPG-like timbres and voices on the leadoff track are to die for) and overt Christian content in the lyrics (sometimes *too* overt – hearing a female happily sing "Undercover – are you covered by the blood of the lamb?" over and over again is a bit too strong an image for me while speeding around L.A. at night). "Our theory behind the use of technology is one of necessity. When you want to simply reach out to people through the message in your music while displaying some semblance of production quality without going bankrupt in the process, synthesized sounds and sequencing are the way to go."

- Chuck van Zyl/Callisto: Chuck's earlier release, Nuclear Winter, showed that a strong imagination could overcome a lack of traditional recording and playing skills. That tone poem for the





Oberheim Xpander chillingly painted exactly the picture its title suggested. This release shows Chuck trying to conform too closely to Berlin Movement/ New Age "sensibilities," with the result being fairly weightless sequences and white noise washes. Get evil again, Chuck – your dark side was your strong point.

- Lia-'s Club/Where Sinners Meet: Weird flashes through my brain on this one. I hear Huey Lewis twenty years younger and street-hip. I hear rare New Wave bands like Fischer Z, Korgis and particularly The Tapes. Good, tight, ruffed-up clean-shaven pop with synth bass (OSCar), D-50, and sharp-edged guitar.

Okay, I'll admit it – I wish the pop clock was turned back ten years. Mix in hip-hop, house, techno-ethnic (à la



Gingrich), and some of the dark industrial works of Mark Wheaton and his kind, and you'd have a perfect musical world for me.

Actually, what would really make it perfect is if you could *buy* any of this stuff at the music store around the corner...

#### Contact addresses:

David Bard, 150 Massachusetts Ave., Box 925, Bosten, MA 02115. Tape costs \$5.

Dialogue, c/o Robert Reed, 14501 Berkshire Drive Independence, MO 64055. Tape or LP costs \$6.

Michael E. Daniels, 3237 Snead Court, Richmond, VA (no zip given)

Devout Scream, c/o Red Shift Records, P.O. Box 694. Brookfield, MA 01506. *Tape costs \$6*.

Lorenz Franzen, 12240 Pacific Ave. #10, Los Angeles, CA 90066. Tape costs \$5.

York Massengale, 6255 Monita St., Long Beach, CA 90803 The Ones That Got Away, c/o Hunter Smith, 6267 Salem Circle #324, Fort Worth, TX 76132

Brian Gingrich, 5301 South Rockwell, Chicago, IL 60632. Tape costs S7.

Times, Ltd., c/o mark Cook, 2820 South Broadway, Englewood, CO 80110. Tape costs \$7.

Chuck van Zyl, c/o Synkronus Music, P.O. Box 22. Upper Darby, PA 19082 Tape costs \$7.

Liar's Club, c/o Keve X. Thompson, 31 Broadway South #602, Tacoma, WA 98402.

The purpose of Readers' Tapes is to expose the *MT* readership to the work and thoughts of their peers, so that they can compare notes and maybe further their own art. Send your tape, price, equipment list, comments, and a photo to: *Readers' Tapes, Music Technology, 22024 Lassen St, Suite 118, Chatsworth, CA 91311.* No, your tapes will not be returned; Yung will either keep them for himself or feed them into his garbage disposal.

MUSIC TECHNOLOGY

# According To Kurzweil



Raymond Kurzweil at a rehearsal for the world premier performance of the California Digital Philharmonic Orchestra.

The prodigious inventor and founder of Kurzweil Music Systems talks about the present and future state of music technology, and the intricacies of inventing the unimaginable. Interview by Leigh Silverman. T THE TENDER age of 12, while his friends were exchanging baseball cards and Wacky Packs, Raymond Kurzweil was at home designing a software package that was quickly snapped up by IBM. At 16, he drew on his knowledge of artificial intelligence to write a software program that could create original music in the style of Mozart, Beethoven and Chopin. Several years later, at the Massachusetts Institute of Technology, Kurzweil developed a computerized college selection program for which he received \$100,000 plus royalties from one of the largest educational publishers, Harcourt Brace World.

Today, 41-year-old Kurzweil runs three companies – Kurzweil Music Systems, Kurzweil Applied Music and Kurzweil Computer Products – each of which places heavy demands on his technical prowess and entrepreneurial savvy. He writes books about artificial intelligence, produces videos and gives lectures around the country. He's the father of the Kurzweil 250, an extremely successful sampler that has helped bridge the worlds of acoustic and digital music.

In view of his accomplishments, Kurzweil may seem like a man sitting on top of the world. But the fact is, he's a contender in the constantly changing world of electronics where product lifespans are short and competition is strong. Instead of attempting to keep up with the fast pace, Kurzweil designs machines that are ahead of their time and therefore less prone to competition. In the early '70s, he developed a reading device for the blind that relies on a process called pattern recognition to translate printed text into automated speech. The Kurzweil Reading Machine, despite its high cost, was a huge step forward for the visually-impaired. Nothing like it had ever come out on the market. In 1982, Kurzweil saw the necessity for a computer that could recognize human speech. The result was the Kurzweil Voice Report, a machine that could recognize up to 20,000 spoken words and transcribe them into printed text.

In the following interview, Raymond Kurzweil candidly shares his vision of the future of electronic instruments. He addresses the complexity of sampling, the future of MIDI and what we can expect to see in controllers over the next ten years.

Leigh Silverman (MT): How do you come up with an original idea? Raymond Kurzweil (RK): "I'm an avid student of technology. I read a lot about technology and also about social issues, particularly as they intersect with technology. When I decide to pursue an idea, I try to pick one that hasn't already been done, and isn't such a minor step forward that fifty other people or organizations are going to solve the same problem. On the other hand, if you pick an idea that's too difficult, you'll never get there before you run out of patience or venture capital. The projects we do tend to be interdisciplinary. In general, I think that inventions today are not a matter of someone disappearing in their basement and coming back three years later with some breakthrough. They tend to require expertise in a lot of different areas and are team efforts. So it's important to try to ascertain what I think I can accomplish in two or three years of development with the kind of people that I could attract and read, and what society and the market will need several years from now." MT: The Kurzweil 250 is still going strong after five years. How did Stevie Wonder influence your decision to build that keyboard?

RK: "It was 1976 and we had just announced the Kurzweil Reading Machine. So he just showed up one day. We didn't have any working models so we had to sort of turn the factory upside down to get one that would work. He wrote out a check, signed it with his thumbprint and spent the day with us learning how to use it. Later we put him in a taxi with the Reading Machine and he went off into the night. That started the relationship and over the next few years, I had an opportunity to spend time with him in L.A. or he would stop by when he came to the Boston area.

"Around 1982, the topic of music technology came up in some of the conversations I had with him. One day he was giving me a tour and showing off some of the instruments he had gotten and he was lamenting the state of the field at that time. On the one hand, there were these acoustic instruments and it was very hard as a musician to control those instruments. For example, he couldn't play most of them. Most musicians can't play most instruments. Even if you're very prolific in your technical skills and learn three or four instruments, which is unusual, you still can't play the vast majority of instruments. And if you could play them all, you still couldn't play them simultaneously. But then there was this electronic world. At that time, there were things like sequencers and sound modification techniques. It seemed like you could do pretty much anything, except the sounds that you had to work with were these very thin,

electronic sounds. Although they were an important class of sounds, they did not include the sounds of choice, which were the acoustic sounds.

"So he said, 'Wouldn't it be great if we could apply these control methods to the acoustic sounds and then all these limitations would be overcome." I thought about that and it seemed like a very exciting prospect. It really seemed revolutionary. It would change the way music could be created. We did some market research and it seemed that the market really was poised over the next four or five years for radical transformation from acoustic and

#### "We will see a fairly slow evolution of controllers that don't resemble acoustic instruments."

analog techniques to digital. So that spawned the genesis of Kurzweil Music Systems."

MT: Your father was a conductor during the '60s. Did he lament similar problems? RK: "Sure. When he would compose a multi-instrumental orchestration, he would have to get a whole orchestra together and that meant arguments about funding, contracting with all the musicians and handwriting all the notation, not to mention copying it, which in those days was a big deal. He would then finally hear his composition for the first time. Prior to that he could only sort of imagine it by playing individual parts on the piano. Beyond very limited changes, he would have to dismiss the musicians, write out all the music again, endure more arguments about funding, and maybe if he was lucky he'd get to hear it a second time. Now, a student in his dorm room can hear an orchestration on a synthesizer within minutes. So the acoustic world is very limited." MT: How closely do you think sampling approaches acoustic sounds?

**RK**: "There are a number of significant limitations if you just use 'brute force' sampling. For example, even a highend sampler only has a limited number of seconds of memory. A piano tone lasts twenty or thirty seconds. There are hundreds of different sounds a piano can make aside from eightyeight keys. For example, hitting middle C hard is not the same timbre as hitting middle C soft. It's not simply louder, it's a whole different time-varving timbre. And you can't easily create C# from C without some distortion because each semitone will initiate

different overtones in the instrument.

"So a number of compromises are made. First of all, looping: a sampler will capture the attack and then loop the last waveform allowing it to decay to silence. When you loop a waveform, the frequencies of all the overtones become perfect multiples of the fundamental. In a real piano, the frequencies of the overtones are not perfect multiples. They're slightly off. These are called inharmonic partials. And that's one of the things that gives a piano its very distinct, exciting character. If you make all the overtones perfect multiples of the fundamentals then it starts sounding like an organ tone because you lose the inharmonicity of the partials. In our technique we don't use conventional looping and we don't lose the inharmonicity of the partials. They keep their inharmonic character throughout the whole duration of the note.

"Another annoving characteristic of samplers is that the sound decays into a noise floor even if they're 16-bit. As the sound decays, the samples get smaller and smaller. And as the samples get smaller, the signal-tonoise ratio gets smaller. The psychoacoustic phenomenon you hear is a growing hiss in the background. That doesn't happen on our instruments because we use a floating-point system, our signal-to-noise ratio stays very high even as the note decays to silence so you never hear any background noise. We were also able to change the characteristic of the timbre at different loudness levels, and we have a much more convincing way of transposing the pitch of samples so that they sound appropriate at each fundamental frequency. There are four or five other technical problems with samplers that prevent them from realistically capturing something with the complexity of the piano.

"So I think one thing that people have realized is that they don't necessarily want to do all that much sampling themselves because it's a tremendously difficult thing to do correctly. It's one thing to sample a sound and then play it back. But an instrument isn't just a sound. It's a whole class of sounds and the interaction between them. And just capturing the samples themselves and then massaging them and setting all the parameters correctly is very difficult. When we capture an instrument, we first record the instrument doing all of the things it can do - in the case MUSIC TECHNOLOGY



 of the piano this means recording at different loudness levels and at many different pitches. It's a massive amount of information."
MT: Do you feel that a musician with some keyboard expertise can simulate other instruments in a way that is idiomatically correct?

RK: "That is a skill. And some people can do it very well. If you have ordinary keyboard skills, you can play music using a wide range of sounds without much practice. If you're really trying to make it sound like a violin played by a violinist, that does take a certain type of skill which requires more than a few minutes to pick up. However, being able to create music, not necessarily sounding like a real 60 MARCH 1990 violinist, but creating something that's musically relevant, using a wide range of tone colors from the synth or sampler, you can be fairly successful without lots of practice." MT: Do you think that the ability to reproduce many acoustic instruments simultaneously on a single controller has reduced job opportunities for musicians? **RK**: "There are far more opportunities for musicians today than there were, say, ten years ago before a lot of the technology happened. I mean, if you insist that you're only going to play a trumpet in a TV commercial the same way it was done fifteen years ago, and that's the only kind of job you're going to take, you may find that employment opportunities are fewer.

But if you stay up to date on the new technology, and are able and willing to adapt to new ways that music is created, then your job opportunities will increase.

"I'll give you an example. About ten billion dollars a year is spent on making music for industry and government training films. Ten or fifteen years ago, all of these films used previously recorded material for their bockground music, because their budgets were not sufficient to hire an orclestra for each film. But today they will routinely hire a musician with the appropriate synthesizer. The result is better background music because the music on these films all used to sound the same."

MT: What direction will electronic instruments take over the next ten years? RK: "Well, a lot of products have a tremendous number of capabilities. They can do lots of things, but the capabilities are really presented in a computer-oriented fashion. You have to be quite proficient in computer technology to use them. There's a lot of terminology, a lot of complicated interfaces, confusing users manuals, menus that are difficult to operate. Musicians really want products that are musical instruments and not computers. A major challenge - and if there's a breakthrough in the early '90s, it will be in this area - is to make musical instruments that are musical instruments and not computers, while still retaining the tremendous depth of power that they currently have. They've really become much too complex, too intimidating. MT: Will MIDI be around in ten years? RK: "There's so much commitment to that standard, so many people know it and there's so much equipment that uses it, it has a great deal of momentum. I personally believe that the problems with MIDI can be overcome while still retaining the essence of MIDI, and building around it.

"There are really two problems with MIDI. First, MIDI was primarily designed to talk from A to B. And now we have people putting together systems in which there are fifteen different components. So they connect A to B and B to C and B to D and D to E and it gets very complex. What we really need is a concept that supports many things talking among each other and a protocol for that. Computers have had that for some time in the form of a local area network. You can still use the MIDI protocol within a local area network.

"The other drawback is the slow speed of MIDI. It's just barely good enough to talk from A to B. If you have a sequence with more than seven or eight tracks, it can begin to get too slow. You can't keep up with the event rate. When you add things like continuous controllers, the delays of MIDI can become quite noticeable. When you have complex sequences and expect eight notes to occur at the same time and the MIDI delay spreads them out slightly, that can be very objectionable. And when you hook up more than just a few pieces of equipment, all talking to each other via MIDI, you get accumulated MIDI delays. So you add all of that up, and the slow speed of MIDI is really a problem.

"But despite these things, MIDI has been phenomenally successful. I mean, it took off very quickly within a year or two and became the absolute, universal standard almost overnight. And it's been of benefit to the whole industry. If the industry didn't have a standard, people just wouldn't buy as much equipment. It would be similar to the video industry before we adopted the VHS standard. When there were several competing standards, people were confused and so they waited for it to get sorted out before they bought anything. So we're fortunate that there was a standard that everybody adopted. And that has certainly encouraged the explosive growth that has occurred in electronic instruments."

**MT:** What will controllers look like ten years from now?

RK: "We'll see a fairly slow evolution of controllers that don't resemble acoustic instruments. On the other hand, the acoustic controllers that we're used to evolved with the physical limitations of creating acoustic sounds. I mean, a violin had to be organized in a certain way in order to create those sounds. It wasn't necessarily set up that way because that's the optimal way to control it. In the area of electronic controllers, we don't have any such limitations. We're not inhibited by the physics of creating a sound because sound is being created by a synthesizer.

"One thing you will see over the next ten years are better controllers that emulate acoustic instruments. We still don't have a completely successful guitar controller. There are more guitar players than there are keyboardists, and yet there's no guitar controller yet that's one hundred percent satisfactory. And we clearly have a long way to go in terms of emulating wind instruments. It's a fairly new area. So I think you'll see the perfection of electronic counterparts to a much wider range of acoustic instruments over the next five years.

"It's difficult, however, for a manufacturer to introduce a whole new controller because it becomes a very pioneering effort. If you consider the OWERTY keyboard, it's not an optimal keyboard. Placement of those keys was optimized for the function of the mechanical typewriter of the late nineteenth century. But everybody knows how to type that way. So introducing a system that's demonstrably more efficient doesn't go anywhere because people have invested all of this time learning a particular technique. Whenever you try to change the way people do things it takes a lot of time, whereas tapping into the way people already do things provides a greater functionality which is what synthesizers have been doing." MT: What do you dream of inventing? RK: "I have in mind a little cybernetical system that you can talk to and that understands human speech. It can interact with you, it knows where all the knowledge in the world is, and can access it. You can ask it to solve research problems for you, some of which may involve information in your own organization. This little system will be able to call up databases by way of telephone and cellular communication around the world. It will be able to call up people and talk to them. It will be able to act as sort of a personal assistant in solving problems.

"One of the paradoxes of automation is that, as we create systems that appear to do the work of people, the opportunity for employment goes up, not down. Most of the automation that we've had in human history has been developed over the past hundred years. Yet a hundred years ago, say in 1870, we had only twelve million jobs in the United States and that only employed about thirty percent of the population. Today we have ten times as many jobs - 120 million jobs employing about fifty percent of the population. And the jobs tend to be at a higher level. Technology has been automating the bottom of the skill level and the whole population has been moving up in skill. The same thing has been happening in music." •

#### World Radio History

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#### Extend your range and smooth out the octave break on your Yamaha wind controller.



YAMAHA'S WX-SERIES wind controllers offer MIDI to saxophonists (and other woodwind players) with little adaptation in embouchure or fingering. The two sets of fingerings shown here serve two functions: when used with the fifth octave key, they extend the range of the WX upward by just short of one octave, giving you a total range of seven octaves. When used in lower octaves, they can make many passages much easier, reducing the dreaded "glitching" that can occur when moving over the octave break. Figure 1 provides a set of fingerings that incorporate the WX's righthand whole-step trill key. The set shown in Figure 2 contains some additional alternates, and incorporates the right-hand half-step key. Use the set that feels more comfortable to you, or combine them. There are even more alternates than those shown here - check the chart in the WX manual and don't be afraid to experiment.







# Twelve Tone Systems **Cakewalk Professional 3.0** *IBM/Compatible Sequencing Software*

File Realtime Hark	GeTo	Track Yiew Settin	ngs KoyM	
1 Hat	P	Undo	Alt-F1	
2 Kick/snare/tom	P			
3 Ride/rim	P • • • •	Сору	FZ	
4 Crash	P • • • • •	<u>Cut</u>	Ctrl-FZ	
5		Paste	Sh-F2	
6 Bass strings	A 8-88	Paste to Qne track	Alt-FZ	····
7 Bass	P			*****
8	m • • • •	<b>Quantize</b>	1000	
9 Organ		Interpolate	1 2 3	**********
18 Organ	a	Length		
11	<b>n</b>	Slide		••••••••
+ 12 ElecPiano/Vibes	P	<u>Betrograde</u>		••••••••••
13		Pitch transpose		
14		Velocity scale		
15 High strings	P	Controller fill		
16 Bass strings	P	Fit improvisation		
Tempo⊁112 x1.00		CAL		Hain≯ 5869
Meter+4/4 Pla	y Re			Scrapt 0
Key C		IDEA	7.WRX	Free 17424
33:01:0004Fr	C110	12:02:000 Now	33:04:11	9«Thru

Cakewalk Professional/MQX 3.0 Copyright (c) Greg Hendershott, 1988, 1989 Edit Menu

This popular sequencing program has recently been updated. Among other things, you can now customize the program to fit your needs. Review by Carter Scholz.

AKEWALK IS A top-of-the-line IBM sequencer noteworthy for its excellent user interface, reasonable price, and lack of copy protection (see the review in the January '89 issue of *MT*). Version 3.0 incorporates some significant new features, including the ability to create your own editing commands.

#### Overview

The program comes in two versions: regular Cakewalk and Cakewalk Pro-64 MARCH 1990 fessional. The Pro version has many enhancements that the other lacks, including direct SMIPTE support, keyboard macros, multiple MIDI ports, variable timebase, and the new Cakewalk Application Language. If any of these are important to you, you'll want the Pro version. There are two flavors of Cakewalk Professional: Pro/MQX runs on any MPU-401 compatible interface, but to take advantage of SMIPTE and multiple MIDI ports you'll need the Music Quest MQX-32 interface (with two MIDI Outs). Pro/C1 is the functional equivalent for the Yamaha C1 computer (utilizing eight MIDI Outs).

Cakewalk's main strength has always been a clean, intuitive user interface that responds as well to a mouse as it does to the keyboard. Pull-down menus (and the commands within them) can be activated by typing their initial letter, or by grabbing them with the mouse, Macintosh-style. Music can be viewed graphically by tracks (up to 256), measures (up to 9999), notes (in player-piano-roll format), or events (a text list of all MIDI events). The note

view is "zoomable," allowing you to change the horizontal resolution, but not the vertical, which is fixed at an octave and a third (tight, but usable). Pro supports VGA and EGA screens, which provides a considerably larger working area. Individual note insertion and deletion is straightforward in note view, although the mouse can't be used to select regions. A simple control-click (or control-enter) on any note displays its parameters for pinpoint editing. To edit other MIDI events, you have to use the event list.

Other amenities include a set of editing functions much too long to list, and a comprehensive "event filter" that lets you determine in great detail just what events will or will not be affected by the edit. Any tracks can be grouped together for editing. Playback functions include real-time key, velocity, and timing offset per track. System exclusive data can be sent out at any time in a sequence, but the messages must be stored ahead of time in a buffer, of which there are only 64 adequate for sending patch data, but

"New in both versions is a command called 'fit improvisation.' This lets you record tracks without a metronome."

not for continuous parameter changes. Cakewalk Pro supports variable timing resolution, up to the limit of your MIDI interface (192 ppq for the MPU-401). Regular Cakewalk supports only 120 ppq.

#### What's New

New in both versions is a command called "fit improvisation" (called "tap tempo" in some other programs). This lets you record tracks without a metronome. After recording the initial tracks, you record another track made up of quarter-notes tapped in time with the recorded material. Cakewalk will then adjust the timing of the recorded parts, aligning them to the tapped quarter-notes, while adding tempo changes so that they sound the same. You can even edit the tap track normally before using it as a guide. The only limitation is that all tracks will be scaled equally to line up with the tap, because the tempo changes are written into Cakewalk's global tempo track.



Cakewalk Professional/MQX 3.0 Copyright (c) Greg Hendershott, 1988, 1989 **Graphic Editor** 

Also new in both versions is a "multi-take" mode that automatically restarts recording and puts each take onto its own track. This is very handy if you always seem to need to warm up before getting it right and manual stop/restart breaks the flow.

In step-record there's a new "pattern" option that accommodates repeating rhythms. Each of sixteen positions in a small strip chart can be set to a rest or a note of constant duration. This is a nice idea, but I'd suggest expanding it to let each rest or note take on any of the common durations Cakewalk already supports in step-record.

What else is new? In playback, you can now loop a track any number of times from 1-9998, or infinitely (as before). You can optionally send a patch change at the start of a track, MIDI Files are fully supported by both programs, and Cakewalk Pro now supports 30frame drop format SMPTE. There are numerous small improvements to the user interface in both programs, and the ugly-as-sin welcome screen from earlier versions is now history.

The previous Cakewalk manual was adequate, but the format left a lot to be desired. The new manual is a vast improvement: 230 clearly written and laid-out pages in a ring binder, with good tutorials and an exhaustive reference section, intelligently indexed.

#### CAL

For me, the biggest news in this release is the Cakewalk Application Language (CAL). CAL permits you to add your own features to Cakewalk Professional. This is an exciting first step towards providing you with custom tools. It's not quite a first - two other IBM sequencers provide something like this. Personal Composer 2.0 includes a dialect of the LISP programming language for accessing many of the program's functions, and GFmusic gives user-written programs access to its data structures. But so far, CAL is the most immediately usable way of adding functions to a sequencer. It's built into Cakewalk, complete with program editor and debugger. And while the language is undoubtedly limited, it's easy enough and solid enough to be used without pain.

You invoke a CAL command like any Cakewalk editing command: select the region over which the command is to work, call up the menu of CAL files, select the file you want, and you're off. It works smoothly, and a dozen example files are included for use and study. One of them randomizes the start

#### "CAL permits you to add your own features to Cakewalk Professional. This is an exciting first step towards providing vou with custom tools."

times of notes - it took me less than a minute to modify this routine to randomize velocities. A more elaborate routine, for scaling a range of velocities by a varying percentage, took me half an hour to write and debug from scratch (see sidebar, A CAL Application).

With CAL, you can insert, delete, or alter events - change their start time, duration, type, and value. The language includes standard commands to accept input from the user, and to display messages. Basic math, relational, and assignment functions are available, as are control flow functions. The language is minimal, which makes learning it a snap. True, a little familiarity 🕨 MUSIC TECHNOLOGY 65





with programming helps. But I expect to see CAL files written by Cakewalk users showing up on MIDI bulletin boards, so even those who don't want to write their own functions should benefit from CAL.

In the future it would be nice if you could add named commands to a separate CAL menu – DOS filenames are notoriously uninformative. Also, CAL programs tend to run slowly. A typical Cakewalk command processes 1,000 notes in a little over a second, but it takes a CAL program over a minute to do the same work. Editing with CAL would be enhanced if you could invoke Cakewalk's standard "event filter" dialog with a user routine.

You should note that CAL is for editing only; it has no real-time commands. Something that permitted programmable interaction with a user while the sequencer played would be very interesting indeed. Twelve Tone's Sound Globs program has a performance language built into it – why not Cakewalk?

World Radio History

#### Conclusions

The new features in both versions of Cakewalk are significant enhancements to a solid foundation. The programs keep their place on my short list of preferred IBM sequencer software, not just for their wealth of features and reliable performance, but for Twelve Tone's ongoing respect and support for their users.

If you purchased Cakewalk 2.0 or Cakewalk Pro 2.0 after September 15, 1989, you can upgrade to version 3.0 for \$5 shipping (with a dated sales receipt). Otherwise, the upgrade cost is \$29 for regular Cakewalk, \$39 for Pro. You can upgrade from regular Cakewalk to Cakewalk Pro (same version number) for the difference between the programs' list prices plus \$25.

**PRICES:** Cakewalk 3.0, \$150; Cakewalk Professional/MQX 3.0, \$249; Cakewalk Professional/C1 3.0, \$349.

MORE FROM: Twelve Tone Systems, PO Box 760, Watertown, MA 02272. Tel: (617) 273-4437.

MARCH 1990

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