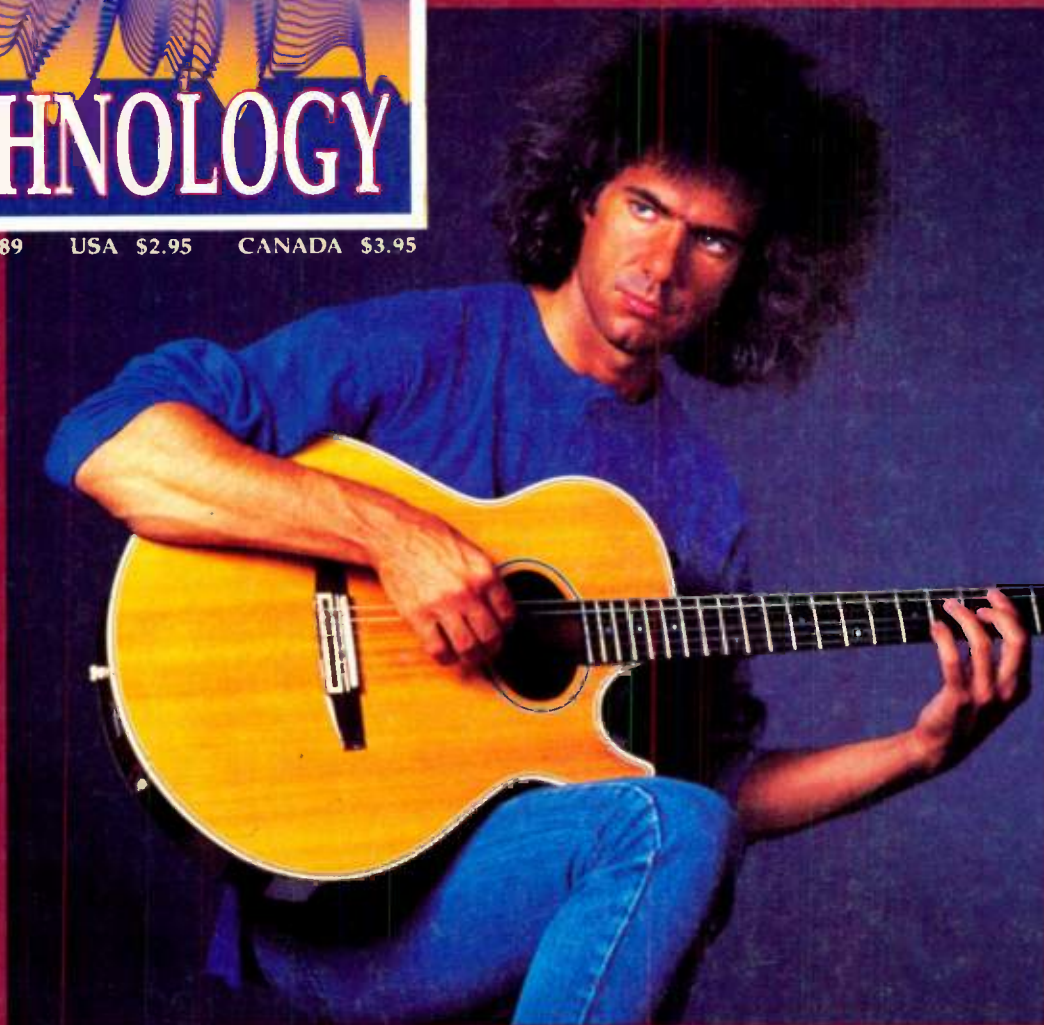


# MUSIC TECHNOLOGY

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## ON THE CUSP

IF YOU'VE BEEN following world events lately, you've probably noticed that there are some pretty important things going on. For the first time since the Cultural Revolution, it appears that another bloody revolution is being fomented in China. On the other hand, Sino-Soviet and Soviet-American relations appear to be improving dramatically, and arms reduction proposals abound. Relatively democratic elections have recently been held in Poland and the Soviet Union. The Ayatolla Khomeini has recently died in Iran, leaving that part of the world highly uncertain about its future.

Of course, the outcome of these developments remains to be seen. Things could change completely by the time you read this. In any event, it seems that the whole world is on a cusp, a point of transition between what was and what will be, between the old and the new. A cosmic crossroad, if you like, that offers a choice of directions in which to go.

On a more personal level, I find myself on a cusp of my own (and it's not even my birthday, which happens to fall directly on the cusp between Leo and Virgo). It seems only natural, then, that *MT* finds itself on a distinct cusp as well. At the third anniversary of its publication in the United States, *MT* has a new editor and is faced with a market that has undergone some significant changes of its own during the past three years.

In fact, it can (and will) be argued that the music technology market in general is at a turning point of sorts. The last three years have seen a transition from the buying frenzy that almost inevitably followed the introduction of a new product to a much more cautious attitude on the part of manufacturers and consumers alike. Attendance at summer NAMM is dwindling. Also, manufacturers are starting to rely more heavily on refinement rather than innovation when it comes to product design. The primary

question seems to be, now that we have all of this musical equipment, what are we going to do with it?

In an effort to reflect these trends, *MT* will be shifting its focus away from the coverage of technology for its own sake and move towards the notion that technology is a tool for making music. To paraphrase a popular concept from the '50s, "Better Music Through Technology." We believe that this approach will rekindle some of the excitement that has recently been lost in the morass of consumer apathy and economic uncertainty.

In the coming months, you'll see interviews with a wider range of industry professionals including composers, performers, software developers, hardware manufacturers, music educators and other pundits who influence and shape the world of music technology. You'll also find several semi-regular and occasional columns in which well-informed, provocative opinions will be unabashedly expressed in the hope of stimulating dialog, controversy and debate (grist for the mill of creativity, so to speak).

Our reviews will concentrate on the musical applications of the products under consideration, rather than providing a litany of buttons and knobs. We feel that this will be of greater benefit to our readers who are trying to make sense of the silicon jungle out there. In addition, we will continue to run articles written to educate novice and advanced readers in the practical application and use of music technology.

Being on the cusp is at once painful and exciting, providing a tremendous opportunity for growth and self-realization. I invite you to join us for a journey into the future of music making, a future in which music is the door and technology is the key. By using the key to open the door, we can choose to realize the vast potential that is clearly visible from the crossroad at which we find ourselves. ■ *Scott Wilkinson*

VOLUME 4, NUMBER 1  
SEPTEMBER 1989

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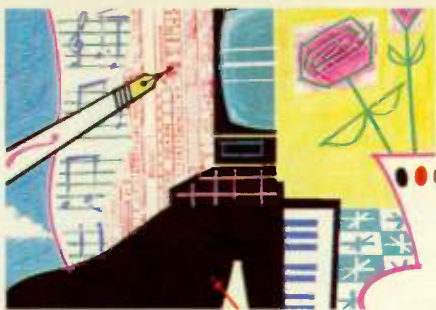
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Microtonal Musings - p17



Vernon Reid - p30



Sample Sources - p22

## MT AT THREE

6

### Meet The Staff

This is your chance to meet the curious characters behind this cosmic concept we call *Music Technology*.

12

### Industry Assessment

As we conclude three years of reporting on the state of the music technology industry, it seems appropriate to step back and take a wide-angle look at what's going on here. What impact have developments over the past three years had on the way we make music today? What can we expect to see in the next three years? Five of the industry's most visible and respected experts share their views.

## PEOPLE

30

### Vernon Reid

The powerful guitarist from Living Colour reveals some unique applications of high technology in rock 'n' roll. Live sample looping and borrowing from house music (isn't that a switch) are just two examples.

43

### The Plant

Fleetwood Mac's *Rumours* and Huey Lewis' *Sports* are just two in a long list of hit albums recorded at this legendary San Francisco-based recording studio. Our interview with owners Bob Skye and Arnie Frager reveal some of the secrets behind their enduring success.

48

### Pat Metheny and Lyle Mays

Two of today's greatest contemporary jazz musicians discuss the pros and cons of jamming with the Synclavier and the impact of Brazilian rhythms on their music.

## TOOLS

22

### Sample Source Survey, Part I

Chris Meyer takes a look at the CDs and cassettes that provide source sounds for sampling, including short reviews on several products and the important things to look for when shopping for them.

## STANDARDS

Readers' Letters .....	7
Newsdesk .....	9
Listening Lab.....	54
The legendary punk/experimental band Wire is creating quite a buzz, while Madonna shows us once again how money can buy some of the best production in the world, and Peter Gabriel takes us on a journey to the Middle East and beyond.	
Square One.....	56
This month's subject is Reverberation - its origins and modern-day characteristics.	
Readers' Tapes.....	60
More From .....	65

# C O N T E N T S

- 33 Proteus**  
The long-awaited sample-playback unit from E-mu has finally arrived, and the verdict is in. Was it worth the wait? Mihai Manoliu reviews.
- 36 MicroReviews**  
Magnetic Music's newest sequencer for the IBM is called Prism, and features Mac-like scroll bars, pull-down menus and a host of powerful editing functions. The Pocket Products – Merge, Filter, and Pedal – are a new line of self-powered, functionally specific devices from Anatek.
- 67 GR50**  
Roland's newest guitar synthesizer/MIDI interface offers faster tracking, multitimbrality and L/A synthesis. Aaron Hallas reviews.

## APPLICATIONS

- 17 Microtonal Musings**  
If you thought microtonality is only for "world music" enthusiasts and experimental weirdos, think again. Scott Wilkinson offers food for thought on some very real applications for alternative temperaments within pop, rock, jazz and "legit" music.
- 38 Synchronization Basics, Part II**  
Now that we've established some of the basic tools involved in synchronization, Chris Many takes us through a typical real-life scenario – scoring a 30-second commercial spot.
- 62 Programming Compleat, Part VIII**  
Lorenz Rychner's final segment on the Korg M1 focuses on some of the oldest orchestration tricks in the book, and how to use them in the Combination mode.



Roland GR50 – p67



The Plant – p43



Synchronization Basics – p38



# Meet the Staff



Scott Wilkinson, Lawrence Ullman, Trish Meyer, Melodie Gimple, Brent Heintz, Debbie Greenberg, Dan Rue.

Photography Melodie Gimple

**I** ALWAYS WONDER about the people behind the names on the mastheads of the magazines I read, and I know MT's readers must wonder the same things about MT's staff. So, when Scott Wilkinson asked me to write a few words about everybody who works on MT, to go along with the accompanying photograph, I thought, "Here's my chance to tell the whole world about how good, kind, knowledgeable and just plain great-to-work-with these folks are." But then I realized this was one tight spot that lying wouldn't get me out of.

Editor Scott Wilkinson, a vegetarian who is fond of crystals and comes to work adorned in Birkenstocks, is exactly what you'd expect someone from Northern California to be. On the

other hand, Technical Editor Lawrence Ullman is very down-to-earth. After surviving a wild and woolly year in New York, Larry returned to Los Angeles, bringing the unfamiliar sounds of Mozart and Bach to the offices here at Music Maker Publications.

Scott and Larry go way back, having played music together for years at the local and famous Renaissance Pleasure Faire. When they don't get their way, they periodically threaten to walk through the halls playing a sackbut duet. There's a certain irony to the fact that the Editor and Technical Editor of a magazine covering the cutting edge of music technology both play instruments that date from the 16th century.

Assistant Editor Dan Rue is the resident bohemian. He listens to bands

whose music reminds one of the sounds bad plumbing makes in the middle of the night, and insists on driving an eclectic automobile that turns its own lights on, although it's not supposed to. When told by Music Maker management that he was to look "professional" at a trade show, he wore batik. He does have a certain style, though, and his poetry's not bad, either. It's widely known that Dan was the inspiration for the Doonesbury character Zonker.

Debbie Greenberg, on the other hand, exerts a more wholesome influence on the magazine. MT's Editorial Assistant is a recent graduate of the broadcasting department at California State University, Northridge. Her favorite hobby is softball, and she even shows up to work on time! We know she must have some deep, dark secret, but we haven't figured out how to drag it out of her yet.

You must have a certain innate appreciation of black comedy to be an advertising sales rep. Brent Heintz has thus learned to see a little bit of humor in everything, as you might expect from the president of the local chapter of the Lonely Hearts Club. He also has a laugh that you'd swear was coming from a small furry animal if you didn't know otherwise. Brent's personal mantra is "Hola!"

The rumors that Production Manager Trish Meyer sleeps with a Macintosh are completely unfounded, although she occasionally is found asleep *at one*! Knowing that her husband's from Ohio, I always assumed she spoke with a Midwest accent. Imagine my surprise when someone told me she's from Ireland.

Photographer Melodie Gimple is an honest-to-goodness Southern belle from Nashville. She made her first pecan pie recently, *from a recipe*, smashing the theory that this is a genetically inherited trait. I'm convinced her pet, Pud, is the dog that Cujo was modeled after.

On most days, the MT editorial staff can be found sharing lunch (or is it recess?) at a local park, where train tracks, kites (sorry about your kite, Scott!) and frisbees inspire them to come back and keep going. So now, when you pick up a copy of MT, you won't have to wonder any more about what sort of crazy people put it out every month. You'll know they're nuts!

Amy "Kite Crasher" Ziffer ■



# READERS LETTERS

**We want to connect with you on a deeper level. We want to know your feelings; we want to know your thoughts. Please send them to: Readers' Letters, Music Technology, 22024 Lassen St., Suite 118, Chatsworth, CA 91311.**

## A Keybored Reader

The July '89 issue of MT was a first for me. This is the first time that an editorial was my favorite part of a magazine. Bob O'Donnell voiced feelings that have been growing in me even before I heard what was at the January '89 NAMM show.

I don't believe that Yamaha has taken FM as far as they could have. There are many improvements that could have been made on the original DX7 design. Casio has taken the FM concept a bit further with the VZ1, but I think the problem with FM is in the market place. Low-cost samplers, sample players, and sample-based synthesizers are more "realistic" than any FM synthesis could be, regardless of how advanced FM becomes. And of course, the more complex FM becomes, the more complaints arise about how confusing it is. As for samplers, one problem is their lack of expressiveness and real-time control of the sound. Synthesis, unlike sampling, can be used to create interesting, non-acoustic sounds.

I don't care for the attitude expressed in another music magazine about the Casio VZ1. In a review, one of the negatives about the VZ1 was that it didn't have PCM samples. Does every manufacturer have to copy what is currently hot in synthesizer design? I hope not. In fact, that is one of the problems in the market. Even though digital circuits can be used in an almost unlimited number of ways to produce sound, what is happening now is that every company seems to be coming out with a D50/M1 clone.

The market is currently in the same position it was just prior to June 1983. The Prophet 5, Oberheim, Memory-moog, Jupiter 8, Polysix, Juno 60 design was predominant. Then along came the Yamaha DX7. The changes were dramatic, but necessary.

Are we about to see another "DX7" crash onto the scene? It's not that I am

a techno junkie who is jaded and has to be amazed every six months by something new. It's just that digital keyboards are in a rut. Can someone please, please come up with something different that is also interesting? Please? Pretty please? I'll even beg if it will help.

**Key-bored, William Roberts  
Indianapolis, IN**

## Sexism In Advertising

Several months ago, I wrote a letter to you praising your advertising policy, which I thought reflected the tone and balance of the articles in the magazine – that is to say technical, intelligent and informative. I like the little snippets of humor that come through too – we all occasionally suffer from what I call "techno-shock" by getting lost in our machinery and the world of MIDI.

But alas, I found two sexist ads in last month's issue (June '89) –Rolls Music on page 11 and Aphex on page 26 – and I certainly hope that you will reconsider your advertising policy to reflect very closely what your magazine's theme is about. Please don't let the quality of your magazine sink downward by allowing your advertising policy to bring the tone to a lower level. Being concerned with the latest developments in music technology, I assure you that I do look at the ads to see what is new and I do read what technical info is presented on these new items, especially so in a magazine with this theme. The Rolls Music ad is particularly "stupid" and "cheesy" in my opinion and probably says a lot about the company. The Aphex ad is a straight sexist marketing technique.

Can you please avoid this type of stuff? Our society is moving away from these values towards a more conscious and equalitarian human potential. Reporting on the democratization and development of technology for musicians is certainly right at the forefront

of that societal and human potential development. Discard the "crap" from the past – keep the good values and build on them. I welcome other readers to make their opinions known.

**Roman Orest  
P.O. Box 81161  
Wellesley Hills, MA 02181**

## A Fool and His Money?

*(Replies to Chad Clay's letter (MT, July '89) have been pouring in. Chad, after winning a large sum of money in a contest and buying a ton o' gear, proposes that "creativity isn't everything . . . money and gear make a huge difference." What do you think? – Ed.)*

If anything, you've proved how an excess of money makes one a fool. Your point of disproving "creativity is everything, equipment doesn't really mean a thing" obviously stemmed from some personal emotion, probably brought on shortly after you won your sweepstakes money. If this issue meant so much to you before, you would have written your letter a long time ago.

After going over the list of gear you purchased, I can see that your purchase was a blind one. Half of your keyboards and modules already supply their own effects processing. You bought two S1000 samplers (I assume you expect one to break down on your worldwide tour), two drum machines (if you had the money, why not just get the Simmons SDX?), and about twice as many mixers and effects/signal processors as you need. The money you would have saved could have lengthened your support from one-and-a-half years to two-and-a-half.

You really should take a look at some of the bands touring these days. You mentioned bands that I also follow (Blue Sky, Skinny Puppy, Kate Bush), and I assume that you've seen some of their live shows. On a recent inspection of Nitzer Ebb and Front 242 live shows (along the Puppy lines), one notices that Front 242 had a massive total of one Emulator II and an Akai S950. Nitzer Ebb had an even more massive ensemble – one Akai S900. You see, real creativity not only stems from a piece of music one composes, but also from how it is composed. For my band (only two people), each of us has only two keyboards, one drum machine, and one effects processor. Everything is run from an Atari 1040ST, and if you compare the music quality to gear ratio of your setup, you would probably deny our existence.

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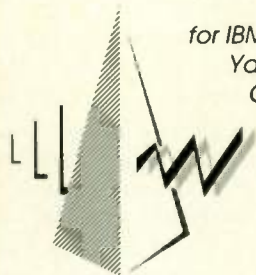


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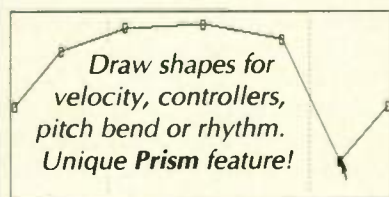


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The real creativity comes with things like multitimbrality, split points, and layering. These are things we use to reap the full potential of our setup. If I had your gear, I would probably end up selling over half of it, as it's nothing more than more gear to lug around and not have any use for.

So you see, creativity is everything – creativity in writing/composing and creativity in utilizing a piece of musical equipment to its fullest extent. Anyone who has the money can buy whatever they want. I constantly see little boys whose fathers keep shelling out money for gear they never use. They buy it only because they saw it on the back of a record cover. If you don't have the creativity to exploit your gear to its fullest extent, it's going to show in your music. So I'm sad to report that money and gear do *not* make a huge difference, only a minimal one.

I would hate to see the look on a road manager's face as you continuously bring in rack after rack of gear to reproduce what could be done with a single S1000 and a DX7IIDF. Who actually talked you into buying all your gear?

Peter Stone  
Chatsworth, CA

I enjoyed Chad Clay's letter in which he discovered musical career "enlightenment" by winning a mega-buck sweepstakes. Before his lucky break, Chad reportedly had under \$1000 worth of musical gear. Now he has a complete digital studio in a beach house and offers knocking on the door (if dreams have copyrights, he owes me and a lot of other musicians some royalties!)

Getting people to listen to your music does take some quality music gear, but being able to realistically afford that gear is not a dream. I make only a fair sustenance as a professional musician, yet I have nearly everything I really want or need for recording and playing, and I'm not in debt. Many musician friends see my stage equipment and say, "Wow, man, wish I had your bucks . . ." I didn't win the sweepstakes, I just budgeted my musical equipment expenses over a given time frame. And now, after several years, that investment has grown. Recently, a close friend of mine completely overhauled his gear with over \$3000 of new equipment, and paid for it in just six months with a simple six-month/25% formula. Here's how it works:

I use a six-month time frame on which I budget new gear purchases. This means that any new equipment I buy must pay for itself in earned income within a six-month period. Furthermore, that equipment purchase must never exceed 25% of my total income for a six-month period (it goes without saying that all other living expenses and bills cannot exceed the remaining 75%, but some musicians tend to miss that part). All old purchases must be paid for before new ones are made. So, if a new synth costs \$2500, that means I must set aside \$416.67 a month to pay for it. Using my 25%-of-income formula, I have to be making a total of \$1666.68 a month to afford that synth (\$2500 divided by 6 = \$416.67; times 4 = \$1666.68.) So if I'm only making \$1000 a month in gigs, either a part-time day job or a cheaper synth is in order. If the synth or equipment purchase is essential to my playing, I'll take out a 90-day note with my bank and get it, reducing the principal by half in the first three months with interest and paying it off in six months. Banks will give you a 90-day note with less hassle than an installment loan if you have signed contracts to validate your upcoming income.

If you have a full-time day job that pays your bills and supports your family, but that's about all, it may be easier to justify new music equipment (especially to your wife or girlfriend) by using your gig money to pay for the equipment. Once again, use the six-month-plan to offset \$2500 or so in equipment with a minimum of \$416 in extra earned income (via the equipment) every month. It's hard to argue with buying anything that can pay for itself in six months, especially since the useful life of the equipment (and the tax credit!) can last many years.

Chad Clay could have doubled his pre-sweepstakes home music setup in six months on an income of only \$668 a month (\$1000 divided by 6 equals \$166.67, times 4 equals \$666.68.) It doesn't take winning the lottery to get the latest gear, just a little planning and determination. If Chad got a creativity rush from winning enough money to buy his dream equipment, imagine the rush he would have gotten if he had earned it! (No offense Chad, musicians need all the lucky breaks they can get and I wish you many more!)

Jim Eshleman, II  
Macon, Georgia  
SEPTEMBER 1989



# NEWS DESK

## NEW TX81Z EDITOR

Bartleby Software has released BELS/81 (\$49.95), a new editor/librarian for the Yamaha TX81Z and IBM PC/XT/AT or compatibles. BELS/81 operates with both menus and hot-keys for experienced users, and context-sensitive help info for every field and function. BELS/81 allows editing of all voices, performances, microtuning, effects and system functions.

The librarian functions allow you to save voices individually or in banks, and move voices between banks. Data sheets can be printed for all voices, banks and performances. Complex microtunings for a single octave or the entire keyboard range can be created, edited, and stored as well. The performance editor allows you to split the TX81Z into eight different instruments, assigned to different MIDI channels or different keyboard ranges. Also included are a separate set of utilities designed for live performance, allowing banks of voices, performances, effects, and other parameters to be quickly loaded on stage. Additional utilities allow you to convert banks of voices in other formats to the BELS/81 format. The program comes with 10 banks of voices as well.

BELS/81 is not copy protected, and requires two floppy drives or a fixed disk, 350k of free memory, and DOS 2.1 or greater.

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

## NAMM NEWS FLASH!

As we go to press, the editors have just returned from the Summer NAMM show in Chicago. While you'll see a complete report on the show in the October issue of *MT*, we wanted to let you in on some of our initial impressions.

As you might be inclined to guess, attendance at the show was quite light. There were many empty and unattended booths (particularly in what became known as the "MIDI ghetto," which occupies the lower floor of the enormous McCormick Place), and many of those who were showing their wares were disappointed at the dealer turnout. Several manufacturers voiced their intention of skipping next year's summer show in favor of the Winter NAMM in Anaheim. In fact, there was a petition being circulated amongst the manufacturers advocating that there be only one show per year.

Product-wise, there was a definite decline in the number of new professional, or "MI" products from the major manufacturers. Both Roland and Yamaha seemed to place greater importance on the home keyboard market, citing the well-known plateau in the MI arena. Yamaha was

showing many new home synthesizer keyboard instruments but no new professional instruments at all. Roland was demonstrating the new S770 16-bit stereo sampler and the U20 keyboard (based on the D110) as well as some very interesting sound modules and computer peripherals for the home market. One interesting development was Roland's purchase of the Rhodes name. They've employed their S/A synthesis technology to recreate the famous Rhodes electric piano sound in the familiar Rhodes "suitcase."

In the software end of things, Atari developers seemed to be squeezing an amazing level of functionality out of the beast. The biggest news on this front was the variety of (mostly incompatible!) multitasking environments being shown by Dr. T's, Intelligent Music, C-Lab, and others. The newest versions of Performer, Vision, and several other Macintosh products were also on display, and many IBM programs were shown running on the Yamaha C1 as well. Stay tuned for a full report next month!



CMS Reps at NAMM.

## AUDIOFRAME OPTION

Waveframe Corporation recently announced the addition of hard disk recording to the AudioFrame Digital Production System. Disc Recording Modules are 4- or 8-channel plug-in boards that occupy one slot in the AudioFrame. Total system capacity can be expanded to

as many as 32 channels, and the resolution is switchable between 16- and 24-bit modes. A four-channel version of the Disk Recording Module (DRM4) will be available late summer 1989 for \$10,000.

**MORE FROM:** WaveFrame Corporation, 2511 55th St., Boulder, CO 80301. Tel: (303) 447-1572.

## S700/X7000 LIBRARIAN

The S700/X7000 Librarian (\$79.95) is a new program for the Akai S700 and X7000, and Atari ST computer from Music Service Software. The program lets you store samples and multisamples on your hard disk or 3.5" floppy, instead of the 2.8" "quickdisks" that the machines accept on their own. In addition to storing sounds from the S700 and X7000 themselves, the Librarian will accept samples from other 12-bit Sample Dump Standard-compatible samplers over MIDI. While it's not an editor, the Librarian will give you a visual display of loop points, allows you to view the envelope of the sample, and even perform crossfades of whatever length desired. Also included is a desk accessory which allows you to send individual samples to GEM-based MIDI sequencers. The S700/X7000 Librarian is not copy-protected, so you can make yourself several dozen backups, just in case.

**MORE FROM:** Music Service Software, 801 Wheeler Rd., Madison, WI 53704. Tel: (608) 241-5615.

## FREE CAKEWALK UTILITY

Twelve Tone Systems has announced Cake2Mid, a free utility that converts Cakewalk 2.0 files to standard MIDI File format. Since this feature has not yet been available to owners of regular Cakewalk 2.0, the company has released this utility to owners in order to "tide them over" until a later update of the program is released. As of yet, no date has been announced for the release of a new version of Cakewalk. Cake2Mid can be obtained from many music-oriented BBS services, including PAN, IEMUG, and CompuServe. Registered owners can write to Twelve Tone Systems to request a free utility disk.

**MORE FROM:** Twelve Tone Systems, Inc., P.O. Box 226, Watertown, MA 02272. Tel: (617) 273-4437.



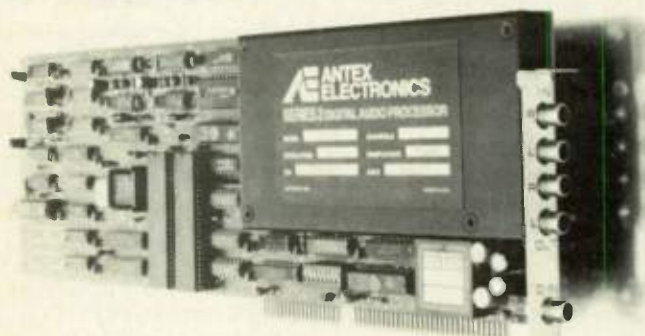
## NEW BLUE INTERFACE

► Antex Electronics, Inc. has introduced the Series 2/ Model SX10, a digital audio processor board designed to plug directly into an internal slot of IBM AT/386, PS/2 Model 25/30 computers, and compatibles. The SX10 can receive external sound as well as analog and digital data from multiple sources, storing it on hard disk. A built-in digital input interface connects to CD, DAT, and other digital sources. The SX10 has a sampling rate of up to 50kHz, with full 16-bit resolution.

User programmable and

menu driven, the board (\$1995) offers simultaneous stereo record and playback. The onboard DSP allows four-to-one data compression, freeing up the computer memory for other applications. A conversion utility is optionally available for editing audio files, providing simultaneous video and audio editing capabilities. A multi-board version of the SX10 driver is also available, enabling multi-board recording and playback.

**MORE FROM:** Antex Electronics, Inc., 16100 S. Figueroa St., Gardena, CA 90248. Tel: (213) 532-3092.



Antex Electronics Model SX10.

## PI PITCHING

If you've been striving to achieve harmonic perfection, then *Pitch, Pi, and Other Musical Paradoxes (A Practical Guide to Natural Microtonality)* by Charles E. H. Lucy is a book for you. This book, now available for the first time in the U.S., includes exact guitar fretting dimensions and tuning codes for synthesizers, samplers and computers. Lucy discusses such topics as why different cultures use different tuning systems, why many of the newer synthesizers have

microtonal capability, why musical tuning was of paramount importance to Chinese emperors, and the relationship of music to quantum physics, longitude, and cosmology.

Lucy Scale Developments, which sells the book for \$56 in printed form or \$48 on computer disk, also publishes a quarterly newsletter called *Pi and Harmonic Perfection*.

**MORE FROM:** Lucy Scale Developments, P.O. Box 5146, Laguna Beach, CA 92652.

## AKG DIGITAL RECORDING

AKG has unveiled their new DSE7000 Digital Sound Editor, a RAM-based (not disk-based) 8-track digital audio recording workstation. Features include high and low speed search with variable pitch audio; a 10-input mixer including level, pan, echo

send/return, track bounce, and solo functions; time-slipping; copying, moving, and deleting of events with last-edit Undo; auto-locator with return to beginning, last recording point, location 1, location 2 and end; remote control; and IBM AT-

## STELLAR DAT

Digital Audio Technologies SA announces the Stellavox Stelladat, the first prototype of its new professional portable RDAT recorder. Designed to replace the Swiss portable professional reel-to-reel recorders, the Stellavox Stelladat is smaller, half the weight, and even more rugged. With features like extended battery life, intelligent easy-to-read metering, and sophisticated

locator functions, the Stelladat will provide two hours of continuous recording, high fidelity sound, and ease of editing. Other benefits include shock resistant, waterproof construction impervious to climate extremes, multiple input and output jacks for maximum versatility, and full remote control capability.

**MORE FROM:** Digital Audio Technologies SA, Puits-Godet 20, CH-2000 Neuchatel/Switzerland. Tel: (038) 244-400.

## SING ALONG WITH MITCH

Akai Professional has introduced the U5 Trackman, a 4-track/4-channel cassette recorder. The U5 (\$299.95) has the ability to play a pre-recorded cassette on tracks 1 and 2 while recording new parts on tracks 3 and 4. In addition, you can record four tracks of your own by recording the first two tracks on a standard cassette recorder, putting that tape into the U5, and adding two more tracks. Echo/chorus, limiter, and distortion effects can be added to any signal recorded into the U5. Effect In and Out jacks enable you to

patch in any outboard effects device. Other features include one mic level input, two instrument level inputs, and a line level output that allows you to mix the four tracks on the U5 to a normal stereo cassette deck. Also included are two stereo headphone jacks (one set of headphones is included with each unit) and a belt-clip built into the body. The U5 runs on batteries, or an optional AC adaptor.

**MORE FROM:** Akai Professional, P.O. Box 2344, Fort Worth, TX 76113. Tel: (817) 336-5114.



Akai U5 Trackman.

compatible computer with pull-out keyboard. Designed for short digital recordings, the DSE7000 utilizes up to four 4Mb DRAM cards to record at 32kHz with a 15kHz bandwidth, or optionally at 44.1/48kHz with a 20kHz bandwidth.

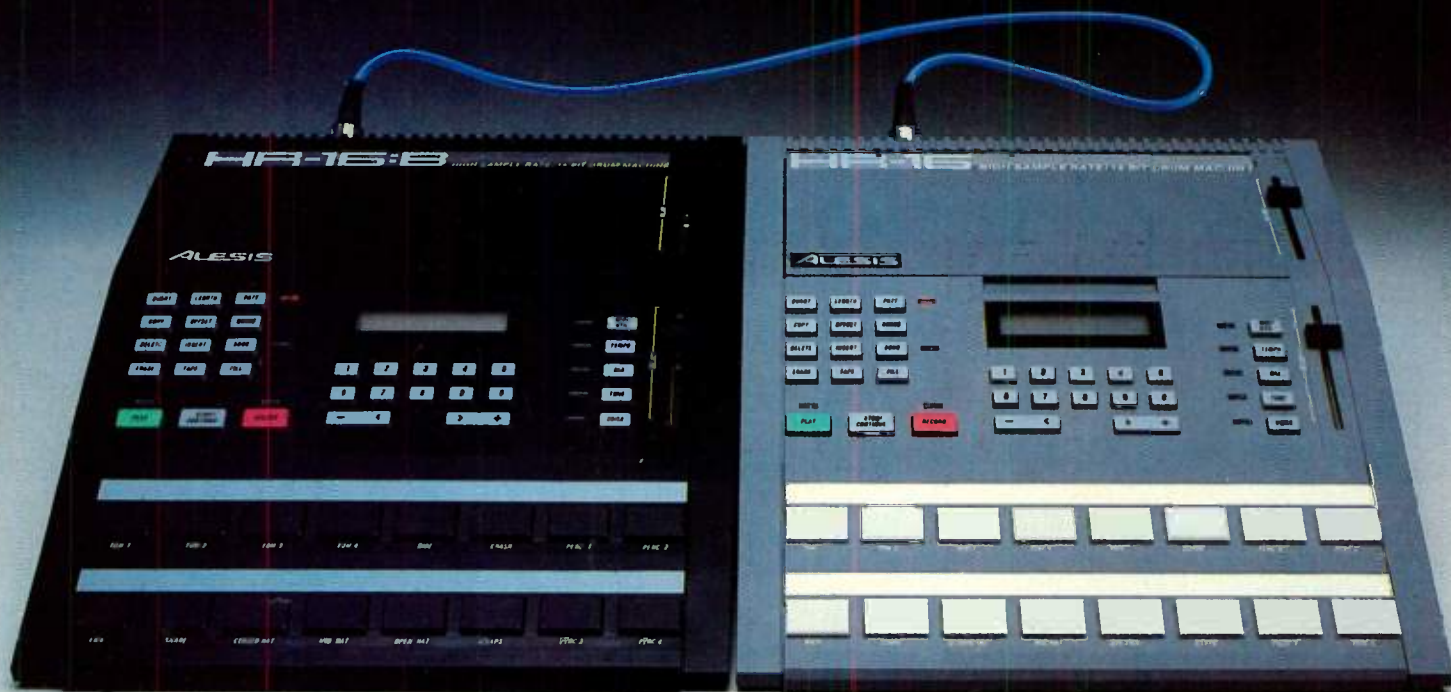
Tentative pricing for the

base system is \$30,000. Optional workstation and monitor/speaker assemblies will cost around \$1200 each. Memory cards will be priced anywhere from \$4500 to \$7500.

**MORE FROM:** AKG Acoustic, Inc., 125 Walnut St., Watertown, MA 02172. Tel: (617) 924-7697.



# Partners in Time



## Introducing the HR-16:B *plus* HR-16

Two brilliant drum machines that redefine the future of drums and percussion. The HR-16 is pure and natural. One of the all-time best selling drum machines. The standard that all other drum machines are compared to. You probably already own one, or wish you did. The HR-16:B is stylized, processed, industrial powered. Master-quality productions right out of the box.

**The choice is yours.** Either way, you get the most staggeringly realistic drums, percussion and sound effects available at any price. And if you hate decisions, get both of them. Just pop the update chip (included with the HR-16:B) into your HR-16. Hook up one MIDI cable and you've got an electronic drum system that covers all the bases. From supple Latin feels to heavy rock backbeats to tough street grooves.

**Here's what you get.** 49 HR-16 sounds plus 47 HR-16:B sounds. That's 96 sounds total. All captured at a phenomenal 47kHz sample rate with 20Hz to 20kHz frequency response and 16 Bit resolution.



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Included with every HR-16:B**

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**Sound is the heart of all Alesis gear.** Our trademark. The technology and craftsmanship that produced these sounds is an Alesis exclusive. You won't get it anywhere else. See your Alesis dealer today and listen to the only two choices in town.

**HR-16 *plus* HR-16:B. Partners in time.**





# THIRD ANNIVERSARY – INDUSTRY ASSESSMENT

**As *Music Technology* celebrates its third anniversary, we find ourselves at a point conducive to reflection, a point at which it seems appropriate to take a moment and assess the state of the industry. What has happened over the past three years that will prove to be of significance to the future of our industry? Where is R&D likely to take us, what lies on the horizon for today's high-technology musicians? We've asked five of the industry's most-recognized authorities to share their thoughts . . .**

## Lachlan Westfall

I'VE NEVER HIDDEN the fact that a healthy portion of my fascination with MIDI stems from its non-musical aspects. It's really fun to grab a bunch of instruments, put them all together and make them work. Hardware, software, whatever – MIDI is a great way to get your hands dirty without having to clean up afterward. Of course, I'm a musician as well, and very often have to balance my desire to radically tweak a slew of notes in a sequence with my creative need to find another set of chord changes that work well with the first. And I'm sure that these mental gymnastics are not unique to me. The advent of MIDI has allowed many technically and musically creative people to find a wonderful new outlet of artistic expression.

Three years doesn't really seem like a very long time ago, but at the 1986 Summer NAMM show (which forms the general focus for new MIDI hardware and software), it seemed like the MIDI industry was just entering its second phase. Things were finally settling down after a few rocky years at the beginning. The first software for Atari's new 520ST was emerging, Macintosh software was about to move up a notch with the release of Mark Of The Unicorn's Performer, and one of the most popular all-in-one synthesizers, Ensoniq's ESQ1, had recently been announced. The tools for developing a serious MIDI studio were finally getting into the hands of the MIDI power-users.

The 1986 Summer NAMM show also saw the debut of an interesting new publication – *Music Technology*. I'll have to admit that this was not such a surprise to me as I had been regularly reading the UK's *Electronics & Music*

*Maker* for a good couple of years. Just the same, I was happy to see that the publishers of this magazine that had so successfully addressed the needs of the emerging MIDI musician would now also be publishing the new *Music Technology* here in the States.

The upcoming 1989 Summer NAMM show will bear witness to a very different MIDI industry from the one we saw in 1986. Through the continued development of new and better hardware and software, the number and variety of tools available to the MIDI musician has expanded greatly. We now have much more powerful computers (such as Atari's Mega4 ST and Apple's Macintosh SE and II line) available for running more sophisticated programs. New forms of synthesis and sample playback have also been developed, bringing the palette of instruments from which a musician can create a MIDI system to

an all-time high.

However, I must say that some of the excitement that spawned the surge of ideas back in '86 isn't felt as strongly today. The industry has almost become complacent in its attitudes toward the MIDI interface. Early on we were all happy to run tangles of MIDI cables between instruments and get a bunch of stuff to work together. Now it seems that users want to avoid the hassles of modes and channels and simply use

**Westfall:** *"The technologies with which we are so familiar will become more and more integrated with emerging computer video technologies to facilitate desktop multi-media systems."*

one of the many new "music workstations" that has everything in one package. This is a very different attitude from the early MIDI advocates' cry of "Complete Connectivity or Death!"

I have little doubt that future developments with respect to MIDI and music/computer interfacing will spark a new resurgence of fascination with "hooking it all together." MIDI and other technologies developed over the next three years will undoubtedly give us more powerful music systems. Beyond that, I'm sure that MIDI and music will ultimately become part of a larger picture. The technologies with which we are so familiar will become more and more integrated with emerging computer video technologies to facilitate desktop multi-media systems. For example, I can use Intelligent Music's OvalTune to integrate color pictures and music in real time. This is an area of the industry that we should all be watching. I don't know what I'll be doing in three years time, but I'm sure going to have a good time figuring it out along the way. ■



LACHLAN WESTFALL is the president of the International MIDI Association (IMA). In this capacity, he publishes their monthly newsletter, *The IMA Bulletin*. He also serves on the Executive Board of the MMA. He teaches courses on MIDI and computers for UCLA Extension and has developed a Macintosh HyperCard stack for the Akai S900 (see 'Hyper MIDI Programming' in the February and March '89 issues of MT for more info on his HyperCard stack). As a musician, he sequences MIDI data avidly and plays bass in his own band.



# THIRD ANNIVERSARY - INDUSTRY ASSESSMENT

## Jim Cooper

IT WASN'T VERY many years ago that the tape recorder was invented. At first, it was perceived as a miracle by some and a curiosity by others. As the technology matured, it was seen as a great gift by more and more people. Now, \$20 will buy a child's recorder with better sound than the first "professional" units.

In some ways, MIDI has undergone some of the same maturing, particularly in the last three years. To those trying to layer synth sounds and/or deal with early sequencers, the first appearance of MIDI was something of a miracle. Up until then, they had to deal with the xenophobic differences among the various manufacturers' interfaces. By now, there is a plethora of layers available, a cornucopia of sequencers.

Not that early MIDI-land was any more perfect than the fidelity of the earliest recorders. There were a number of "band-aids" necessary in the first couple of years. Channelizers, channel filters, and crossed fingers were needed. The first two of these are generally no longer needed, or indeed, manufactured.

Just as there were early nay-sayers concerning tape recording (back when "direct-to-disk" really was!), MIDI had early distractors. One leading manufacturer of synthesizers was quoted that MIDI was not up to their standards, and would not be implemented. That stance lasted about half a year as their market share eroded to practically nothing.

In the past few years the maturing of MIDI can be particularly seen at a "pro audio" show like the AES convention. Three years ago, only the adventurous

synth or software company showed anything with MIDI, and I was asked a great many questions of the "so what does MIDI do?" variety.

Now, just try to find a studio of any size without MIDI. Equalizers, delays, reverbs, mixing boards, patchbays, and even tape recorders have MIDI connectors on them. MIDI has gone from being a buzz word to a marketing necessity in a relatively short time.

This change has come about partly because MIDI has gone from being perceived as just a synth layering tool to being a truly useful general interface

*Cooper: "The major change I see will be MIDI 'piggy-backing' on some sort of Local Area Network (LAN)."*

for the control of practically anything to do with music, and a surprising number of applications having almost nothing to do with music at all.

Another reason for the change of MIDI's status has been the adoption of the MIDI Time Code standard, which is almost three years old. MIDI Time



**JIM COOPER** owns and operates JL Cooper Electronics, manufacturers of a wide variety of MIDI products, including MIDI patchbays, processors, and automation devices. He is a past president of the MMA and has contributed significantly to the MIDI specification.

Code (MTC) represents the final link between the use of MIDI, SMPTE timecode, and the fantastic power of computers as an integrated production tool in the world of pro audio.

Would it be too much of an overstatement to say that MIDI has had the same impact as a tape recorder? Probably, but it is interesting to see the same introduction/maturation process take place.

How about the next three years? I would expect to see MIDI continue to mature without any spectacular changes. There will undoubtedly be some small changes along the lines of file format standardization or newly defined modes.

The major change I see, at least in larger studio installations, will be MIDI "piggy-backing" on some sort of Local Area Network (LAN). LANs are found in the business world as a very high speed method of communication between a large number of computers and peripherals. LANs have many attractive elements. For instance, they can transmit data 20 to 200 times faster than MIDI. A single cable can carry *all* data to and from all attached equipment. Implied in the data protocol is an "address" for each attached peripheral so that no equivalent of a MIDI "switch box" or patchbay is necessary. (For a look at one such LAN, see 'MediaLink' in the August '89 issue of MT.)

In a studio, there would be a LAN which would carry data from a central (fairly high performance) computer around the studio to a number of "servers." These would convert the LAN data into MIDI for connection to the synths, etc. This could bring to MIDI the equivalent of what has happened to tape recording with the advent of digital techniques: very high performance with enhanced flexibility.

## Roger Powell

ALTHOUGH THE DIGITAL revolution within the music industry can be traced back to its roots in the '60s, it is only within the last five to seven years that its impact has fully spread to all areas of the music-making community.

We have experienced the advent and refinement of many intriguing new computer-derived tools during this period. But before gazing into the future and projecting what is yet to come, I'd like to recap some of these developments.

The introduction and rapid success of compact discs as the preferred consumer medium for audio storage and playback has had a profoundly

stimulating effect on all facets of the music production business. By providing a standard, convenient method for reproducing sound in high-quality digital format, CDs have sparked a revival in the record industry.

Digital audio has also been embraced by musical instrument manufacturers, who made the leap from the older, clumsy analog synthesizers to today's digital instruments. Besides



# THIRD ANNIVERSARY - INDUSTRY ASSESSMENT

► offering sound of higher fidelity, digital synthesizers provide greater reliability, large libraries of sounds, faster recall and greater precision of control parameters as well as the potential for integration into all-digital recording environments.

Still missing at this time, however, is more intuitive and expressive control of subtle sound nuances like that taken for granted on traditional acoustic instruments. This is partly due to the architecture of digital sound generating instruments as well as the general acceptance of static sampled or synthetic sounds as being adequate for commercial music. Perhaps this explains the reluctance of instrument de-

**Powell:** "We'll see new methods for synthesis introduced, such as 'chaotic modeling,' which attempts to duplicate the physics of conventional instruments in software."

signers to tackle the invention of new ways to create and control sound that would yield character, personality and subtlety of expression comparable to established instruments like the violin, saxophone or piano.

From the perspective of those who compose and produce music, the inception of MIDI is likely to be considered among the most important developments in musical history. The adoption of MIDI as a standard for expressing musical performances has literally changed the face of composition. It has also rendered the personal computer a necessity as the "word-processor-for-music," just as the computer became essential to the business and scientific communities years ago.

Based on these ideas, let me create a potential view of what might appear on the near horizon. In the coming years,

there will be dramatic developments in the compact disc arena. Already, we have audio-video CDs and playback units that combine visual presentations with high-fidelity sound. Expect this trend to continue, with improvements in audio and video quality. In the near future, CD sound will move from the current 16-bit format (allowing the representation of 65,536 different volume levels per sample point) to 18-bits (262,144 levels). Professional equipment that provides 20-bit resolution is now available and there are plans to eventually reach 24-bits. Analog multitrack tape recorders will gradually be replaced by tapeless digital workstations as mass storage devices become faster and cheaper.

Music synthesizers will begin to



ROGER POWELL began using and designing synthesizers in 1969 for ARP and Moog. In addition to recording two solo synthesizer albums, he is a long-standing member of Utopia with Todd Rundgren. He is also the author of *Texture*, a MIDI sequencer program for the IBM PC. He is currently employed as a senior software engineer for WaveFrame Corp., manufacturers of the AudioFrame Digital Audio System.

appear with digital outputs in order to interface directly with other digital audio gear, radically improving the quality of sound that can be reproduced in a synthesizer-based studio. We'll also see new methods for synthesis introduced, such as "chaotic modeling," which attempts to duplicate the physics of conventional instruments in software. Maybe this will open the door for more expressive control of synthesized sound and inspire designers to develop innovative controllers to match the enhanced audio possibilities.

The MIDI software/personal music computer world will continue to expand with more elegant, integrated programs for sequencing, notation, synthesizer voicing and music education all running on lightning-fast computers. Expect performance data for MIDI-based productions to be included with recorded sound on the same CD. More hardware expansion devices like Digidesign's Sound Accelerator or IMS' Dyaxis system will be developed that will turn the personal computer into a digital audio recorder and editor. DSP (Digital Signal Processing) capabilities will become standard, integral elements of personal computers as the computer industry realizes that sound, as well as graphics, is a vital programming resource (the NeXT computer has lead the way with the powerful Motorola 56000 DSP chip on-board).

Also, we'll probably see the MIDI spec grow to include faster, more dense communication links, and control of auxiliary devices like CD players, digital tape recorders, mixers, computerized video animation, motorized video camera dollies . . . in short, you'll be able to use your MIDI-equipped computer and inexpensive outboard gear to create an entire, synchronized multi-media production!

## Chris Meyer

AS NOISEMAKERS GO, electronic musical instruments in their current incarnation are pretty young - whether you date them from their immediate

cousins, the voltage-controlled analog synthesizers that first started appearing in the early '60s, or from MIDI, which appeared in the early '80s. It's hard to imagine what the next twenty (or even three) years might bring, but it does seem popular to assume that we're in a period of stagnation right now.

No one disagrees that MIDI is one of

the most significant developments in the field of musical instruments and the music they can create. Three years ago, MIDI was at its most active point since its inception. The Sample Dump Standard had just been approved, MIDI Time Code was on the horizon, and a large number of controller codes and standard practices were defined



# THIRD ANNIVERSARY - INDUSTRY ASSESSMENT

and added to the MIDI specification. MIDI was also accepted by virtually every sub-nook of the music industry.

Given all that, I'm bewildered that most companies still treat their MIDI implementations as a necessary evil, and that additions to the MIDI specification have slowed to a crawl. This is definitely an athlete that peaked too soon. Much more can be added, particularly in the areas of control and automation, with a chance to impact virtually all facets of music making.

**Meyer:** "What I want to know is, where are people going to sell all of this music they're recording at home?"

Perhaps the problem is that most people still haven't gotten beyond thinking of MIDI as just a messenger of simple performance information - typically, originating from 61 piano keys, a pitch wheel, and a mod wheel. Once people view MIDI as an instrument itself with 128 discretely selectable pitches and over 100 individual parameters of nuance, maybe it will be nurtured as it deserves.

A lot of the current engineering-types are contributing their two cents by creating music software, an area that's perhaps come farthest of all over these past three years. I worry for the developers in this field - rampant illegal copying and distribution of programs is really destroying their profit margins, and hence their reason for staying in business. Also, I think that the market has strangled itself - people have bought just about all the \$500 sequencers, \$150 synth editors, and \$300-\$700 sample mulchers they care to. I don't know how many people are going to buy into the next generation of expensive programs, particularly those that lean towards "features wars" evolution rather than innovative thought (you saw how many people dropped their DX7s to get DX7IIs). I think that software must be inexpensive and/or unique to generate major interest anymore. Sequencers like Intelligent Music's RealTime and Dr. T's Tiger are breaths of fresh air. Also, I (like many) have started collecting algorithmic composition programs like baseball cards -

again, as long as they're cheap.

Speaking of slowed-down markets, I've heard from several sides that the synthesizer and sampler markets are also saturated. Everybody in the existing market has already bought their FM synthesizer or sampler. The only people left to sell to are new entries. I've even heard dealers say that they just break even on electronic instruments now - the real action is in home recording. But let's face it - if a truly different-sounding synthesizer (like the D50 proved to be) or sampler (like 16-bit stereo samplers proved *not* to be) was to pop up in the next three years, we'd have another stampede. And then another saturation, until the next new thing hit town.

Not that home recording isn't hot. I'm encouraged by signs from the likes of Tascam, Fostex, and Peavey that the manufacturers of such gear see the need to blend in with MIDI equipment, not vice-versa as it was in the past. There's no good reason (beyond ►



**CHRIS MEYER** has been instrumental in the development of MIDI, having largely written the Sample Dump Standard and MIDI Time Code. He has served on the Technical Board of the MMA and worked for Sequential Circuits and Digidesign. In addition, he was Technical Editor for MT, Home & Studio Recording, and Rhythm magazines. He is currently a design engineer for Tom Oberheim's Marion Systems, and continues to contribute regularly to MT.

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▶ tradition) that the creation, recording, and mixing of sound cannot be seamlessly integrated and controlled from one place. For example, imagine a program that controls the recording of your MIDI and audio tracks, with transport controls and program selectors built right into your mixer.

But what I want to know is, where are people going to sell all of this music they're recording at home? Maybe an artist's ability to deliver a finished master will lower record company resistance to picking up new material because they'll have fewer up-front costs at risk. This is certainly possible

now with RDATs, Hybrid Arts' ADAP II, or Digidesign's Sound Tools. And in three years, RIAA willing, it may be possible with writeable CDs.

More and more of these musicians will call what they do "jazz," not because it'll be like any traditional form of jazz, but because it'll be beyond what we've come to expect from rock. And they won't want to be called "New Age" (which has come into and gone out of fashion over the past three years in pretty much the same way FM synthesis did three years before it). Or maybe we'll invent a new term - like "post industrial" or "Cyberpunk."

After three years of explosion, I think we've hit a plateau. On the one hand, I wouldn't mind seeing a moratorium on technology while we all become musicians for awhile and figure out how this stuff works (I've heard a lot of industry engineers talk about taking time out to create music themselves - good for music and them personally, but potentially bad for the industry). On the other hand, I can't help but think that we stopped way too soon. Check back in three years and let's see where we're at. Maybe I'll have finished my own Cyberpunk post-industrial jazz album by then. ■

## Jeffrey Rona

LOOKING BACK OVER the last three years, one clear point I see is that electronic musical instruments have gone from revolutionary to evolutionary. Three years ago, synthesizer manufacturers were boasting about new synthesis techniques and more power for the money. Today, instrument makers are concentrating most of their energy on lower-cost, lower-end products that appeal more to the novice and amateur "home market." Important new instruments are few and far between. It seems that the electronic music market has hit a saturation point. Or has it? I think the market is saturated by the kinds of instruments being made *now*. As instrument designers continue to refine and rethink the relationships between musicians and instruments, the market will continue to flourish.

In the last three years, MIDI has become to the musical instrument world what color is to TV. I remember when some television shows used to proudly proclaim "In Color" at the beginning of each episode. It was a throwback to the Age of Black-and-White. Now days, we are seeing less and less mention of MIDI in advertisements and product brochures - it is simply assumed. Productivity is stressed over technology.

For the future, I see a movement from discrete devices (i.e., sequencer to synthesizer to reverb to EQ to delay to mixer to tape) to general purpose

modules that will be combined together to produce "meta-instruments" which are made up of any number of components. This would allow you to create your own synthesizer and signal processing chain based on the requirements of the music and personal taste (and as always, your budget). We are already starting to see this in the form of multi-effects processors, which are able to perform functions that would have taken three or four separate devices a couple of years ago. Many of these effects use similar signal processing chips found in some of today's synthesizers and samplers. We're also at the dawn of

digital audio connectivity, which will allow compatible devices to interconnect without the need to convert between the digital and analog domains each time.

Changing musical styles will also play a part in the evolution of musical technology (hey, there's a great name for a magazine!). There is a trend away from hi-gloss, hi-tech music toward a more natural, and even *dated*, sound. How will technology race to keep up

*Rona: "For the future, I see a movement from discrete devices to general purpose modules that will be combined together to produce 'meta-instruments' which are made up of any number of components."*

with this musical back-stepping? Look to Roland's introduction of an all-digital "Rhodes electric piano" this year for a possible clue. And who knows what twists and turns lie ahead in musical style?

MIDI will still be around in three years, but I think that we might start to see alternate possibilities for musical system integration. The strengths and weaknesses of MIDI are well-known to most of us by now. However, I also think that these alternatives will remain fully compatible with the current enormous arsenal of devices for a long time. I see a big change in the way we use musical instruments and computers. We are moving (though slowly) toward systems that give us personal configurability and greater ease of use. ■

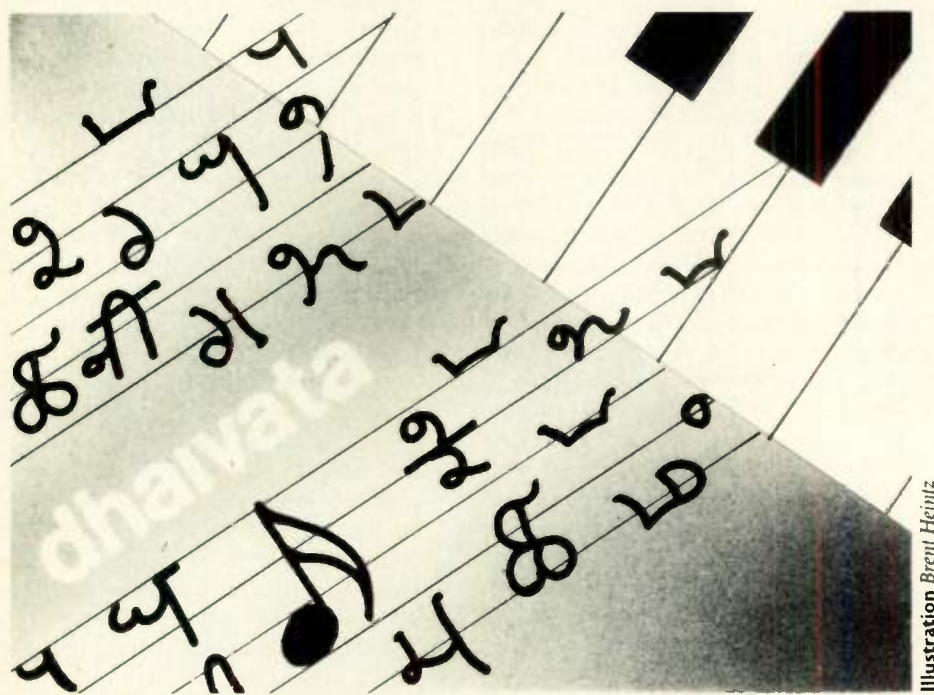


JEFFREY RONA is a founding member and current president of the MIDI Manufacturers Association (MMA). He has worked for RolandCorp US as a software developer and is currently a freelance musician, writer, educator and synthesizer programmer. He is also a prolific composer and sound designer for television, motion pictures, and dance companies. He performs and records with Philip Glass, Jon Hassel and Bill Meyers among others.



# Microtonal Musings

## Applications for All Musicians



**Are you interested in alternate tunings and scales, but unsure about how to use them in your music? Read on, then, to discover the practical applications of microtonality. Text by Scott Wilkinson.**

**I**F YOU HAVE been reading this and other hi-tech music magazines over the past couple of years, you have undoubtedly become aware of the growing interest in microtonality. The ability to play the notes "in the cracks" of the standard twelve-tone scale offers the promise of new musical dimensions for composers, performers and listeners alike.

I know what you're thinking. "Yeah, I've read some articles about microtonality lately. But isn't it mainly for doing really weird, far out stuff? What exactly can I use it for?" Well, bend an ear (or rather, an eyelash) over this way and I'll tell you about the wide range of microtonal applications that any musician can use to enhance the quality of his or her music.

### A Bit of Background Music

Many people think that microtonality is only about scales that consist of very small musical intervals. In fact, these scales comprise only a part of the vast world addressed by microtonality. A more accurate and complete assessment would be that microtonality is concerned with *any* interval, particularly those intervals not found in twelve-tone equal temperament. Many of these intervals differ from those in equal temperament by very small amounts, hence the term *microtonality*.

When you stop and think about it, there is an infinite number of musical pitches available to composers and performers. Trombonists, fretless string players (such as violinists) and singers know this instinctively because they can produce any pitch of any frequency with equal ease (as long as it's within their range). And yet, virtually all of the music composed and performed in the Western world during the last 200 years has been created using only twelve distinct pitches that are repeated in all of the octaves audible by human ears. The reasons for this twelve-tone limit are found in the history of Western scientific and musical development.

As a musician, you probably know that the distance between any two notes is measured as an interval. One of the most common and easily recognized intervals is the octave. In this interval, the frequency of the higher note is exactly twice the frequency of the lower note. As a result, the two notes are said to be in a ratio of 2/1. In a perfect fifth (such as C up to G), the frequency of the higher note is exactly 1½ times the frequency of the lower note. This interval is described by the ratio 3/2 (or 1½). The nice thing about ratios is that they can be used to describe intervals without regard to the actual notes that make them up. Any two notes that form an octave will always be in the ratio of 2/1.

The ratios of various intervals can be found in the harmonic series. The intervals between consecutive harmonics become gradually narrower as you ascend the series. The first interval in the series is the octave, followed by the perfect fifth, perfect fourth, major third, minor third and so on. The first 12 members of the harmonic series and the intervals that they form with the fundamental (C in this example) as well as between consecutive harmonics are shown in **Figure 1**.

MUSIC TECHNOLOGY

17



Harmonic Number	Note Name	Ratio with Fundamental	Interval with Fundamental	Consecutive Ratio
12	G4	3 / 2	Perfect 5th	12 / 11
11	F#4	11 / 8	Augmented 4th	11 / 10
10	E4	5 / 4	Major 3rd	10 / 9
9	D4	9 / 8	Major 2nd	9 / 8
8	C4	2 / 1	Octave	8 / 7
7	B <sup>b</sup> 3	7 / 4	Minor 7th	7 / 6
6	G3	3 / 2	Perfect 5th	6 / 5
5	E3	5 / 4	Major 3rd	5 / 4
4	C3	2 / 1	Octave	4 / 3
3	G2	3 / 2	Perfect 5th	3 / 2
2	C2	2 / 1	Octave	2 / 1
1	C1	1 / 1	Fundamental	

Figure 1. The harmonic series based on the fundamental C. The intervals and ratios have been adjusted to compensate for the different octaves in which they occur. Notice the interesting pattern in the ratios describing the consecutive intervals.

► As you can see, the harmonics in one octave are repeated in all higher octaves with the addition of new harmonics. The intervals in the harmonic series are known as “pure” intervals because the ratios that describe them are composed of two whole numbers. An entire diatonic scale can be constructed from the members of the harmonic series. This is one form of “pure” or “just” intonation.

In the days of ancient Greece, the famous scientist Pythagoras constructed scales in a different way by generating consecutive perfect fifths. For example, he might have started on C, moved up to G, then to D, A, E, B and so on around the “Circle of Fifths” that music students study to this day. If you are or were such a student, you probably remember that the Circle of Fifths closes on itself, returning to the starting point of C (actually, to its enharmonic equivalent B#) after 12 perfect fifths (and the appropriate octave adjustments).

However, Pythagoras found a problem with this procedure. If the fifths used in the procedure are truly in tune (that is, exactly in the ratio of 3/2), the Circle of Fifths does not close on itself. By the time he got to B#, it was almost a quarter step sharp with respect to the starting note C. When using truly in tune (or “pure”) perfect fifths, the Circle of Fifths becomes the Spiral of Fifths.

This error in the Circle of Fifths when using pure fifths, known as the “Pythagorean Comma,” is one of the main reasons why pure intonation does not allow the performance of diatonic music in any key. In order for

any of the 12 key signatures to be available, the circle must close on itself. The octave must be preserved. This means that the Pythagorean Comma must be placed somewhere else in the scale.

One way to close the Circle of Fifths is to divide the Pythagorean Comma into twelve equal parts and subtract this very small interval from each of the pure fifths in the Circle. This results in twelve-tone “equal temperament” that we have grown to know and accept as the only alternative. You can also derive twelve-tone equal temperament by dividing the octave into twelve equal intervals (called *semi-tones*). The fifths in this tuning are slightly flat and the major thirds are noticeably sharp (not to mention that all of the other intervals except the octave are also impure).

As you might imagine at this point, there are many other ways to divide the octave into a scale. By exploring these other alternatives, the intervals that are important to Western music can be made more pure and harmonious to the ear.

### Improved Intonation

One of the most important but least understood applications of microtonality is improved intonation for “normal” Western music of any style including (but not limited to) pop, rock, jazz and classical. Today’s musicians and listeners alike have come to accept the imperfect intonation of twelve-tone equal temperament because it has been used almost exclusively for the last two centuries. Our ears have become culturally accustomed to the imperfect fifths and sharp

major thirds that are inherent in our standard scale.

Pure tunings such as the just intonation series derived from the harmonic series provide the opportunity to create music with greatly improved intonation. Perfect fifths are indeed perfect and major thirds are noticeably lower than their equal tempered counterparts. More to the point, these and the other intervals used in Western music are truly in tune when played in a pure tuning. Music performed with pure intervals and chords has a “shimmering” quality and a conspicuous absence of “beats.”

One of the best examples of this phenomenon can be heard on the debut album of a new group called Take 6. This a cappella vocal sextet sings with such intonational purity that it almost hurts (but it hurts so good!). They use the world’s most sophisticated computer (the brain) to tune each and every chord to perfection, even through the most *gnarly* modulations. The only beats you hear are those that the group intended to produce. I highly recommend that you take a listen to this remarkable use of shifting pure intonation.

Of course, the reason that pure tunings such as just intonation were abandoned was that only a small number of key signatures sounded good in any particular tuning (although it’s important to remember that these keys sounded *very* good, much better in fact than in equal temperament). This is due to the fact that each note performs different functions in different harmonic contexts. For example, C acts like the third in the key of Ab major and the dominant seventh in the key of D. In order to maintain pure intonation in both harmonic contexts, two slightly different Cs must be used. The difficulty of retuning an instrument for a piece in a different key (not to mention the increasingly popular modulations within a single piece) made the compromise of equal temperament more and more attractive. How would *you* like to retune the piano on stage between each piece in a concert?

Equal temperament, however, is a double-edged sword. While all key signatures sound equally good, they also sound equally bad. Except for the octave, no interval played in equal temperament is purely in tune. This is the price we have paid for musical flexibility.



One solution to this problem is to divide the octave into many more than twelve equal parts. It turns out that other equal divisions of the octave produce the important intervals (such as the perfect fifth and fourth as well as the major and minor third) with greater purity than twelve-tone equal temperament. Such divisions include 31, 53, 65 and 118 equal intervals per octave. Within these large scales are hidden the specific intervals that allow

*"One of the most important but least understood applications of microtonality is improved intonation for 'normal' Western music of any style including pop, rock, jazz and classical."*

performance in any of the twelve keys with improved intonation over twelve-tone equal temperament.

The problem with these tunings is that they don't map well onto the standard musical keyboard. Instrument designers throughout the ages have come up with a variety of keyboards that are better suited to playing these large tunings, but none have ever enjoyed widespread acceptance. Sort of like the Dvorak typewriter keyboard, eh?

Microtunable synthesizers provide a capability never before available in the history of keyboard instruments: instant retuning. If you write a piece for synthesizers that starts in C minor and modulates to A major, and you wish to use just intonation so that the intervals and chords in both keys are pure, you can change the base key of the tuning with ease. This can be done manually on the front panel of the instrument or, in some cases, by sending a program

change message that recalls a preset with an associated tuning.

Another, even more useful, prospect on the horizon is the development of a standard MIDI microtuning file format. Carter Scholz and Robert Rich, two regular contributors to MT and members of the Just Intonation Network, have proposed a microtuning file format that codifies the specific characteristics of any tuning into SysEx messages. Similar in principle to the MIDI Sample Dump Standard, this file

format will allow synthesizers from different manufacturers and computers to share microtuning data.

With such a file format, you will be able to send entire tuning tables from your sequencer to any compatible synth or sampler. In addition, the proposed format includes provisions for real-time control that will allow you to tune individual notes in any compatible synthesizer on the fly. This has far-reaching implications for improving intonation in any musical style and will revolutionize the way in which tunings are implemented in electronic music.

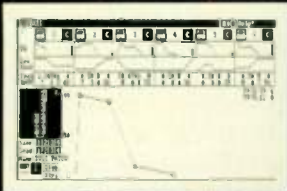
### Ethnic & Historical Music

Although it may sometimes be hard to imagine, there is a whole world of music out there that has little or nothing to do with diatonic scales and twelve key signatures. The indigenous musics of Asia, Africa, Australia, India, the Pacific islands, the Middle East and South America are rich with melodic, harmonic and rhythmic elements not found in the Western musical tradition. (By the way, "dhaivata" is one of the steps in the 22-step Indian scale, in case you were wondering.) These ele-

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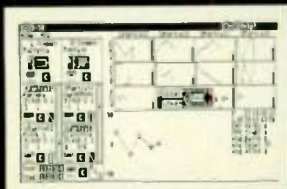
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►ments are now being incorporated into the music of contemporary American and European composers such as Terry Riley and Eberhard Schoener (see "Towards A Global Music," MT February '89).

Wendy Carlos is another well-known composer who uses elements from various ethnic sources in her music. In particular, she has pioneered the use of non-Western tunings and scales with electronic instruments. Her album *Beauty In The Beast* is a stunning example of how these tunings can be incorporated into an electronic setting. Using such instruments as the Syn-ergy, MuLogix Slave 32 and Kurzweil 150FS, Carlos uses imitative synthesis to recreate the sounds of instruments from different parts of the world and plays these sounds with tunings appropriate to the sounds and the cultures from which they came. She also mixes her metaphors for a wonderful hybrid effect as in one section of 'Poem For Bali,' which is a mini-concerto for Gamelan and Symphonic Orchestras.

Another area ripe for the picking (or plucking, banging, bowing or blowing) is found by reaching into the past. Elements of historical music can be extracted and used in contemporary composition. New Age artists use historical instruments such as recorders and harpsichords to establish a certain elegant feeling. The tunings from these bygone eras can also be used to enhance the historical perspective of this music.

Microtunable synthesizers offer some very attractive possibilities to music educators and early music specialists as well. If you teach music history or keyboard performance, synths and samplers with historical tunings can be used to illustrate the music as it was meant to be heard. Various principles of acoustics can also be demonstrated with these instruments.

Performers of early music can use synthesizers to try out different tunings before they commit their harpsichord or pianoforte to any particular one. Electronic instruments are also much easier to take to rehearsals and hold their tuning perfectly, unlike their acoustic counterparts.

## Experimental Music

I know what you're thinking. "OK, here comes that really weird stuff!" Well, *some* of us like to get outside from  
20

SEPTEMBER 1989

time to time. Besides, if no one ever experimented with new musical ideas, we'd all still be listening to bones and skins (my apologies to any drummers out there – your contributions illustrate that music is a *cumulative* art).

One area of experimental music that has yet to be fully explored involves the use of *psychoacoustics*. This rather esoteric branch of psychology deals with how we perceive sound. There are several very interesting psychoacoustical effects that can be easily generated with microtonal synths to enhance your music.

One of the most common psychoacoustical effects results in what are known as *combination tones*. When pure intervals and chords are played, our brain actually manufactures additional tones that we perceive from the interaction of the primary tones. For example, if you play a C major triad in root position with pure intervals, most people will hear the G a fourth below the root and the Cs one and two octaves below the root in addition to the primary tones (see Figure 2). While this might not seem very experimental, it does help reinforce the purity of intonation. A more experimental application would be to compose a piece in which combination tones are produced to provide the melody by varying the primary tones.



Figure 2. A pure C major triad in root position based on middle C produces several combination tones below the triad.

Another interesting effect is known as *binaural beats*. You are probably familiar with regular beats that occur when two slightly out-of-tune notes are played together. In fact, this phe-

nomenon can be used to good effect in experimental composition on its own. However, binaural beats provide even more interesting possibilities. They arise when two tones of slightly different frequencies are played separately into the two sides of a set of headphones without interacting electronically or acoustically. Under these conditions, you might expect to hear the two tones as separate and distinct. Surprisingly, you don't. Binaural beats are perceived as a single tone that circles around *inside your head* with a rich, almost chorus-like effect. As you might imagine, this is quite startling. It suggests an entire genre of music intended solely for headphone listening that makes extensive use of binaural beats and other binaural effects.

## Conclusion

If you intend to experiment with some of the ideas presented in this article and you use a Macintosh computer, I would highly recommend that you contact Robert Rich at Soundscape Productions, P.O. Box 8891, Stanford, CA 94309. Aside from working on the MIDI Tuning Dump Standard, he has also developed a HyperCard stack called *Jl (Just Intonation) Calculator* that facilitates the design of any tuning with up to 48 notes per scale (and scales need not be octave repeating). The Mac's sound chip can be used to hear the results of different tunings and the stack even sends its tuning tables to the Yamaha DX7II, TX802 and TX81Z over MIDI! The best part is, it only costs \$10.

Another product of interest to microtonal explorers is the *Tune Up* tuning library for the TX81Z from Antelope Engineering. This program is available for IBM PC and Macintosh computers and includes 100 historical, ethnic and contemporary tunings that can be downloaded into the TX via MIDI. *Tune Up* is available for \$49 from Antelope Engineering, 1048 Neilson St., Albany, CA 94706.

So, there you have it: a brief introduction to the applications of microtonality. I hope that I've piqued your curiosity and interest in using these ideas in your own music. Perhaps we will even get to review a reader tape in which microtonality has been used. Happy Tuning! ■

For more info on this subject, read Scott Wilkinson's book *Tuning In: Microtonality in Electronic Music*, published by Hal Leonard Books, 7777 W. Bluemound Rd., Milwaukee, WI 53213.



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# Sampling Your Own

## Part1: Cassettes & Single CDs



Illustration Clive Goodyer

**You've decided you need some fresh sounds for your sampler, but you don't want to go the pre-made route and don't have the desire to book your very own recording sessions. Here's a review of several currently available alternate sources.**

*Microphonics by Chris Meyer.*

**A**FTER A FEW years away from actually making music, I now have a strong desire to get back to it. Since the occasion is rare that I can develop a good head of creative steam, I take pains to have as many resources at my fingertips as possible so as not to break the creative momentum by having to stop and develop the right sound. I have a good arsenal of synths (and patches for them), but I also use samplers extensively – to fill out backgrounds, and to establish a more “organic” texture out front. My current couple-hundred sample disk collection is comprised of factory disks, an early commercial library, and tradings with a couple of fellow users. It's an okay collection, but a little rough in the sound quality

department and lacking depth in some areas.

I'm a busy person – broke, too. Spending a lot of phone time trying to arrange charity recording sessions at local colleges and studios (with uncertain results) didn't seem like an attractive proposition. Therefore, I was curious to find out just how good the various sample cassettes and CDs I regularly see advertised really are. After about 30+ hours of listening, I'd like to pass along what I came up with to you.

This month, I'll be covering the cassettes, and the “single CD” collections. Next month will find the libraries from Prosonus, McGill, and Sound Ideas. There are also numerous already-sampled-and-looped sounds available on

disks and CD ROMs – but I still feel there's nothing like Doing It Yourself when it comes to perfecting tools you're comfortable with (thus, this series will cover basic sampling as well). And, as a final warning, all of these reviews are admittedly pretty picky and subjective – but I hope that I kept enough of an open mind for you to make a decision for yourself.

### First, The Tapes:

– **MIDImouse Music Digital Sampling Sound Cassettes:** There are three volumes available for \$24.95 each: Synthesizer Complete, Orchestral Instruments, and Pianos & Classic Keyboards. The tapes are digitally recorded originally, and transferred to chrome cassettes with no noise reduction (this latter detail, combined with low recording levels, resulted in a less-than-ideal S/N ratio). Packaging and documentation is minimal. Only the synth tape came with a complete numbered listing (the others just have ▶



*Perfect Pitch method verified at Ohio State University!*

# They laughed at me and doubted me.... until I showed them the secret to Perfect Pitch!

A true story by David L. Burge

**W**e were in ninth grade when I first heard that Linda had "Perfect Pitch."

Supposedly, she could name any pitch *by ear!* I was told she could even play any song after hearing it on the radio!

I doubted it. How could she know F# or Eb just by *hearing* it? An ear like that would open up unlimited possibilities for any musician.

It bothered me. Did she *really* have Perfect Pitch?

"Yes," she told me casually.

Perfect Pitch was too good to be true. I rudely asked, "Can I test you sometime?"

"OK," she said cheerfully.

## Now I was going to make her eat her words...

I carefully picked a time when Linda had not been listening to music. Then I challenged her to name tones for me—by ear.

I made her stand so she could not see the piano keyboard. I made sure other classmates could not help her. Everything was set just right so I could expose this ridiculous joke.

Nervously, I plotted my testing strategy. Linda appeared serene. With silent apprehension I played a tone: F#. (She'll never guess F#!)

I barely touched the tone. *Instantly* she said, "F#!"

I was astonished.

I quickly played another tone. She didn't stop to think. *Immediately* she announced the correct pitch. I played more and more tones here and there on the keyboard, and each time she knew the answer—without effort. She was SO amazing—she could identify pitches as easily as colors!

"Sing an Eb," I demanded, determined to mess her up. Quickly she sang the proper pitch. I asked for more tones (trying hard to make them increasingly difficult), but she sang every one perfectly on pitch.

I was totally boggled. "*How in the world do you do it?*" I blurted.

"I don't know," she replied. And that was as much as I could get out of her!

The reality of Perfect Pitch hit me hard. My head was dizzy with disbelief, yet I now knew that Perfect Pitch was real.

## I couldn't figure it out...

"*How does she do it?*" I kept asking myself. On the other hand, why can't *everyone* identify tones by ear?

It dawned on me that most musicians go their entire lives without knowing C from C#, or G major from F major. That's like an artist who paints picture after picture without knowing green from orange. It seemed odd and contradictory.

I found myself even more mystified than before I had tested her.

Humiliated and puzzled, I went home to work on this problem. At age 14, this was a hard nut to crack.

You can be sure I tried it myself. I would sweet-talk my brothers and sisters into playing tones for me, then try to determine each pitch. Almost every attempt failed miserably.

I tried day after day to learn the tones. I tried to visualize the location of each pitch. I tried playing them over and over in order to memorize them. But



nothing worked. I simply could not recognize the tones by ear. It was hopeless.

After weeks in vain, I finally gave up. Linda's gift was extraordinary. But for me, it was out of reach.

## Then came the realization...

It was like a miracle. And it happened all because I had stopped *trying* so hard. I had stopped *straining* my ear and started to listen NATURALLY. Then the incredible secret to Perfect Pitch jumped right into my lap.

I began to notice faint "colors" within the tones. Not *visual* colors—but colors of *pitch*. They had always been there. But this was the first time I had ever really "let go" enough to hear these *pitch colors* which reside in every tone.

*Now I could name pitches by ear!* It was simple. An F# sounded one way—a Bb had a distinctly different sound. It was as easy as naming red or blue.

The realization struck me: THIS IS PERFECT PITCH! This is how Bach, Beethoven and Mozart could mentally hear music on a page—and identify tones, chords, and keys at will—by *listening* to these *pitch colors*. It's that simple!

I became convinced that *any* musician could have Perfect Pitch by just knowing this secret of "color hearing."

When I first told my close friend Ann, she laughed. "Oh, I could never have Perfect Pitch," she asserted. "You can develop a good *Relative* Pitch [the ability to compare one tone with another], but you have to be *born* with Perfect Pitch."

"That's because you don't understand what Perfect Pitch is," I said. "It's easy!"

I showed her the secret and she heard it *immediately*. Soon she too could name any tone and sing any pitch requested. We became instant celebrities. Everyone was amazed.

As a keyboardist, Perfect Pitch allowed me to progress faster than I ever thought possible. I completely skipped over required college courses. Perfect Pitch made *everything* easier—performing, composing, arranging, transposing, improvising—and it skyrocketed my enjoyment as well. Music is definitely a *hearing* art.

Of course, music professors were highly skeptical when I started teaching Perfect Pitch years later. Most would laugh at the mere *suggestion* that anyone could have Perfect Pitch. But when I showed them how to hear the pitch colors *themselves*, they changed their tune!

## Now there's more proof...

Research at Ohio State University has now independently verified my Perfect Pitch method (March '89). Their findings? *It works*, according to OSU researcher Dr. Mark Rush in an interview with *The Hartford Courant* (call our studio below for more info). I was pleased. They're just now finding out what thousands of musicians I've taught already know: that you *really CAN* have Perfect Pitch if you know *how to listen!*

**YOU can have Perfect Pitch too**, but you have to discover it. All you need are a few basic instructions. I've put everything I know into my **Perfect Pitch® SuperCourse™**, available on audio cassettes with handbook. The **Color Hearing Technique** I'll teach you is *totally guaranteed* to work for you, regardless of your style, instrument, or current ability level. It's easy—you *don't even have to read music!*

Like most musicians, you will *immediately* hear the beginning Perfect Pitch colors—or you can *return the Course for a full refund*. You've got my word on it.

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► a list of what instruments were covered). All instruments are announced by number on the tapes themselves. The acoustic instruments also had their names mentioned.

All of the synths are recorded at one pitch only (so much for spreading them across the whole keyboard), and many are beefed up with stereo reverb or delay effects. The high degree of



chorusing and vibrato makes looping a little more difficult, but on the thoughtful side, most sounds are hit briefly once for setting levels, and then sustained for actual recording. The selection of basses, leads, pianos, brass, strings, and layers is fair. I checked just eight of the roughly 90 synth sounds as "must sample" (with another two dozen marked as possibles). The 20 drums are sampled from drum machines (very Linn-like). A couple of kicks are hot, while some toms have silly runaway echoes on them. The sound effects are also mostly synthesized and not very exciting.

The orchestral tape includes over a dozen instruments (double bass, cello, violin, string ensemble, flute, clarinet, oboe, bassoon, trumpet, trombone, brass section, triangle, bell tree, timpani, and gong), typically recorded over two octaves. Only one performance of each note is given. All sounds are recorded dry, and many are too short to achieve a good long loop (a shame – some sounds with otherwise good tone have to be discarded). Performances are fair with some inconsistencies (glitches, slow attacks, excessive vibrato, or attacks that are too slow relative to others in the group). This is offset by having several notes (typically four) per octave. The clarinet, double bass, and timpani are very good, while the flute and trumpet are particularly disappointing.

The piano disk includes a Steinway, generic upright, Rhodes, Clavichord,

and harpsichord with 20 samples per instrument (generous!). Most have pretty good tone (with the exception of the occasional overload or funky attack), but are once again too short to achieve a loop (the one exception – the great low note on the Rhodes). Nonetheless, if you plan to play staccato a lot and entering short loops right after hitting the note doesn't bother you, there are some punchy sounds for the buck here.

– **SoundSations Cassettes:** These are the definite loss-leaders in the sounds-for-sale department. Their six volumes (\$24.95 each; discounts available for three or more) include 834 Orchestral and Synth Sounds, 500 "Best of DX7" samples, 500+ Drum and Percussion Samples, 500 Sound Effects, 1000 Synth Samples, and 850 M1 Sounds (but before you get *too* excited, one synth patch sampled on five different notes counts as "5" sounds, etc.).

I received four of the volumes for review. They come on chrome tapes with your choice of noise reduction, and are recorded at fairly hot levels. Overall recording quality is fair, with some loss of high end and the occasional overload. The length of the samples is just a little on the short side in places, too. Documentation includes some general sampling suggestions and fairly complete numbered listings of the sounds. Each sound on cassette is announced by number and played once (moving along at a rather brisk pace, to fit as many on a side as possible). Consider these as candidates for building up disks for backing tracks.

The Orchestral and Synth volume is a lot of fun. Most sounds cover two to five octaves, with one or two notes per octave (a pretty good spread for multi-sampling). The range of material is pretty wide, with a heavy leaning towards orchestral sounds (real and synthesized). However, a slap on the wrist is required, because I recognized some of the special effects as being lifted straight from albums (the Tomita bite is particularly noticeable, guys). I marked about two dozen sounds I thought I'd find useful, along with several drum sounds and special effects.

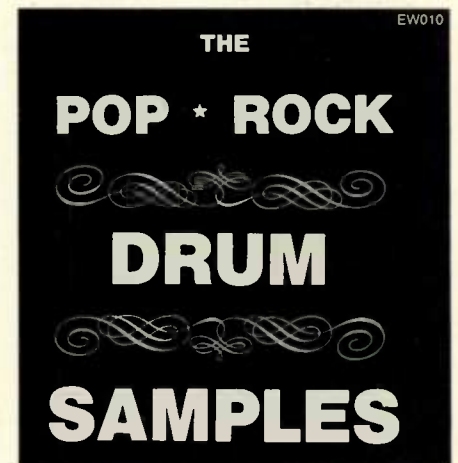
I was less impressed with the DX7 and Percussion cassettes. The lack of fidelity hurts their ability to cut through, which is the point of most DX7 and percussive sounds. The DX7

patches are recorded over one to six notes apiece (four on the average), spaced over octaves – fine for multi-sampling. They lean heavily towards the Rhodes/guitar/harp side, with lots of organs and typical DX7 brass and strings – essentially, a collection of typical FM sounds for backings. The percussion recordings, although varied, tend to sound like poorly processed drum machines. That surprised me; I liked some of the sounds on the first volume.

The 1000 synth samples (Kurzweil, D50, Matrix 6, ESQ1, Kawai K1, and DX7II) are a synth-lovers delight. Most cover four or five octaves, sampled on Gs and Cs. The lengths are also good for looping. It seemed like I wanted to sample at least every other sound. This is perhaps the best value out of all the source materials reviewed here.

### Now, The CDs:

– **East-West Pop-Rock Drum Samples:** This collection of "over 700 sounds" for a mere \$99 has received some very favorable reviews elsewhere, and after the first minute or so I was drooling



too. One hour later I was tempering my judgement somewhat.

The kicks are great. So are the electronic drums. And arranging sets of drums into 18 "fully matched kits" is *very* helpful when it comes to crunch time on a session, or just grouping kits together on the same disk. But many of the sounds are also very short (with the cymbals and snares in particular asking for a sound that should ring out) and lacking in fidelity (a bit coarse and crunchy – imagine an E11 run through a \$400 reverb for a quality ranking).

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- ▶ repeated playings of these sounds in different kits and at different pitches. As a matter of fact, it seems as if many of these sounds are in reality being replayed from a sampler(!) as opposed to being fresh studio efforts (particularly when you get to some of the percussion "banks," which are the same sound played back in semitone transpositions). Some of the vocal effects are downright dreadful. Also, the documentation is fairly minimal, requiring you to take your own notes. Nonetheless, this is the best source of

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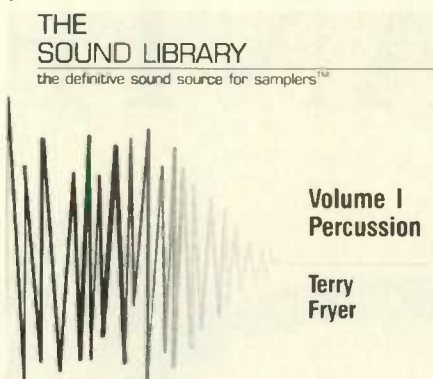
Great - you've finally captured the ultimate piano from that CD or cassette. It's better than any factory or third party disk you've heard for your Brand XYZ sampler. Time to share it with the rest of your fellow users and make some money in the process, right? Uh, wait a second...

Some of the CDs come with warning notes, ranging from Korg's "Lending prohibited!" to the vague warning on some Prosonus CDs that their sounds are "not for resale of competitive products." Many of the CDs (and all of the cassettes) carry no warning at all. Clear sailing, eh?

Uh, no. What everybody really means is perhaps most clearly stated on the Ear Works CD: "(This) Sound Library is licensed for use without additional permission or payment for use in production. To record them (the sounds) in whole or in part in any form for re-use, re-issue, trading or re-sale is strictly prohibited without the express written consent of Ear Works, Inc." The word of clarity there is *license*. In buying the sounds, you've licensed the use of them for your own finished performances (music, soundtracks, etc.), but not for any other form of resale or distribution. This is the purest form of the musician's/engineer's argument against stealing bites off of records - someone spent a lot of time and money getting just that sound. They deserve to make some money from it.

Personally, I don't think that they have much ground for protection if all the vendor did was sample a synthesizer's factory patches or a drum machine (or worse, sampled somebody else's sampler disks or recording!), and then spruced it up with just a touch of EQ or reverb. On the other side of the coin, you could always mutilate the sound beyond recognition (but then, it isn't the original sound any more anyway, is it?) or just plain hope to avoid getting caught. But in reality, we're all in this music game together - so let's try to play fair so there's enough pie for all of us to get a slice later, okay? - CM

trashy-drum samples I've found - it's just not going to cover all the bases for you.



- Ear Works Sound Library, Volume 1 - Percussion: And now for something completely different - for a scant \$49, a tasteful collection of very cleanly-recorded percussion esoterica (examples: an Acacia wood bowl floating in water, Chinese tom-toms, log drums, crotales, a whirling green plastic tube, triangles, bells, gongs, rain stick, etc.) The word here is Quality. Each class of instruments has its own CD track, with each variation having its own index. Some sounds only get one hit; on others, we're treated to up to four different hits. The crotales are taken in semitones. The room they were recorded in also has a nice, understated ambience with no premature truncation. I wish some of the hits were more aggressive, but all are very clean. The overall loudness level of this CD is low - no clipping, but sometimes I wonder if the full dynamic range is being used. The documentation is also very good.

- Korg Sound Sampling Collection Volume 1: Produced in Germany, this is meant to be a something-for-everyone collection for the sampling enthusiast starting out. Korg sets no suggested retail price, which is deter-



mined by the dealer. Sounds include percussion, string bass, "violoncello," violin, trumpet, trombone, "cross" flute, clarinet, and piano. Most sounds are very cleanly recorded and all are very well documented, with each being performed twice so you can set your levels on the first hit and record the second. Also, numerous notes - typically seven - are taken per octave, making multi-sampling a breeze. The booklet that comes with the CD explains a lot about the frequency range of each instrument, and how to use the CD (each octave of an instrument or class of percussive device has its own track, with different notes/variations per index within a track). On the downside, there are some curious editing errors, and whoever was directing some of the performances wasn't thinking about looping at the time.

The drums (including the standard trap kit, plus timbales, cabasa, cowbell, guiro, woodblock, vibraslap, bell tree, jinglebells, and triangles) are pretty standard, but crisply done (with some nice reverb here and there). These sounds are good for a jazz kit. The string instruments are all really in your face, but all have slow attacks (and one has its attack accidentally edited out). There is no string ensemble, and the violin is a little scratchy. The trumpet is curious - lots of ambience, performed in very short staccato notes (looping can only be of the one-cycle variety, and is still tricky at that). The same goes for the trombone. The cross flute has a very high degree of wind whistling, making it unusable in my book. On the other hand, the clarinet is great. Finally, the piano wasn't tuned very well (resulting in a chorused sound, requiring long loops), and the notes are very short (making long loops impossible). You'll get a few good sounds out of this, but in general it might make sampling a more frustrating experience than fun.

## Next Up...

As promised, next month we'll look at the Rolls, Mercedes, and Peugeot lines of the industry - Sound Ideas, Prosonus and McGill. Then, we'll be going into transferring these beauties to your sampler in semi-excruciating detail (including fun tricks with sampling rates). After that, looping (including the most thorough discussion of crossfade looping techniques I can come up with), and then the all-important performance parameters. Happy shopping...



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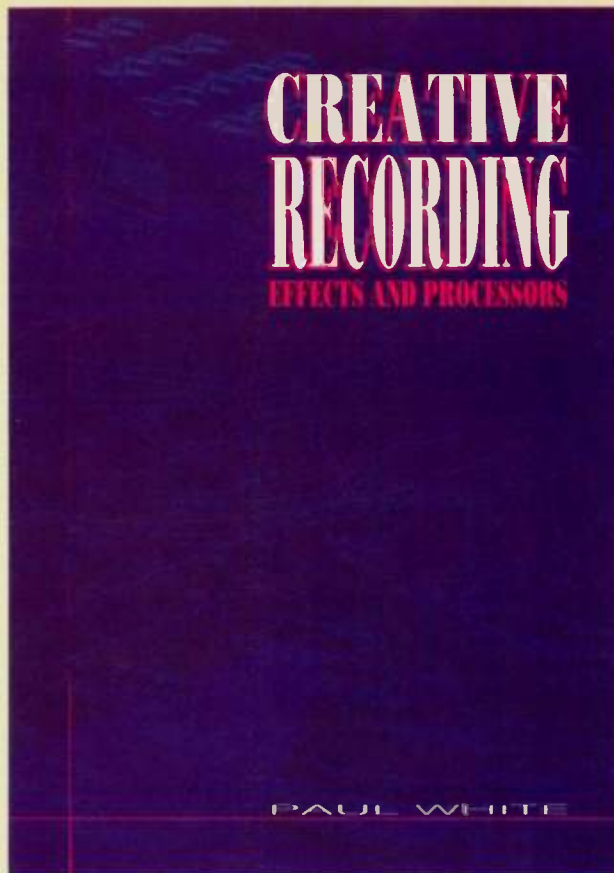
And when each new acquisition seems to expose as many problems in your recording system as it solves, it becomes increasingly necessary to choose equipment which is precisely suited to your needs and to get the very best out of it on a day-to-day basis.

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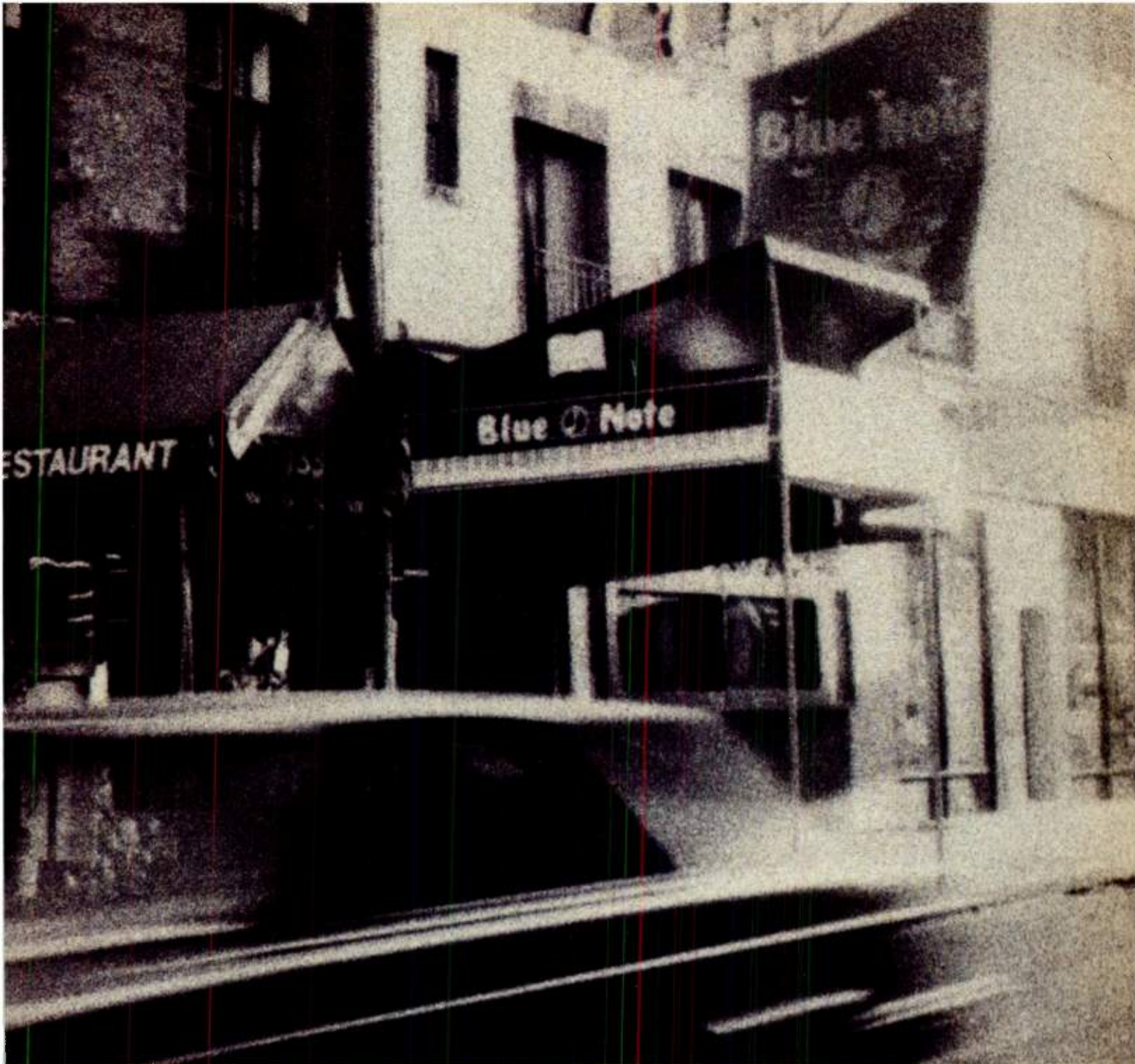
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Photography Drew Carolan

L-R: Cory Glover, Vernon Reid, Muzz Skillings, Will Calhoun.

# Multi-Coloured Sound

Prominent in the raw tension and energy of Living Colour's musical stories is the dynamic guitar sound of virtuoso Vernon Reid, whose playing is augmented by more than a few tricks up the old sleeve . . . *Interview by Lars Lofas and Nick Armington.*



**A**S THE MOON controls the tides, guitarist Vernon Reid's mastery of his instrument often seems almost unearthly. And, in this age of interchangeable musicians, his playing remains unique while helping to propel the critical and commercial success of the band Living Colour.

The music on the group's first album, *Vivid*, addresses a variety of subjects. Reid's playing blasts through an unexpectedly wide spectrum of styles, at times paying homage to early power rockers like The MC5, Jimi Hendrix, Ten Years After and The Who, while at other times dashing off funk licks that would make Nile Rodgers or George Clinton grin. Most of the time, though, Reid wails with a sound to which he alone can lay claim.

Along with vocalist Corey Glover, bassist Muzz Skillings, and drummer Will Calhoun, all of whom are strong musicians in their own right, Reid has managed to finesse that rare achievement: creating a record which makes a strong socio-economic statement while going platinum. This album, propelled by the success of its first single, 'Cult of Personality' as well as the band's energetic live shows, has established Vernon Reid as a modern-day guitar hero for a new generation of young players.

Despite the fame and attention granted to him in recent months, Reid remains disarmingly shy and soft-spoken. The transformation he undergoes night after night on the stage is remarkable, for up close he's decidedly unlike his onstage persona. We recently caught up with him while shopping at Manny's Music in his hometown of New York City, curious about exactly how he manages to create those incredible sounds that make Living Colour's music so undeniably vivid.

"Most of the time," says Reid, "we've been lucky in finding the right sound by trying all kinds of things until we find something we like a lot." Pressed for details, he offered examples from the recording of *Vivid*. "We took a lot of different amplifiers and put them in a big room. Then we miked all the different corners of the room, with mics close in, far away, and in places where they would catch the sound from an amp bouncing off a wall, and brought all of these mics into the console.

(Laughs) "I think we had practically one of every amp made, including

Marshall, Fenders, Vox and Dean Markleys. For example, on 'Cult of Personality,' we used the Marshalls and a Dean Markley DR150 amp, and the sound on the solo is a combination of the Marshall, the Dean Markley and one of the new Fender Showman amps."

Although the system of outboard electronics and preamps that he uses onstage to recreate the album's sound is quite elaborate, Reid recalls that he followed a much more low-tech course in the studio. "At the time we were recording *Vivid*, I still had a lot of floor pedals that I had used for years.

"Two of my favorites were a distortion box called The Rat, made by Pro-Co Sound, and an old ADA chorus reverb that didn't have MIDI. I also had some Boss reverb, chorus and flanger pedals. For a long time, I was using an Electric Mistress flanger made by Electro-Harmonix and an old Roland floor-pedal chorus device.

"I experimented with using a lot of old gear that hadn't been used a lot recently. For example, there's a Vox Cry Baby wah-wah on the song 'What's Your Favourite Color?,' and a Talkbox on the track called 'Memories Can't Wait,' which was first done by Talking Heads. The Talkbox was also put through a reverse gated reverb at the board, which clipped the attack of the vocal and gave it a very 'other worldly' kind of sound."

**R**EID AND HIS bandmates also make use of numerous non-musical samples on *Vivid*, which add a sense of historical context to the music. "We listened to a lot of old records to get the samples for the album," he explains. "The John Kennedy speech on 'Cult of Personality' was on tape, and we ended up using the actual recording instead of a sample, but we did a lot of old-fashioned tape editing to make it sound the way it did.

"If you listen to the original speech, where he says the words 'Ask not what your country can do for you . . .,' it's spoken much slower, with a lot of dramatic effect. We had to edit out the pauses in the speech, and we also sped up the two-track tape of Kennedy while slowing down the multitrack when we laid it into the song. Later on, when we started playing the song live, we sampled it into an Akai S900 sampler, and Will, our drummer, triggers it with an Octapad."

Reid himself does much of the

sample design for the band, and is currently updating his stage gear to make more use of the MIDI interfaces built into the equipment he's using these days. "I've started to use a device called the RFC1 MIDI Mitigator, made by Lake Butler Sound in Florida, which runs my whole system now.

"The Mitigator is a MIDI controller for guitar, with five footswitches and a display built into the unit. I use it to send MIDI note messages and implement program changes. My guitar is wired normally, with 1/4" guitar cables looping through all the effects, and the Mitigator is hooked up with MIDI cables going to each unit's MIDI In and Thru jacks. Each footswitch can simultaneously change programs and turn a MIDI note on or off.

"The Mitigator also has a keyboard mode, so that a MIDI note is transmitted as long as you keep your foot on the pedal. You can also set it up so that hitting a pedal once sends a MIDI 'Note On' message, and hitting another pedal sends a 'Note Off.' I'm going to use it more when I start using some of the sample loops we've developed onstage."

Sample loops? This sounded intriguing, especially coming from a guitarist. Reid admits the idea's a little unconventional, and certainly a far cry from the slow-attack sound that's come to be associated with MIDI guitars.

"What we are doing is taking a bunch of samples and grouping them across the keyboard. When you take a rhythmic sample, and put in a long loop, it ends up sounding and acting almost like a sequencer. This way, you can have a whole sequence thing with a lot of information in it assigned to a single MIDI note, so if you key-group a whole bunch of these things in your sampler, one program can conceivably have a ton of stuff in it.

"We use this technique when we play 'What's Your Favourite Color?' live. There's a sample of Chicago house music that we use in a break section of the song, and I use the Mitigator to turn on a MIDI note to start this loop, which sounds like a sequence. Some of that is going into Will's monitor, and he'll play in time with the sample. It's cool.

"On top of that, with my current setup, I can actually string together a bunch of sample loops for different parts of a song. If I adjust all of the loops to play at the same tempo, I just hit the next pedal every time I want a part to change. Plus, I've programmed ►  
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the Mitigator to send program change messages to my ADA MP1 Guitar Preamp and my DigiTech IPS-33 Pitch Shifter, so I can play the samples and change the sound of my normal guitar at the same time."

When Living Colour appeared as the musical guests on Saturday Night Live a few months ago, an Akai S900 was sitting prominently in Reid's amp rack. But recently, he's traded up. "The band recently bought a brand-new Akai S1000 sampler, with a hard disk," he says. "In fact, I've been sitting in front of the thing all week, loading in samples from the S900 and from the Oberheim DPX sample player, which I used before the band bought the S1000.

"We're starting to use a lot more sampling live, so we want to improve the quality. The S1000 is really easy to use. In a way, I'm kind of a dunder-head, because I have to read manuals over and over and over again, fiddle with the gear, then go back to the manual and fiddle around some more until I get it down and figure it out.

"The Akai's got a really logical operating system, and I love the fact that it comes with a hard disk built in – it's great to have all the samples there ready to use so that you don't have to reload them each time you turn the machine off. In the past, whenever we played live, one of our technicians would keep changing the disks, checking his set list to make sure that the right disk was loaded at the right time. Now, we'll be able to control most of that ourselves."

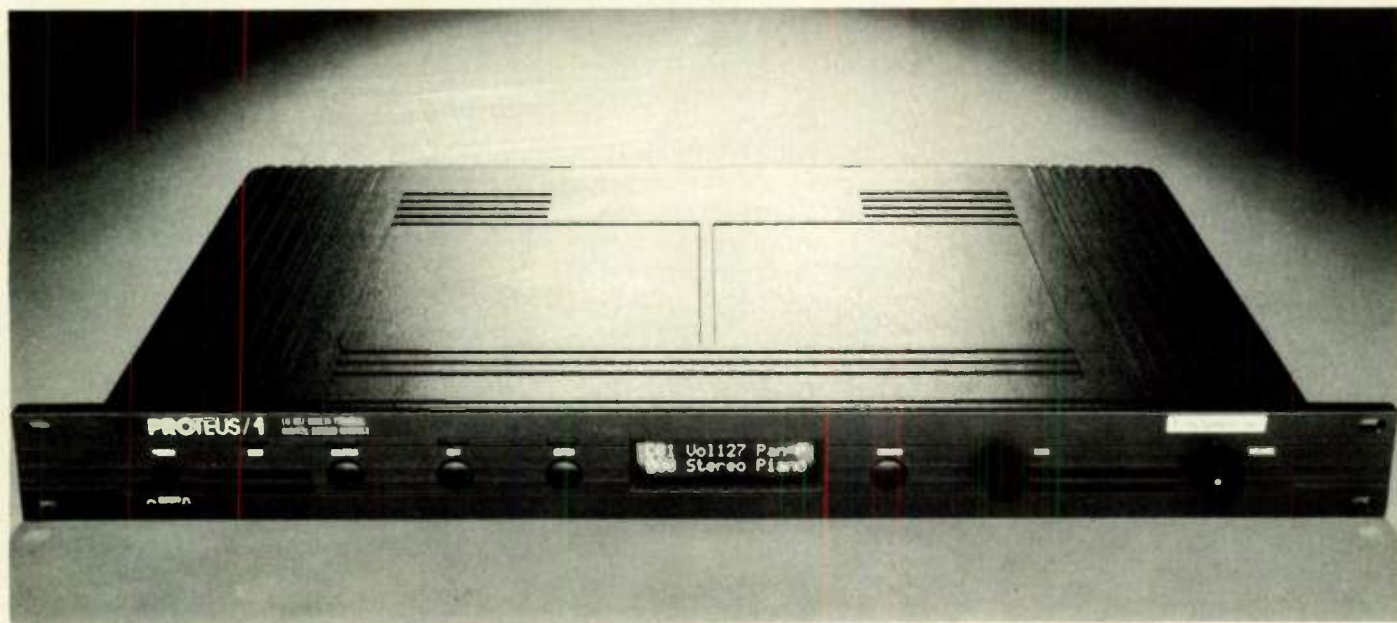
Despite all the technology that's around him, Reid quixotically – and humbly – admits that the toys he's acquired over the past year or two serve mainly to enhance the band's overall presence, rather than his own sound. "I'm a little bit amazed by all the attention to my playing, because I've sounded more or less the same for quite some time now.

"Even though we've bought all of this equipment, what's still really personal is what's inside of you as a player. Someone could go out and buy all the same stuff I have, but unless a person really wants to study how I play, he's not going to sound like me. What really makes a player unique is the way he or she decides to use technology and samples. It's not really what the equipment brings to you, it's what you bring to the equipment!" ■

Lars Lofas and Nick Armington own and operate Manhattan Digital Recording Studios in New York City.



# E-mu Systems Proteus



**E-mu's new sample playback unit packs quite a punch for the buck. *Review by Mihai Manoliu.***

**T**HE PROTEUS SOUND module is finally shipping after a long wait following its initial introduction at the Winter NAMM Show in Anaheim last January. Was it worth the wait? Absolutely! E-mu Systems has managed to combine an incredible four megabytes of high quality 16-bit samples from the Emulator III sound library with a simple, yet effective, programming interface into a module that lists for only \$995. The single space rack-mount unit features 32-voice polyphony and multitimbral response. It will also be internally expandable to eight megabytes for around \$500.

## The Basics

There are 192 preset locations, 64 of which are user-programmable. All 192 locations are filled with factory presets, most of which are very useful, either musically or as a demonstration of what the Proteus can do. The basic building blocks for these presets are the 125 Proteus "Instruments" stored in ROM. These include 69 sampled sounds (4 pianos, 4 strings, voices,

choirs, saxes, flutes, trumpets, trombones, brass, guitars, basses, synth pads, and an extensive selection of percussion sounds), 22 harmonic waveforms, 21 single-cycle waveforms (both synthesized and sampled), and 13 multi-cycle waveforms from sampled sounds.

Instruments can be assigned to each preset by using the "Primary" and "Secondary" instrument layers. Two different sounds are thus stacked or spread adjacently across the keyboard. However, you can achieve further stacking or keyboard splits by "linking" presets. Up to four presets can be linked, allowing up to eight sounds to be stacked simultaneously, or creating an eight-way keyboard split. The diversity of permutations inherent in the Proteus system is truly astounding. A dedicated programmer could get lost in Nirvana for years...

The demo sequence E-mu has wisely provided with each unit is quite impressive. The versatile "band" will take you on a whirlwind journey through rock, funk, classical, and new age that will leave you reeling. The clean, clear sounds sparkle with tone

qualities similar to a CD. No doubt about it, this machine would definitely help you produce a professional sounding demo.

The interface is extremely simple and easy to use. The front panel consists of a mere two knobs, four buttons, a two-line display, and the power switch. The master menu button is used to affect global parameters such as master tune, transpose, MIDI parameters, mix outputs, and display angle. Two other very useful global parameters are velocity curve (which provides four different types of dynamics to fit your playing style or controller) and user key tuning (for creating microtonal scales with fine tuning in increments of 1/64 of a semitone, or approximately 1.56 cents). The edit menu button is used to change parameters for the presets. The cursor button moves the cursor within the display, while the data entry knob changes parameter values. The feel of the knob is just right. The control is stepped, changing the current value one unit with each tick (it's also very easy to speed through the values with accuracy). A volume control knob ►

MUSIC TECHNOLOGY

33



► completes the well-designed front end.

The back of the unit includes MIDI In/Out/Thru ports as well as three stereo outputs, called Main, Sub1, and Sub2. These outputs are also configurable as six polyphonic Sub-mixes with fully programmable panning. The Sub1 and Sub2 jacks can also be used as an effects send/return (using a tip/ring plug) to a dedicated signal processor. In fact, these effects returns can also be used to sum the signals from additional instruments into the main outputs of the Proteus. This is great news for users short on mixer inputs. On a minor down note, each preset can be routed to only one set of stereo outputs.

### Monster Sounds

It was hard to get past the first few presets. They sounded so good that I kept getting distracted by all kinds of musical ideas. From "Stereo Piano" and "Hall Strings" to "Thunder Bass" and "Heaven," (an especially sweet piano/strings mix), the sounds are clean and authentic down to the minute details. It took several days before I finally got through listening to all 192 presets, and by then I had already accumulated at least ten compositions full of multitimbral excess. It's hard to avoid the impulse to add that one extra track when you have such a vast instrumental palette to choose from.

The factory presets are definitely a good starting point for understanding the power and programming behind the Proteus sound. These presets are classified into twelve categories: keyboards, strings, voices, brass, reeds/flutes, plucked, synthesizer, bass, tuned percussion, percussion, world, and sound effects. Each category has more than several outstanding examples. I am especially happy with the percussion categories, as well as the bass and "world" sections. The great presets in the "world" section made me wish for more than the six provided. No matter, I look forward to developing my own sounds anyway.

### Speaking of Programming . . .

A good place to start programming on the Proteus is to change the Primary or Secondary instruments of a factory preset. Or you can use the link function to create keyboard splits as well as sound stacking. Having accomplished this rather simple task, the next step would be to experiment with the extensive modulation implementation.

This includes two multi-wave LFOs, two envelope generators, and the ability to respond to multiple continuous controllers. Real-time modulation sources include pitch wheel, keyboard pressure (channel aftertouch), polyphonic aftertouch, and any four miscellaneous MIDI controllers. Three foot-switch controllers can be programmed for the Primary, Secondary, or both instruments to switch sustain, alternate volume envelope, alternate volume release, or cross-switch between Primary and Secondary instruments.

For each preset, key number and velocity can control any six of 33 possible destinations, while real-time controllers can be simultaneously patched to any eight of 24 destinations. I don't have enough space to list all of the possible destinations, but included are pitch, volume, attack, release, decay, pan, and sample start for both Primary and Secondary instruments, as well as crossfade and LFO/envelope parameters. This flexible routing scheme makes the Proteus a killer real-time performance tool.

### For Example . . .

Let's put together a quick preset. The edit menu is used to assign Primary and Secondary instruments. Choose the "mix" output as main, select key ranges for the entire preset and perhaps for each instrument, set the relative volumes of the instruments, set the pan levels, then the coarse and fine tuning for each. Perhaps you want to delay the second instrument and even play its sample in reverse, and thicken its sound by turning the chorus on. You might also want to remove the attack portion of the Secondary instrument, so you use the "Sound Start" parameter to play the sample from a later sample point.

Select the crossfade or cross-switch mode (the first fades between the

*"It was hard to get past the first few presets. They sounded so good that I kept getting distracted by all kinds of musical ideas."*

Primary and Secondary instruments, while the second toggles between the two - key note, velocity, or other controllers can be used to trigger either mode). If you go with crossfade, set crossfade direction, crossfade balance, and crossfade amount. You might want to use a different tuning as well, so

select Gamelan for the Keyboard Tuning parameter (five other tunings are available: Equal Tempered, Just C, Vallotti, 19-tone, and one user-programmable tuning). Name your preset using the MIDI keyboard (which can also be used to set many other parameters) and you're done. It sounds like a lot of work, but it actually takes only a few minutes.

The MIDI implementation is excellent, as is the general user interface: simple, complete, and solid. The manual is very good, although some things could have been covered with more depth and clarity. A few lackluster presets sneaked by, which is to be expected (the most disappointing is the String Bass - come on guys, my three-year-old Mirage blows that away). I also wish there was more than one user-definable keyboard tuning preset.

The most annoying aspect of the Proteus is the fact that it is often not truly 32-voice polyphonic. Each instrument uses a voice, and the chorus effect doubles the number of voices used. Linking also uses extra voices. Suppose you have four double instrument presets linked, all instruments using chorus. Playing a two note interval would eat up all of the available voices. This example is extreme, but it serves to illustrate the inherent limitations of the machine, and the necessity of planning ahead to utilize its multitimbral capabilities effectively. To E-mu's credit, 41 of the factory presets are single voice, demonstrating that quality sounds need not be voice-eating monsters.

### The Bottom Line

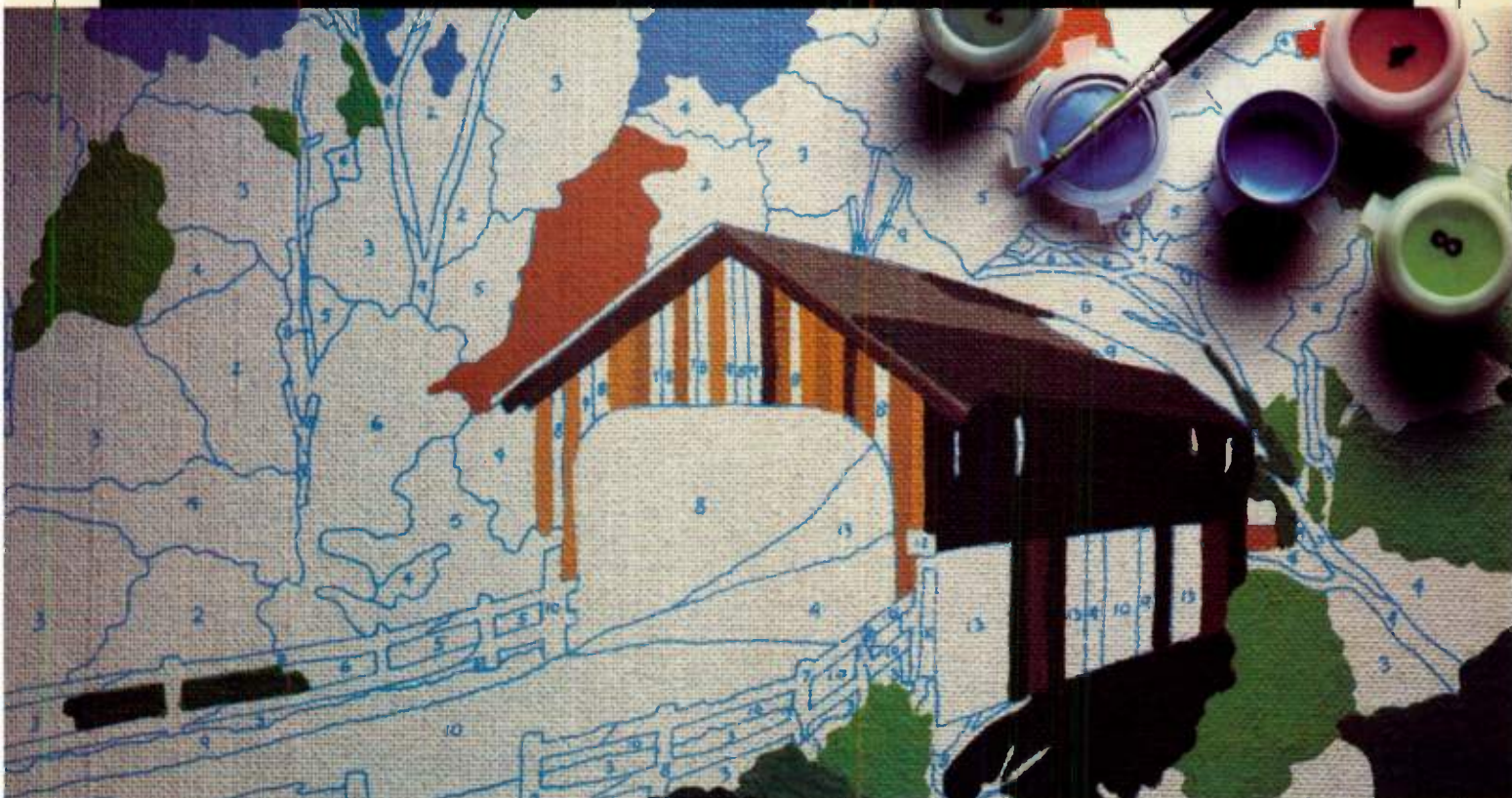
For any musician, the bottom line is the ratio of sound quality and flexibility to cost. Ease of use and versatility are also critical to the growing numbers of musicians new to MIDI. The Proteus should prove successful in all of these areas. From a marketing standpoint, the demo sequence alone will sell plenty of units. With availability of the 8Mb upgrade and software support for the popular computers, Proteus will become one of the leaders in low-cost, professional-quality sound sources. If you're considering purchasing a sound module, you owe it to yourself to hear what this machine can do. ■

PRICE: \$995

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



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# Magnetic Music Prism

## Sequencer Software for IBM PC/XT/AT, PS/2, and Clones.

Review by H. P. Newquist.

I HAVE A theory about software that costs \$99 - if you don't like it, you can throw it away and not be too upset about it. On the other hand, if it works, and you do like it, then you've gotten yourself one hell of a bargain. Yeah, such software *does* involve a little bit of gambling. It could be like "Let's Make a Deal" where you get a year's supply of rutabagas behind Door #3, or "Russian Roulette" where only one out of every half dozen offerings is worth the trouble.

Fortunately, this \$99 software package falls into the category of "The Price Is Right" sequencers. The product in question is Prism, one of the newest sequencing packages available for the IBM PC, from Magnetic Music.

For your information, Magnetic is the same group of people who gave us Texture. This program, like Texture, is the brainchild of ex-Utopia keyboardist - turned - software - developer Roger Powell (former Utopia leader Todd Rundgren is currently following a similar path).

Prism has all of the normal editing features found on standard sequencers, with two very important pluses: it acts like a Macintosh program, and it has an excellent manual.

Prism works on all classes of PCs, including IBM's most recent offering, the PS/2. It also requires at least 384Kb of RAM (although 512K is the practical minimum), as well as a graphics card and any available MIDI interface. Magnetic Music also highlights the fact that the package runs on Yamaha's C1 Music Computer.

The program relies exclusively on Mac-like scroll bars and pull-down menus, and like almost all current generation PC sequencers, requires a mouse. Prism allows the user to create up to 16 tracks (pretty standard on PC packages these days) as well as 32 separate patterns with up to 50 links between them. One nice feature which separates this program from other

products in this category is its ability to designate multiple MIDI channels per track. Many sequencers allow you to specify one channel or all channels, but nothing in between.

One of Prism's most impressive features is its use of graphics to control note velocities, time swing, and other MIDI parameters. While changing the peaks and valleys of the graph, you can hear the result as the sequence is playing - no need to stop, edit, and then start again. And one of its most unique features is the fact that graphs are used to create templates. In effect, these templates are the foundation for track sequencing, and eliminate a lot of the track editing that must be done after recording.

The manual is by far one of the best I've seen for PC packages of any sort, with liberal use of examples and analogies to make each function of Prism clear to the novice and expert alike. Complete with diagrams, this manual is almost worth the price of purchase all by itself.

I like this product - a lot. Its use of the features that make icon-based software so pleasant to work with raise it up a notch over many other PC music programs. And given the fact

Windows      Quit      Memory: 204k      Song File: "log\_jam.sng"

Transport ?

◀◀ ▶▶ ▶▶▶▶ Ⓢ Ⓣ 4 Tempo ◀◀ 96 ▶▶  
☐ Half Tempo

⚠ Record || 002:2.00  
 002:2.00 ▶ select

☒ Quantize  
☐ Loop  
☐ Count in  
☐ Metro

☐ Song Mode 16:0.00  
 ◀◀ Pattern: 1 ▶▶

Track Sheet: Pattern 1 "" ?

Start ◀◀ 002:1.00 ▶▶      End ◀◀ 004:1.00 ▶▶      Editing Special

M	S	Ch	Name	1	2	3	4
A		10	drums D	.	.	.	.
B		10	Drums A	*	*	*	*
C		10	Drums B	*	*	*	*
D		10	Drums C	.	.	.	.
E		1	Bass	*	.	*	*
F		8	flute	*	*	*	.
G		7	Piano	.	.	.	.
H		7	piano 2	*	*	*	*
I		4	Synth Stab	.	.	.	.
J		1		.	.	.	.
K		1	organ	*	.	*	*
L		1		.	.	.	.

Links

Link Edit

EventList

Prism is an inexpensive and user-friendly new sequencer for the IBM PC.



that it's becoming more socially acceptable to use IBM-type PCs for sequencing, even more PCs, PS/2s and their clones are going to be showing up in music environments ranging from homes to studios to stages. For a mere \$99, I can't think of any reason why Prism shouldn't be right there with them. ■

**PRICE:** \$99

**MORE FROM:** Magnetic Music, RD 5 Box 227A, Myrtle Dr., Mahopac, NY 10541. Tel: (914) 248-8208.

## Anatek Pocket Products

**Low price, compact MIDI merging, filtering and pedal control. Review by Carl Glenn.**

WITHIN THE HEART of most MIDI instrument owners is a wish list of products that solve problems, work without hassle, and are priced within the reach of mere mortals. High on most of those lists might be a simple 2-In, 1-Out MIDI merger for blending keyboards, sequencers or other controllers. Well that wish, and a couple of others, may have come true.

Anatek, a hi-tech company that specializes in low-cost, low-energy IC (integrated circuit) design, has released three simple but unique products for the MIDI market, called Pocket Products. They are the Pocket Merge, the Pocket Filter, and the Pocket Pedal. Each is a tiny (about 3"×2"×1"), lightweight (less than 3oz.) black plastic box with nice color graphics to distinguish them from each other.

The Pocket Merge has two MIDI Ins, a MIDI Out and a single red LED. That's it. No power plug, no battery compartment, no *nothing*. As with the other Pocket Products, the processor in this Anatek device gets all of its power by drawing a miniscule current from the MIDI cable itself! Quite a unique feature. Of course, if everyone did that, you'd probably be in a lot of trouble, but that's Anatek's advantage, being the first to do this.

The Pocket Filter and Pocket Pedal each has a single MIDI In and Out, eight small dip switches and a single red LED on its front panel. The Filter

allows you to selectively filter out any combination of MIDI messages including aftertouch, continuous controllers, pitch-bend, program change, notes, System Common and Exclusive messages, "all messages," and real-time messages, including active sensing. It can also filter messages from any combination of MIDI channels. This feature is programmed by flipping all eight switches up and pressing keys on the incoming MIDI controller.

The Pocket Pedal adds two standard 1/4" phono jacks, one labeled "Sw" and the other "Ped." A footswitch and foot pedal can be plugged into the Pocket Pedal at the same time. The eight DIP switches correspond to the messages that can be sent by activating the pedals. These include volume, pitch-bend, modulation wheel, portamento time, sustain, sostenuto, Start/Stop (for sequencers), and portamento on/off. The first four functions can only be sent with the pedal while the second four are only sent with the switch. As with the Filter, the Pocket Pedal can be programmed to send on one, any combination, or all 16 MIDI channels and is reset by unplugging the unit for five seconds.

So how do they work? In a word, great! The Merge was able to handle massive amounts of note and continuous data without choking or producing errors. Torturing it by sending a SysEx bulk dump from one source and a stream of performance data from the other did finally make it angry, but what do you expect? The Filter and Pedal work fine as well. Changing dip switches by hand can be

## M I C R O REVIEWS

difficult, but I was able to operate the devices with a little effort. The instructions for the Filter say that the real-time filter will include active sensing, but since all three of these boxes send their own active sensing at all times, this doesn't exactly matter. As a matter of fact, it sometimes worked and sometimes didn't. The LED on the front panel is lit as long as the device is connected to a MIDI controller with the power on. The light momentarily shuts off to indicate the presence of MIDI data. This feature alone might be worth the price.

All of the boxes are well designed, and the single page instructions are clear, complete and well written. Anatek claims that up to four Pocket Products can be successfully chained together, and indeed, in putting all three in line there was no problem with my instruments. It remains to be seen if all MIDI instruments would work after the energy drain caused by these devices. In all, simple solutions for specific problems. ■

**PRICE:** \$99 each

**MORE FROM:** Anatek Microcircuits Inc., 240 Brooksbank Ave., North Vancouver, BC V7S2Z8 Canada. Tel: (604) 980-6850.



The Anatek Pocket Products require no outside power source, and fit in the palm of your hand.



► article, an Address track is an extra, auxiliary track available on video tape separate from the audio tracks, on which you can record an additional audio signal, commonly the SMPTE timecode. However, if you want to read information from this track, you'll need to have a VTR that has the record and playback heads to access it. Otherwise, you'll wind up receiving a video tape that has audio information on tracks 1 & 2 and your all-important timecode embedded on the Address track, which your machine can't see. A lot of good that will do you . . .

So, the first step in synchronization is to procure something to synchronize to. Simple enough, but an important first step. I always ask for a 3/4" copy with any audio on track one and timecode (SMPTE) on track two and the Address track, with "window burn." Window burn is simply the SMPTE time numbers that are recorded on the audio channel made visible on the video screen, usually placed horizontally in a box across the bottom of the screen. You'll use this regularly as a visual reference, for spotting hits, sound effects, etc., so don't forget to ask for it. Ultimately, you must be sure to work out the exact format in which you want your video tape to arrive, and then clearly communicate it.

## Getting Down To Work

Suppose you receive your video tape exactly how you wanted it. After spotting it (going through the piece any number of times with the director/producer/creative director i.e., whoever is calling the shots), and determining SFX (sound effects) placement and music direction, it's time to get to work. Here's your first test: can you get the code on the video tape to control your sequencer?

You might think that this is a pretty straightforward affair, and nine times out of ten it is, providing you've hooked everything up correctly. However, don't expect to take the SMPTE coming from track 2 of the VTR, plug it in to your MTC-compatible sequencer, and instantly synchronize. SMPTE and MTC are similar, but ultimately different communication protocols. You will require a specific conversion device that translates the audible square waves that comprise SMPTE timecode into the MIDI information which your sequencer understands. Such a device might be an external MTC conversion box, or a device which allows your

computer-based sequencer to read SMPTE directly, or a chip somewhere in the guts of a machine.

So you've hooked up your machines correctly, followed every instruction in your well-written manual, checked every connection, ensured that you're reading the right kind of SMPTE code (remember, there are four types: 30-frame non drop, 30-frame drop, 25- and 24-frame), and still you can't get your sequencer to lock up to the picture. One point many overlook is that SMPTE is an audio signal. It is subject to things like noise level, not being printed hot enough in the first place and all of the other problems we face routinely when dealing with magnetic tape.

I have all of my SMPTE input sources routed through a small mixer, with outputs going to several sequencers via SMPTE converters. This solves a wide variety of problems, chief among which is a level that is too low for the sequencer to reliably lock to the code. Sometimes I've found it necessary to filter out some of the high-end frequencies to allow the conversion hardware to function properly. Having all possible SMPTE source points routed through a mixer and then sent to multiple sequencers also opens the door to things like polyrhythms (two sequencers locked but operating at different tempos), and affords the possibility of doubling (or tripling or more) the available sequence tracks and MIDI channels. But, I digress . . .

## Sound Effects

Since we're doing sound effects, we might as well tackle them first. This is a good idea, since elements like doors opening, locks clicking and deadbolts being thrown are integral to this particular commercial. This is where window burn comes in handy. Simply jog through the video and write down the SMPTE times for the various points where you'll need to add effects. Sound design is a subject we won't cover here, but suffice it to say you'll need to procure the precise sounds necessary for the various effects by sampling them and map them out on your sampler(s).

Depending on the sophistication of your sequencer, you can type in the times you noted from the window burn display and assign a MIDI note to be triggered at that time, or just run the video tape and play the sound at the

moment it should occur in real time. Hopefully, your sequencer will allow you to edit the placement of the sound/MIDI note in some way, either by sliding the track or micro-editing the time to an earlier or later moment. Obviously, the greater the ease of editing and alignment to SMPTE displays, the easier it's going to be to line up the sound effects with the picture.

A note regarding visual code, your list of hit points, and the final result of laying in the SFX: just because you've put the effect at exactly the right second and frame of the video does not guarantee that it's going to feel right. It doesn't do much good to have everything lined up and triggering perfectly only to have the client comment that some hits seem late and some seem early. Just as in recording sequenced music and rhythm tracks, feel is the ultimate guideline. If you've put in your effects accurately, it may be that the sample's attack is too slow, or the sound doesn't really work with the visual or something else altogether. Simply adjust the effects so that they look and sound right to you as you watch the picture. Here's the real beauty of synchronizing your sequencer to video: you've got the video driving the sound generation device so that you can add, change, edit or subtract sound at will. And because we're using an agreed-upon communication protocol (SMPTE) to which both pieces of machinery adhere, it works the same way every time.

When the ad agency people come in and want to move or change or augment a sound, it's as simple as sliding it one way or the other in the sequencer, or resampling and triggering the sound at the identical time. We tend to take a lot of this for granted, but if your code isn't working properly, you'll curse the tape it came in on. If you've got enough gear (sampling instruments), you should just trigger the SFX in real time, since you can change and alter sounds and their placement right up until the time you commit to tape.

## Music & Voice-over

Now that we've got the effects in place, it's time to tackle the music. Scoring to picture has been covered in other articles in this magazine, but if you're doing it using video and SMPTE, it's certainly much simpler than film. You can write and perform your score



directly to picture, seeing and hearing the results while actively being synchronized.

In addition to identifying the SFX hit points during the spotting session, you also noted the sections of the video that are to include music. In a 30-second commercial, there is usually music during the entire spot. In longer projects, you would note the SMPTE start and stop times between which music was to be played. Also, you would decide on the mood or type of music that will enhance the message being presented in the spot. You then

*"By juggling the offset times between the two machines, it's possible to slide a voice track in much the same way by which you can slide your sound effects around in the sequencer."*

write (or improvise) the music and record it into the sequencer.

You've written and sequenced your music, your sound effects are laid in – now it's time for the voice-over. Unless you've got a high-end sampler with lots of memory (at least 30 seconds worth), you're going to have to start working with tape now. However, if you've got the extra hardware, you can lock your multitrack to the video deck, which is driving the sequencer to fire the SFX and sequenced music at the same time. In other words, you need yet another conversion box of a slightly different nature for this task.

This device is going to supervise and actually take over the transport controls of your MTR. Because we're outside of strictly software-based synchronization (namely, your sequencer), you'll find the need for several devices to get your VTR and MTR in sync (incurring additional expenses as well). However, it's all based on the same principle: one machine acting as the Master controller and the other devices being slaved to that machine. You can set up your system so that the video machine is controlling the transport of the multitrack, or vice versa. But one machine controls everything else, and that machine's timecode is also considered to be the master clock.

Which brings us to another potential problem area. What if the code on the master multitrack is different from the code on the video deck you've been working with. I'm not talking about different formats (25-frame to 30-frame non drop for example – just restripe one or the other to match formats). Let's say that the tape you originally

received starts at 1:32:00:00.00 and the code you've striped on the MTR starts at 1:00:00:00.00. Fortunately, it is possible to offset the timecode in one or the other machine. By adding or subtracting hours, minutes, seconds, frames and subframes in the hardware devices connecting the two machines, you can synchronize the video and audio machines together, even if their SMPTE codes do not match.

If you've ever seen a badly synchronized movie or TV show in which the actors lips aren't totally meshed with what's being said, you've

seen an example of poorly specified offsets. By juggling the offset times between the two machines, it's possible to slide a voice track in much the same way by which you can slide your sound effects around in the sequencer. But instead of doing it in the software of the sequencer, you're actually changing the time values the machines use to synchronize together.

### Assembling the Elements

You've got the voice-over recorded, edited to the appropriate length and laid down on a master audio tape. Now it's really just a matter of assembling all the elements on your multitrack. Stripe one of the tracks with SMPTE code and transfer the voice-over from the master audio tape. Usually there will be some reference voice to work with on the original video tape, so use this as a guide by running the video and audio machines together. This also allows you to find the right offset between the machines. Record the music and SFX being played by the sequencer (which is also locked to the VTR via SMPTE), mix your tracks to a two-track master, and voilà – a 30-second masterpiece.

This brief synopsis doesn't cover all of the ins and outs of synchronizing VTRs and MTRs by any means, but hopefully provides some insight into the uses of SMPTE in the audio and video field. There are as many pitfalls in this subject as you'll find in any technical area, but fortunately there are plenty of tried and true solutions. It's no harder to learn than your latest piece of gear. All it takes is diving right in, reading a manual or two and getting some experience making all these machines work in tandem. ■



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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.

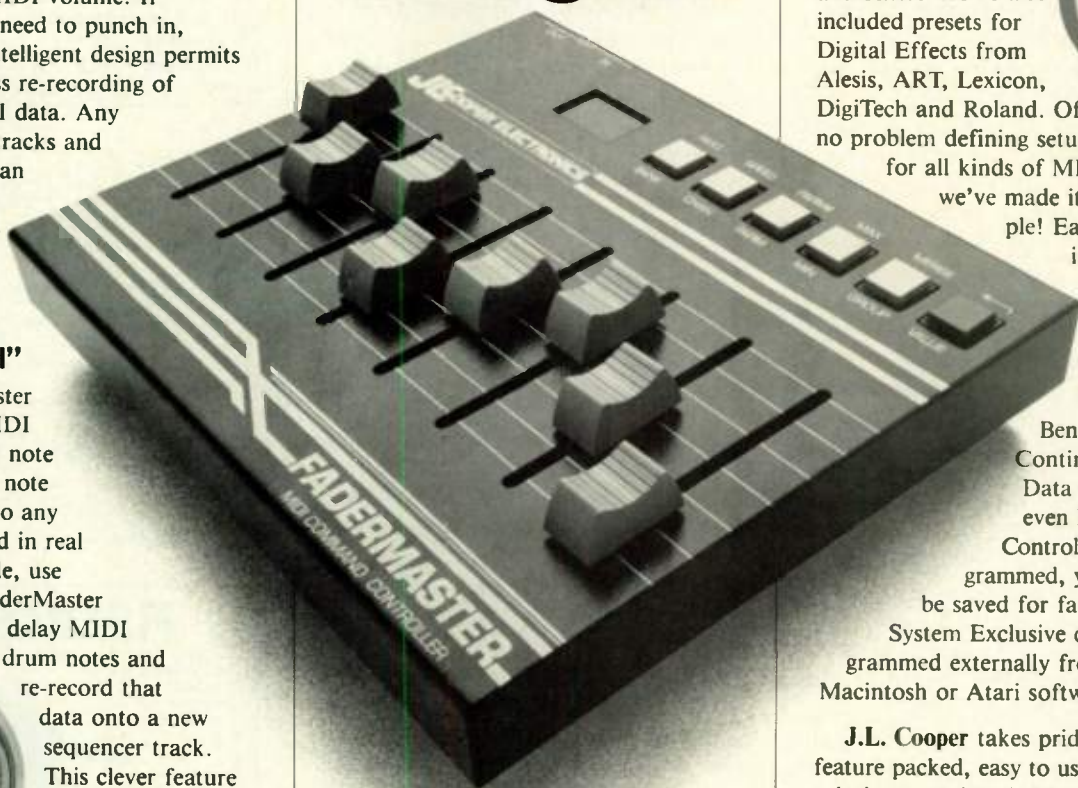


### Double the Power of your Digital Effects Processor

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

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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.

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### 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.

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Photography Christine Alicino

L-R: Greg Shaw, Arnie Frager, and Bob Skye

# Tapeless Wonder

**V**ERY FEW RECORDING studios can boast of tracking a "classic" album, one that goes on to become legendary long after its initial release. The Plant in San Francisco, long considered one of just a few "world-class" recording studios on the West Coast, has had the fortune to facilitate the creation of quite a few legends, from Fleetwood Mac's *Rumours* to Stevie Wonder's *Songs in the Key of Life* and Huey Lewis' *Sports*.

The magic in The Plant's massive complex is now being augmented by a flood of high technology as well as some critical rethinking of how such a facility should be run. Under the new ownership of partners Bob Skye and Arnie Frager, The Plant's core operations are undergoing a metamorphosis designed to position the studio as a full-fledged media center, complete with tapeless and

The Plant, San Francisco's legendary studio that helped launch many of the rock era's top-selling albums, is now gearing up for the '90s and beyond by embracing the latest in tapeless and MIDI technology. *Interview by Lars Lofas and Nick Armington.*

MIDI recording in addition to the live sound that helped establish it in the first place.

Together with Synclavier owner Greg Shaw, who's taken up permanent residence within the complex, Frager and Skye are excited by the promise that these new technologies offer. In a candid conversation, all three discussed the motivation behind their decision to keep The Plant on the cutting (and costly) edge of recording.

*MT: The Plant has always been renowned for its live sound, yet you've clearly made a decision to invest heavily in a very*

*different area – tapeless recording. What prompted your decision to move in this direction?*

**Arnie Frager (AF):** "Our philosophy is having the best of the old and the new – our approach is not to tell you how to record, but rather to give you the flexibility to record the way you want to, or the way the project demands. When Bob and I became partners in September of 1988, we realized that The Plant needed to be upgraded – and so we decided to go all the way in the reconstruction.

"On the one hand, we've always had one of the largest collections of vintage equipment in the country – tube microphones, Pultec equalizers, ►

MUSIC TECHNOLOGY



## SPECIFICATIONS

### TAPE FORMAT

- 1/2 inch AKAI original cassette tape (MK20)

### HEAD CONFIGURATION

- Super GX recording playback head

### WOW AND FLUTTER

- 19 cm s: 0.03% (W-RMS) ± 0.05% Peak (DIN IEC Weighted)
- 9.5 cm s: 0.04% (W-RMS) ± 0.06% Peak (DIN IEC Weighted)

### DISTORTION

- 19 cm s: 0.5% 0dB (315Hz third harmonic distortion)
- 9.5 cm s: 0.8% 0dB (315 Hz third harmonic distortion)

### DYNAMIC RANGE

- 115dB, 1kHz (19cm s, 9.5 cm s)

### FREQUENCY CHARACTERISTICS

- 19 cm s: 50Hz - 20kHz, 9.5 cm s: 50 Hz - 16kHz

### SN RATIO

- 94 dB (NAB A - WTD, 315 Hz, 3% third harmonic distortion)

### CROSS TALK

- (Between neighboring channels) 55 dB, 1 kHz (19 cm s, 9.5 cm s)

### EQUIVALENT INPUT NOISE

- MIC - 126 dB

### PARAMETRIC EQUALIZER

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► industry standard as well. Digital mastering is definitely a major concern right now, because it provides such a fast efficient means of editing after the fact and formatting for compact disc."

**MT:** *Isn't there also some concern on your part about how to archive all this digital information?*

**GS:** "Very much so. After all, the industry has developed a number of standards that allow the transfer of data from one place to another, like AES/EBU and MIDI, and we've pretty well standardized basic sampling frequencies, but what we haven't addressed is an archiving standard, and that's absolutely critical.

"We need an archiving standard for the digital domain much like the 2" tape standard currently used for multitrack archiving. Until we get a standard we can depend on, one that we can take off the shelf in ten years and still read, it will be difficult to sell all of these digital tools to the world."

**BS:** "Archiving presents a real problem, but that's where CD-I and WORM (Write Once, Read Many) technologies come in. Between the requirements of computers and tapeless recording, we need mass storage based on some sort of standard. Whoever comes up with the strongest marketing and the most capital to bump everybody else out of the market is going to set the standard."

**MT:** *But isn't optical storage beginning to gain acceptance?*

**GS:** "Optical media is promising, but there's still a lot of thrashing about in that marketplace. It's not mature yet. The audio CD is definitely here to stay, and that could develop into an archiving standard. If and when WORM CDs become cheap enough, they may well become an archiving standard that could survive for ten years or so.

"In other words, if we could get Sony, Yamaha and NED, for example, to agree to promote a digital archiving standard, that would help get things rolling – but even that could take a year or two. All of the audio manufacturers are working on things, I know, but it's like this – anytime you talk about something that doesn't exist yet, it's anybody's guess whether or not it will become a standard.

"Here's an example – two years before it was released, who would have predicted that the analog audio cassette would become a consumer standard over eight-track cartridges?"

**MT:** *Does technology drive the market or does the market drive technology?*

**GS:** "I think the two go hand in hand. Technology certainly enables a marketplace to occur and cultural conditioning forces people to take advantage of the new technology. In the consumer market the compact disc has certainly raised expectations, and that's going to affect the pro audio industry more and more.

"As other formats like stereo TV and HDTV emerge, and transmission delivery systems improve, we'll be raising consumer expectations all over again. For example, Dolby SR is now installed in a lot of movie theaters, and that's making people sit up and listen more carefully too."

**MT:** *But are consumers really getting that much more demanding?*

*"We need an archiving standard for the digital domain much like the 2" tape standard currently used for multitrack archiving, one that we can take off the shelf in ten years and still read."*

**BS:** "The consumer is a hard nut to figure. Consumers don't directly dictate what we do – we're a service company, working with art manufacturers, the artists and producers who are our clients, the people who tell us what they want. At the same time, the artist/producer is making his decision based on what he can sell to the consumer. So the consumer is really second in line to us."

**MT:** *Do you think that the pressure on the artist/producer forces the issue of experimenting with new, unproven technology?*

**BS:** "The Plant has taken the view that we like to be on the cutting edge, but we don't want the client to do our R&D for us. When evaluating new technology, Arnie and I work great together. Arnie will say, 'I have clients who are asking me for this and pounding the desk for that, and we can do them a service by providing it.' Then I'll ask how much will it cost us, what's our return, what will it be worth in five years – and how quickly will it become obsolete.

"My biggest fear is that we'll have clients come in and work on some brand new piece of hi-tech gear, and a year later, the manufacturer will go belly-up. Five years later, when those clients want to come back and remix their masters, who's going to have a machine that can do it?

"These days, people are buying digital machines saying, 'This is going to be my standard forever and ever,'

which is pretty ignorant. All the same, I think we're fairly safe with what we've got at the moment, and with standards emerging, as Greg said, we'll probably be able to ensure that the information gets kept in a usable form for the future."

**MT:** *Do you want to hazard a guess as to where that future may be heading?*

**BS:** "I definitely see further trends towards tapeless recording, more interfaces between sound and picture, which will lead up to our goal of making it faster and easier to accomplish the task of recording."

**GS:** "I see memory prices dropping by a factor of two each year – that's been going on for a number of years, and I'm sure it will continue. One of the reasons I got involved with the Synclavier was to determine how

much memory you need to do real pieces of music. We recently did an album for a group on Polygram Records called *Tony, Toni, Tonè* that was recorded entirely on the Synclavier, without ever having to go to tape.

"Right now, the amount of memory we have here on the Synclavier is reasonable for doing songs, commercials or film scoring – a gigabyte of storage on an off-line optical disk containing a sample library, roughly a gigabyte of Winchester disk storage for real-time audio recording, and 10 to 20 megabytes of RAM for buffering and minute audio manipulation.

"That's roughly what's available today, and I think that's what will still be used ten years from now. Today, a Synclavier that size costs roughly half a million dollars – ten years from now, it will cost \$300 or \$400. Looking ahead, I see that there's going to continue to be a democratization in the industry, with technology getting so cheap that more people will have access to those tools.

"Right now, the record companies have a pretty strong control over the way music is distributed. Over a longer term, lots more people will be able to create a high-quality product more easily and cheaply. My own long-term goal is to create a full recording studio in a box using digital technology by the turn of the century!"

■



# Metheny and Mays:

The Music, Mechanics and Marketplace



L-R: Pat Metheny, Lyle Mays, Paul Wertico, Armando Marcal, Steve Rodby, Pedro Aznar.

**While you might hear the Pat Metheny Group over a supermarket sound system, their music (and attitude) is definitely more sophisticated than meat and potatoes. Interviews by John Diliberto.**

**P**AT METHENY DOESN'T make the kind of music you usually hear in a supermarket between the soft rock and broccoli. But recently, I heard 'Last Train Home' from his last album, *Still Life (Talking)*, right after an announcement for a two-for-one sale on economy-size boxes of Pampers.

"That's one of the least weird ones," says Metheny, unfazed by this revelation. "I mean, there's actually Muzak versions of some of our tunes. That is weird."

Weird, but perhaps not surprising for one of the most popular

instrumental groups in America. Since his solo debut on 1977's *Bright Size Life*, Metheny has continued to ride a line between popular acceptance and experimentation. In his solo albums – *New Chautauqua*, *80/81*, *Rejoice* and the critically acclaimed 1986 recording, *Song X* with Ornette Coleman – he pushes the limits of jazz improvisation and freedom.

In the Pat Metheny Group, he's created a melodic, texturally inviting, rhythmically compelling music that has drawn a cross-sectional audience. Pat Metheny and his long-time cohort and keyboardist, Lyle Mays, find

themselves in a nether region between the straight-ahead jazz that they grew up with, and the easily seductive music they make with the Pat Metheny Group.

"It tickles me," laughs Lyle Mays, thinking about the Pat Metheny Group as supermarket music. "I could have an attitude that 'this is not background music,' but it's kind of fun to hear it seep into the culture."

"I think the cross-pollination is inevitable," asserts Mays in the offices of his managers in Brighton, Massachusetts. Mays is like Billy Strayhorn to Metheny's Duke



Ellington, or perhaps Mr. Spock to Captain Kirk. His quiet background role has forged the group's underpinnings for years, and like his contribution, Mays is understated and sedate next to Metheny's well-known, boyish exuberance.

"Personally I don't see our music as background music at all," says Metheny. "I see it as important to me. This is the music that I feel strongly about. It's designed to be listened to closely, preferably through headphones, *really loud*."

Metheny grins from beneath his thick mane of salt-and-pepper hair. Sitting in a New York City hotel room, barefoot and in leather pants, Metheny is at the top of his game as the architect of a music that blends rock, jazz, Brazilian music and classical impressionism.

Both musicians have become increasingly involved with synthesizers, although with different philosophical points of view. Metheny's first synthesizer love was the Roland GR300 Guitar Synthesizer, whose elephant trumpet clarion has become one of his trademark sounds. He followed the Roland with the Synclavier II.

Looking back, Metheny is almost embarrassed by some of his earlier, naively enthusiastic comments like "The Synclavier is a breakthrough that makes the guitar look like nothing," or "The guitar synthesizer makes everything possible as an improviser."

"Oh boy, I must have really been in an optimistic mood when I said that," he laughs, rocking back on the couch. "I take it back. I take it back. There is this one guitar synthesizer, and I would put it in quotes, which is the Roland GR300. It's this sort of primitive thing that a lot of people use. It's basically one sound that you can sort of turn the filter up and down on, and sort of move it up an octave or down an octave or wherever you want it. *That one* I love because you look at it and it knows you are looking at it. Anything you do, it does a sound that's analogous to it."

Mays, on the other hand, has always looked at synthesizers somewhat askance, even though he's played them since he bought his Micromoog in 1975. He currently uses a Macintosh with MIDIPaint software to run a Kurzweil 250 and other synthesizers, including his favorite Oberheims, to compose and arrange his own music.

"I feel that I have the freedom to say

derogatory things about synthesizers, maybe because I've explored them for quite a while and have used them in all sorts of settings," he declares. Piano remains Mays' personal voice, and while he lives with synthesizer technology, he's not quite ready to take it to bed.

"There is the aspect of different personalities and what they bring to the music and there's also the actual complexity of the sounds," he says, revving up the standard argument that synthesizers can't replace the true feeling of musicians. "Acoustic instruments are just more interesting, on the sonic, acoustic level."

Metheny has come around more to Mays' way of thinking. "Synthesizers want to sound bad," he proclaims. "They do sound bad. So for me, the easiest thing is to play straight-ahead jazz with just a regular electric guitar, acoustic bass and drums. Adding synthesizers to that makes it twice as hard. Adding a guitar synthesizer to that makes it twice as hard again. Adding a sequencer to that makes it twice as hard *again*. So the music has to be seven or eight times better than it would normally be."

On '5-5-7' from *Letter From Home*, Metheny opens up a window to his Wes Montgomery/Jim Hall jazz roots. "Yeah it's funny, that's the first time with the group that we've actually come out and played like tang-a-dang," says Metheny, who's contemplating a recording of jazz standards in the near future. "We're all thinking much more in those terms than we are into pop music or whatever, even though with this record and the last one, we're dealing with the sort of pop environment more than we are with the straight-ahead jazz environment. I spend more time thinking about how what I *do* measures up to the standard set by Wes Montgomery and Jim Hall than I do about anybody else. I think that for Lyle it's Bill Evans and Keith Jarrett. For Paul (Wertico), it's Roy Haynes. For Steve (Rodby), it's Ron Carter and people like that. Even with the stuff that we do that's more rock-oriented, it's still coming from that other point of view."

Nevertheless, don't expect either musician to be giving up their synthesizers any time soon. Both use them extensively as composing and orchestrating tools. Lyle Mays may have hired a chamber ensemble for his second solo album, *Street Dreams*, but

they were mixed in with a lot of electronic sounds and ambiances. Metheny, who is planning a solo album of guitar and synthesizers and takes credit for the synthesizer programs on the new Metheny Group album *Letter From Home*, is still prone to enthusiastic claims for his Synclavier.

"It takes the limits off of your imagination," he explains. "I was a jazz guitar player and anything in the world of jazz guitar was conceivably available to me if I practiced long enough and hard enough. But now any music that I hear, I can put that into my immediate world."

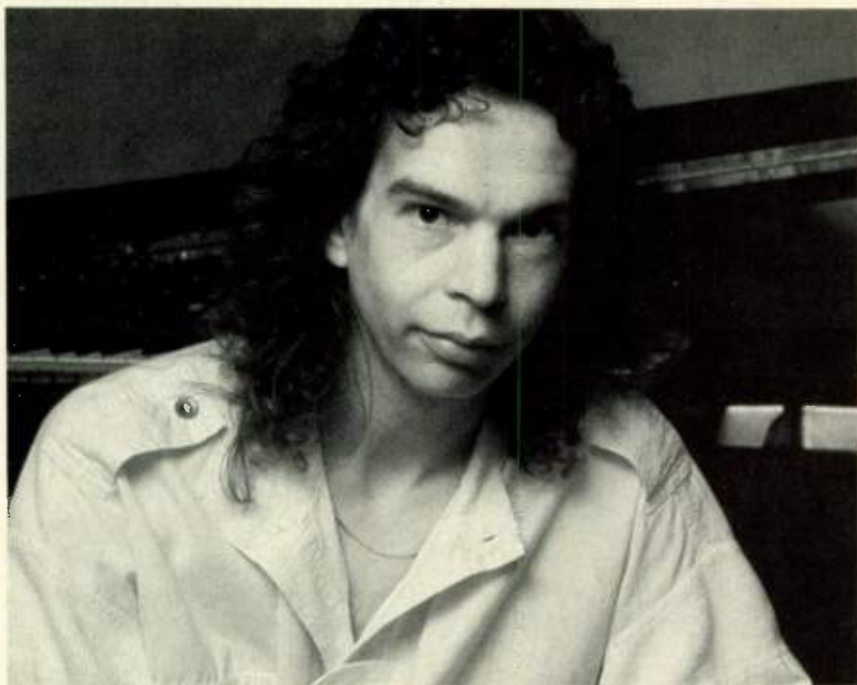
Mays, who has more traditional, classical training than Metheny, also looks at synthesizers and computers as an orchestrating and composing medium. "Yeah, the process is all mixed up," he agrees. "'Cause I learned to write music the old-fashioned way, where you just had to imagine it and write out the scores. I still find that graphic representation to be a real aid, but it's also a great help to have a sonic sort of sketch. I view a lot of the sequencing things as just sketches for how the real thing will happen. I can get close enough with samples to let my imagination fill in the gaps, but for me the music doesn't happen until the end with the combination of the acoustic and electric instruments. And in the process of copying, I realized that there were all these things that acoustic players can do that you just can't do on a synthesizer, so my imagination starts taking over. In the process of actually writing out the parts, I got closer to what the music would finally sound like."

**M**AYS AND METHENY also share a common interest in Brazilian music, which became dominant on 1984's *First Circle* with the introduction of Brazilian musician Pedro Aznar. His sultry percussion and sweet, Milton Nascimento-inspired wordless vocals brought the Metheny Group closer to a pop-jazz-Brazilian sound. Even before that, Nana Vasconcelos brought that sound to the group in the early 1980s. Metheny now lives part-time in Brazil with a Brazilian girlfriend, and to hear him talk about it, the sounds of Brazil have always been a part of his music. ►

MUSIC TECHNOLOGY

49





Photography Andy Freberg

Lyle Mays

► “The first songs that I learned that had any kind of complicated harmonic structure at all were (Antonio Carlos) Jobim tunes,” claims Metheny. “Like a lot of kids who pick up the guitar and get interested in harmony, one of the first tunes I learned is ‘Girl from Ipanema’ with that wild bridge that goes all over the place.”

Metheny reduces his music to a simple formula. “To me, every record I’ve made is full of what are essentially bossa novas. I’ve often said that this whole thing about me being completely taken by Brazilian music in 1981 or whatever it was when Nana joined the band is really a myth. Because if you were to overdub percussion and somebody singing along with the melody, even on *Bright Size Life*, it would sound essentially the same as what I do now. The thing of having people in the band who are from Brazil certainly brings out that aspect of it.”

Lyle Mays interpolated some Brazilian breezes into his own album, *Street Dreams*. One piece, ‘Chorinho,’ sounds like a computerized Brazilian samba via Switched-On Bach.

“Well, Brazilians, of course, will think it’s very stiff, which it is from a Brazilian standpoint,” says Mays sardonically. “I wasn’t attempting any kind of authentic Brazilian sort of feel. It has a very Baroque element combined with the more Brazilian kind of harmonic scheme that seemed interesting to me. It was more of an etude, more of a study in a way. But it

also had a kind of playfulness. It’s more complex than the average little ditty.”

Sometimes they’re influenced by Latin music even when they don’t know it. Metheny is surprised when I suggest that the opening of ‘Every Summer Night’ from *Letter From Home*, with its bandoneon-like melodica and the tango rhythm, sounds inspired by Argentinian new tango master, Astor Piazzolla. “Wow, tango,” Metheny exclaims with surprise. He laughs, “Well to me it sounds like Burt Bacharach. I never thought of that as a tango, wow. I suppose it is kind of a tango. To me, it’s like real pop. But yeah, why not. I mean, I’m a huge Astor Piazzolla fan, so maybe there’s some kind of subliminal something in there that’s happened. In fact, we are probably going to do a piece together sometime in the next few years. He wants to write something for me to play with his group.”

Even as the group has gotten more and more electronic, they’ve infused more and more percussion, beginning with Nana Vasconcelos. “Yeah, it’s true,” says Metheny. “I think that as you increase the electronic elements in the group, you have to balance it with other things. It’s not just percussion, it’s the voice too, which really is a nice antidote to all of the technology that we use. It kind of balances things out.”

Lyle Mays disagrees, however, countering with the example of the four-part title suite to *Street Dreams*, especially the energized second

movement with its percolating Brazilian percussion groove. “On the second part of *Street Dreams* there’s an awful lot of machine percussion,” he reveals. “It wasn’t my original intent to use machines, but I had some trouble getting the written-out parts played. It’s a tough thing sometimes without adequate rehearsal or adequate money for adequate rehearsal. It’s tough sometimes to get very complex things played in such a way that they don’t sound complex or they don’t sound awkward. I ended up having to use a lot of machines, but I don’t feel necessarily that percussion is a balance to the synth. I think that acoustic instruments in general provide more of a balance to the synths and that the rhythmic aspect of music is just something that is intrinsically interesting.”

The Pat Metheny Group has set the standard for both longevity and style in contemporary jazz fusion. Despite the sometimes soft-focus pop ambience of their compositions, they’ve rarely sacrificed the traditional improvising basis of their music. The group tours relentlessly after each album release and, for Metheny, that’s where the music comes alive. “All the different things I get to do are really fun,” he exudes, “but to me it’s all peripheral to the main activity of playing, which is what I became a musician for in the first place, to face it and come up with some new stuff each night.”

**I**N RECENT YEARS, the Metheny Group has been facing it more and more with sequencer backups. “We use the Synclavier as an orchestration device to play woodwind parts and string parts and stuff so that Lyle can really concentrate on the piano. So in essence, we do play with the Synclavier a lot, live and in the studio. It’s very similar to a big band, and using the Synclavier as an orchestration device is exactly analogous to hiring a horn section. You are still going to write the parts for the guys and expect them to play the same every night. And what you play around that as a soloist or whatever is completely different from night to night. It’s just a matter of setting up a world to play in as an improviser and the Synclavier for me is our band. It’s part of the band.

“We’ve been doing this since 1981,” he reveals. “I don’t feel the need to



keep it secret. I've never really advertised it that much. But 'Are You Going With Me,' one of our most popular songs, the basic groove part of that is played by the Synclavier and that's like 1980 or '81."

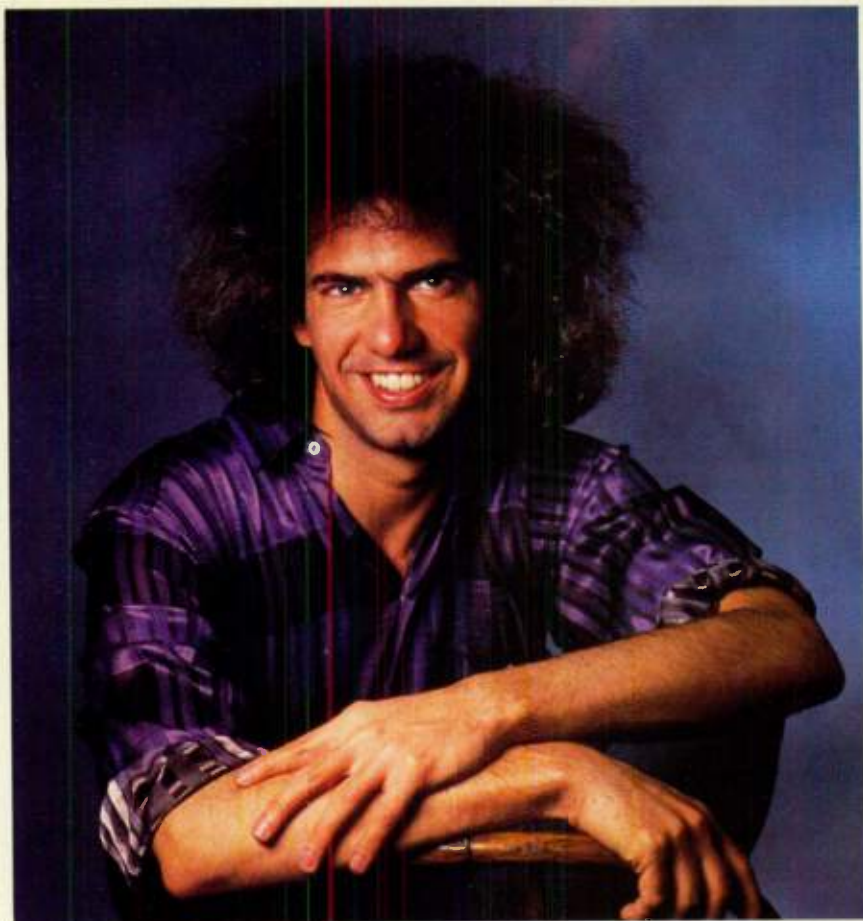
"Using sequences enables us to really get a lot more parts in the music, a lot of information, and it's something we've been using more and more," affirms Mays. "It's a way of enabling complex things to happen in the course of the music that wouldn't happen with six people."

They both see no contradiction in an improvising, interactive ensemble playing with pre-programmed sequences. "We don't feel any kind of restriction from that at all," asserts Metheny. "Because everybody can really do it. I mean, I've heard people play with sequencers and it sounds so bad, you know, there's eighth notes all over the place. But Steve and Paul have a way of grabbing the machine by the horns and saying, 'Okay, this is it,' making it swing like I've never heard a rhythm section do. Rodby uses an analogy which I think is so perfect: playing with the Synclavier is like playing with somebody in the band who's got perfect time but can't listen. He's got no ears. You've just got to take that into account and make it swing. And the guy is going to lay it in the pocket every time."

"It's like playing with a musician who's incredibly stubborn," amplifies Mays, laughing. "Very accomplished in some areas, but very dense and inflexible in others. It can be frustrating if you're used to really mixing things up and really having a lot of interplay, but then again if you compare it to playing jazz with an orchestra backing the combo, it's much more flexible than that, and it certainly doesn't lag as much."

The arrival of sequencers parallels their interest in more complex, multitimbral, multi-layered compositions, which began in their pre-sequencer days of 1980 with the Pat Metheny/Lyle Mays recording, *As Falls Wichita, So Falls Wichita Falls*. For most listeners, *Wichita* is an evocative landscape that shifts through clouds of synthesizers with wistful melodies and Nana Vasconcelos' almost subliminal, yet earthy percussion.

"For me, it's about harmony," laughs Metheny, recalling all of the exotic imagery people have attached to the piece. "It's about chords. I think this is probably true for Lyle too. Even



Pat Metheny

though I know the music has the potential for imagery etc., etc., when I hear it, I hear notes and I hear chords and I wish I played better. I wish there wasn't so much reverb."

Mays won't go anywhere near an image for *Wichita*, nor his other, more

some other instruments, you are leaving the jazz realm."

Mays is trying to bring the worlds of composition and improvisation closer together. "There's a very curious connection and also a disconnection between written and improvised

**Metheny:** "This is the music that I feel strongly about. It's designed to be listened to closely, preferably through headphones, really loud."

impressionistic, extended works such as 'Alaskan Suite' from his eponymous debut or *Street Dreams*. "I don't think of them as landscapey and I don't really want to address them from that standpoint," he insists, clearly trying to avoid anything approaching the New Age tag. "I do think that one of the things that we've not explored in the group with Pat is more extended forms, and different kinds of structures for the music. The music with Pat is very song-based. And that's very much in the jazz tradition. The more impressionistic stuff, as you call it, is not always song-based. I think it's much more through composed and that's the main difference from a structural standpoint. You know, when you stop the rhythm section and you have the time to float for a minute with

music," he explains. "All written-out music is improvised at some point. You have to conceive it or just spontaneously do it or whatever, so it's improvised at that moment. There's also a lot in the various improvising forms that is not improvisational. There are licks the players have, there are devices that they use time and time again that one might call compositional elements. But I think that the biggest diversion is in style. I mean, thoroughly composed music for English horn and bass clarinet just sounds different than walking bass and saxophone. There are all sorts of stylistic elements that are different. And I think that when you try to bridge that gap, it gets more difficult."

Mays created impressionistic, almost classical forms with guitarist Bill Frisell ►  
MUSIC TECHNOLOGY





► on 'Newborn' and the Miles Davis-influenced 'Hangtime.' "I think that there's a spectrum in what I'm doing with composed music that may not always be as apparent as composed music. But I've been trying to put as many compositional elements as I can

**Mays:** "There's a very curious connection and also a disconnection between written and improvised music."

in the more jazz-based music that I've done. For me, one of the ways of bridging the gap is to not really try to bridge it stylistically. Not trying to make an English horn swing for instance, but rather trying to organize more jazz-based music, trying to put another level of organization into it, another level of architecture. I think when that's done well, it's not all that apparent. And it's part of my continued exploration into a little more abstract, 20th century style."

Metheny took his own excursion into 20th century music when composer Steve Reich wrote *Electric Counterpoint* for him. It consists of ten pre-recorded electric guitar parts and two bass guitar parts, all played by Metheny, to which he adds a live guitar part. It's a work that evolves and transmutes in Reich's distinctive style, with melodies given births and rebirths.

"It was also incredibly difficult for me," confesses Metheny. "It was the first time I'd ever played anything that was written from start to finish with no improvising at all. And also just

technically it was hard. It was a difficult piece to play."

A longtime fan of Reich's music, it wasn't until he played it that Metheny began to understand the complex nature of his seemingly simple compositions. "What you hear and

what gets played are two different things," he says. "In the composite thing that you hear, no one thing is playing. Which I sort of knew. But it wasn't until I started to hear this part that I just played an hour ago and the part I was playing live and then realizing there was this other part in the middle of my head that wasn't one single part playing, it all clicked."

Like Mays' music, *Electric Counterpoint* was an attempt to merge a jazz and classical feel. That's one of the reasons that Reich decided to write it for Metheny rather than a classical guitarist. But Metheny thinks it didn't quite work on that level. "My idea was to play it a bit looser rhythmically rather than the way his music usually gets played," he explains, "which sounded great on paper to me. It's just that what I ended up doing was making this rhythmic curve in things that I then had to follow as I kept adding parts to it. That not only wasn't spontaneous after a while, it was difficult for me to follow my early parts. If I had it to do over again I would play it in a straighter way."

This merger created something of a dichotomy for Metheny. He's essentially a performing musician, playing in the jazz tradition of improvisation as composition. In the Metheny Group, that side is less evident than in his solo recordings, particularly *Song X*, recorded with his longtime hero, alto saxophonist and composer Ornette Coleman, along with drummer Jack DeJohnette, bassist Charlie Haden and drummer Denardo Coleman.

Playing toe-to-toe on freeform blow-outs like 'Endangered Species' with Ornette's saxophone joining Metheny's guitar synthesizer in a frenetic squall of passion and daring is a shock next to the more controlled atmospheres of the Metheny Group. "It wasn't about notes anymore," recalls Metheny. "And when you can get to that point, that's when you know you've crossed the line. The thing is, Ornette is at that point about 99% of the time and that was the tune on which I could consistently cross the line with him. To me, that song is melodic, but to an extreme degree. It's a certain kind of melody playing that's a little hard to understand sometimes. But it's about the shape of melody."

Of course, *Song X* is the kind of record that wins critics polls instead of readers polls and sales charts. Metheny, in particular, seems to save his outside playing for outside dates, like a forthcoming Jack DeJohnette record with Herbie Hancock and a reuniting with his old boss, vibraphonist Gary Burton. But the Metheny Group has nothing if not an ear for the limits of the commercial marketplace. Their skill lies in taking music from the inside out on even their most popular songs, like the searing solos on 'Are You Going With Me?' which is continued on the Mays composition, 'Are We There Yet?' on *Letter From Home*.

"We have to survive. We are on the fringes of the music industry, even being pretty successful playing this kind of music," says Metheny, thinking about his presence on supermarket sound systems and New Age radio playlists. "We need every possible source of exposure that we can get, because the everyday person in America is not going to hear our music, ever. It's got to get played while you are picking out your asparagus. Because it's us against Madonna or whoever it is this week. And we are going to lose." ■



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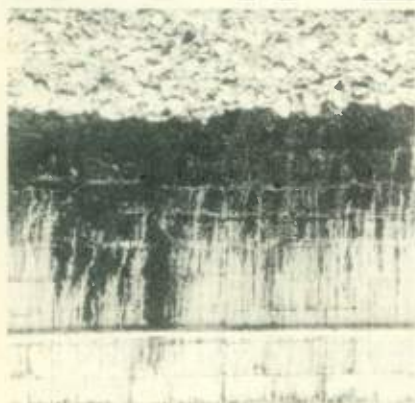
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# LISTENING LAB

Our reviewers recommend listening to the likes of Wire, Madonna (yes, Madonna!), Peter Gabriel, S'Express and others. Strap on those headphones!

## WIRE



## IBTABA

### WIRE

*It's Beginning To And Back Again*

Enigma/Mute

### Pick of the Month

Wire has been one of the most subversive and influential bands to come out of the 1976 English punk scene. From the early days along with the Sex Pistols, to last year's *A Bell Is a Cup Until It Is Struck*, the band has maintained an unshirkable artistic originality, as well as an increasingly large and dedicated following. Their music has influenced the likes of R.E.M. (Michael Stipe has been quoted as saying: "Wire changed my life in '77."), the Cure, and New Order. Now their latest album, *It's Beginning To And Back Again* is receiving unprecedented airplay. The boys from South London have transitioned into the modern musical age rather well.

*IBTABA* continues on the paths they've forged into electronic experimentation. While Wire has always

insisted that their music is "pop," this album is truly their most accessible effort yet, blending Colin Newman's typically ambiguous lyrics and detached vocals, with highly rhythmic and well-orchestrated songs. 'Eardrum Buzz,' the most commercially successful song of the band's 12-year career, is literally still "buzzing in the drum of my ear," with its hooky, near-nonsensical chorus.

The eerie, psychotic lyrics to 'It's A Boy' blend surprisingly well with its energetic pulsating beat. On songs like 'Public Place' and 'Illuminated,' the band has brewed an intriguing stew of heavily-delayed guitars, analog synth washes, and various eclectic electronic noises. Such songs as 'Over Theirs' and 'Boiling Boy' use silence as effectively as noise. For me, 'Finest Drops' held the finest melodies on the album.

Overall, *It's Beginning To And Back Again* is an artful effort, imaginative, provocative – an album worthy of the band's name. I think it's safe to say that Wire will continue to inspire and influence young musicians for some time. ■ *Debbie Greenberg*

images of modern society? Go tell that to Picasso. Go tell Edger Allan Poe. Hell, go tell the press themselves.

Once you get past the 480 volt shock of the lyrics on the opening trio of tracks ('Straight Outta Compton,' ---tha Police,' and 'Gangsta Gangsta'), you realize that these kids have crafted some of the tightest, most intelligent hip-hop ever. No gee-whiz aural jokes and reliance on records of old for value here – the past is used sparingly in conjunction with solid rhythm programming and good sampler work. The key changes in the title track are also enough to make any calculated, self-respecting pop group jealous.

The rest of the lyrics are more standard rap fare (with the bent that they can not only out-rap your ass, they'll put their foot up it too) plus more down-to-earth street commentary on subjects ranging from girls to pushers. Street technology plus street violence equals: "Crank it up – and shut the doors, lest you get shot." ■ *The Cyberpunk*

### MADONNA

*Like A Prayer*

Warner

Believe it or not, Madonna is required listening this month. Don't laugh – this album is a serious work, worthy of some serious respect. From a songwriter's point of view, Madonna has matured tremendously. Divorce and ageing into her 30s are having an effect on the Princess of Pop.

I think I can safely assume that literally every one of you has heard the title track by now, so you know that she has by no means shaken her trademark super-pop style. The difference here is that the album does not

### N.W.A.

*Straight Outta Compton*

Ruthless/Priority Records

The Press doesn't know what to do with this group. At first, they praised their chillingly blunt "reportage" of street life in gang-ridden LA. But when their album went gold and their following got large, the press turned on the group and asked them why they weren't acting like positive role models for today's street youth. Since when did any free country ever expect any branch of the arts to be responsible for representing only positive, uplifting



come across as a Ronco special, filled with hit after hit. Take 'Oh Father,' for example, a scintillating pledge of defiance against an overbearing father. The mood is subdued, even *down* -- this ain't no party tune, kids. It is beautiful, however. 'Dear Jesse' lacks the driving beat found in her club-oriented tunes. In fact, it almost sounds like a ditty out of a Broadway musical. And then there's 'Love Song,' co-written and co-performed by Prince, which just plain comes out of nowhere and fades out into nothing -- Madonna has never permitted such an eccentricity in her albums before. In short, this is the most album-oriented work of hers to date.

From a tech-type's point of view, you are not likely to find a more shining example of ideal production. Granted, the Synclavier and DX sounds do not represent mind-blowingly creative programming, but I guarantee that the strings and piano on 'Promise To Try' will melt you, they're so pristine. Ultimately, Madonna and co-producer Patrick Leonard have once again maintained a stranglehold on the popular music culture by combining tried-and-true hooks with the very latest in music technology and, thankfully, with an individual style that is continuously and logically maturing. It is precisely this well-defined focus that has made Madonna so much more successful than the dozens of "pop female vocalists" that continuously paint their Kilroys on the retail and (especially) radio charts. Madonna has now rounded out a decade of gargantuan success, and if *Like A Prayer* is any indication, the end is nowhere in sight.

■ Dan Rue

## HOUSE HALLUCINATES

*Pump Up the World Vol. 1*

A&M

Who would expect someone as straight-laced as A&M records to put out what is not only a two-record compilation of Acid House (for the price of a single record), but a *good* one at that? The two records are divided into *The Beginning* (including Slezzy D's 'I've Lost Control,' the twelve-minute version of Phuture's 'Acid Tracks,' Jungle Wonz/Marshall Jefferson's 'Time Marches On,' and Farley Jackmaster Funk's 'Jack the Bass') and *The Future* (including a Les Adams remix of Maurice's 'This is Acid,' Mr. Lee's not-very-acid 'Pump Up New York,' and a Mike 'Hitman' Wilson remix of Phuture's 'The

Phuture Will Survive'). Whoever did the track selection manages to show that Acid isn't just a Roland Bassline and noodly resonate synths (which all too many cash-in-now Acid records are), but a very dreamy, minimal, surrealistic, synth-heavy version of House with a bit of jamming(!) replacing the turntable work. Think of it as kind of a stripped-down Tangerine Dream, or Peter Baumann with a four-on-the-floor beat. ■ Chris Meyer



## S'EXPRESS

*Original Soundtrack*

Rhythm King/Capitol

House music has produced a lot of one-hit wonders, with S'Express having made their mark as early examples of British Acid House. It was a very pleasant surprise to hear that their album reveals not a dance band, but what (with 20/20 hindsight) is the logical late-80's extension of late-70's technopop. With gurgling basslines, bouncing sequences, cheap drum machines, the string stab or wash, a reverence of analog synths, a bit of Trevor Horn bombast, real song structures, lots of echo, and a good dose of *fun*, S'Express has turned out a mature, varied work that'll hold its own off the dance floor and much longer than the next string of 12" 45s due to hit your store shelves. There's even a slow cut to end the album ('Coma II'), showing that these folks have been listening to a bit of Tangerine Dream and Jarre in their spare time. A workable alternative to D50 New Age, and worth studying if you want to show a little more thought than just clever cuts in your own dance work. ■ Yung Dragon

## PETER GABRIEL

*Passion*

Realworld/Virgin

From the soulful, rhythmic opening cut to the lyrical ending, Peter Gabriel's *Passion* weaves a hypnotic sonic journey for the attentive listener. As with his many other rock masterpieces, Gabriel challenges and surprises both listeners and critics with his unique musical vision. *Passion* clearly demonstrates the work of a master musician using technology, acoustic instruments, vocals, and inspiration to create the powerful textures that form the soundtrack to Martin Scorsese's *Last Temptation of Christ*, yet work equally well as a double album of instrumental music (no lyrics).

Most of the twenty-one compositions have an eastern, world music feel that is at times delicate and flowing, and at other times dark and mysterious. Gabriel's careful mixture of technology with traditional rhythms and sounds provides a solid foundation for inspired performances by the many excellent guest musicians from all over the world (Shankar's violin playing is outstanding). Amazingly enough, the Prophet 5 is a dominant contributor in a cast of instruments that includes the Fairlight, AudioFrame, Emulator, and Akai S900. The sounds and samples blend in perfectly with the other musical elements, providing support and unique textures without the synthetic quality found in a lot of modern music. This album is a must for anyone interested in genuine world music. ■ Mihai Manoliu

MUSIC TECHNOLOGY

55



# FOCUS MAGAZINE

**In this, the first of two parts that focus on the basics of signal processing, we'll take a look at one of the most common types of effects – reverb. Text by Scott Wilkinson.**

**Reverberation** – *The effect caused by sound waves reflecting and decaying within an acoustic space. Also, the simulation of this effect by analog or digital means.*

IT IS A VITAL component of virtually every sound you hear. Your brain uses it to ascertain the size, shape and other characteristics of the space in which a sound was produced. Reverberation. It occurs naturally because acoustic sounds bounce off of nearby surfaces and arrive at your ears after the original sound itself, unless they are produced in an anechoic chamber (an acoustically controlled room in which sounds are totally absorbed by the walls). Reverberation. Even outdoors, this effect is a prominent part of Swiss alphorn music, although the echo from the next mountain top is closer to a delay effect (more about delay effects next month).

In reverberation, the reflected sound waves reach your ears milliseconds after the initial sound from which they came. I'm sure that most if not all of you recognize reverberation when you pay attention to it – a haunting "ringing" quality that lingers for some period of time after the original sound stops. This ringing quality usually appears to be continuous rather than a

series of separate echos because the time between the reflected waves is so short that your brain blurs them together into one sound.

Each acoustical factor contributes to the reverb effect. For example, the larger the space, the longer it takes for sound waves to reach the walls and reflect back to your ears. Walls closer to you will reflect sound waves sooner than walls that are far away. Heavy drapes and thick pile carpeting will absorb much more sound than marble walls and hard wood floors. In especially "live" environments (such as a gymnasium or tunnel), sound waves may be reflected many times. People

*"It's actually quite amazing how much better most music sounds with a little reverb."*

tend to absorb a fair amount of sound energy (unless they're wearing a suit of armor), so an empty hall will have different reverb characteristics than a full house. In any acoustical environment, however, the reflected sound waves lose some energy every time they are reflected and will fade away to become imperceptible sooner or later.

The phenomenon of reverb can be distilled into several distinct parts. The most obvious part is the length of time over which the reflected sound waves remain audible. This depends pri-

marily on the reflection characteristics determined by the texture of the walls, ceiling, floor and furnishings of the space as well as the strength of the sound. Also, there may be a perceptible delay between the original sound and the onset of reverberation. This occurs in very large spaces such as enclosed stadiums. Sound waves at different frequencies (or pitches) often fade away at different rates as well.

## Artificial Reverb

As the recording industry became more and more important to the distribution of music, it was necessary to develop a means of artificially reproducing the reverb effect. Musical sounds produced and recorded in the controlled, but relatively "dead" environment of a recording studio sounded – well, *dead*. It's actually quite amazing how much better most music sounds with a little reverb. That's one reason why churches have been long been popular for concerts and live recordings.

In the early days of recording studios, reverb was added to sounds in several ways. In one procedure, the signal from a microphone or instrument was amplified and sent to a speaker located in a small tiled chamber, usually located in the basement of the studio. A microphone in the chamber picked up the sound coming from the speaker and bouncing off the tiled walls, and sent it to be recorded on tape. Different reverb effects were obtained by moving the microphone and/or speaker in the chamber. In a ►



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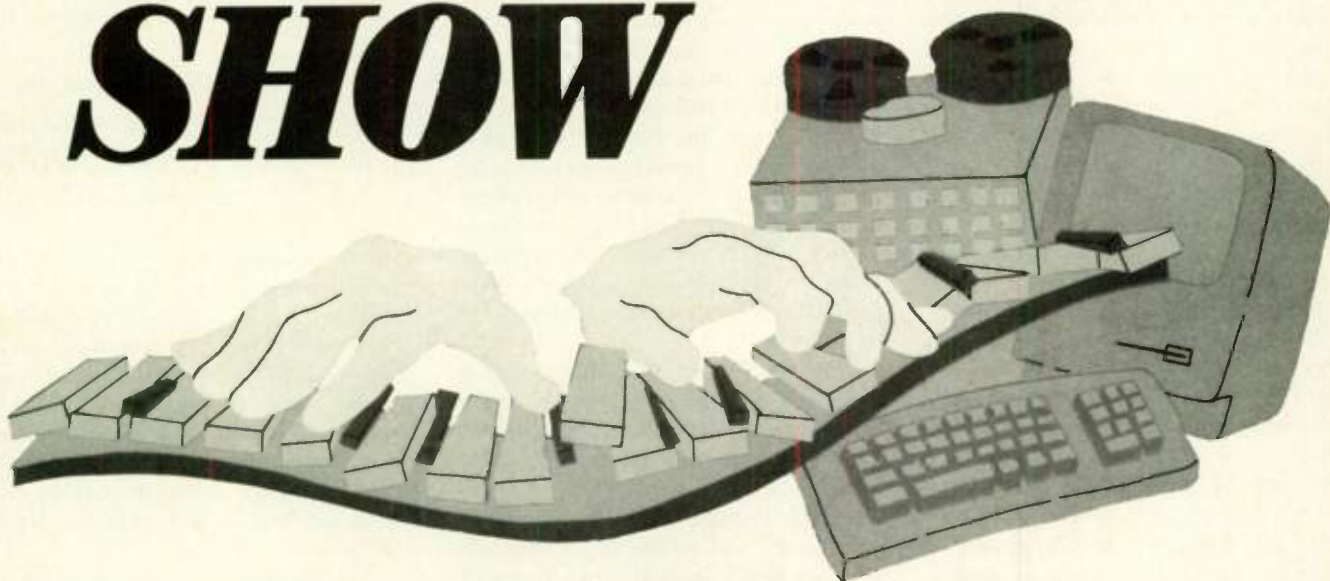
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► similar procedure, the speaker and microphone were placed in a room that could be lined with various materials to produce different reverb effects.

The earliest artificial reverb units were electromechanical wonders. Some would convert an incoming electrical signal into the mechanical energy of a vibrating transducer. This transducer was connected to a spring, which would vibrate with it. These vibrations traveled down the spring, causing another transducer to vibrate at the other end. The second transducer's vibrations, delayed slightly with respect to the input signal by the intervening spring, were reconverted back into an electrical signal. In other early reverb units, a large metal plate was used instead of a spring. A small speaker was placed at one end with a contact transducer microphone at the other end. In fact, this method of recreating reverb is highly prized and is still being used in recording studios today.

In both of these cases, the reverberated sound was generally mixed with the original "dry" (unreverberated) sound in a balance determined by the recording engineer before being recorded onto tape. This is the "wet/dry" mix referred to in reverb reviews. It allows you to determine how much of the reverberated sound will be recorded with the original sound, providing further control over the final effect.

Finally, the art and science of

*"With 'gated reverb,' the reverb sound starts loud and becomes softer, but is abruptly cut off before it has decayed completely."*

electronics came of age and reverb effects could be reproduced without requiring physical spaces or mechanical vibrations. Using analog circuitry at first, reverb units began to offer very specific control over the reverb effect applied to signals passing through them. With the advent of digital electronics, the degree of control became even finer. In a digital reverb unit, the analog input signal from a synth, microphone or mixing board is sampled. The numbers representing the input signal are altered according to a formula in the unit that calculates the reverb effect specified by the user. These numbers are then reconverted back into an analog signal, which is

sent on to its destination – back to the mixer, directly to an amplifier and speakers, to the tape deck, etc.

### Typical Parameters

Digital reverb units provide several basic types of reverb effects, using the same names that were applied to artificial reverb techniques in the early days of recording. For example, most units include several different basic types of reverb sounds with names like *spring*, *plate*, and *chamber*. Each of these reverb types maintain the basic sonic characteristics of the method after which they are named. Most units also include basic types of reverb sounds called *room* and *hall*. As you might expect, these simulate the acoustic characteristics of rooms and halls (very large rooms) of various shapes and sizes.

One effect common to digital reverb units is usually called *reverse*, *inverse*, or *nonlinear*. In this type of reverb, which has no acoustical counterpart, the volume of the reverberated sound is reversed, starting softly, growing to a loud level, and suddenly cutting off. Another nonacoustical type of reverb sound is usually called *gated reverb*. In this effect, the reverb sound starts loud and becomes softer, but is abruptly cut off before it has decayed completely. Both of these effects are used extensively on drum parts (particularly on the snare) in the pop music you hear on the radio.

Once you have selected the type of reverb effect you want, there are several parameters to be adjusted. These relate to the specific characteristics of the acoustical environment that you are simulating. The first and most obvious parameter is *reverb time*, which determines the length of time over which the reverb sound will be audible. The higher the value, the longer the reverb effect will sound. This parameter provides control over the apparent size and reflective characteristics of the acoustical space. For example, a "hall" reverb usually has a longer reverb time than a "room" setting.

In particularly large acoustical spaces, it takes a perceptible amount of time for the original sound wave to reach the walls and return to your ear. This first wave of reflected sound, called the *early* or *first* reflection, has a large influence on how you perceive reverb in a large space. A parameter common to virtually all digital reverb units is

called *predelay*. This parameter determines the time between the original sound and the first reflection. As the predelay time gets longer, the apparent size of the space gets larger and your apparent location within the space gets closer to the "center."

There is another common parameter that relates to the early reflection called, reasonably enough, *early reflection* (in some units, this parameter is

*"In a digital reverb unit, the analog input signal from a synth, microphone or mixing board is sampled."*

called *density*). It controls the time between the first few reflections, which determines the "opacity" or density of the first few milliseconds of the reverb sound. Like the reverb time, this parameter affects the apparent size of the space. It's very useful with sharp, percussive sounds that can become confused with the early reflections if they are distinct and widely separated in time.

The *diffusion* parameter controls the separation of all of the reflections in the reverb sound. This parameter is used to control the "thickness" of the reverberation. Typically, reducing the diffusion level results in a thinner sound in which the reflections are more widely separated in time. By increasing the diffusion level, the reflections are spaced more closely together, resulting in a more continuous, thicker sound.

One of the characteristics of reverb is the rate at which sounds of different frequencies decay. Many digital reverb units include a *high frequency (HF) damping* parameter with which you can specify the decay rate of the high frequencies independently from the rest of the frequencies in the reverb sound. Some units go one step farther and provide a low frequency damping parameter as well. These parameters allow you adjust the apparent size of a room and the texture of its furnishings. For example, softer surfaces cause high frequencies to decay more rapidly and smaller rooms cause the low frequencies to decay more rapidly.

That just about wraps up the basics of reverb. Next month, we'll take a look at the other major types of signal processing, including delay, flanging, chorusing, EQ, and pitch shifting. Until then, keep on making music! ■



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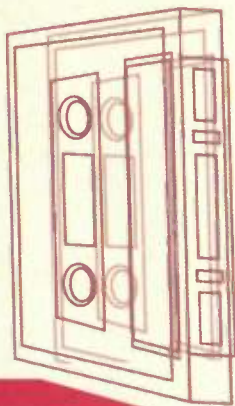
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# READERS



# TAPES

## Is this a real column, or did we just make it up?

*Reviews by Yung Dragen.*

OR, TO DIRECTLY quote the title of Bill Sethares' latest cassette, "Is that a real song, or did you just make it up?" I can easily imagine a friend making this reply upon having someone audition their -gasp- very own songs to them. I mean, aren't real songs made by people who have records (excuse me, CDs) in stores, the ones that get played on Top 40 radio? An interesting, plausible conjecture of what is probably most consumers' view of the music world.

Bill's tape comes with a lyric book smattered with interesting chit chat and wry social comments - a "confessional," he calls it. His songs are similar. The recording quality is no great shakes, and the instrumentation is pretty simple (Kawai drum machine, TX81Z, CZ101, Quantar MIDI guitar controller, bathroom - quality vocals and reverb processing). The tunes have a quaint minstrel quality - interesting and "relevant" without being preachy. If this is technofolk, it's fine with me.

But now, we gotta talk. I braved the saxophone assault of a couple o' months ago; it was actually rather refreshing. And the alternate guitar attacks last month were equally fine. But what's this sudden preoccupation with the D50 flute and lite-jazz New Age (the two are often tied together)? It was stranger than déjà vu punching in one tape after another this month and getting the same Wave/Colors sound. Get a life, guys - or at least a patch randomizer for your synth!

But enough of that. I can hear the

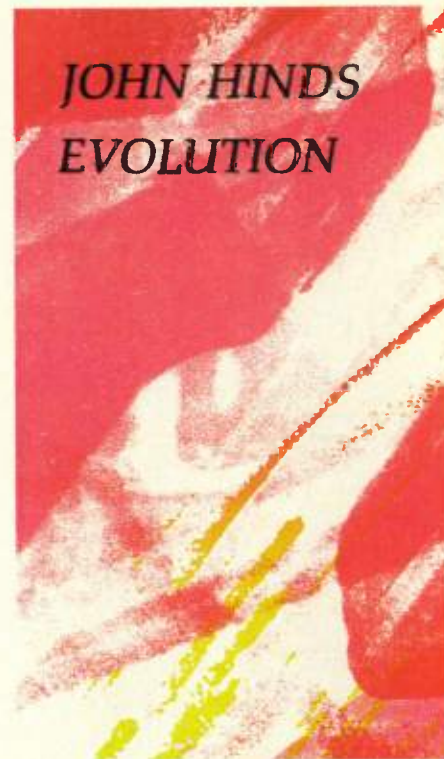
-muted screams for this column even as I sit here, late at night, out in the distant reaches of funky Venice Beach (in front of my latest path to enlightenment, a brand-new platinum Macintosh Plus, with LaCie 100Mbyte hard disk), so let's summon up one last burst of adrenaline and survey the latest crop of home-penned efforts.

- **Brideshead**/... *ruined choirs*: "Dan Quayle likes Heavy Metal and loose women," reads the newspaper caption at the top of the letter. Ron Hall of LV428 (a group which I described over a year ago as an adolescent Art of Noise) has returned in a far darker, more mature form (he semi-classifies the new material as "organized noise"). It's got a machine rhythm, gritty samples, lots of noisy industrial sounds, snippets of speech, minimal but effective melodies, and a nocturnal, rusted post-industrial age sound with a malevolent edge. In other words, it's fantastic.

- **Ali Rahman**/*Works With Others and Himself*: Continuing with readers who also submitted strong first efforts a year ago, Ali shows more development in the Prince-meets-Detroit mutant funk mold. The ideas are great - the instrumentation is innovative and interesting (original vocal "harmonies," synth squiggles and bass strokes, plus clean rhythm and metal lead guitar work). The recording quality is still very poor (bad balance, with the vocals in particular buried and many spots of distortion - a shame, really. I can hear many layers and subtle ideas

within the murk). Anybody in Chicago with a halfway-decent studio would be wise to try to enter into a partnership with this guy.

- **John Hinds**/*Forward* and *Evolution*: Guitar/bass/drum/keyboards (the latter shared by John and Peter Hinds) efforts that borrow much from '70s German space/acid rock (early Amon Düül II, etc.) - noodley, meditative, spacey, and metaloid (in an "endless fiery solo" versus "power chord" kind of way). No bass frequencies to be found. The drumming sounds like a drum machine programmed by a space rock drummer. *Evolution* tries to expand in style (it even has a syrupy New Age-ish piece, plus an extended drum solo), but I prefer the more focused *Forward*.



- **Steven Douglas Brown**/*Sensibility*: Steven plays "various modules" driven by a Kurzweil MIDIboard with a leaning towards sampled orchestral sounds, including a pan-type flute (not quite the dreaded D50 flute). He's occasionally assisted by Peter Forbes on voice, Tony Malady on sax, and John Ettinger on violin. The sound is smooth and professional, comfortably enveloped in clear reverb (with particularly good percussion parts). The style is an upbeat demi-classical with light jazz and latin tinges. Uplifting and relaxing.



– **Axis and the Rim/five-song demo:** A well-produced, pretty straight-ahead Midwestern club-style (even though they're just a studio band) rock effort with very slight country twinges by the married duo of Sherry and Bob Richardson. Good jangly guitar sound. The drums (Alesis HR16 through a couple of Alesis reverbs) sound perfectly real. The closest reference in my particular album collection is Robin Lane and the Chartbusters.

– **David K. Gross/client Christmas present/demo tape:** One of the D50 flute offenders. After 12 years of "wearing a tuxedo, playing 'Girl from Ipanema' at hummingbird volume for a bunch of drunk lawyers," David eventually started his own video production company. His music has that happy, skipping, background texture with jazz and latin touches and above-average energy and funk. Okay, it's not weird enough for my personal tastes, but it is classy background music for business people...

– **Steve Spencer/four-song demo:** A variety of clean, plinked and jangly guitars, a little Farfisa-style organ, and ride-the-cowbell drums in a cross between mid-'70s American and mid-'60s British rock (he admits to being a big Beatles fan) with a bit of surf rock around the edges. The only problem – the lead vocal is often sharp or flat in pitch. Hey, it's an effect, I suppose.

– **David Snow/The Demo Suite:** I won't

perhaps irreconcilable tendencies in order to imbue advertising and industrials with real worth: music for commercial purposes requires stylistic recognizability... all of which tends to fly in the face of heartfelt creativity." Well, a lot of great rock that sounds like rock is still great... Those who would like a cross between traditional jazz and electronic easy listening will get into this.

– **William Hartzell/eight-song demo:** Roughed-up rock with munchy guitar, low fidelity (no highs), reasonably good drum programming (although the kick drum is a little *over* active), FM bass, and female lead vocals (by Beth Lewsen) that sound just a little like a Joan Jett that didn't shred her voice. The occasional synth solos, plus the soundtrack-ish slower and synth-heavy numbers on the second side don't work as well – keep going with the rock material.

– **Arnold Mathes/Destination: Studio:** A true analog synth freak can make anything sound analog (in this case, an Ensoniq SQ80 and Crumar DS2, along with a truly analog Roland SH101). Mathes' tape is in the style of the semi-underground/semi-mainstream/semi-avant garde/always experimental-and-loose electronic music of the late '70s and early '80s. "This tape is more controlled than *Taboo* (a tape of his which I reviewed about a year ago). I like using found sounds, but sometimes am too lazy to look for them. This is the case with this tape." Arnold's 28th tape (featuring 20 songs), *Destination: Studio* is indeed more rhythmic and less varied, but still considerably different than most New Age you'll hear. Those who have been

doing this for a while with old equipment will find Mathes' efforts happily nostalgic.

– **Peter Unicorn/Unicorn Sampler:** And to wind up this month, a true schizophrenic (and a talented one, at that). "Each song was performed on a different sequencer, and I found that each sequencer's environment had a profound effect on the composition." Which sequencer did what? He wouldn't tell me, but the styles range from what sounds like a humorous modern dance soundtrack performed with overdriven FM ('The Snerveling Snobel'), to an easy listening electronic instrumental with an MT32 flute ('Renewal'), a faux chorale ('Brahms Theme Permutations'), and a Caribbean/Latin number ('Katuba in Aruba'). Indeed with it – worth getting if just for the study.

Two final notes – Michael Sage – your very elegant bio, cassette, and lyric sheet don't have a contact address or phone number! Remedy post haste! (It's some of the better use of vocoder background vocals, so I'd like to be able to point other ELO holdouts his way...) Same goes for the jazz Making Tracks – no exposure for the deserved if there's no address. ■

#### Contact addresses:

**Bill Sethares,** 622 North Henry Street, Madison, WI 53703. Tape costs \$6.

**Brideshead** c/o Ron Hall, 247 South Juniper Street, Apt. 802, Philadelphia, PA 19102.

**Ali Rahman,** 1464 West 72nd Place, Chicago, IL 60636. Tel: (312) 873-7406.

**John Hinds** c/o Omni Sonic, POB 786, Millbrae, CA 94030. Tel: (415) 343-0247.

**Steven Douglas Brown** c/o Dare Studios, POB 5832, Phoenix, AZ 85010.

**Axis and the Rim** c/o Sherry Richardson, 1524 Dodge Street, Lake Geneva, WI 53147.

**David K. Gross** c/o AVID, 130 East Marks Street, Orlando, FL 32803. Tel: (407) 423-9535.

**Steve Spencer,** 637 Scenic View Drive, Atlanta, GA 30339. Tel: (404) 435-2587.

**David Snow,** 9824 Maple Leaf Road, Gaithersburg, MD 20879. Tel: (301) 963-3742.

**William Hartzell,** 11 Linden Street, Allston, MA 02134. Tel: (617) 782-4872.

**Arnold Mathes,** 2750 Homecrest Avenue, Brooklyn, NY 11235. Tel: (718) 891-7008. All tapes are \$5; they're worth it just for the cover art (not to mention the weird photos and reprinted reviews that come with his catalog).

**Peter Unicorn** c/o Peter Einhorn, 445 East 68th Street, New York, NY 10021.

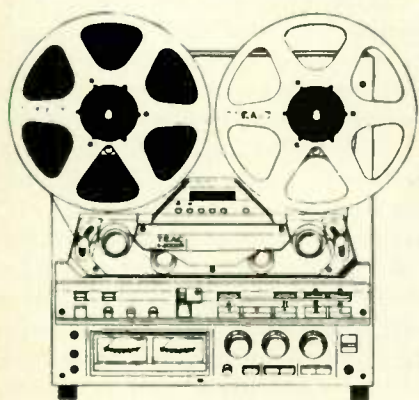
Tapes are reviewed in something vaguely resembling the order received. Send your contributions along with name, address (on tape or J-card – due to the backlog, tapes without addresses will be discarded in the future), equipment list, photo, price, and favorite breakfast cereal to: *Readers' Tapes, Music Technology, 22024 Lassen Street, Suite 118, Chatsworth, CA 91311.*

MUSIC TECHNOLOGY

61

## THE DEMO SUITE

BY DAVID SNOW



hold the chuffy flute patch against him. He crafts some nice instrumentals in the same background/business suit style as David Gross (with a bit more jazz and chops). Acknowledging the audience, David comments "one would need to integrate opposing,





# Programming Compleat

## PART 8

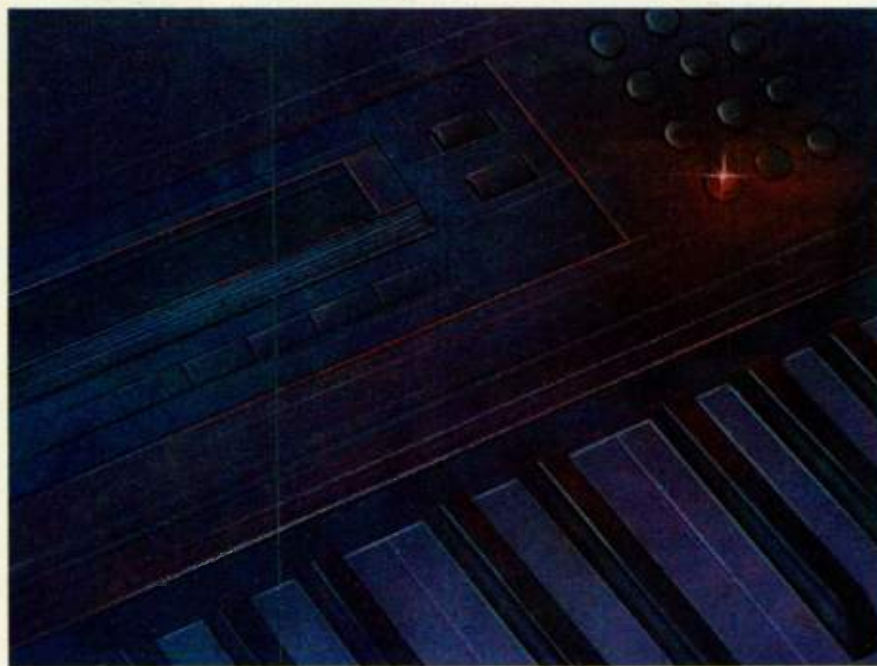


Illustration Rick Lohmes

**Our final segment on programming the Korg M1 shows you how to use some traditional orchestration rules to achieve more vivid timbres. Text by Lorenz Rychner.**

**W**ANT TO start this last M1 article with a word of encouragement for those of you who know your music but aren't too sure about the programming process: don't get lost in the hokus pokus of tech-talk. Rather, always remember why you got yourself into this – because you want to expand your musical potential. The M1 has brought more non-synthesists into the synth club than any keyboard I can remember since the DX7. So there are a lot of you out there who are enthusiastic about playing but are still reluctant to program your M1. I know what's on your mind because some of you have told me so.

I'm very familiar with a turn of phrase that goes something like this: "I'm really just a piano player, and all this stuff is Noodleroni to me." I have also just finished teaching the first ten-week class on the M1 at the Grove School (by the time you read this, we'll be well into a new quarter), and the same underlying truths came through.

62

SEPTEMBER 1989

Even if you're unsure about the technicalities of a sound, you know a good one when you hear it, and you want to make *music* with it. When faced with solid musical reasons for changing a sound, even non-programmers become interested. So that's what we'll do today – look at real-life scenarios, with an eye towards orchestration and sequencing, based on the original factory sounds.

In my previous M1 articles, I showed you how the "sounds" are really a hierarchy of sources. Multisounds are played by the oscillators in single or double mode Programs, and Programs are grouped into various types of Combinations. There are many significant ways to affect what you hear. Some of these methods involve heavy-duty programming, as in altering an existing Program beyond recognition. But often, you only need to make minor adjustments (called "tweaking") that can easily lead to fresh results. Either way you must

always start out with an existing Program or Combi, since there's no blank initialized default setting on the M1.

There's another way of creating new sounds. It's called orchestration, and it's the oldest trick in the book. By blending and combining existing sounds, you can create an entire palette of new sound colors. That's what composers have been doing for centuries. You can also do it on the M1, and you can even go one step further – you can re-build an instrument whenever you need to. Composers can't normally do that, although many attempts have been made to physically modify instruments. For example, Richard Wagner instigated the construction of new super-tubas, and I'm sure many of you are aware of "prepared" pianos.

### Big Sustaining Low End

Let's assume that you want a definite attack followed by a low, huge



sustained sound. This is a favorite sound category, so let's look at several ways of getting it. Anytime you have a musical passage that doesn't use the bass as part of a rhythmic groove, you can think of the bowed string basses in the orchestra. The problem is that the basses alone don't sound big enough to create a huge sound that can fill a movie theater and rattle the popcorn in your stomach. In an orchestra, you would have the basses bowing away furiously, probably reinforced one octave higher by the celli. For the attack, you might have the percussionist hit a tympani or the bass drum, or both, and some basses might play pizzicato. A tuba would add body to the sustaining sound, while a bassoon would give it a clearer edge if needed. Blend in a low piano note and you have a whopper sound.

Producing this whopper bass on the M1 is a piece of cake. In the first article, I showed you the ins and outs of the Combi mode in which you can assemble such orchestral blends. The only problem is this: you may not want to use up all the resources in the M1 for just the low notes, leaving no timbres in the Combi to play midrange or treble parts with different sounds.

When using the M1's sequencer, you come up against another problem. Even if you had a suitable Combi, the sequencer wouldn't be able to use it. The on-board sequencer is restricted to eight tracks, each of which can only play one Program (not Combi) at a time, on one MIDI channel. To achieve our mammoth bass effect, you would have to record the musical part into a track, then copy it to as many tracks as you need to control all the Programs that need to come together to create the sound.

As you can see, the most economical way to do it is within a single Program. This may not get you every desired nuance at once, since you have no more than two sound generators (the oscillators). But the beauty of AI synthesis is the richness of the Multisounds. Many of them are sampled sounds that are, in themselves, a blended layer of color shades. Let's see how we can build a rich, fat, low sound that has a definite attack using a Multisound.

### Building The Whopper Bass

Check out Program 16 'Pick Bass.' It has the attack that we're looking for, but then it wimps out. Press Edit Prog and change Single into Double (press

tab A and the Up tab). Press Page Up once and you see that Osc1 plays Multisound 14:Pick Bass at a loudness level of 99 and at the lower 16' octave transposition. Let's look for a suitable Multisound for Osc2. Press Page Up, tab A, and select Multisound '16:Fretless.' Press tab D and set the level to 99, then press tab E and set it to 16'. Now

*"You can re-build an instrument whenever you need to; composers can't normally do that."*

the 'Pick Bass' has all but disappeared, and the 'Fretless,' while nice and fat, doesn't quite make it on its own. Change its level back to zero while you attempt to fix Osc1. Could it be that the 'Pick Bass' fades too quickly? Press 4 and look at VDA1 with its numbers for the loudness envelope of Osc1. Press tabs D and F and change the Breakpoint and Sustain levels to 99. And, for good measure, press 2 and change the VDF1 Cutoff to 99. The 'Pick Bass' still wimps out. It seems certain that this is so because the recorded sample is meant to fade.

Give up on it and press zero, followed by Page Up and tab A. Select

Multisound '16:Fretless' for Osc1. You now have the same Multisound assigned to both oscillators. Press Page Up, tab G, and set the Detune for Osc2 to +20 for a fatter sound (the two oscillators are slightly out of tune). Notice that the attack still has a peak accent, although the VDA envelopes keep the volume at maximum (Breakpoint and Sustain levels are all at 99). Again, the attack is a characteristic of the sample itself.

Can you emphasize the attack some more, in a manner that speaks more quickly? Try doing it with the filter. Press zero, Page Up twice, tab D, and set the level for Osc2 to zero for now. Press 2, reduce the VDF1 cutoff to 40, set EG Intensity to 50, press Page Up, and give it the following shape: AT00, A+99, DT03, B+00, ST11, S+34, RT99, R+99. Press zero, Page Up twice, tab D, and bring the level of Osc2 back to 99. Now you have a fat bass with a serious attack accent. For keeps, press tab 9, name the Program, and store it under any number you wish, as long as you've decided that you can afford to lose the Program that was there before.

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- ▶ exactly the same Program settings that you cooked up before, but this time switch Multisounds. Set Osc1 to play Multisound '84:DWGS Bass 2' with a bassoon-like nasal quality, and assign Multisound '37:TubaFlugel' to Osc2, for its rounder quality. Feel free to try other selections, even those that seem unlikely candidates judging simply by their names, and keep in mind that the current filter settings might not suit every choice you make.

Listening to the combination that I just selected, I don't think that this is the greatest of sounds by itself. But when you go a step further to blend these two Programs in a Combi, they can add up to an even bigger sound than they do now. Try Combi #2 'Pankala.' It's a layer of two Programs, and its first effect is Chorus, which is always helpful if a fat sound is required. Use the Detune in the Combi to further enhance the fullness and play with the balance levels. If you're sequencing, however, forget the Combi. Assign each Program to a different track and make sure that both tracks play the same notes in unison. The effect will be the same as when you play the Combi from the keyboard.

### Attacking String Problems

You know the problem – you have a great string sound for those long lush notes, but any time you need an accent or faster moving notes you're in trouble. You are, of course, in good company. String sections are notorious for lazy attacks. It's almost as if there was an unwritten rule about swelling notes lagging behind the beat. When arrangers started to use string sections for very rhythmic figures on commercial dance projects like disco tunes, the players had to come up with a whole new attitude towards beat placement.

On the M1 there are a few helpful features to help deal with just this type of problem. The obvious one is straight out of Orchestration 101: enhance the rhythmic definition of the beat by adding a percussive sound of short duration to the string part. Traditionally this would be, in order of increasing intensity, having some string players playing pizzicato, celeste, harp, piano, and xylophone.

Select Program 27 'Strings' and press Program Edit. Press the Plus tab to change Single mode to Double. Play and listen to the attack being produced by a bright metallic sound. Press Page

Up twice and you'll see that the Multisound '00:Piano' is being played by Osc2 at a level of 50 versus Osc1 at a level of 79. Let's make both levels 99 for an even starting point. How could you make the piano (or any other of the many percussive Multisounds) from Osc2 come in only when you want it to? Press tab 4, Page Up four times, and set A+99 above tab B. This ensures that Osc2 only plays when you hit hard notes.

But what if you need a lush string sound as well as a percussive attack? You'll need to dedicate one more Program to this sound. Why not use Program 27 again as a starting point, but now assign Multisound '31:Strings' to Osc2 after initially switching from Single to Double mode. Use plenty of Detune on Osc2 for warmth, and take out the harsh bowing attack by setting VDF1 and VDF2 to zero EG Intensity with Cutoff=63 or less, and slow down the attack with VDA1 and VDA2 at AT75. Give VDA2 a Breakpoint and Sustain level of 82, and notice how VDA1 is velocity sensitive whereas VDA2 is not. This lets you add a harsher and more rhythmic phrasing on faster notes as long as you play those notes harder. Now combine these two Programs in a Layer Combi. Use more Detune, and play hard and soft, short and long, until you get a feel for the new sound.

### Freshen Up Your Percussion

Say you have a tune with a fairly repetitive phrase; maybe it's the melody or a background figure. The problem you have is this: you need to highlight this figure every now and then, maybe every fourth time when the vocals have a break at the end of a little section. But it's not a big solo deal, just a highlight. Behind the vocals you need a relatively subdued color, so you've selected some sound that doesn't stick out. How can you highlight it when the time comes?

You can't simply make it louder, as this would blow your well-balanced mix. You could double the same part with the same sound an octave higher. Or you could double the part with a fresh, unusual color that only happens on those rare occasions. Make it a percussive sound, as they tend to get the job done quickly when there's not a lot of time to establish something new. How about a popping sound that echoes itself, as if it were going through a digital delay? Ah, but you're not going to waste the built-in effects

on this little number. You'll do it differently.

Select Program '10:PanMallet.' Reassign the Multisounds as follows. Osc1 plays Multisound '23:Karimba,' at Level 99 and in the 4' octave; Osc2 plays Multisound '48:Block,' at Level 99 and the 4' octave, with a Detune value of D+25 (simply because it sounds out of tune otherwise, don't ask me why...) and a Start Delay of DL20. This last value is adjustable. Depending on the tempo of your song, you might want to make it play in time with your music at 16th or 8th note intervals or any other repeat value. If you want more than one repeat without sacrificing the on-board effects, then bear with me as we explore the tremolo feature.

Do you remember the 'Good & Bad' Program (see 'Programming Comp-leaf' in the August '89 issue of MT)? It uses a trick similar to the one you need right here. The idea is to make Osc2 play a Multisound that can sustain its output, not one like the percussive pops that we have just used. You then chop up that sustaining sound with the tremolo, into a now-you-have-it-now-you-don't effect. Press zero, Page Up twice, and change Osc2 to Multisound '71:Pingwave.' Now press 4, Page Up three times, and set the following VDA2 EG: AT00, A+99, DT30, B+99, ST00, S+00, RT00.

Now, as you play, you hear Osc1 ('Karimba') speak immediately and percussively, followed by the 'Pingwave' from Osc2, which sustains for a brief moment, then cuts off. If the faint sustain from Osc1 bothers you, then press Page Down and set the following VDA1 EG: AT00, A+99, DT14, B+00, ST00, S+00, RT00. Press 8, Page Up three times, tab H, and change the dry/wet balance from 75:25 to 90:10. Press 6 and Page Up to get to the VDF MG screen. Press tab A and change the waveform from Triangle to Saw Down. This determines the shape of the chopping-up effect. Use tab C to set the Frequency (speed) of the effect to 50, tab E to set Intensity to 99 (maximum), and tab F to OSC2. Press 3 to access the filter for Osc2 and set the VDF2 Cutoff=12 with EG Intensity=00.

Now go back to the Osc2 main screen (press zero then Page Up twice) and change the delay to DL27 for an even timing of the original hit and the three repeats of Osc2. You can still go shopping for other waveforms for Osc2 if you don't like 'Pingwave.' See if you like '#22:BellRing' or '#44:Flexa-



Tone' (strictly for laughs). How can you control the loudness of the repeats while staying with a uniform loudness of the original ('Karimba') hit? You guessed it, good old velocity. Press 4, Page Up, tab B, and set A+00; then press Page Up three times, tab B, and set A+99. The harder you play, the louder the repeats.

## Learning from Mother Nature

The M1 lets you adjust the loudness of each oscillator's Multisound independently from any other aspects of their sounds with the VDA1 and VDA2 EG. If you don't keep brightness changes in mind as well, you're likely to come up with stiff sounding Programs. Nearly every significant change in loudness should somehow be accompanied by a change in brightness. Who says so? Mother Nature, that's who. Just try to

*"A better way of adding brightness is to gradually add another sound that is of a brighter quality or a higher pitch, or both."*

name three acoustic instruments that you can play at different loudness levels without also affecting their brightness. Give up? Most anything that you blow, bow, hit, or pluck harder ends up sounding both louder and brighter. Let's look at several methods that ensure that your sound's brightness behaves properly.

Velocity is the obvious choice. But there are three ways of using it for the purpose at hand. Select Program '92:-SynthBrass.' Play hard and soft and notice how the loudness and the brightness change together. Enter the Edit Mode - it's a Double Program producing the same synthesized sawtooth wave from both oscillators, with a touch of detuning for chorusing.

Press 2, Page Up twice, and notice the sensitivity of VDF1. Playing harder increases the EG Intensity by virtue of a sensitivity value of 46. This works as follows. The filter cutoff (the basic brightness before you play a key) is at 50, and the EG Intensity (the maximum amount by which the EG brightens up the sound at the beginning of every note) is at 38. So, every note starts medium bright, gets brighter, and returns towards the medium brightness as you hold the key down. The harder you hit, the higher the brightness climbs after the attack, up to a maximum level allowed by the

## more from

If you've stumbled across a product mentioned in MT that you've never heard of, check it out here and get the scoop straight from the horse's mouth.

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

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

**AudioFrame:** WaveFrame Corporation, 4725 Walnut Street, Boulder, CO 80301. Tel: (303) 447-1572.

**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.

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

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

**Digital Sampling Sound Cassettes:** MIDImouse Music, Box 272, Rhodo-dendron, OR 97049. Tel: (503) 622-4034.

**DPX1:** Oberheim-E.C.C., 2015 Davie Ave., Commerce, CA 90040. Tel: (213) 725-7870.

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

**Dyaxis:** Integrated Media Systems (IMS), 1552 Laurel St., San Carlos, CA 94070. Tel: (415) 592-8055.

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

**ESQ1/M:** Ensoniq Corp., 155 Great Valley Parkway, Malvern, PA 19355. Tel: (215) 647-3930.

**EV5:** Roland, see D10.

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

**FB01:** Yamaha, see C1.

**FC100:** Roland, see D10.

**GK1, GK2:** Roland, see D10.

**GR50, GR300:** Roland, see D10.

**IPS33:** DigiTech (DOD Electronics), 5639 South Riley Lane, Salt Lake City, UT 84107. Tel: (801) 268-8400.

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

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

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

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

**Macintosh Plus, SE, II:** Apple Computer, Inc.

20525 Mariani Ave., Cupertino, CA 95014. Tel: (408) 996-1010.

**Matrix 6/r:** Oberheim, see DPX1.

**MC500, MC300:** Roland, see D10.

**MIDI Mitigator RFC1:** Lake Butler Sound Co., Inc., 5331 West Lake Butler Rd., Windermere, FL 32786. Tel: (407) 656-5515.

**Minimoog:** formerly made by Moog Instruments.

**MP1:** ADA Signal Processors, Inc., 7303D Edgewater Dr., Oakland, CA 94621. Tel: (415) 632-1323.

**MPU101:** Roland, see D10.

**MT32:** Roland, see D10.

**Octapad/II:** Roland, see D10.

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

**Pop-Rock Drum Samples:** East-West Communications Inc., 8515 Hollywood Blvd., Los Angeles, CA 90069. Tel: (213) 650-8972. FAX: (213) 654-4539.

**Prophet 5:** formerly made by Sequential Circuits Inc.

**Rat:** ProCo Sound, Inc., 135 E. Kalamazoo Ave., Kalamazoo, MI 49007. Tel: (800) 253-7360.

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

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

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

**Slave 32:** Mulogix, 63 Lynmar Court, Halesite, NY 11743. Tel: (516) 673-7181.

**Sound Accelerator:** Digidesign, see Creator.

**Sound Library Volume 1: Percussion:** Ear Works, c/o Gand Music & Sound, 780 Front Rd., Northfield, IL 60093. Tel: (312) 446-4263.

**Sound Sampling Collection Volume 1:** Korg USA, Inc., 89 Frost Street, Westbury, NY 11590. Tel: (516) 333-9100.

**SoundSations Cassettes:** SoundSations, 370 Mt. Vernon, Grosse Pointe Farms, MI 48236. Tel: (313) 885-1539.

**Sound Tools:** Digidesign, see C-Lab Creator.

**SQ80 Patch Collection:** Mescal Music, P.O. Box 5372, Hercules, CA 94547. Tel: (415) 724-0804.

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

**Tiger:** Dr. T's Music Software, Inc., 220 Boviston St. #306, Chestnut Hill, MA 02161. Tel: (617) 244-6954.

**TX7, TX216, TX802, TX816, TX81Z, TX16W:** Yamaha, see C1.

**X7000:** Akai, see S612.

MUSIC TECHNOLOGY



► EG Intensity value of 38. And Osc2 plays the same waveform with virtually identical settings. So this is the obvious, traditional way of modulating the filter cutoff, via EG Intensity, using keyboard velocity.

But what does "brighter" really mean? Sure, we all know how to crank up the midrange and treble knobs on the EQ, and how to raise the filter cutoff. But what happens when we do that? On most synthesizers, the filter lets more of the high overtones that were part of the oscillator's waveform through at higher cutoff values. So we're not really adding brightness, we're just putting the higher (brighter)

aspects back into the sound that were there in the first place.

But sometimes your music wants to go beyond that. Think of the orchestra with all of its instrument colors. If you want a brighter sound, you can simply ask everybody to play louder. Most instruments will also sound brighter. But that's the sledgehammer approach. Wouldn't it be nicer to add the flutes an octave above the clarinets, put the first violins up by an octave, then add piccolo on top of everything, maybe even a high xylophone? The volume of the orchestra would hardly rise with the addition of these instruments, but the overall sound color would certainly

be brighter. So it follows that a better way of adding brightness is to gradually add another sound that is of a brighter quality or a higher pitch, or both.

## The Oohs Have It

Call up Program '03:Ooh/Aah,' press Edit Prog and Page Up twice. Osc1 plays Multisound '29:Voices' (the Ooh sound), and Osc2 plays Multisound '30:Choir' (the Aah sound). Alternate hard and soft keystrokes in the right-hand octaves where it sounds best. Now press 4 and Page Up to get the VDA1 Velocity Sensitivity screen where you see that Osc1 has a negative value of -60 for its amplitude sensitivity. Press 5 and Page Up where Osc2 has a positive +99 value for the same parameter. This means that Osc1 plays the loudest when you play the keys very lightly, and Osc2 doesn't play at all. When you play hard, you hear all of Osc2 and a tiny bit of Osc1 (because its value is -60, not -99 which would shut it off completely on hard keystrokes). It's up to you to make musical use of this clever feature - I'm sure that it will inspire many musical ideas.

To show you how easy it is, let me suggest two variations. Press zero and Page Up, select Multisound '28:Bottles' for Osc1, set it to L99 and 16'. Press Page Up, select Multisound '27:Pan Flute' at L99 and 8'. Change the velocity values at will. I like VDA1 VEL SENS A+00 and VDA2 VEL SENS A+50, but anything goes. Then try Osc1 playing Multisound 60:Hammer at L99 and 16' with a VDA1 VEL SENS value of A-25, and Osc2 playing Multisound '61:Metal Hit' at L99 and 8' with a VDA2 VEL SENS value of A+50.

There are other ways of dealing with velocity that work in the context of a Combi. If the Combi is of the Velocity Switch type, then you simply set up an "either/or" situation with a threshold velocity value between 1 and 127. Only one of two Programs will play. If the Combi is a Multi, then you can set up a Velocity window for each participating timbre. This brings us back to where I started four issues ago. I hope that you now have more confidence to do your own programming, be it major or minor, after reading these four articles. More than anything else, I hope that this new confidence will translate directly into more enjoyment of what this technology is all about - making music.

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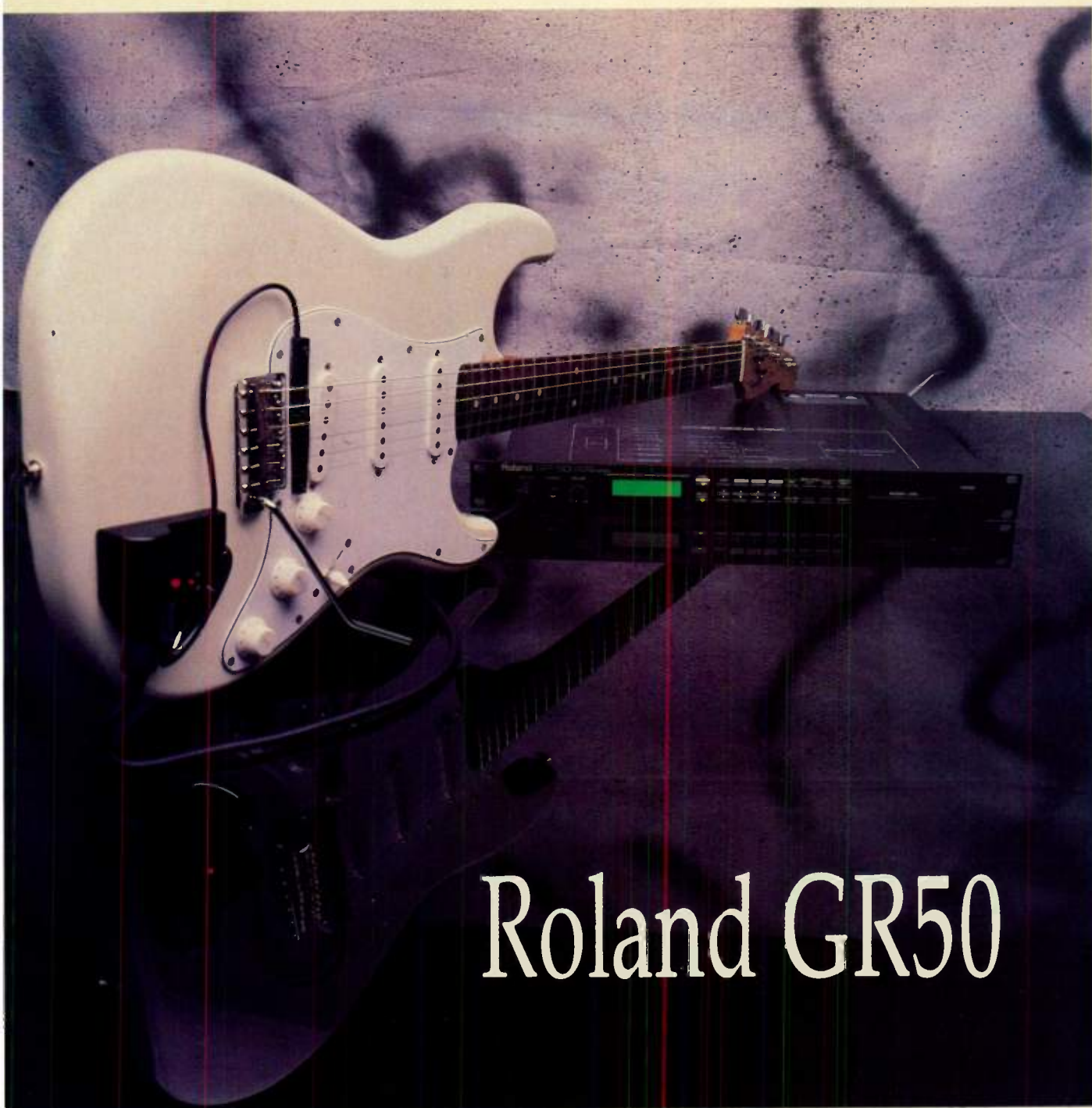
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# Roland GR50

Photography Melodie Gimple

**R**OLAND'S NEWEST GUITAR synth, the GR50, is a single rack space unit that combines an L/A synthesizer module (see sidebar for more on L/A synthesis) and a guitar-to-MIDI converter. I think that the GR50, accompanied by the GK2 Synthesizer Driver mounted on your favorite guitar, is a top contender for the Ultimate Guitar Synth title. Let's take it into the ring for a good workout and see what its got.

The internal sounds can be triggered directly from a GK2-equipped guitar, any MIDI controller, or a sequencer. If you already have a GK1 or any of the Roland G-series guitar controllers, an

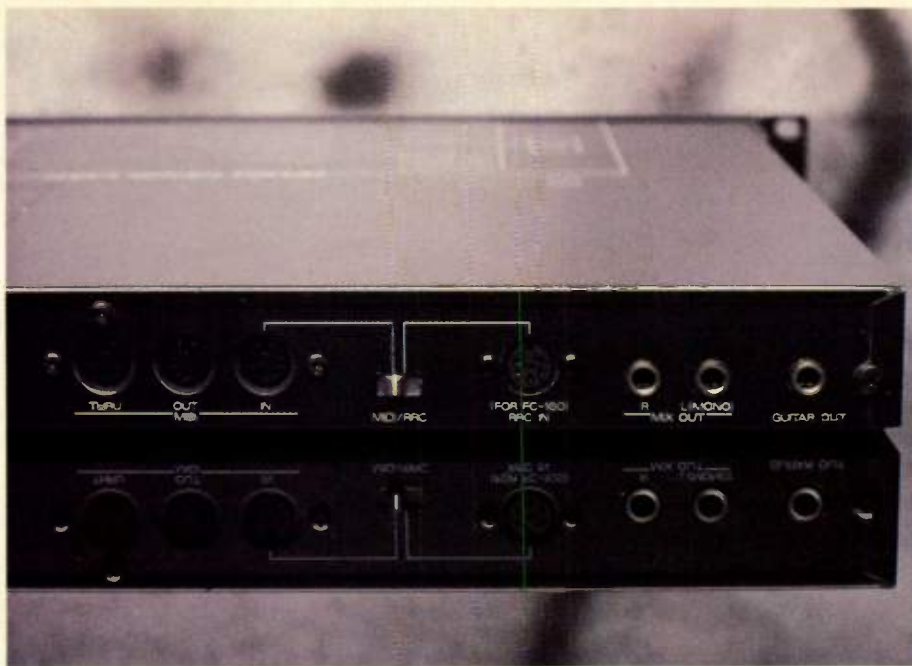
**Roland's newest guitar synthesizer offers multitimbral L/A synthesis in addition to sophisticated MIDI control of your entire studio. Review by Aaron Hallas.**

optional BC13 converter will put you in the driver's seat of the GR50. The 128 preset Tones (more about Tones later) cover a wide variety of instruments and are, with a few exceptions, very good. There are enough drum and percussion sounds to cover just about any trap set you can imagine, and there's room for an additional 64 user-programmable Tones. The GR50 can make use of the D10/20/110 ROM card Sound Library for

additional sounds and optional RAM cards for storing your own creations.

Two different sounds can be assigned to each string. These sounds can be played in Dual, Velocity Switch, Velocity Mix, or Velocity Crossfade modes, so up to twelve sounds can be triggered from the guitar. Sixty-four Patch memory locations and five Patch Chains are available. A Patch stores information about the internal sound assignment, control settings for exter- ▶





►nal MIDI instruments, settings for the GR50's built-in digital reverb, volume, fine tune, mode, bend on/off, and stereo panning for each string. Patches can be recalled via the GR50's front panel, an optional FC100 foot controller, or external MIDI program changes. If you are using the GR50 and the GK2 for live performances, 25 patches can be stored in each of the five Patch Chains and can be accessed in sequence using the up/down switches on the GK2.

The GR50 is multitimbral, allowing it to play several parts or instruments at a time. It wasn't until I started using the system with a sequencer that I discovered its immense power and flexibility. While using it in this way, I had the sequencer playing the rhythm instruments such as drums, bass and keys while I played a solo instrument with the guitar/GK2. I was able to get a

functions as a guitar controller and as an extra MIDI module. I still prefer using my DX7 for playing string pads and keyboard type sounds such as piano and organ, but I found the GR50/GK2 to be superior for doing solo lines and brass parts.

### Tracking

As a MIDI sound module, the GR50 is nothing short of spectacular. I didn't have a chance to try it in a live performance situation, but I would love to find a permanent place in my rack for it. When playing the internal sounds, the GR50/GK2 is one of the fastest and most accurate systems that I have used. When using it as a controller for external MIDI instruments, it proved to be slightly faster than the earlier G-series controllers. It is not, however, immune to the problems inherent in the pitch-to-MIDI

*"I think that the GR50, accompanied by the GK2 Synthesizer Driver mounted on your favorite guitar, is a top contender for the Ultimate Guitar Synth title."*

very full sound happening – and that was before I hooked-up any of my other MIDI instruments.

I was a little disappointed that the GR50 doesn't have eight outputs (like the D110), but the stereo outputs should be sufficient for most live performance work. I used the GR50/GK2 system in my MIDI studio to replace or at least supplement my master controller, a Yamaha DX7. For sequencing I used an Atari ST with C-Lab's Creator software. I rather like having the GR50 in the studio. It

territory, such as slightly slower response on the low strings, occasional mistracking, and the inability to handle string damping well. Apparently, the GR50 bypasses the MIDI scheme for triggering the internal sounds to avoid these problems. I was amazed at just how fast and accurate it is. I discovered this when I entered the tuning mode and found that I was unable to outplay the note display. In other words, it accurately showed every note that I played.

Although the GR50 can be triggered

from the GK1 or other G-series Guitar Controllers, it is recommended that the GK2 Synthesizer Driver be used. The GK2 allows you to control the GR50 and route the guitar's own audio output to a guitar amp by way of a jack on the back panel of the GR50. The GK2 can be permanently mounted to your guitar using screws or temporarily mounted with adhesive pads.

As mentioned earlier, a pair of buttons on the GK2 allow you to step through the Patches that are stored in the GR50's Patch Chains. If you don't need the Patch Chain function, these two buttons can be programmed independently to control sustain, modulation or octave up transposition. Adjustments to the string sensitivity and tuning are done on the GR50, so the only other controls on the GK2 are a volume control for the synth sounds and a switch for selecting the guitar, synthesizer or both. Additionally, an optional Roland FC100 pedal and an EV5 pedal can be connected to the GR50. This would give you control over program changes, modulation, volume, and pitch-bend in a more familiar pedalboard configuration.

### Programming

There are four levels of programming available on the GR50. The first is the Tone level where you can slice, dice, mix, blend, whip and combine up to four of the basic sounds. These basic sounds are called Partials and come in two flavors. They are either 16-bit PCM samples (which include acoustic instruments, drum and percussion sounds, and sound effects), or they are synthesizer waveforms. Creating a Tone involves such things as combining Partials, adjusting envelopes, amplifiers, filters and LFOs, selecting waveforms, and so on. There are 128 preset Tones on board and room for 64 of your own creations.

The next level involves setting the Bender range, Keyshift (transposition), Assign mode and Fine Tune to create what Roland calls a Timbre. You can store up to 128 Timbres for use at the Part level. To create a Part, you modify a Timbre by setting the Output Level, Panning and MIDI channel. This may seem like a lot to go through just to get this puppy to sing, but the fact is that you will probably be programming at the Patch level a lot more often than at the first three levels.

The Patch level is where it all comes together. A Patch is created by combining two Parts, then selecting the



#### BEGINNER'S NOTE:

### Roland's L/A Synthesis

Roland released the first L/A (Linear Arithmetic) synthesizer over two years ago with the flagship D50. Since then, L/A synthesis has gone through a number of incarnations ranging from the MT32 to the D550, D10, D20, D110 and most recently the D5 and GR50 Guitar Synthesizer. Along with every new major development there seems to come a new set of terms. If you're not already familiar with Roland's brand of techno-mumbo-jumbo, maybe this will help you out...

Roland's L/A Synthesis is a component system that uses two different types of voices, or "Partials" in Roland tech talk. Members of the first type are called PCM (Pulse Code Modulation) Partials. These are 16-bit PCM samples of acoustic instruments. Some of these are looped while others are just the attack portion of the sound. Some special effects are included in this category along with sixty-four different drum and percussion Partials (samples). Members of the second type are called Synthesizer Partials. These are digital waveforms that include parameters for pitch, amplifier and filter envelopes, as well as LFO and waveform type. Partials are the building blocks used in creating "Tones."

A Tone is comprised of up to four Partials (two in a D50) and includes all of the parameters for fine-tuning the Partials. The number of Partials being used in a Tone has a lot to do with the number of notes that can be played simultaneously (polyphony). In other words, if four Partials are being used per Tone, then the maximum number of simultaneous notes would be eight. Partials always come in pairs called "Structures." These are similar to the algorithms found in Yamaha's FM synthesizers. Structures combine the partials in various ways. Two Structures

can be combined per Tone. A "Partial mute" function allows you to turn off Partials that are not needed so unwanted ones are not using up some of the available notes (cutting away at your available polyphony).

"Timbres" are found in the next level of the system. A Timbre is simply a Tone combined with several additional parameters that affect all four of the Partials (the whole Tone). These parameters include Key-Shift, Fine Tune, Output Assign, Bender Range, Assign mode and Reverb status (on/off). A "Part" is a Timbre that is further modified by several additional parameters such as Output Level, Panning, Key Range and MIDI Channel.

Once you get a handle on these levels, you are ready to create a "Patch." This is where the parameters for the built-in reverb are set (reverb type, level and time). The reverb only affects Timbres that have their reverb switch turned on. This is where the GR50 differs from its brethren D-series instruments. Whereas the D-series instruments can have eight different Parts and a Rhythm Setup per Patch, the GR50 can have only two Parts and a Rhythm Setup per Patch. Since the GR50 is designed for use with guitar controllers, it doesn't have the Key Range parameter, but it does allow you to assign two Timbres to each string. A lot of button-pushing is required to get to the Tone level and, as you can imagine, having this many levels can be rather confusing and somewhat frustrating to deal with at times. However, the flexibility offered by this type of system can open up new areas of creativity to anyone who is willing to take the time to master it. Remember that experimentation can lead you to a better understanding of any synthesizer. ■ Aaron Hallas

reverb type, setting the reverb level and time, and giving the Patch a name. If you are content with using the factory preset Tones, then you may never have to do more than program Parts and Patches. However, if you like to experiment with creating your own sounds, then you will find all the power and flexibility you can handle at the other levels.

#### Conclusion

After working with the GR50/GK2, I must say that, from a performance standpoint, this is definitely a winning

combination. Not only does it sound great by itself, it works well enough with other MIDI gear to be used as a master controller. If you're a guitarist in search of a capable guitar synthesizer, check out the GR50/GK2 package. You shouldn't be disappointed. ■

**PRICES:** GR50, \$1549.50; GK2, \$199.95; BC13, \$120.00; FC100, \$325.00; FC100 MK II, \$350.00; PG10, \$399.50.

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Synclavier, Prophet VS. *Tech features:*  
Marrying MIDI and SMPTE, Guitar  
Synthesis, Dx Explained pt. 1 (of 5).

## FEBRUARY 1987

*Interviews:* Frank Zappa, Seigen Ono.  
*Reviews:* Oberheim DPX1, Beetle PR7 and  
JR1, Dr. T's KCS, Yamaha DMP7, Jam  
Factory, Korg DRV1000. *Tech features:*  
Digital Reverbs, Percussion Technology.

## MARCH 1987

*Interviews:* Adrian Belew, Michael  
Stearns. *Reviews:* Digidesign Softsynth  
2.0, Intelligent Music "M", Sequential  
Studio 440. *Tech features:* Bandwidth  
Jargon, 1987 Winter NAMM report, MIDI  
Modes, Using Sample Dump pt. 1 (of 2).

## MAY 1987

*Interviews:* Allan Holdsworth, Kim Ryrie.  
*Reviews:* Kawai K5, Yamaha RX5, Roland  
MK570, Kahler Human Clock, Alesis MIDI-  
verb II. *Tech features:* Stereo Sampling.

## JUNE 1987

*Interviews:* Bill Bruford, Jerry Goodman,  
Richard Horowitz. *Reviews:* Roland D50 pt.  
1, Casio FZ1, Korg DDD5. *Tech features:*  
MIDI Delays, Mac MIDI Workstations.

## JULY 1987

*Interviews:* Ryuichi Sakamoto, Cutting  
Crew. *Reviews:* D50 pt. 2, Yamaha TX81Z  
and MDF1, Passport Master Tracks Pro.  
*Tech features:* Recreating Acoustic  
Instruments, MIDI Time Code, more.

## AUGUST 1987

*Interviews:* Laurie Anderson, Danny  
Elfman. *Reviews:* Kawai K5, Integrated  
Media Systems Dyaxis. *Tech features:*  
Wavetable Synthesis, 1987 Summer  
NAMM report, MIDI 101, more.

## SEPTEMBER 1987

*Interviews:* Steve Roach, Level 42, Wally  
Badarou. *Reviews:* Alesis HR16 and  
MMT8, Yamaha TX802, Sequential Prophet  
3000, Kawai R50, Grey Matter Response E1  
2.0. *Tech features:* Microtuning, MIDI 102,  
Art of Looping pt. 1 (of 3), more.

## OCTOBER 1987

*Interviews:* Todd Rundgren, Vienna.  
*Reviews:* Akai EW1/EV1, Roland MT32,  
Hybrid Arts ADAP, Yamaha QX3 and REX50,  
Garfield Time Commander, Kawai M8000.  
*Tech features:* S900 Update, MIDI 103.

## NOVEMBER 1987 \*

*Interviews:* Kitano, Daniel Lanois. *Reviews:*

# BACK ISSUES

Roland S220 and VP70, Keytek CTS2000,  
Suzuki Unisynth XG1 and XGIM, Twelve  
Tone Systems Cakewalk, Yamaha TX802.  
*Tech features:* MIDI 104, Amiga Update,  
Fairlight Series III Explained pt. 1 (of 2).

## DECEMBER 1987 \*

*Interviews:* Jean-Luc Ponty, Michael  
Hoenig, Jon Hassell. *Reviews:* Roland  
TR626, Music Mouse, Stepp DGX, Akai  
EW1, EV1 and EVW2000. *Tech features:*  
MIDI Note Numbers, Wind Synthesis, 1987  
Winter AES report, MIDI 105 (final pt.).

## JANUARY 1988

*Interviews:* Yes, Lucia Hwong. *Reviews:*  
Roland GP8, Korg DRM1, Mark of the  
Unicorn Performer 2.2, Digidesign  
Q-Sheet. *Tech features:* MIDI Switchers,  
Scoring to Video, Subtractive Synthesis.

## FEBRUARY 1988

*Interviews:* Rush, Brian Eno, Peter Erskine.  
*Reviews:* Ensoniq SQ80, 360 Systems Pro  
MIDI Bass, Yamaha RX7, Artistryn MIDISax,  
Simmons Silicon Mallet. *Tech features:*  
Artificial Intelligence and Music, Envelope  
Generators, Sampler Quality, more.

## MARCH 1988

*Interviews:* Steve Reich, Marcus Miller.  
*Reviews:* Kawai K1, Technos Acxel  
Resynthesizer, Yamaha WX7, Ensoniq EPS,  
Alesis MMT8. *Tech features:* 1987 Winter  
NAMM report, IBM Sequencers, MIDI  
Processors pt. 1 (of 2), MIDI Automation.

## APRIL 1988

*Interviews:* Thomas Dolby, The Christians.  
*Reviews:* Alesis HR16, Lyre FDSoft, Sting  
EW2, C-Lab Creator. *Tech features:* Re-  
Sampling, Additive Synthesis pt. 1 (of 2).

## MAY 1988

*Interviews:* Lee Ritenour, John  
Abercrombie. *Reviews:* Axxess Mapper  
2.0, Yamaha TX16W, E1 for the DX7II,  
Simmons SDX, Korg 707. *Tech features:*  
Multitasking, Frankfurt show report, more.

## JUNE 1988

*Interviews:* Jan Hammer, Jane Siberry.  
*Reviews:* DigiTech DSP128, Yamaha DX7II,  
E-mu Emax SE and Roland S550, Kawai K1,

Blank Software Alchemy. *Tech features:*  
Hard Disk Recording, Secrets of Timbre,  
Sampling Bowed Guitars, Digital Pianos.

## JULY 1988

*Interviews:* Earth, Wind and Fire, Richard  
Burmer. *Reviews:* Korg M1, Beetle  
Quantar, Forte Mentor, Akai/Linn MPC60.  
*Tech features:* Music Notation, Wind  
Synthesis, Vocal Sampling pt. 1 (of 2).

## AUGUST 1988

*Interviews:* Scritti Politti, Contemporary  
Christian artists. *Reviews:* E-mu Emulator  
III v.1.14, Roland D110, Casio PG380.  
*Tech features:* Copy Protection, Intro to  
Digital Audio pt. 1 (of 2), ARP 2600.

## SEPTEMBER 1988

*Interviews:* Joe Zawinul, Hip Hop  
producers. *Reviews:* Oberheim Matrix  
1000, Casio VZ1, Digidesign Turbosynth,  
Sonus SuperScore. *Tech features:*  
AudioFrame Explained pt. 1 (of 4), Bass  
Sampling, 1988 Summer NAMM Report.

## OCTOBER 1988

*Interviews:* Andy Summers, Frank Harris,  
Hi-Tech Heavy Metal. *Reviews:* Simmons  
Portakit, Roland D20, Passac Sentient Six,  
SMPTE-to-MIDI converters. *Tech features:*  
Algorithmic Composition, Interactive  
Music, Programming Tricks.

## NOVEMBER 1988

*Interviews:* Tom Scott, film composers.  
*Reviews:* Roland E660, Kawai Q80, Yamaha  
DEQ7, Softwind Synthaphone, JL Cooper  
Mix Mate. *Tech features:* MIDI Files, Post  
Production, Dynamic Panning. *Outside:*  
Wiring Your MIDI Studio, The Other Side.

## DECEMBER 1988

*Interviews:* Mark Isham Band, Information  
Society. *Reviews:* Yamaha G10, Roland  
Pad80 Octapad II, Lexicon LXP1 & MRC,  
Coda Finale, Yamaha C1. *Tech features:*  
MIDI Live. *Outside:* Scoring on a Budget.

## JANUARY 1989

*Interviews:* Al Di Meola, Brett Tuggle.  
*Reviews:* Akai S1000, Twelve Tone  
Systems Cakewalk Professional. *Tech*  
*features:* FM Programming Compleat pt. 1,

Rehumanize Your Sequences pt. 1, 1988  
Winter AES report. *Outside:* Passport  
NoteWriter review, The Other Side.

## FEBRUARY 1989

*Interviews:* Art of Noise, Techno-World  
music. *Reviews:* C-Lab Notator, Oberheim  
Systemizer, Roland U110, Eventide Ultra-  
Harmonizer. *Tech features:* HyperCard  
MIDI Programming pt. 1, Rehumanize pt.2.  
*Outside:* John Lifton, MIDI Book of the Dead.

## MARCH/APRIL 1989

*Interviews:* House/Cutup/Acid/Techno  
music special. *Reviews:* Akai S950,  
Intelligent Music OvalTune. *Tech features:*  
1989 Winter NAMM report. *Outside:*  
Roland TR808, Syntonyx Overtone.

## MAY 1989

*Interviews:* Dave Grusin, Yello, Sanctuary  
Studios. *Reviews:* Roland R8, Intelligent  
Music RealTime 1.1, 360 Systems Audio  
Matrix 16, Voyetra Sequencer Plus/C1.  
*Tech features:* 1989 Winter NAMM Report  
pt. 2, Fun in the Waves pt. 1 (of 2),  
Rehumanize pt. 4, Sequencing with MIDI  
Guitars, Programming pt. 4. *Outside:* Alesis  
QuadraVerb, The Other Side.

## JUNE 1989

*Interviews:* New Order, Jerry Goldsmith.  
*Reviews:* Oberheim Cyclone, Synclavier  
Explained pt. 1 (of 3), Yamaha V50, Sansui  
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RX8, Aphex Feel Factory, Yamaha WX11  
& WT11, Opcode Vision, Synclavier pt 2  
*Tech features:* Programming pt. 6, Real-  
Time MIDI, System Exclusive pt. 1 (of 2).

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# ADVERTISERS' INDEX

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Acoustic Sciences Corp. ....	44
Akai .....	46
Alesis .....	11, OBC
Alexander Publications .....	53
Anatek .....	3
Aphex .....	27
Applied Research & Technology .....	IFC
Aura Lighting .....	1
Creative Recording Book.....	28
Ensoniq .....	35
Four Designs Company .....	41
Frontal Lobe .....	25
Guitar Shack .....	32
JL Cooper.....	42
Kawai.....	21
Keyfax 3.....	66
Lone Wolf .....	59
Magnetic Music.....	8
Martin Audio .....	45
MusiCity.....	15
Music Loft .....	69
Music Solutions.....	70
Perfect Pitch .....	23
Rhythm City .....	63
Rolls Music Center .....	IBC
Sam Ash Music .....	32
Samson.....	39
Sound Quest.....	19
West L.A. Music .....	57
Yamaha DMI.....	29

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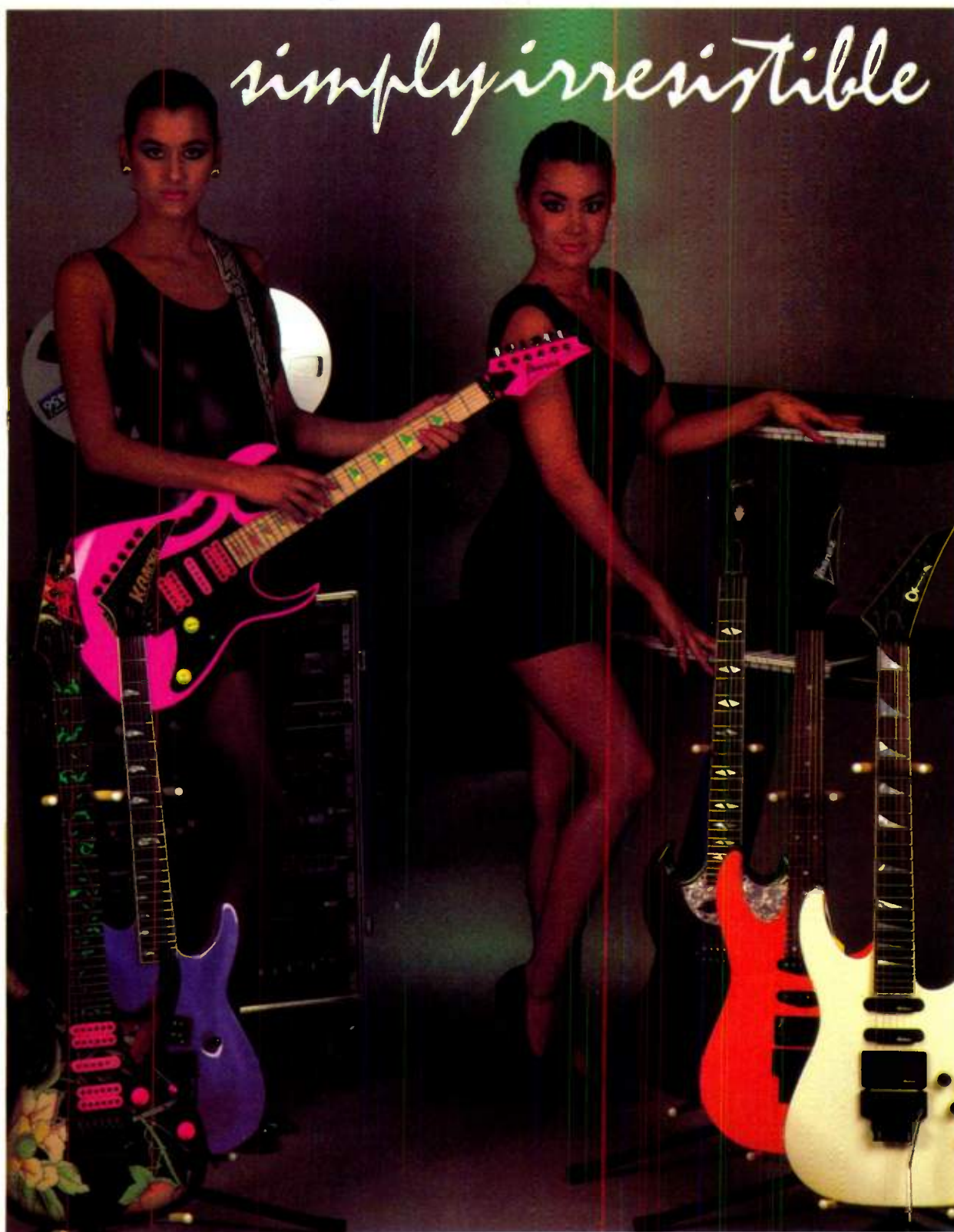
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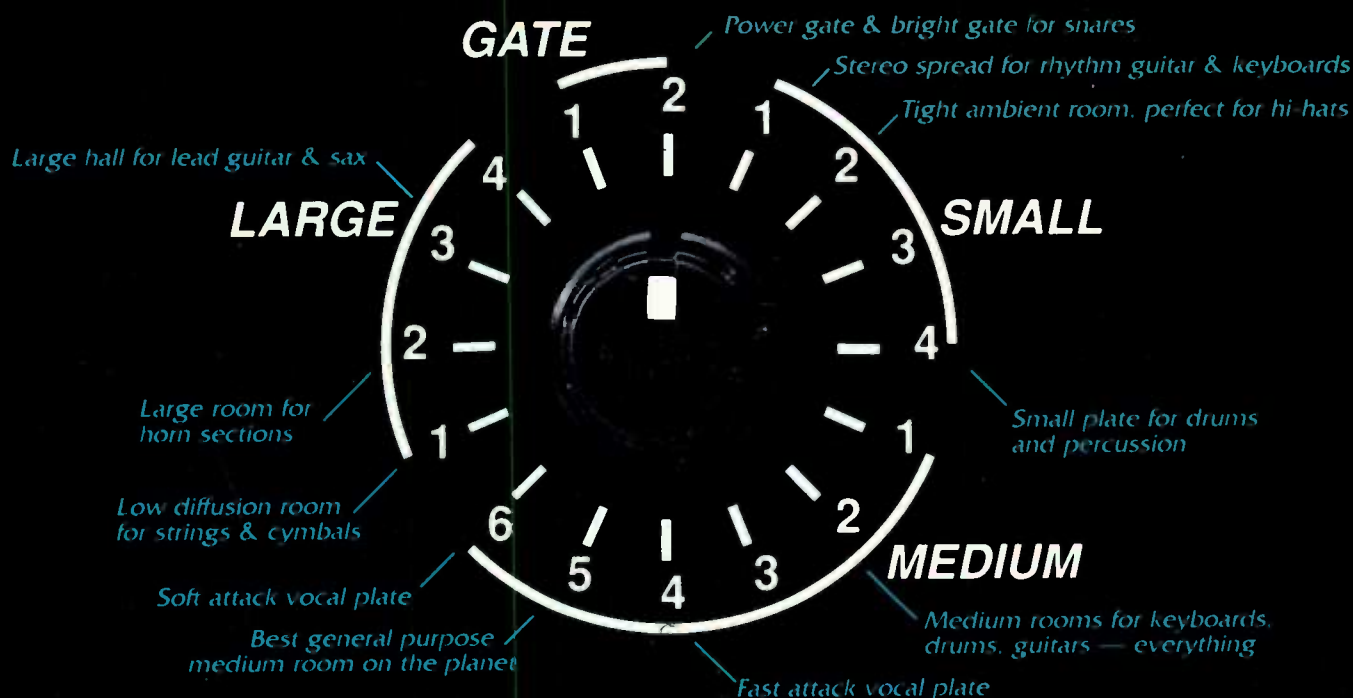
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