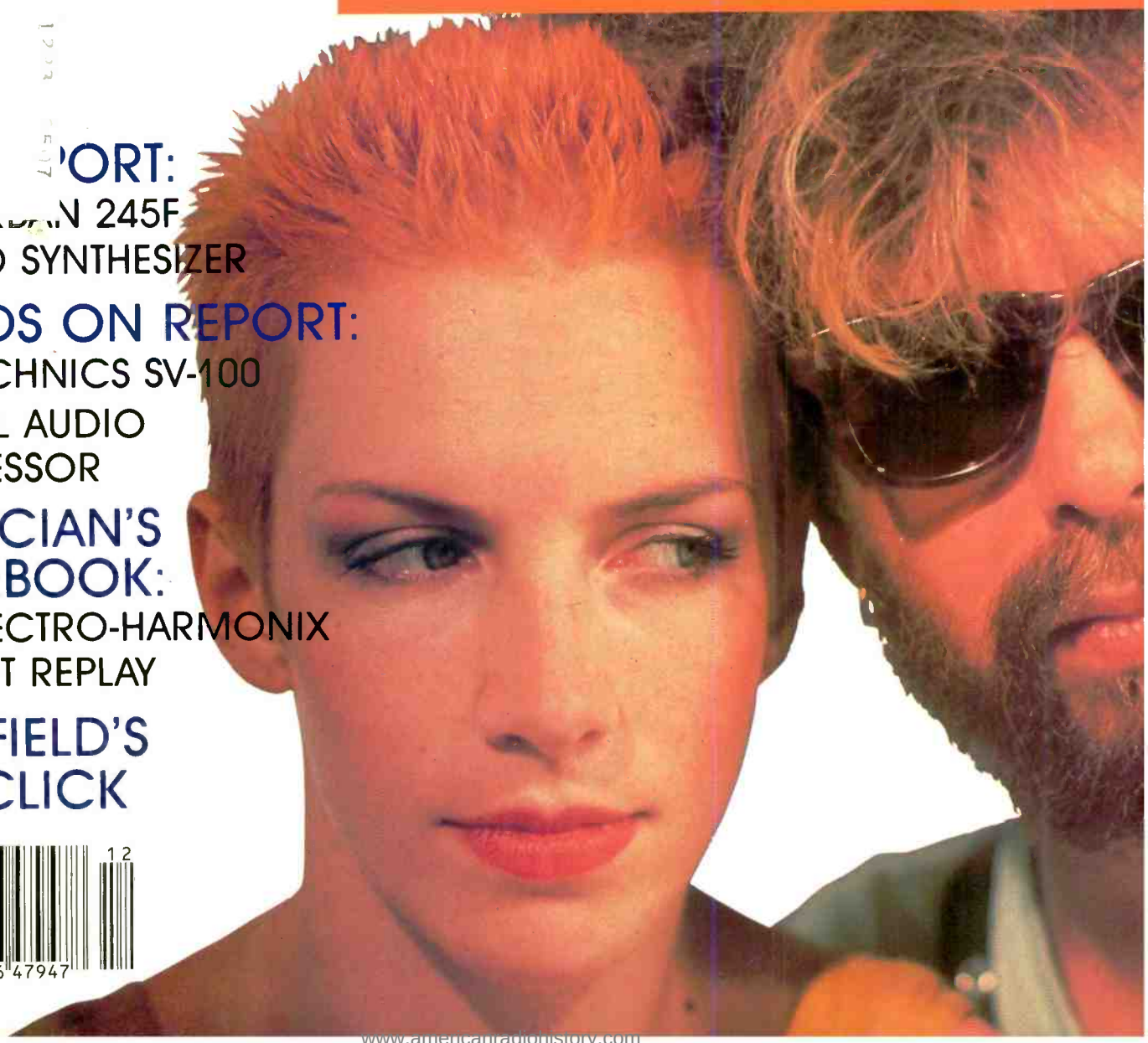
the PRODUCERS

MODERN RECORDING & MUSIC

DECEMBER 1983 VOL. 9 NO. 11 $1.95

47947

EURYTHMICS' DAVE STEWART



L[illegible]'ORT:
TH[illegible]N 245F
STEREO SYNTHESIZER

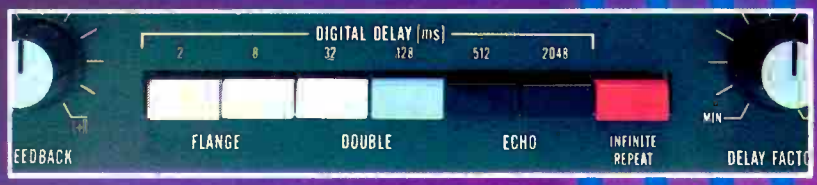
HANDS ON REPORT:
THE TECHNICS SV-100
DIGITAL AUDIO
PROCESSOR

MUSICIAN'S NOTEBOOK:
THE ELECTRO-HARMONIX
INSTANT REPLAY

GARFIELD'S DR. CLICK

0 71896 47947 12

DELTALAB'S NEW *SUPER* TIME LINE



SIMPLE

The Super TIME LINE® offers basic simplicity without compromising performance. Each control on the front panel is easily understandable and readily accessible.

PROGRAMABLE

Now you can store your favorite settings via the "simple-to-use" program bank. Each program is easily addressable by either the front panel or the optional accessory remote control.

BEST OF ALL...AFFORDABLE.

The ADM 2048 is a full bandwidth (16kHz), wide dynamic range (90dB), fully programmable special effects processor that features flanging, doubling, chorusing and echo effects with up to 2048 milliseconds (2 seconds) of high performance digital delay . . . all for only $999.00.* The Super TIME LINE,® born in the tradition of DELTALAB's reputation for value, quality and performance, establishes a new standard of affordable excellence.

Visit your dealer and check it out . . . You will be simply amazed!!

Also available is the ADM-512 providing 512 milliseconds (½ second) of full bandwidth digital delay for only $799.00.*

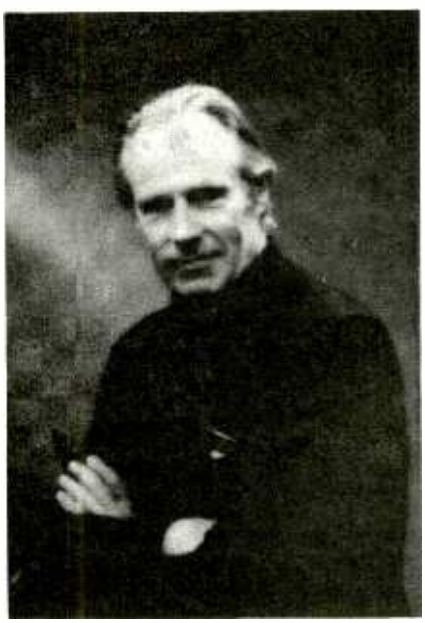
DeltaLab

*Manufacturer's Suggested Retail

DECEMBER 1983
VOL. 9 NO. 11

MODERN RECORDING & MUSIC

FEATURES



Eurythmics' Photos: Courtesy of RCA Records
George Martin Photos: Courtesy of AIR Studios
Technics SV-100 Figures: Courtesy of Technics Sales Literature

DEPARTMENTS

SOUND IDEAS

Modern Recording & Music (ISSN 0273-8511) is published monthly by MR&M Publishing Corp., 1120 Old Country Rd., Plainview, NY 11803. Design and contents are copyright 1983 by MR&M Publishing Corp. and must not be reproduced in any manner except by permission of the publisher. Second class postage paid at Plainview, New York, and at additional mailing offices. Subscription rates: $15.00 for 12 issues, $26.00 for 24 issues. Add $3.00 per year for subscriptions outside of U.S. Subscriptions must be paid in advance in U.S. funds. Postmaster: Send Form 3579 to: MR&M Publishing Corp., 1120 Old Country Rd., Plainview, NY 11803.

MODERN RECORDING & MUSIC

Editorial and Executive Offices
MR&M Publishing Corp.
1120 Old Country Road
Plainview, NY 11803
516-433-6530

Editorial contributions should be addressed to The Editor, Modern Recording & Music, 1120 Old Country Road, Plainview, N.Y. 11803. Unsolicited manuscripts will be treated with care and must be accompanied by return postage.

Letters

The People Speak Out

I heartily support the expansion to include sound reinforcement as a regular part of *MR&M*. It's an extremely complex field and very few people know much about it. Any help would be welcomed.

—Richard G. Smith
Assoc. Professor of Theater
and Sound Supervisor
S.U.N.Y. Binghamton

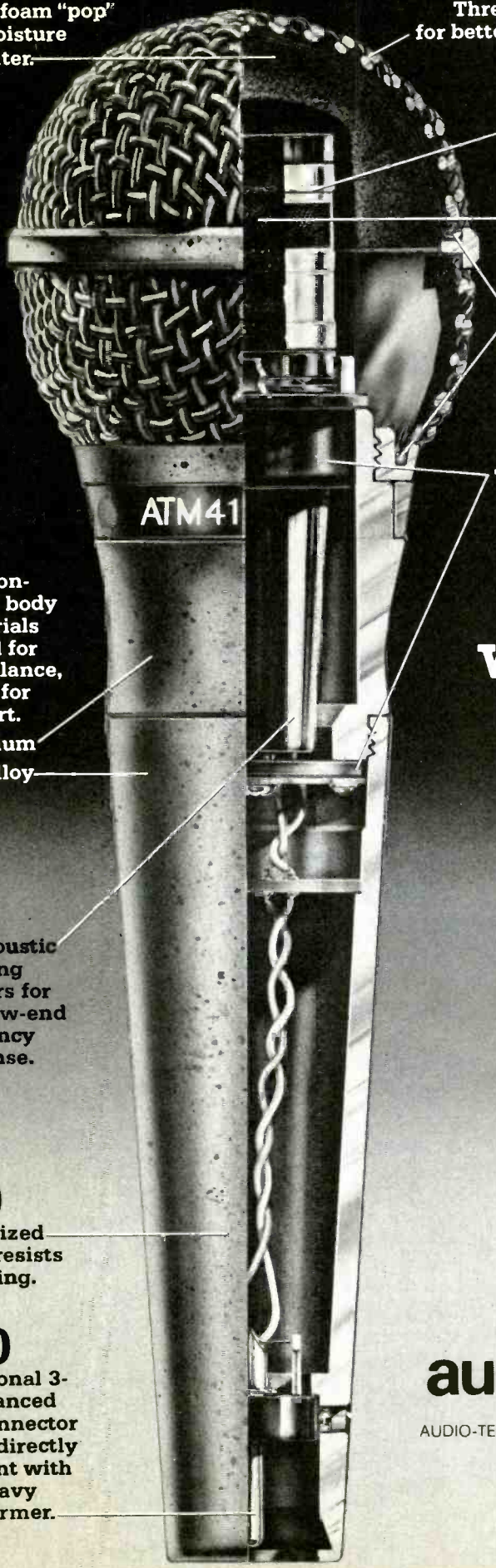
...I too want to read more about sound reinforcement in *MR&M*, particularly medium and large concert systems and multi-channel monitor systems. Any articles and information would be greatly appreciated.

—Paul Sundt
Albuquerque, NM

...I would like to vote against sidetracking your great magazine into sound reinforcement. I do appreciate the need for reading material in this growing field, but why not develop a magazine devoted to it? Your magazine is unique in its high caliber intense concentration on modern recording, and spreading out into sound reinforcement would inevitably result in one of two things: a decrease in recording articles, or an increase in magazine size with a big jump in subscription rates. The magazine is not large enough to cover both fields adequately.

—John Donato
Conellsiville, PA

In your Sept. '83 issue you requested feedback from readers on sound reinforcement. I would like to say "full speed ahead." I think your magazine is great and your articles are interesting.



1
Acoustic foam "pop" and moisture filter.

2
Three-layer mesh grille resists denting for better element protection and appearance.

3
High-output moving-coil dynamic cardioid capsule.

4
Felt dust cover protects entire element.

5
All grille screens soldered (not glued) to brass retaining rings for maximum strength.

6
Two integral shock mounts to reduce cable and handling noise.

7
Precision-machined body of materials selected for perfect balance, shaped for comfort.
Aluminum
Zinc Alloy

8
Rear acoustic phasing chambers for shaped low-end frequency response.

9
Armorized finish* resists chipping.

10
Professional 3-pin balanced output connector connects directly to element with no heavy transformer.

10 reasons why you can't buy a better vocal microphone!

*We have six more *very* colorful reasons to choose an ATM41: Red, White, Blue, Green, Black, and Gold! Each custom-color ATM41 comes with matching-color 25-foot cable, complete with connectors. Look as great as you sound!

There's one other reason why you'll put the ATM41 first in vocal microphones. Listen. Our sound blows them all away! Try it today at your Audio-Technica sound specialist.

audio-technica®

AUDIO-TECHNICA U.S., INC., 1221 Commerce Dr., Stow, OH 44224 216/686-2600

Going wireless? Write to Nady Systems, 1145 65th St., Oakland, CA 94608 for details on the ATM41/Nady combination.

Based on ideas I have regarding recording from your magazine, I am sure you can help with... the application of sound reinforcement.

—Don Pearson
Mississauga, Ontario

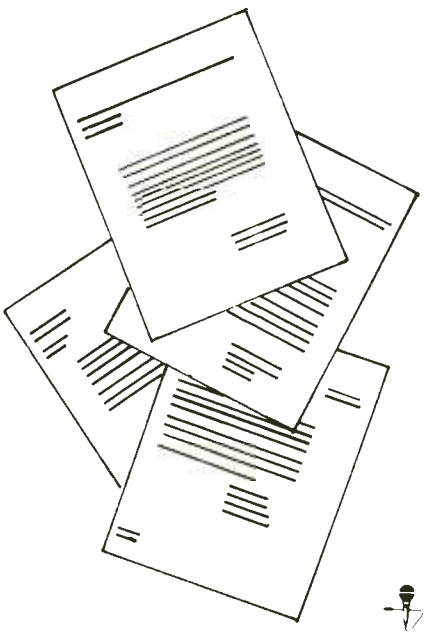
These are just a sampling of the many letters we received in response to Mark Togan's letter in the Sept. issue suggesting we extend the editorial content to include articles on sound reinforcement. In view of all these responses, we have decided to go ahead with a series of articles on sound reinforcement in clubs. By limiting it to club sound systems, we hope to cover the subject thoroughly—while not taking away from any other area. And don't worry, John, we have no plans to become *Modern Reinforcement & Music.*

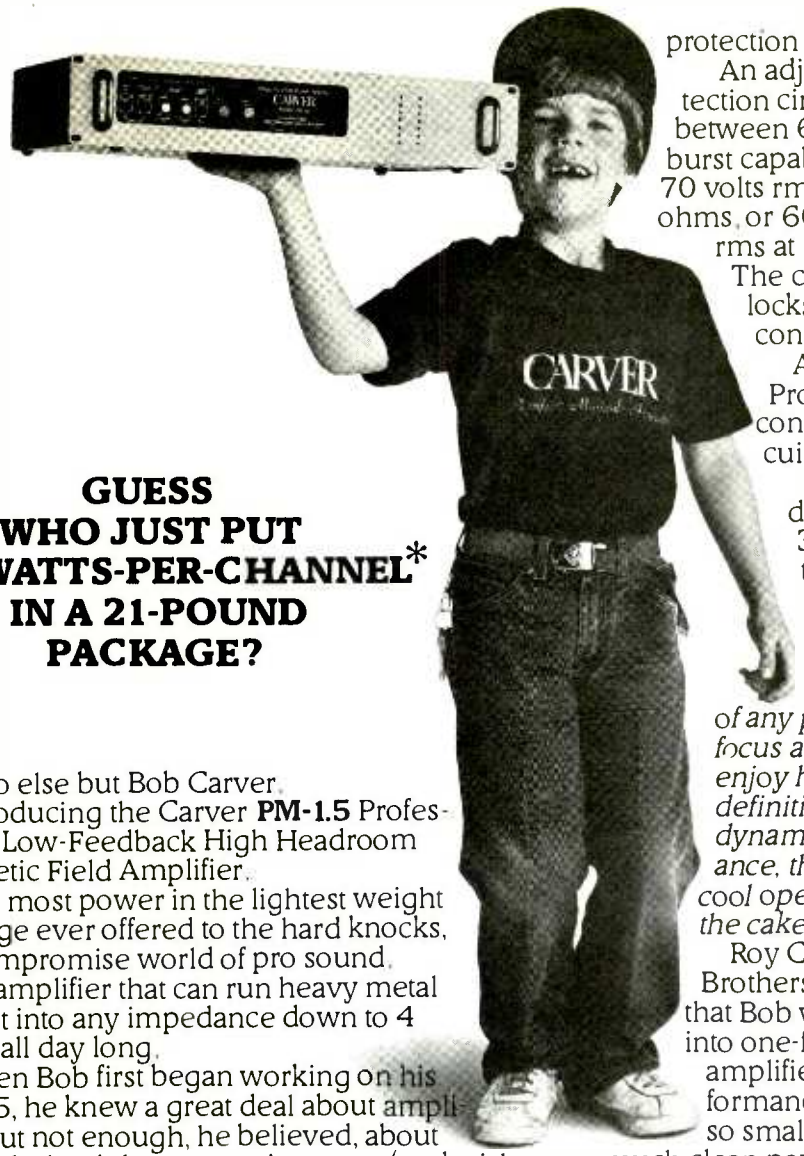
On the Beach

I am writing this letter in reference to an article in the May '83 issue of *MR&M.* The article is "Making a Plate Reverb Unit" by Robert Buontempo. I am very interested in the subject, and would like to try the project. The article mentioned that *MR&M* would review the project in the following issue. To my knowledge, no review was printed. Do you have any plans to do a follow-up?

—Danny Grogan
Dallas, TX

Yes, we do have great hopes of printing a test report on the Plate Reverb Unit. We sent the kit to the School of Music at the University of Miami, and as soon as we can get them off the beach and into the lab... we'll have an article for you.





GUESS WHO JUST PUT 450 WATTS-PER-CHANNEL* IN A 21-POUND PACKAGE?

Who else but Bob Carver.

Introducing the Carver **PM-1.5** Professional Low-Feedback High Headroom Magnetic Field Amplifier.

The most power in the lightest weight package ever offered to the hard knocks, no-compromise world of pro sound.

An amplifier that can run heavy metal flat-out into any impedance down to 4 ohms all day long.

When Bob first began working on his PM-1.5, he knew a great deal about amplifiers but not enough, he believed, about the night-in night-out requirements (and wish dreams) of the pro sound world. And so he spent much time consulting with a large number of sound reinforcement professionals, including the "pros' pro," Clair Brothers.

Clair Brothers asked for lower input ac line current, greater transformer thermal capacity, dual modes of precision balanced inputs with 1% resistors, back-to-front cooling with a fully proportional fan system that can just tick over at idle or blast 1000 ft/min. to keep output transistor temperatures constant. They wanted greater noise immunity and unbelievable long-term, high-power operation, as well as a 3/16" front panel with deep-recessed controls.

Others wanted rear rack-mounts, adjustable protection circuit thresholds, front panel selectable clipping eliminator, and even a sequential, soft-start power-up mode.

Now that the PM-1.5 has undergone thousands of lab test hours and seven months of hard road testing, Clair Brothers, Bob, and you get all that and more.

The PM-1.5 is designed to run balls-to-the-wall, even into 4 ohms day and night without compromising itself or your drivers. Because the PM-1.5 has three special adjustable speaker protection circuits.

An adjustable Short-Term Speaker Protection circuit adjusts dynamic headroom between 60 and 77 volts with a short term burst capability of 70 volts rms at 8 ohms, or 60 volts rms at 4 ohms. The circuit locks-in to the control setting after 0.5 seconds.

Front-panel-adjustable protection circuits.

An adjustable Long-Term Speaker Protection circuit matches the time constant of the output shutdown circuit to your PA or monitor system.

Finally, the Clipping Eliminator detects clipping lasting longer than 30 milliseconds and attenuates the input signal just enough to pull the PM-1.5 out of clipping.

As for sound quality, consider this quote from **The Audio Critic Magazine,** *"...the equal of any power amplifier in transparency, focus and smoothness. We especially enjoy hearing spatial detail, instrumental definition and completely natural dynamics. At this level of sonic performance, the astoundingly small size and cool operation become icing on the cake..."*

Roy Clair and Ron Borthwick of Clair Brothers said it this way, "We are amazed that Bob was able to put the same wattage into one-fourth the volume of conventional amplifiers without sacrificing audio performance. It's hard to believe that an amp so small and lightweight can put out so much clean power. But it does!"

Whether you run a megawatt sound company, a struggling bar band, or a recording studio gearing up for digital, the PM-1.5 will pay you. In increased portability and reduced freight costs. In freedom from expensive blown drivers. In sheer sonic excellence.

Write for a detailed brochure today or give your local pro store no peace until they order you 21 pounds of pure power.

*__Power:__ 8 ohms, 450 watts/chan. 20 Hz-20 kHz both channels driven with less than 0.1% THD. 4 ohms, 600 watts/chan. rms 20 Hz-20 kHz both channels driven with less than 0.1% THD. 16 ohms, 300 watts/chan. 20 Hz-20 kHz both channels driven with less than 0.1%THD. 2 ohms, 525 watts/ chan. at clipping, 1kHz, with less than 0.2% THD. Note: 2-ohm specification for information purposes only. Operation at 2 ohms is permissible but not recommended. **IM Distortion:** Less than 0.1% SMPTE **Frequency Response:** –3 dB at 3 Hz, –3 dB at 80 kHz. **Damping:** 200 at 1 kHz. **Gain:** 26 dB. **Noise:** Better than 115 dB below 450W A-weighted. **Input:** Balanced to ground, XLR or phone. **Impedance:** 15k-ohm each leg, balanced to ground. **Bridging:** 1200W into 8 ohms, 1000W into 16 ohms, accessed through rear-panel recessed switch. **Dimensions:** 19 in wide, 3½ in high, 10¹³/₁₆ in deep. Weight: 21 lbs.

CARVER

(206) 483-1202 P.O. Box 664 Woodinville, WA 98072

Circle 13 on Reader Service Card

Talk Back

Wrong...But Right, Too

Could you briefly explain how automated mixdown works? I know that we store all the information on one "memory track," then we play this and record it—making slight changes by using the UPDATE mode on a new memory track. Afterwards, we keep on switching these tracks roles (one plays, one records) back and forth until the desired mix is achieved. However, I can't figure out how the signal put altogether can possibly be stereo if it is only on one track. Where am I wrong?

—Fuerza Fria
North Hollywood, CA

We received the following reply from Michael Tapes, president of Sound Workshop Professional Audio Products, Inc.

You are only wrong in that you already know the explanation but are ignoring it. The key is that, as you said in your letter, we store "the information" on the tape. The information that is stored is not the actual audio mix. It is a digital "bit stream" or series of "words" that represent the levels of the individual console channels, as well as the status of the mutes on each channel.

In Sound Workshop's ARMS Automation System, the channel faders do not control audio signals. They control voltages that are sent to the ARMS console computer. These analog voltages are converted into digital form (numbers ranging from 0-255). Then the values for each of the console channels are sent out in a bit stream that has been conditioned to be able to be recorded onto an audio tape recorder. The "information" on this tape track therefore represents the actual mix, only in the fact that it knows the level of each channel at every instant in time. And, of course, that is in fact what creates the mix.

The update process is essentially as you described it. When the desired mix is achieved, the final data track is fed into the ARMS computer, the multi-track master is played, and the actual audio mix is recorded onto the two-track master tape...in living breathing stereo.

No Mismatch Here

I have a Peavey 600S Stereo PA board I am using for recording. What I would like to know is, should I be running the line outputs from my Teac A2340 into the Hi-Z mic inputs (using the attenuator), or is there a simple circuit I could build to adapt the mic inputs (hi or low) to line level inputs that would yield a better match?

—R. E. Lester
Harrisburg, PA

The input impedance of the Peavey 6000S Stereo PA board is 220K ohms and your tape deck output impedance is most likely a much lower impedance. This is an OK situation, so I do not believe there is a serious mismatch of impedance.

The main concern is the line level output capability of the tape deck. Many manufacturers of tape-related products build a tremendous output signals and many times the signal is too *hot* for the mixer. You should check the Teac specs and if your line level is listed as two volts or more, you should add an in-line *pad* to reduce this signal to a comfortable level for the 600S mixer. A signal around one volt would be ideal for the line input of the 600S.

—Hollis Calvert
Director of
Sales Promotion/Education
Peavey Electronics Corp.

EV Pro-Line Microphones

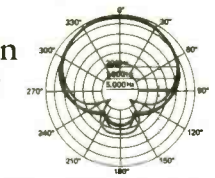
Electro-Voice lets you select your mike like you select your music. You choose the music that projects your image and style. And with the EV Pro-Line, you'll find the perfect mike to match every musical application.

EV offers a complete range of dependable mikes that are among the most sought after in the world. They're manufactured to exacting standards that have earned EV recognition worldwide as a leader in professional recording and sound reinforcement.

We've been setting the standards for mikes for over 50 years. And through meticulous research and development, such as our application of FFT (fast Fourier transform techniques) to microphone design, we're constantly defining and redefining products as well as creating new ones. All so you can create your own unique sound without limitations.

FREEDOM OF CHOICE

One example is the PL-80 vocal microphone that has been computer designed for real life use. The result is a precision instrument that enhances the performer's voice without compromising vocal quality.



PL-80's tight super-cardioid pattern gives better gain-before-feedback than virtually any other mike.

With the EV Pro-Line, you have a choice of six vocal mikes for different singing styles—plus five instrumental mikes for every application from live strings, reeds, percussion, and brass to miking any amplified instrument you can think of. So whatever your needs, Electro-Voice has just what you're listening for.

From now on, you don't have to limit your performance, because EV gives you the freedom of choice. See your EV dealer—or send for our new EV mike brochure. Write to: Greg Hockman, Director of Marketing/Music Products, Electro-Voice, Inc., 600 Cecil St., Buchanan, MI 49107.

EV Electro-Voice® SOUND IN ACTION™

Circle 15 on Reader Service Card

bruce bartlett

Recording Techniques

Microphone Techniques for Realistic Reproduction

The sound of digital compact discs is disappointing. Sure, compact discs sound much cleaner than LP records, and they last much longer. But they still don't sound *real*.

CDs have been heralded as a quantum leap forward in sound reproduction. In many cases, however, the music still sounds like a recording, not like real instruments. Of course, accurate and natural reproduction is not always the goal. But I think many CD listeners will demand more realistic sound now that we're so much closer to achieving hi-fi reproduction. Artificial sounds are more irritating on CDs because they're so clear.

What's causing the problem? The clarity of digital recording and playback has exposed *microphone techniques* as a weak link in the chain. It's up to us to advance the state of the art by investigating new microphone techniques.

How do you mic an instrument to make it sound real? For example, suppose you want to record an acoustic guitar so that the loudspeaker playback sounds like a guitar playing in your listening room. Where should a microphone be placed to do this? Let's find out.

Live vs Recorded Techniques

First we need a method to tell us when we're doing things right. Here's one:

Place an acoustic guitar midway between your playback speakers. Have a friend play it while you record it with various techniques. Then, alternate between the live instrument and the tape playback while listening for differences between the two (as in *Figure 1*). If you make a mono recording, play the recording in mono over both speakers.

Another method is to record yourself playing a guitar, using various microphone techniques. Then place the guitar midway between the playback speakers, where the sonic image of the reproduced guitar appears. Sit in front of the speakers as you normally would and play the tape. Which recording makes you believe the real guitar is playing? If the microphone technique is accurate, the guitar you see in front of you

WHY YOU SHOULD MAKE A CORPORATE CONTRIBUTION TO THE AD COUNCIL

The Advertising Council is the biggest advertiser in the world. Last year, with the cooperation of all media, the Council placed almost six hundred million dollars of public service advertising. Yet its total operating expense budget was only $1,147,000 which makes its advertising programs one of America's greatest bargains . . . for every $1 cash outlay the Council is generating over $600 of advertising.

U.S. business and associated groups contributed the dollars the Ad Council needs to create and manage this remarkable program. Advertisers, advertising agencies, and the media contributed the space and time.

Your company can play a role. If you believe in supporting public service efforts to help meet the challenges which face our nation today, then your company can do as many hundreds of others—large and small—have done. You can make a tax-deductible contribution to the Advertising Council.

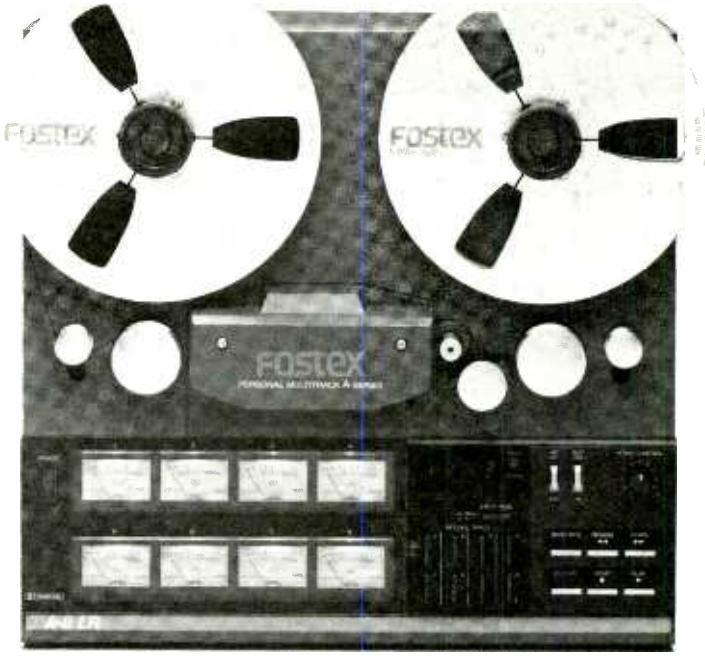
At the very least you can, quite easily, find out more about how the Council works and what it does. Simply write to: Robert P. Keim, President, The Advertising Council, Inc., 825 Third Avenue, New York, New York 10022.

Ad Council A Public Service of This Magazine & The Advertising Council.

The cost of preparation of this advertisement was paid for by the American Business Press, the association of specialized business publications. This space was donated by this magazine.

FOSTEX

THE 8-TRACK FOR THE 80's.



When 4-track just isn't enough anymore, the A-8LR is everything you need for 8-track recording, and not a penny more.

Uncompromised Performance
- 8-track simultaneous record/reproduce with −55 dB adjacent channel crosstalk.
- Built-in Dolby C* noise reduction for a 72 dB signal-to-noise ratio.
- Overall frequency response from 40 Hz to 18 kHz ± 3 dB.

More Flexibility
- The A-8LR is small, compact, portable. Take it with you on remotes or wherever the music is.
- It's easy to understand and easy to use. Punch-In/Out with a remote foot switch (optional).

Best Buy
- $2500.00 is the Suggested Retail Price. And if you don't need to record all 8 tracks in one pass, save more than $500.00** and go for the A-8. The original ¼" 8-track.
- ¼" tape is a whole lot easier on your wallet. Besides, ½" tape is for 16 tracks.

See Your Fostex Dealer Today
Getting your act together on tape may be the next step in taking it on the road. To success.

Fostex
PERSONAL MULTITRACK

Fostex Corporation of America
15431 Blackburn Avenue, Norwalk, CA 90650 (213) 921-1112

* Dolby is a registered trademark of Dolby Labs., Inc.
** Based on suggested retail prices.

Circle 17 on Reader Service Card

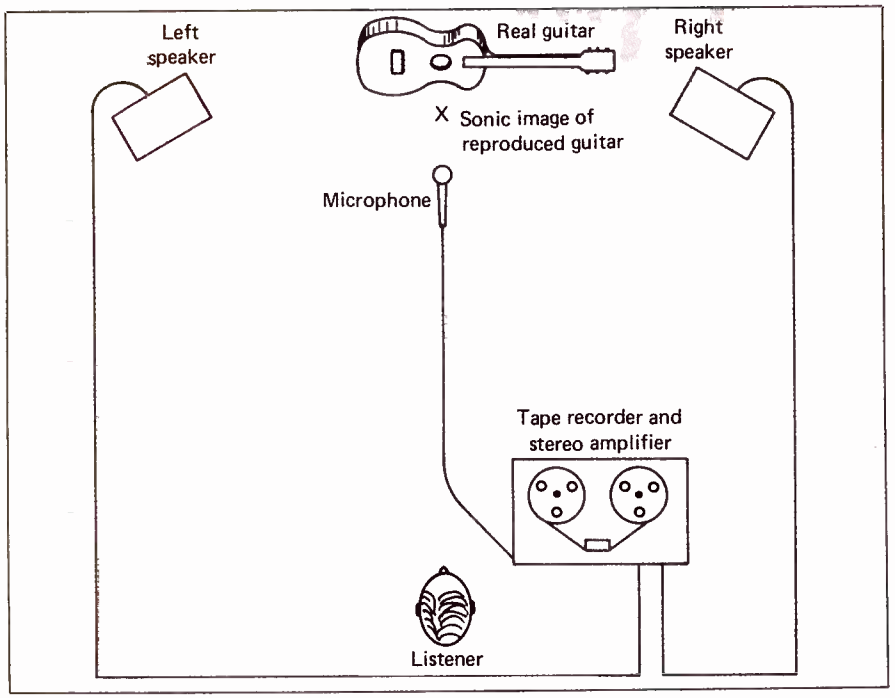


Figure 1. Use this method of set-up to distinguish differences between live instrument and tape playback when experimenting with mic'ing techniques.

should seem to be actually playing. In effect, the recording is a "ventriloquist" and the real guitar is the "dummy."

With either method, it's very important to match the loudness of the tape playback with that of the real instrument. If you play the tape quieter than the live instrument, the recording will lack bass (due to the Fletcher-Munson effect).

Now we're ready to try some experiments. We'll use a microphone with a flat frequency response to avoid coloring the recorded tone quality.

Let's assume a microphone is like an ear. Put the microphone close to your ears and record someone playing the guitar. Play the recording back. Does it sound like the live performance? No way.

How does it sound different? Well, the recorded guitar sounds "hollow." It sounds much more distant than the live guitar. The room acoustics (echoes and reverberation) are more audible in the recording than in the live performance.

Why does this happen? The microphone responds to room acoustics differently than our ears. do. Room reverberation—sound reflected off the walls, ceiling, and floor—approaches our ears from all directions. Thanks to our binaural hearing, we can reject the reverberation because it comes from all directions. We can focus on the sound coming from in front (the guitar). But during playback of a recording, all the recorded reverberation is concentrated into a tiny spot—the same place as the image of the guitar. We can't aurally reject the recorded reverberation, so it's much more noticeable than live reverberation.

We want to pick up less room acoustics and more guitar. The laws of physics suggest a solution: The closer you are to a sound source, the louder the sound. So let's put the microphone closer to the guitar (say, two feet away) to increase the ratio of guitar sound to room sound.

How does the playback sound now? Much clearer. We've made the guitar sound closer by moving the microphone closer.

The "Sweet Spot"

Now let's try placing the microphone about three inches from the sound hole (a common position for

sound reinforcement). How does the recording sound? Very bassy, boomy, and thumpy. That's mainly because the guitar's sound hole resonates around 100 Hz. A microphone placed close to the sound hole picks up this boomy resonance.

In general, very close mic'ing emphasizes the part of the instrument that the microphone is near. A close microphone picks up a tonal balance that differs from the tonal balance heard from a live instrument.

So, for realistic sound, it's just as bad to mic too close as it is to mic too far. There's a "sweet spot" somewhere between, where the room reverberation is well controlled and the tonal balance (timbre) is natural. The distance of this spot varies with the instrument and the room acoustics. You have to find it by experimenting.

The best spot I've found so far, using flat-response cardioid condenser microphones, is 1¾ feet in front of the guitar. Closer than that, the guitar sounds too bassy. Farther than that, the guitar sounds too distant. But around 1½ to 2 feet, the tonal balance is natural. The tweeter controls on the speakers may need a little touch-up to reproduce the high end accurately.

Stereo Mic'ing

Now, does the playback sound just like the real instrument? Not yet. The live guitar sounds "spacious" or "airy," while the recording sounds "little" or "confined." In other words, the live guitar seems to fill the room with sound—it sounds three-dimensional. But in the recording, the room sound doesn't spread out around the guitar. It comes from a tiny point, the same spot as the image of the reproduced guitar.

We know that stereo recording gives a wider sound than mono recording. Let's record the guitar with a pair of microphones, or with a stereo microphone. On playback, the room and the guitar sound more spacious (and real) than they did in mono.

When you record in stereo, you can control the stereo spread—the apparent width of the instrument. To widen the spread, angle or space the microphones farther apart. Do the opposite to narrow the spread.

When the guitar is mic'ed about two feet away, conventional stereo mic'ing techniques make the guitar sound bigger than real life. For example, using two microphones spaced three to six feet apart gives too wide an image. So does the ORTF system (two cardioid microphones angled 110 degrees apart and spaced seven inches horizontally). The reproduced guitar has a more natural size when the microphone angling or spacing is reduced (say, 110 degrees, two inches).

So now we have a stereo pair of flat-response microphones, placed 1¾ feet away. The recording does sound pretty realistic. You can almost believe a live guitar is playing in the room with you—but not quite. There's still a subtle difference. The live guitar "projects" sound into the room, while the recorded guitar just sort of lies there; flat, compressed, and confined. This difference is especially apparent when you directly

compare the live guitar with the recorded guitar.

The live guitar excites the room acoustics differently than the loudspeakers do. Specifically, the guitar's sound-radiation pattern is different than that of the speakers. The center sound image of the guitar doesn't radiate sound in all directions like a real guitar does. And the room echoes excited by the loudspeakers have different directions and spectra than those excited by the real guitar.

Maybe we could place an omnidirectional speaker where the guitar was to improve the radiation pattern. In the future we may have variable-directivity speakers to simulate any sound source.

Another solution might be to remove the listening-room acoustics by padding the walls around the speakers. Place acoustically absorbent material (such as Sonex™ or muslin-covered thick fiberglass) on the walls, ceiling, and floor behind and to the sides of the speakers. That way, the speakers don't create confusing sound reflections off these surfaces, and the *recorded* acoustics become clearer.

These measures should make the recorded guitar sound more true-to-life. If it sounds very realistic, you can almost sense someone playing in your listening room. You may even feel a little self-conscious, as if there's another person in the room with you. That's realism!

Recording Groups

Try the live-versus-recorded method on other instruments to find the most accurate microphone techniques.

Note that close-mic'ed recorded drums generally sound better than real drums—bigger-than-life, fuller, tighter. That's a case where recording technology has improved on reality. You'll have to decide how much you want to sacrifice a commercial, tight sound for realism.

Also note that a microphone placed 1½ to 2 feet away from a guitar may pick up too much leakage (off-mic sounds from other instruments). If that happens, you may have to overdub the guitar, as well as other instruments that are mic'ed at a distance.

Let's say you've recorded a group with a separate stereo microphone on each instrument. How should all these stereo tracks be panned to simulate a real group playing between your speakers?

Suppose you've recorded an acoustic jazz quartet of sax, piano, bass, and drums. If you pan each instrument's stereo tracks full left and right, you'll hear the bass and sax in the middle, with the piano and drums spread between the speakers. While this is an interesting effect, it's not the way real groups sound in space.

If you're sitting in an audience, you might hear the drums on the left, piano on the right, bass in the middle, and sax slightly right. The drums and piano are not point sources, but are somewhat spread out. To simulate this spatial arrangement, try the following:

- Pan the left drum track full left, and pan the right drum track half left.
- Pan the right piano track full right, and pan the left piano track half right.

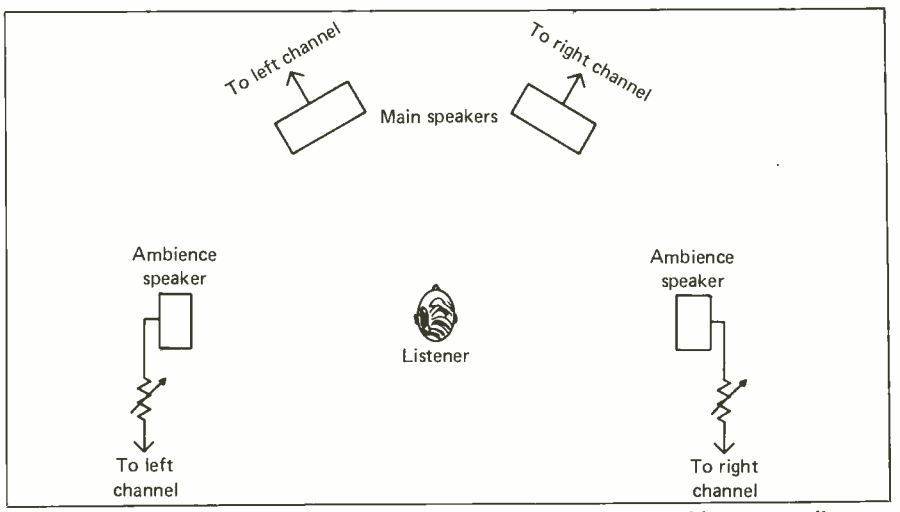


Figure 2. The Madsen ambience extraction system for making recordings sound fuller and more spacious.

Updated
Recording Studio Handbook

A must for every working professional. . . student. . . audio enthusiast

Features latest state-of-the art technology of creative sound recording.

21 Fact-Filled Chapters

I. The Basics
1. The Decibel
2. Sound

II. Transducers: Microphones and Loudspeakers
3. Microphone Design
4. Microphone Technique
5. Loudspeakers

III. Signal Processing Devices
6. Echo and Reverberation
7. Equalizers
8. Compressors, Limiters and Expanders
9. Flanging and Phasing

IV. Magnetic Recording
10. Tape and Tape Recorder Fundamentals
11. Magnetic Recording Tape
12. The Tape Recorder

V. Noise and Noise Reduction
13. Tape Recorder Alignment
14. Noise and Noise Reduction Principles
15. Studio Noise Reduction Systems

VI. Recording Consoles
16. The Modern Recording Studio Console

VII. Recording Techniques
17. The Recording Session
18. The Mixdown Session

Three all-new Chapters
19. The In-Line Recording Studio Console
(The I/O Module. The Basic In-line Recording Console Signal flow details.)
20. An Introduction to Digital Audio
(Digital Design. Digital Recording and Playback. Error Detection and Correction. Editing Digital Tapes.)
21. Time Code Implementation
(The SMPTE Time Code. Time-Code Structure. Time-Code Hardware.)

$39.50

The *Recording Studio Handbook* is an indispensable guide with something in it for everybody. It covers the basics beautifully. It provides in-depth insight into common situations and problems encountered by the professional engineer. It offers clear, practical explanations on a proliferation of new devices. **And now it has been expanded with three all-new chapters . . . chapters on the in-line recording studio console, digitial audio and time code implementation.**

Sixth printing of industry's "first" complete handbook

The *Recording Studio Handbook* has been so widely read that we've had to go into a sixth printing to keep up with demand (over 30,000 copies now in print). Because it contains a wealth of data on every major facet of recording technology, it is invaluable for anyone interested in the current state of the recording art. (It has been selected as a textbook by several universities for their audio training program.)

Highly Acclaimed

Naturally, we love our book. But don't take our word for it. Here's what others have to say:

"John Woram has filled a gaping hole in the audio literature. This is a very fine book . . . I recommend it highly." *High Fidelity*

"A very useful guide for anyone seriously concerned with the magnetic recording of sound." *Journal of the Audio Engineering Society*

15-Day Money-Back Guarantee

When you order *The Recording Studio Handbook* there's absolutely no risk involved. Check it out for 15 days. If you decide it doesn't measure up to your expectations, simply send it back and we'll gladly refund your money.

Easy to Order

You can enclose a check with your order or charge it to Master Charge or BankAmericard/Visa. Use the coupon below to order your copies of the new updated *Recording Studio Handbook* ($39.50).

ELAR PUBLISHING COMPANY, INC.
1120 Old Country Road, Plainview, N.Y. 11803

Yes! Please send ____ copies of THE RECORDING STUDIO HANDBOOK. $39.50. On 15-day approval.

Name _____

Address _____

City/State/Zip _____

Total payment enclosed $ _____
(In N.Y.S. add appropriate sales tax)

Please charge my ☐ Master Charge
☐ BankAmericard/Visa

Account # _____ Exp. date _____

Signature _____
(changes not valid unless signed)

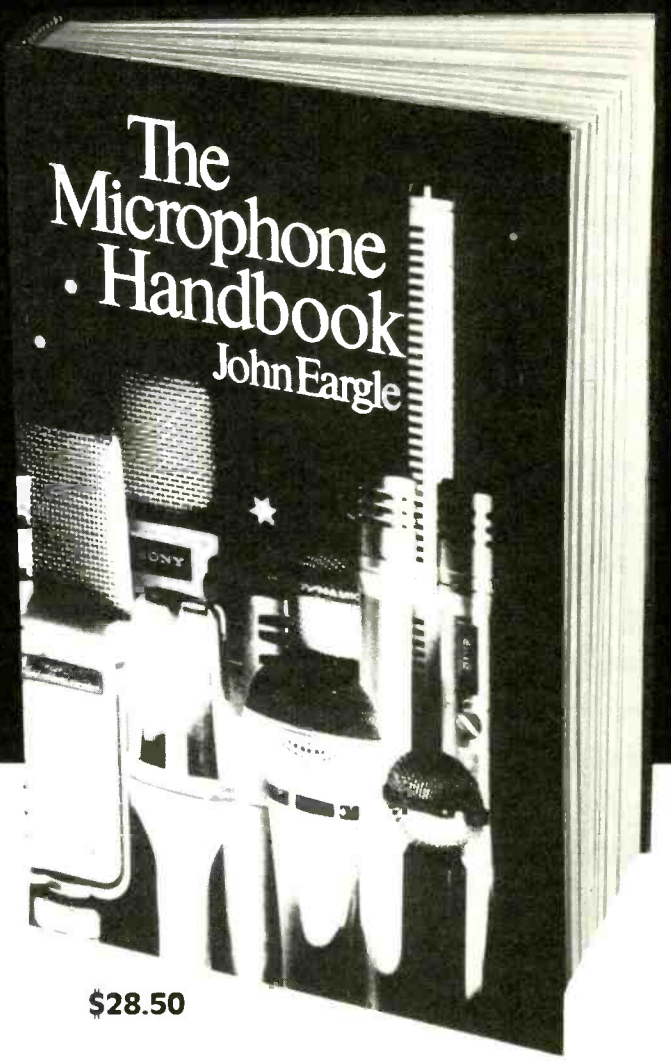
Outside U.S.A. add $2.00 for postage.
Checks must be in U.S. funds drawn on a U.S. bank.

MICROPHONES!

At long last, all the questions you ever asked...all the problems you ever grappled with...are answered clearly and definitively!

The Microphone Handbook

In 256 fact-filled pages, liberally sprinkled with over 500 illuminating photographs, drawings and diagrams, John Eargle covers virtually every practical aspect of microphone design and usage.



$28.50

Completely up to date, this vital new handbook is a must for any professional whose work involves microphones. Here are just a few of the topics that are thoroughly covered:

- Directional characteristics–the basic patterns.
- Using patterns effectively.
- Microphone sensitivity ratings.
- Remote powering of capacitors.
- Proximity and distance effects.
- Multi-microphone interference problems.
- Stereo microphone techniques.
- Speech and music reinforcement.
- Studio microphone techniques.
- Microphone accessories.
- And much, much more!

THE MICROPHONE HANDBOOK. You'll find yourself reaching for it every time a new or unusual problem crops up. Order your copy now!

JOHN EARGLE, noted author, lecturer and audio expert, is vice-president, market planning for James B. Lansing Sound. He has also served as chief engineer with Mercury Records, and is a member of SMPTE, IEEE and AES, for which he served as president in 1974-75. Listed in *Engineers of Distinction,* he has over 30 published articles and record reviews to his credit, and is the author of another important book, *Sound Recording.*

ELAR PUBLISHING CO., INC.
1120 Old Country Road, Plainview, NY 11803

Yes! Please send _____ copies of **The Microphone Handbook** @ $28.50 per copy. (New York State residents add appropriate sales tax.)

☐ Payment enclosed.
Or charge my ☐ MasterCard ☐ Visa

Acct. # _____ Exp. Date _____

Name _____
(please print)

Address _____

City _____

State/Zip _____

Signature _____

Outside U.S.A. add $2.00 for postage. Checks must be in U.S. funds drawn on a U.S. bank.

If you aren't completely satisfied, you may return your copy in good condition within 15 days for full refund or credit.

• Pan the sax tracks half left and full right.
• Pan the bass tracks full left and full right.

In this way, the instruments are located where they were in real life. There's also some "air" surrounding and joining the instruments (thanks to stereo mic'ing and leakage between microphones).

In contrast, pan-potted mono tracks usually sound artificial. Each instrument sounds like it's isolated in its own little space. If you can spare the tracks, it helps to record several instruments in "true stereo" (with a stereo microphone or two microphones) and pan these stereo tracks to positions that real instruments could occupy. You'll capture some spaciousness or "air" around each instrument, which adds realism.

"You Are There" Recordings

So far we've been trying to make recorded instruments sound like they're in our listening room. This approach is called "They are here" recording. But what if we want to transport ourselves to a concert hall? Suppose we want to hear an instrument as it sounds in another environment. We want to record the on-location room acoustics as well as the instrument.

Doing this requires more distant microphone placement—about three to 10 feet from a soloist, or five to 20 feet from a large ensemble. Again, you experiment with mic'ing distance to find the sweet spot that provides the desired sense of persective or distance to the ensemble.

With a stereo microphone or a pair of microphones placed out front and raised about 14 feet, you adjust the stereo spread so that the reproduced ensemble spreads evenly between the speakers. If the spread is too wide, off-center instruments will sound like they're coming from the left or right speaker.

The reproduced hall reverberation should surround the listener as it does in real life. One way to achieve this is to use the Madsen ambience extraction system. Place an extra pair of speakers on either side of the listener. These extra speakers should be several feet farther from the listener than the main pair, as in *Figure 2*. Using a rheostat or L-pad, adjust the level of the side speakers for maximum loudness, then turn them down just to the point where you don't notice them as separate sound sources.

The ambience extraction method makes recorded orchestras sound bigger, fuller, and more spacious—like real life. But it doesn't seem to help the guitar-in-the-listening-room recording. It makes the guitar sound bigger, but not more real.

If we want to be transported to the concert hall, we want to hear only the concert-hall acoustics, not our listening-room acoustics. So it helps to make the walls absorbent near the speakers by applying muslin-covered fiberglass or Sonex™. Leave the rear wall behind you hard and uncovered, and sit far from the rear wall. This treatment approximates a Live-End-Dead-Room room design (described in Part II of this series).

With all of the above methods, the recorded sound closely approaches real life. There are more exotic methods, such as recording binaurally with a dummy head and playing back through a binaural-to-stereo converter. I don't know what to do next, other than adding video! If you have any ideas, send them to this magazine. You might advance the state of sound recording and reproduction.

Summary

We've explored microphone techniques to bring the musician into the listening room ("They are here"), as well as techniques to transport the listener to the concert hall ("You are there").

For "They are here" recordings, record each instrument about one to three feet away in stereo; use very flat microphones; pan the tracks to stimulate the spatial layout of the live group.

For "You are there" recordings, record in stereo from several feet away. Add ambience extraction to make the concert-hall reverberation surround the listener.

These methods should help make compact discs sound more natural. Remember, when consumers buy compact discs made from digital master recordings, they hear essentially the output of the mixing console. If they don't like the sound of the compact disc, that means they don't like the sound of the recording (assuming that they're satisfied with their playback systems). Critical attention is now focused on us, the recording engineers and producers, to make better recordings.

Musicians Notebook

Electro-Harmonix Instant Replay

One of my favorite delay line features is "infinite hold," where you store a sound in the delay line's memory and repeat (loop) that sound indefinitely. You could, for example, strum a single guitar chord and have it repeat over and over, or create repeating rhythm patterns ("solid state tape loops") from just about any sound—drums, scraped objects, clinking bottles, sound effects records, etc. However, while many delay lines include this feature, once the sound is stored your options are rather limited. You can stop the looping effect or transpose the pitch by varying the unit's delay time, but you generally cannot trigger the sound on command nor re-trigger it. The latter two features are particularly important should you want to sync the stored sound to an existing sync track, drum unit, synthesizer trigger output, or other sync pulse output.

Which brings us to the Electro-Harmonix "Instant Replay" (IR for short), a delay line-like device that has been specifically optimized for digital recording (sampling) applications. However, before getting too excited, you should realize that the IR is not perfect by any means. The frequency response is rather limited and, at longer recording times, there is a grainy "digital" quality to the sound (along with what seems like a muted, high-pitched whistle). Also, the memory is volatile, meaning that when you turn the power off, whatever you recorded disappears. Nonetheless, the IR is a fascinating device with many creative applications—which we will explore during the course of this article.

What is It? The IR is actually a pair of devices. The main "Instant Replay" unit is AC powered and comes in the standard, one-size-fits-all E-H aluminum box. The companion External Trigger (which includes all hardware necessary for mounting the unit on Roto-Tom and most cymbal stands) provides a drum pad mounted on a second aluminum box. With the External Trigger's output plugged into the IR's Ext Trig jack, striking the drum pad triggers the stored sound. (Note, however, that you are not limited to triggering the IR solely from the External Trigger.) As a bonus, the External Trigger can also trigger some electronic drum units. The two units together list for $299, although, of course, many stores will discount from this list price.

Sounds enter the IR through an input jack; a level control and associated overload LED aid in matching the IR to the input signal. Unlike many units, this overload LED doesn't fool around... when it comes on, better trim back the level. The IR accepts a pretty wide range of input signals, from about 25 mV to 1.6V RMS.

The IR's memory can store up to two seconds of sound. While recording, the Pitch control sets the amount of recording time. During playback, this same control transposes the pitch of the recorded sound over a two octave range. (You may also change pitch from a synthesizer keyboard, as described later.)

Once the sound is recorded in memory, you can play it back in several ways. The Repeat On switch, when on, loops the sound continuously—just like the infinite repeat function on a delay line. With Repeat On off, you can trigger sounds from the External Trigger. You can also trigger the stored sound from other trigger pulse outputs; I've used the PAIA "Master Synchronizer," as well as several drum machines and synthesizers, to trigger the IR. However, unlike other trigger sources the External Trigger lets you introduce dynamics where, the harder you hit the drum pad, the louder the triggered sound. While the dynamic range is somewhat limited, the addition of any dynamics at all is a most welcome feature for which E-H deserves credit. A matching Trig Level control lets you adjust the IR for optimum dynamic range, as well as match the IR to trigger pulses from other pieces of equipment.

INTRODUCING EFFECTRON II FROM DELTALAB

LOW COST, FULL BANDWIDTH, HIGH PERFORMANCE, DIGITAL DELAY.

The EFFECTRON™ II is an enhanced EFFECTRON. We have added many features per our customers suggestions. These features depend on Model and include increased flanging range, external infinite repeat, increased input range, stereo output and even lower prices!

The EFFECTRON II series is still the only low cost, full bandwidth (16KHZ), high performance line of digital delay processors. Visit your local dealer and check it out !!!
Listen and Compare . . . .

*Manufacturer's Suggested Retail

DeltaLab

Music & Electronics . . . Naturally!

Plugging an external synthesizer into the remaining IR jack (Ext Freq) gives the emulation-type effects described towards the end of the review. The only other control is a Record pushbutton (with associated Record light), which tells the IR when to get ready to record.

Recording Sound With the IR. To set up the IR, first plug its AC cord into the wall (since there is no power on-off switch, the unit comes on instantly). Plug a microphone, synthesizer, guitar, or other signal source into the Mic Input jack, and play the sound you want to record. Adjust the Mic Level control so that the Overload LED is off except on the very loudest peaks, and you're ready to go.

Set the Pitch control for the desired amount of recording time (clockwise for less time, counterclockwise for more time). Bear in mind, though, that the longer the recording time the poorer the fidelity. (With a one-second record time, for example, the bandwidth is around 6 kHz.)

After setting the record time, press the Record button. The Recording light will come on and stay on until you play a sound into the IR. As soon as you start playing, the recording process begins and the Recording light flashes. As a helpful feature, the flash rate slows down at longer recording times and speeds up at shorter recording times. The light goes out when you've used up your recording time.

Chances are you will not have set the Pitch control perfectly on the first try, so you may have to record again with the Pitch control trimmed up for the correct amount of recording time. Once you've got the sound properly stored in memory, you are then ready to trigger it.

Triggering the Stored Sound. Now the fun begins. (Sounds like the N.Y. Mets—ed.) With Repeat On, you can loop the sound and transpose the pitch with the Pitch control. With Repeat On off, you can trigger the sound from the External Trigger pad. One of the nicest features of the External Trigger is that you can re-trigger the sound by rapidly striking the pad. For example, suppose you recorded the word "microsound" into the IR. Repeatedly hitting the pad would generate a "stutter" effect where the output would sound something like "mi/mi/micro/micro/mi/mi/micro/microsound" (each slash represents where you would hit the drum pad). So, you're not just locked into triggering the sound and having it play back; between the Pitch control, the dynamics of the External Trigger, and the re-triggering possibilities, you can really go to town.

Emulation Effects. There are a few keyboard devices out on the market (E-mu's "Emulator" and the Fairlight CMI are probably the best known examples) that let you sample a sound and then transpose the pitch using a synthesizer-like keyboard. This effect has been used extensively by Larry Fast (Peter Gabriel group) and other experimentally-minded musicians. The E-H ad copy for the IR says that it "...gives you access to sounds and effects previously obtainable only on the Fairlight or Emulator, but at a small fraction of their cost." Well, I'll agree with the small fraction of their cost part, but, on the other hand, don't expect any miracles for $299. Still, with a little tweaking you can indeed get the IR to do some very cute emulation tricks.

The secret to emulation is to set the Pitch control for maximum recording time, and send a 1000 Hz carrier tone (from a synthesizer or function generator) into the Ext Freq jack. Upon playback, as you play the synthesizer monophonically in the range of 500 Hz to 2000 Hz (approximately an octave above middle C to three octaves above middle C), you can transpose the recorded signal over about a 2:1 range. The level of the reproduced sound depends on the level of the triggering signal and the setting of the Trig level control. While the sound quality will not be fantastic, and you will have to fool around quite a bit with the synthesizer's timbre and level while recording (and playing back) for best results, you can still obtain some useful emulation effects. Playing a key on the keyboard triggers the sound; as long as the key is held down, the sound will loop. Playing chords gives some really bizarre effects, and when you arpeggiate the keyboard notes...let's just say you have to hear it to believe it.

Evaluating the IR. Conceptually, the IR is brilliant—being able to record sounds, play them back on command with optional dynamics, *and* sync them to external trigger sources makes for a pretty potent device. In practice, however, there are some limitations both with respect to sound quality and emulation abilities. One of the biggest problems is that if you record some super-duper sound into the thing, you had better leave the IR plugged in, otherwise, you will lose your recording. So, if you played live gigs and wanted to trigger the sound of dogs barking, you would need to load that sound in from tape (unless, of course, you carry an entourage of barking dogs) before each gig.

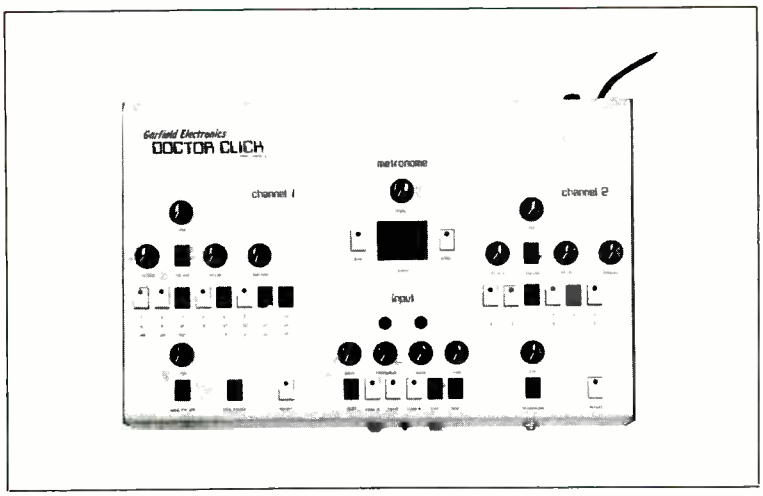
The IR is surprisingly quiet, but the bandwidth just isn't there for recording cymbals, synthesizers, fuzz guitar, and other sounds with lots of high frequency content. Standard guitar and voice, which have more restricted bandwidths to begin with, give a more convincing sound. Still, if you tweak everything up just right, the sound quality is acceptable and the results can range from dramatic to humorous.

Remember, though, that sound quality is not the only way to judge a device like the IR. First of all, it's a lot of fun and can be a real crowd-pleaser at gigs. For example, get the name of someone in the audience, store it in the IR, and trigger it at appropriate times—or transpose the person's name upward in pitch for a "Chipmunks" effect. In fact, just fooling around with the IR is bound to cause smiles, chuckles, and occasional guffaws from all but the most humorless of listeners. However, this is not just a fun device, as there are some very valid musical uses. If you are a drummer and want to rhythmically trigger some synthetic sounds or sound effects, this is one extremely powerful little box. Of course, the IR is useful to more than just drummers; synthesizer players who are into synchrosonic music (a la Devo, Human League, Ultravox, and so on) will doubtless find the IR highly useful for creating unusual effects and rhythms.

Overall, the IR is such a neat toy that I can hardly wait until someone produces a studio-quality version. In the meantime, though, I'll be happy to use what already exists. The IR may not be perfect, but it has what experimentally-minded musicians need in order to come up with some new and different sounds.

j. b. moore

Garfield's Dr. Click



Question:. In a world full of slick new electronic music toys like the current generation of sequencers, synthesizers and drum machines, etc., who needs an unassuming, $2295 box which makes absolutely no sound of its own? Answer: anyone who wants to interface all the slick new electronic music toys and take full advantage of their rhythmic possibilities.

Dr. Click is an interfacing device incorporating sync code generation and translation, a metronome, two channels of note values to drive one gate output and two envelope outputs (one for each channel), an external trigger circuit that also converts external sources into a click, and a 1,000-beat memory timer for syncing to varying tempos (human or otherwise), all in one discrete package. It can be used on stage, but is basically a studio device.

The usual way to write this sort of article is to run-down various features and specs. Judging from the number of calls for help this author has received from people in and out of sessions with questions about the Doctor's operation, however, and noting that there is no signal-to-noise ratio, bandwidth or true RMS spec to discuss, it makes more sense here to explain its use.

Methods of Driving Dr. Click.

Dr. Click has a dual-function Metronome controlled by a ±.001 percent crystal. With the B/M switch on, it outputs beats-per-minute; with the switch off, frames-per-beat. Tempo is set by thumbwheels on the TEMPO readout. The Metronome controls Dr. Click unless a jack is plugged into the PULSE IN, CODE A/B IN or CODE C IN. For external control, Dr. Click can be driven by a click track or sync code, but click track drive is recommended for reasons explained below.

Click Track Drive

To begin, set the Metronome to the desired tempo, send the METRONOME OUT to tape and lay down a track of metronome clicks. Be sure to record a much longer click track than you think you'll need. If you don't need it, it can be wiped.

For a fractional tempo, 100½ BPM for instance, set the Metronome to 201 BPM and send the GATE OUT to tape. Press the GATE PW VAR (Pulse Width Variation) switch, and adjust the PW control directly above it until a narrow, click-like pulse is heard. To complete the operation, turn on the LOW RANGE switch and the half note value (the switch marked 2 on the bottom row of Channel One numbers). The click at the GATE OUT is now 100½ BPM and ready to be recorded.

To drive Dr. Click, rewind the tape and send the click track direct from tape to Dr. Click's PULSE IN jack. Begin with the GAIN, THRESHOLD, MASK and FINE controls at nine o'clock. Raise the THRESHOLD control until a rhythmic flashing appears on the left hand INPUT LED. If no indication appears or the LED stays on, bring the THRESHOLD back down and try raising the Gain. If the same thing happens after increasing the GAIN, check to see that the click is getting to the PULSE IN jack. *Do not* compress or gate the signal. Dr. Click's THRESHOLD, MASK and FINE controls act as a gate, and compression brings up noise as well as the click.

When a rhythmic indication is seen on the left hand LED, increase the MASK control until the incoming pulse is passed on to the right hand INPUT LED. Next, press the RESET switch (essentially a standby switch which turns off [sets to ground] most of Dr. Click's outputs), and rewind the tape.

From this point forward, all sync codes, trigger pulses and envelopes can be derived from the click track. By using click rather than sync code drive (described below), editing, dropouts, crosstalk between tracks and varispeed—all of which can, and usually do, render sync codes useless—are superseded.

Sync Code Drive

Sync codes generated by Dr. Click or other devices will drive the unit. Simply send the sync code direct from the machine (or molted through a fader if level problems are encountered) to the CODE A/B IN jack or

the CODE C IN jack. (Check the manual for the appropriate input.) Dr. Click translates 48X or 96X (the X is used here as shorthand for square-waves-per-quarter-note) into all the others.

If a sync code such as 12X or 24X is already on tape, generate a compatible click track by finding the appropriate Channel One rhythm multiple which matches quarter notes and use the GATE OUT to print a click track.

Debugging Sync Code

Other sync code glitches to be aware of (with or without Dr. Click) are *ground problems* and *recording problems*. Since most sync codes have a carrier frequency less than 400 Hz, and sync pulse frequencies are also relatively low, any 50 or 60 Hz AC leakage can wreak havoc on them. Be certain that Dr. Click and all drum machines, sequencers and synthesizers connected to it are grounded through the console, not through three-pronged power plugs. Since not all studios have enough ground lifters, bring your own.

The second problem is the way that sync codes are printed on tape. Here are some tips, obvious and otherwise: 1) Print sync without noise reduction; 2) Print between -3 and -10 on the VU Meter. -7 is a good starting point; 3) Judge the level using the VU on the machine, not on the console; 4) If you need to record something on an adjacent track, record an instrument with mostly high frequency information like a cymbal or tambourine, which, if it bleeds into the sync in any way, will not tend to invalidate it; and 5) *Never, ever* move on to something else until you have checked to see that the sync on tape is coming back at the same level at which it was printed, that it does not waver on the meter even slightly (if it does, it probably won't work), and, last but not least, that it does in fact work on the entire track, top to bottom!

Dr. Click outputs trigger pulses, envelopes and seven different sync codes (1X, 12X, 24X, 48X, 64X, 96X and 384X) which will drive virtually every brand of synthesizer, sequencer and drum machine currently in use. This makes it possible, for example, to sync up an MXR drum machine (24X), an Oberheim DSX (96X), a Synclavier (1X) and a Linndrum (48X) all in perfect sync on the same track.

To use any output, connect VCOs, VCAs, VCFs, arpeggiators or sync inputs to the appropriate jack or jacks. With click drive, press RESET followed by PLAY just before the beat on which the Doctor's output is desired. With sync, also press RESET and PLAY, but always begin ahead of the sync track. Either way, voila! synchronized everything! Well, maybe.

Microprocessor Related Delays

Various sequencers and drum machines use different microprocessors, and different microprocessors take different amounts of time to actually *decide* what to do and then to *do* it. An example with a drum machine follows.

The song in question begins with a kick drum on the first beat. Assume there are eight beats at the top for the benefit of humans (whose microprocessor operates by ear) and that the drum machine operates at 12X. When the drum machine's microprocessor receives the appropriate sync pulse, in this case the 97th (8×12 plus one for the downbeat), it must *decide* to trigger the kick drum chip and then actually *trigger* it. Although the sync pulse arrives right on time, the kick drum often sounds (and is) just a wee bit late. There are two ways to compensate for this.

If click drive is being used, send the click track to a DDL (Digital Delay Line) and increase the delay until the click seems to be just ahead of the next one on tape. Send the delayed click to the PULSE IN and fine tune the length of the delay until the device being driven falls in sync. If the DDL being used brings the device in question close to, but not right on the beat, try Dr. Click's internal delay (0 to 1.5 milliseconds) for finer resolution. The click track can also be "pre-echoed" (described below), which saves time on multiple overdubs.

With sync code drive, "pre-echo" is the only answer. Go a few seconds past the end of the sync track, flip the tape over on the multitrack machine, send the sync track to a DDL, and record it in reverse on another track. The manual suggests a 20-millisecond delay, but use 50 for a safety margin. After setting the multitrack back to normal, send the "pre-echoed" sync track to the DDL and then to Dr. Click and fine tune as above.

Syncing to a Live Drummer or a Varying Tempo

One of Dr. Click's most important features is the memory. Suppose you want to use a drum machine to sweeten a track with a live drummer or even to replace the drums. No matter how good the drummer is, even playing to a click track his time will vary. Two and four beats, in particular, will tend to be slightly anticipated, especially during fills.

The band played to the drummer, so new parts must match his time. If not, even slight variations will be obvious. To sync up with the live track, a quarter note (in rare cases an eighth note) guide track has to be "built." Be advised that this takes time. I have occasionally spent as little as an hour, but it usually takes several. Here is one way to do it.

Combine the kick and snare tracks. This may be done direct, or through Dr. Click's trigger-to-click converter. Since clicks are somewhat easier to deal with later on, the click method is described below.

Since the combined kick and snare into Dr. Click's PULSE IN jack and send the METRO OUT to tape. After you have gotten rhythmic indications on both LEDs (see the previous section on CLICK TRACK DRIVE), increase the MASK control until it masks the next incoming quarter note. Back it off some and use the FINE control, which is additive to the MASK control, to get a tight mask. If there are any anticipated kick drum beats, especially 1/16th notes, it is nearly impossible to get the mask tight enough to eliminate them without occasionally also masking a one or a three beat. Record the resulting click on a separate track.

Compare the composite click track to the original drum track and note the location of all inaccurate, missing or questionable clicks as you go. Next "patch" the click track; i.e., spot-wipe the superfluous, insert the missing, and correct the questionable. Here the advantage of clicks becomes apparent since clicks are much easier to spot-wipe than drum hits (all that messy decay).

If the clicks at any given beat are too tight to spot-

"We Don't Miss a Sound"

Whether you need a P.A. system to get the sound out to your audience or a monitor system to get the sound back to you, Carvin has over 25 different matched systems of which one will be right for your application.

We sell "DIRECT" from our manufacturing plant in California, which means that you can save hundreds of dollars. We also give fast Mail-Order service with low freight rates! Another big plus at Carvin is our ten day trial with your money back if not satisfied. When in southern California, visit our showrooms for a personal demonstration.

To receive your 84 page color catalog of P.A. systems, tube and solid state guitar amps, electric guitars and basses, and guitar parts send $1 (or) $2 to rush by 1st class mail.

"Because quality sound reinforcement is critical in the music business, we rely on Carvin."

— Terry, Dale & Warren, Missing Persons

MX 1644	16 in 4 out P.A./recording board	$1898
DCA 800	800w (bridged) stereo power amp	$ 549
EQ 2029	29 band ⅓ octave Equalizer	$ 279
XC 1000	Stereo electronic crossover	$ 279
750M	Pro monitor, w/Magnalab	$ 169
790E	Pro monitor, w/15" EV	$ 259
1330E	Horn loaded bass bin w/15" EV	$ 279
R540E	90° radial horn w/EV driver	$ 279

OLL FREE 800-854-2235
alif. 800-542-6070

CARVIN

ept MR 52, 1155 Industrial Ave.,
scondido, CA 92025

Circle 22 on Reader Service Card

CARVIN CATALOG
☐ $1 for Bulk Mail ☐ $2 for First Class Mail

Name
Street
City
State
Zip
MR 52

wipe or too ambiguous, spot-wipe them all and record a replacement click. If you have the luxury of more open tracks, put the replacement clicks (or beats) on a separate track and bounce the replacement track together with the spot-wiped original to yet another track. To insert new beats, patch in Dr. Click's step switch (which is somewhat awkward to hit right on time) from the METRO OUT, or use a manual hit from a drum machine, i.e., clave, claps, cowbell or click. Any sound with a sharp attack, live or synthetic, will do.

After a complete guide track has been patched together, rewind to the head of the take, turn on both the MEMORY and RECORD switches, send the guide track to the PULSE IN jack, and play the entire track into Dr. Click. When the complete take has been memorized, turn off the RECORD switch (*do not* turn off the MEMORY switch) and rewind the tape. If by any chance the MEMORY OVERFLOW LED is lit (unlikely since it takes almost nine minutes of quarter notes at 120 BPM to do it), check the manual for procedures on how to deal with it.

Now roll back to the head of the take, hit RESET followed by PLAY, and you're ready to roll. As soon as Dr. Click receives the first incoming beat, voila! synchronized everything. Well, maybe. Prior caveats about microprocessor related delays still apply. When sync has been adjusted and the drum machine runs against the original track, you may still find that some of the clicks, in particular those manually played, are slightly off. Note their location and patch them as before. Keep in mind that any power problem will dump Dr. Click's memory, so in this instance lay down a 48X sync track after the guide track is done.

Envelopes and Triggers

Dr. Click has two channels of rhythmic values. Channel One has 16, ranging from as long as four measures (16 quarter notes) to as short as 1/64th note triplets. Longer and shorter values are toggled by the LOW RANGE switch. Channel Two has six, from quarter notes to 1/32nd notes.

Both envelopes have AMOUNT, ATTACK, DECAY and PW (pulse width) controls that can be set from OV to +12V for VCA and VCF modulation or OV to +1V for VCO modulation. They can be used separately or combined. Using one envelope creates simple, rhythmic waveforms. Using both with a Y-jack adds considerable complexity.

Two trigger pulse outputs are available on Channel One. The GATE OUT is a rising edge clock pulse with a selectable +5V or +15V level, one of which works with most arpeggiators. The TIME LAG OUT is identical to the GATE OUT, except that it is a falling edge clock which can, by adjusting the GATE PW VAR control, deliver a rising edge pulse that is slightly ahead of the beat. Such a pulse is just the thing to trigger sounds which develop so slowly they have to be played ahead of the beat to sound on time. Both the GATE and TIME LAG OUTs are set by the Channel One rhythm switches.

Both channels have an INVERT switch. The invert function is especially useful when sync code is cued on the fly rather than from the top. Such cues tend to be slightly off the beat, but trigger pulses and envelopes can often be brought back into sync by inverting them.

Finally there is the trigger-from-tape function which converts information from a recorded track, a snare drum for example, into a +5V or +15V trigger pulse. It is similar to the click converter, but it is accessed from the TRIGGER OUT rather than the METRO OUT. Like the click converter, beats are passed from the left hand INPUT LED to the right. Unlike the click converter, however, the MASK control should be left all the way down and the FINE control should be brought up only enough to pass the pulse onto the left hand INPUT LED.

The resultant pulse can then be used to double a live snare with a triggerable sound such as a Simmons snare or white noise from a synthesizer. As before, microprocessor delays may be encountered and a "pre-echoed" track is the answer. Not all sounds work well in this mode. Open high hats, for example, may be too ambiguous. Nevertheless, sounds with sharp attacks work well. I have gotten the output to match the fastest 1/16th note snare drum a Roland 808 can produce, but the adjustment of Dr. Click's input controls had to be very fine indeed.

Dr. Click's Other Functions

Yes, there are more. Dr. Click will "clock" sequencers from the 48X/PGM OUT. This is accomplished manually by using the STEP switch to count any given number of pulses into a sequencer, a *very* time-consuming, not to mention error-prone, procedure. There is, however, an easier method—"auto programming."

In the auto programming mode, a specific number of pulses matching any of the note values on Channel One is delivered in time-base 48X from the 48X/PGM OUT by pressing the appropriate Channel One rhythm selector. If the sequencer in question operates on a time base other than 48, auto programming is accomplished by doing the appropriate mathematics. For example, ⅛th notes will be 1/16th notes in Oberheim's time base 96. With 16 note values available plus the step switch for odd values, anything is possible.

Something that you won't find in the manual is a reference to playing Dr. Click. The note value switches on Channel One and Two can be played. Hook up an arpeggiator to the GATE OUT. While playing a chord with one hand, change the note value being played with the other. The results can be quite interesting; a sort of a semi-random feel. The same is possible with the envelopes, although it is not always effective.

And last, a word or two on quality and service. I have had two glitches with my Dr. Click. The last one was taken care of very quickly and efficiently (three day turnaround from NY to LA and back), but then again Dan Garfield knew I was doing this article. On a previous occasion, however, I had a PC board go down on a Thursday night. Naturally I had the most important session of my life coming up on Sunday of that week. (True to my muse, the ghost of W.C. Fields, the session was cancelled.)

On Friday I called Garfield, who at the time knew me only as some guy on the phone with some questions, desperate for the board. He air-freighted it to New York that night and I had it Saturday morning. No request that I ship him the unit so he could see if what I thought was wrong was actually wrong or if I had abused the unit. No demand that he get the old board before he would send me the new one. And *no bill* for the air freight to New York. If there is an automobile manufactured anywhere in the cosmos which has comparable service, air-freight me the name of the manufacturer and send it collect.

DOD Electronics announces a new line of high quality signal processing equipment. . . .

The DOD Pro Products Group

The all new DOD Professional Products Group contains the seven most needed pieces of equipment necessary for professional signal processing, from digital to analog delay units, fifteen to thirty-one band graphic equalizers and much, much more.

Each product in the DOD Pro Products Group has been designed with the professional in mind. All DOD products have user-friendly controls and status indicators for quick and easy operation. Each product contains the latest circuit technology for performance and reliability, and all DOD products are manufactured and tested in America.

Check out the new DOD Pro Products Group at your local DOD dealer and see why DOD continues to be the leader in cost-effective quality equipment.

DOD

For more information call or write:
DOD Electronics Corp.
2953 South 300 West
Salt Lake City, Utah
(801) 485-3534

Circle 30 on Reader Service Card

DAVE STEWART

Eurythmics, this week's talk of the town, is a group distinguished by its sexually ambiguous lead singer, a hit single ("Sweet Dreams Are Made Of This"), and an unusual self-image that redefines the conventional boundaries of a pop band.

"Eurythmics is really a name for a project that encompasses all kinds of music, film, and video," explains David Stewart, producer/composer/arranger, and one-half of Eurythmics.

The duo's other half is lead singer/lyricist Annie Lennox, whose orange-cropped hair and penchant for visual role-reversing has invited comparisons to early David Bowie.

Unlike many groups whose principals grew up together, Lennox's and Stewart's backgrounds have little in common. A native of Aberdeen, Scotland, Lennox studied piano, harpsichord, and flute at London's Royal Academy of Music. Her musical influences range from cabaret to jazz to rock to folk; she cites Stevie Wonder as one of her favorite vocalists. Stewart was raised in Sunderland, England, began playing guitar at the age of 13, and spent the latter part of his adolescent life as a vagabond searching for, among other things, a musical style to call his own. His search introduced him to the disparate worlds of medieval folk music, blues, and funk. His is an unconstructed and instinctive knowledge of music and technology.

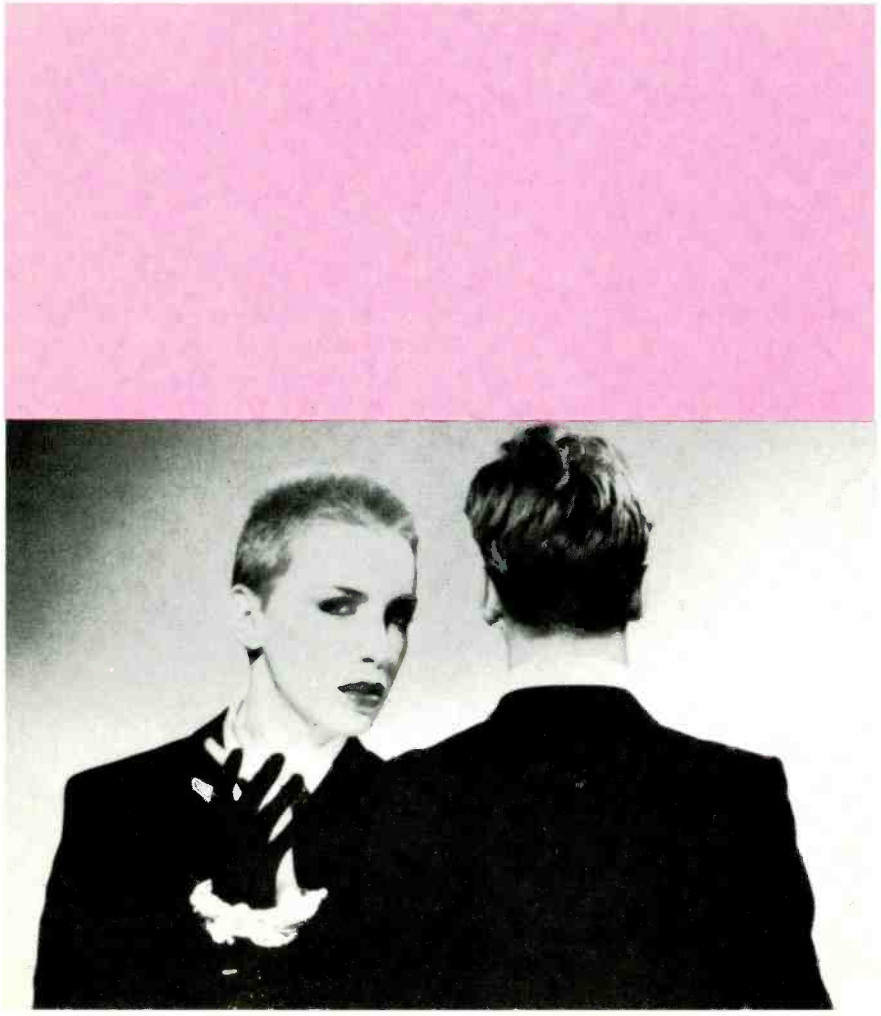
suzan crane

PRODUCING SWEET DREAMS

The two met in 1977. At the time, Lennox was waitressing, gigging and writing songs on the side. Her disillusionment with formal musical training drew her to the more loosely-webbed Stewart. Along with Pete Coombes they formed the Tourists, a forgettable little rock band featuring a less masterful Annie Lennox as frontwoman. After receiving some attention for their rendition of Dusty Springfield's "I Only Want To Be With You," the Tourists joined the ranks of the deceased.

In 1980 Lennox and Stewart re-mobilized, trading in the traditional four-piece rock lineup for a cheap Wasp synthesizer. They dubbed themselves the Eurythmics. Their first album, *In The Garden*, overseen by the adventurous German producer Connie Planck, was released by RCA (UK) later that year. It was Planck who served as Stewart's mentor in the area of production and experimentation and thus inspired some of the unusual techniques employed by Stewart in the making of the *Sweet Dreams Are Made Of This* lp, Eurythmics' American debut.

Entirely written, arranged, and produced by Stewart and Lennox (with some knob turning done by Adam Williams) and recorded with a budget lower than what most synthesizers cost these days, the album is quickly putting Eurythmics on the musical map. Whether out of true economic necessity, as Stewart claims, or a desire to prove that it could be done, Eurythmics have indeed proven that less could be more. Lyrically, too, simplicity seems to be the goal. "Sweet Dreams...," the current hit single, consists of only two sparse lyrical refrains. Actually, all their songs stick to the lyrical basics. Apparently, an understated elegance, coupled with a less-is-more philosophy is at work here. Eurythmics' modus operandi: visual sound.



Modern Recording & Music: Let's discuss the making of the *Sweet Dreams...* album. I think many people will be surprised to learn the truth behind the finished product.

David Stewart: We recorded it all on a Teac 8-track, which is unusual because most albums are made on 24- or 48-track decks. We used a Soundcraft Series 2 desk and we bought two Beyer M 20 black microphones, a Roland space echo, a Furman compressor, and a spring reverb unit. Now, to any technicians reading this, they'll think this is a really Mickey Mouse way to make a rough demo, but we made our whole album like that.

MR&M: Why did you use this particular equipment?

DS: A) because we wanted to be an experimental band and B) because we couldn't afford to buy ourselves a 24-track. All the equipment I mentioned only cost about 5,000 pounds. So, for 5,000 pounds we made the album. It costs a lot of bands that much to record just for three days in the attic. We had an empty warehouse where we were able to do it for free, and take seven months with it.

MR&M: Aside from the obvious financial consideration, what were the advantages of working in a warehouse?

DS: Well, for one, it was really difficult to get anywhere to make a noise in London, and it was big. At night when all the employees from the picture-framing factory below went home, we'd go into the big room of the warehouse, and that's how we got a lot of the ambient sounds. We couldn't afford a plate reverb. There [the warehouse] we could experiment or record whenever we wanted to.

MR&M: What other equipment eventually found its way up to the warehouse?

DS: I bought a Roland SH-09 synthesizer with a CSQ-100 digital sequencer, and a thing called an audio movement visual drum computer, which has real drum sounds on silicon chips and a TV screen. That is what we played a lot of the instrumentation on. And I used a Gretsch Country Gent slide guitar. Later in the album we used a Roland Juno-6 polyphonic synthesizer, and oc-

THE FINE LINE

In the world of digital signal processors there is a fine line between processors that are "loaded" with features and those that are truly useful processing tools. Carefully designed signal processors have features and functions that are designed to work with each other logically and efficiently. This makes the digital processor easier to understand, to control, and ultimately to integrate into live musical situations.

It is this fine line that separates Ibanez digital signal processors from the competition. Each Ibanez digital processor—from the low-cost, full-function DM500 to the top-of-the-line DM2000—stands on its own as a strong, logical and useful processing system. And each is engineered to be the most cost effective processor in its class. So cross over that fine line to Ibanez digital signal processors—they're on your horizon.

DM1000 DIGITAL DELAY: 900 millisecond, full-function delay with infinite hold. **$449.**

HD1000 HARMONICS/DELAY: Pitch shift more than one octave (up and down) plus digital delay. **$499.**

DM500 DIGITAL DELAY: 256 millisecond, 16KHz bandwidth full function delay. **$349.**

DM2000 DIGITAL DELAY: Over one second of delay at 16KHz bandwidth, with digital readout. **$649.**

TOMORROW'S INNOVATIONS

Ibanez

For a full color catalog send $2.00 to: Ibanez, dept. MR • P.O. Box 886, Bensalem, PA 19020
17421 "B" East Gale Ave., City of Industry, CA 91748 • P.O. Box 2009, Idaho Falls, ID 83401
In Canada: 6969 Trans Canada Highway, Suite 105, St.-Laurent, Quebec, Canada H4T1V8

Circle 24 on Reader Service Card

casionally a friend lent us an Oberheim synthesizer, but mainly we used the ones I mentioned before. It was a cheap but effective way of recording.

Since [the album] I've had over 200 offers to produce—some from people who are quite famous. They just can't believe it was recorded on 8-track because it sounds like a very high quality 24-track digital recording. The secret is that I was taught techniques of recording real sounds mixed with synthetic sounds by the German producer Connie Planck and a guy named Holga Suki. Many parts of the album where people think synthesizers are used, they really aren't. It could be me banging on the table with a rubber mallet mixed with Annie tapping a milk bottle at exactly the same time. For instance, in the song "Sweet Dreams...," when she sings "Hold your head up," it's milk bottles that go "dodododo." It sounds like an instrument.

MR&M: Are there other examples of this type of "musical deception" on the record?

DS: Yeah. The snare drum sound on "This Is The House" is me lashing a big wooden door with some flex from a washing line, because we couldn't afford a claptrap, and we wanted that kind of sound. The underground train station in "Mississippi Never Sleeps"—I recorded the squeaking of wheels with a Sony Walkman and slowed the tape down so it was in tune with the track. Then I played the slide guitar at the same time as the wheels were squeaking so the wheel squeak turned into a slide guitar. That, again, sounds like a synthesizer.

MR&M: The period while you were making the album was filled with financial difficulties for you and Annie because of a law suit against your former managers. Having recorded in many fashionable studios in the past, why didn't you just wait until everything was sorted out and money was available to begin work on the second Eurythmics album?

DS: We wanted to carry on making our tapes while all that was going on. We weren't consciously starting to make an album. We were just recording, experimenting, and it gradually became more and more like an album. We made 50 tracks and chose ten.

MR&M: Will the other tracks ever be released?

DS: Some already are. In England we have lots of 12 inches [EPs], and on the B-sides there are always four tracks.

MR&M: I have an import of "This Is The House" (which appears on the album) with four live cuts—"Your Time Will Come," "Never Gonna Cry Again," "4/4 Leather," and "Take Me To Your Heart"—on the flip side.

DS: The way we recorded those songs live may be interesting to your readers because it was actually very experimental. You know, most people when they say "live" actually record on a 24-track then go somewhere else to remix and re-do the vocals. We played live in an unusual way: We had the mixing desk on stage where the drummer would be, and Adam Williams [bass player from the Selector who worked on some tracks with Stewart] would be on the mixing desk and we all plugged what is called a DI into the board. I had a suspended bass and six-string joined together from a big lighting rig so that it just hung down. To the audience it looked like it was just in mid-air. I also had synthesizers to the right so I could hit the guitar and leave it and play something else and it would be hanging there. We had a musician named Tim Winter who plays all kinds of classical flutes, including Thai and Chinese flutes with onion skins that sound like snake charmers. We had a drum computer and Annie sang. We did the whole thing live like a dub mix. We had little speakers like in a studio so that we were hearing what the audience was hearing. Usually you have a guy mixing up front and a monitor guy mixing, and the band has no idea what the audience is hearing.

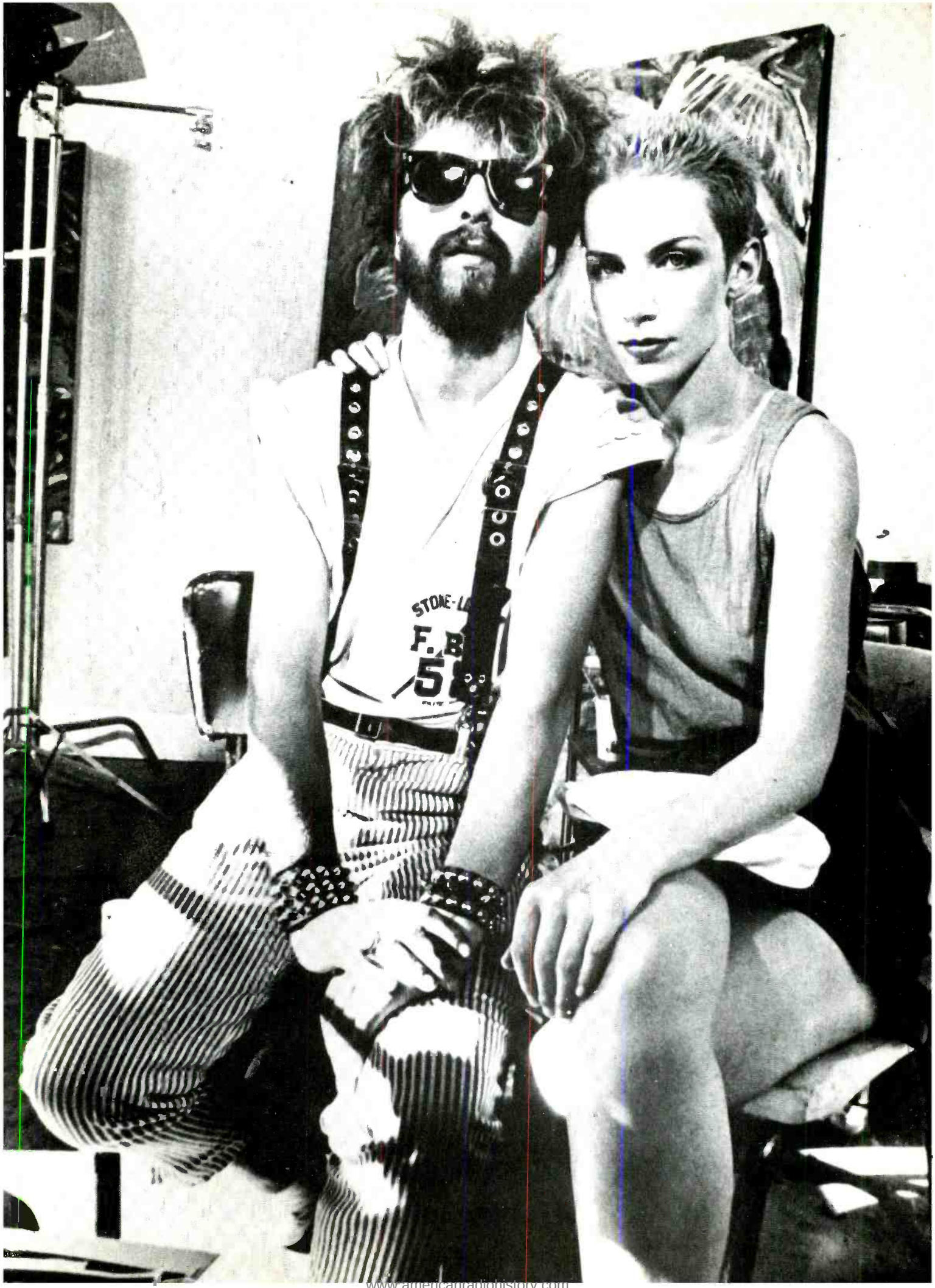
MR&M: Has this technique ever been employed before?

DS: Philip Glass has done it. You always find that when you think you're doing something unusual, somewhere along the line it's been done before. Basically, though, I'm a complete lunatic. My ideas are so off the wall that it used to be that no one would take them seriously. Then you do something that sells a million records and people start thinking that maybe you're not such a lunatic. Now people are giving me money and telling me to do my thing. That's why I now direct the videos and write the scripts, and all that sort of stuff—even though RCA was a bit shocked when I wanted to put a cow in the boardroom (for the "Sweet Dreams..." video).

MR&M: You mention the aural and visual so casually together. Are you suggesting that there is some sort of symbiotic relationship?

DS: Yes. This goes back to our philosophy, and the philosophy of recording. It's about thought structures. People think on different levels. Some people think, "I'll eat this sandwich because I'm hungry," and some people go a bit deeper into it. It's the same with recording. Some engineers say, "I think I'll use some treble boost and record the guitar like this," and other people think, "I want the guitar to sound like it's coming from somewhere over there in the field and suddenly it gets nearer"—thinking more visually as an overall effect, which I'm sure must be the way the Beatles did *Sgt. Pepper's*.... Visual tricks, that's the way we record.

I think that as soon as the industry sees something sells, they wreck it by trying to sign up every possible (band) that sounds slightly like it. There are some greatly inventive groups like Blancmange and Simple Minds, but all we really get are...some manufactured and marketed thing with the most expensive synthesizers and the prettiest looks.



There's a track on our album called "Jennifer" which is about Annie drowning her old personality and bringing forth a new personality, and it's got the sound of the sea on it which I recorded back where I come from on the northeast coast of England. I used a Walkman and recorded it from different distances, and then we slowed it down. We wanted it to feel so intimate that it sounded like Annie was actually whispering in your ear when it was coming out of the stereo.

We recorded that cut—actually the whole album—with two really cheap mics (30 pounds each). When I tell engineers that we did the album with those two Beyer mics they don't believe us. So many of them are convinced that you must use all these different, expensive microphones. Beyers are usually used for high-hats and things like that. We did all of Annie's vocals, the drums—everything—with them.

Again, it's the attitude of recording. We'd rather take the time to get the recording right from the source. The sound of Annie's voice coming out of her mouth has to be reproduced coming out of the speaker. A lot of people lose that sound going through all the intricate circuitry and all the special mics. In the end what comes out is a synthetic sound. When you hear all those vocals that are multi-tracked, sort of layered and textured—like the Foreigner types of bands—it doesn't sound real anymore. When you listen to early Stones records, though, it sounds like Mick Jagger is singing in a room somewhere. It's really basic.

MR&M: What is your objective as a producer?

DS: I record for atmosphere, which is how people used to record in the early days of rock 'n' roll. Like *Sgt. Pepper's*...—to use that album as an example again—the actual sounds, if you analyze them, aren't perfect. There might be noises and bits of distortion, but the overall effect washes over you like a feeling. Early Kinks recording, also—"Waterloo Sunset." Everybody at the moment is going for complete techno sounds, perfect clarity. But I don't necessarily think that has the maximum effect.

MR&M: Eurythmics are often associated with the current wave of synth-pop technocrats—bands like Soft Cell, Depeche Mode, Human League. But your live performances and varying use of other instruments, including horns and guitars, would seem to preclude you from that category.

When you hear all those vocals that are multi-tracked, sort of layered and textured—like the Foreigner types of bands—it doesn't sound real anymore. When you listen to early Stones records, though, it sounds like Mick Jagger is singing in a room somewhere. It's really basic.

DS: We are definitely not just a synth-pop band! Somebody in America wrote the bio before we arrived here. They never would have thought that if they'd seen our last show in England. It was on "The Old Grey Whistle Test" show on TV and we appeared with a 16-piece gospel choir, grand piano, and the national steel dobro guitar. The last thing anyone seeing that could've thought is that we're a pop band. They'd think we were a gospel group. Eurythmics is really a name for a *project*. That's why we didn't call ourselves the So-and Sos. And our project encompasses all kinds of music, films, and video.

MR&M: You and Annie work alone in the studio with only the occasional contribution from an outside musician. But Erythmics one sees on stage is always an unpredictable aggregation.

DS: It's a bit like Bowie, you know. Everytime we play live we appear with a different lineup. It's as if we're solo artists and each time we appear with a different outfit, e.g., a gospel choir. On this tour, we're playing as an eight-piece band. We like to keep our options open. Sometimes we appear as just the two of us with a tape recorder and maybe one other guy hitting strange drums.

MR&M: How do you transfer your studio sound to the stage?

DS: On the album we used a drum computer, mixed with live percussion to get the spontaneous sound. Live, we use drum machines mixed with a live drummer. We have Simmons drums which we mix with real snare drums. Then I play keyboard and guitar with an effects rack which has a space echo, an Ibanez multi-rack [consisting of] compressor, phaser, chorus and distortion. I also have a Roland SH-09 and CSQ-100 sequencer, a Portastudio 4-track cassette with different sounds on it—and it all goes through the different effects so that at any point I can effect what's happening with anybody on stage.

MR&M: Do you feel that there is a difference in your live sound and recorded sound?

DS: Sometimes it sounds more gutsy on stage because you get that adrenalin rush of live performance. We also use a bit more guitar on stage. Not normal guitar, but weird guitar. I think it's boring to just recreate the album. That's why we're always changing the way we play and the people we use. Sometimes we want to lengthen a song, other times we want to change part of it.

MR&M: You noted earlier having worked with German producer Connie Planck (known for his innovative work with Kraftwerk). How did that relationship come about?

DS: We had known him for six years and worked with him at different stages. He produced our first Tourists album and later became a personal friend. He was the only person we trusted to experiment with in the studio. (The result was the first Eurythmics album, *In The Garden*, unreleased in America.)

MR&M: In what way did his approach influence you most profoundly?

DS: It was his attitude. All the other producers we've met seem only to be interested in getting the music to sound professional and polished and getting it done as fast as possible.

We are definitely not just a synth-pop band! Somebody in America wrote the bio before we arrived here. Eurythmics is really a name for a project. That's why we didn't call ourselves the So-and-Sos. And our project encompasses all kinds of music, films, and video.

Connie is more interested in total experimentation, creating a sort of film of sound.

MR&M: Having produced yourself, how would you feel about working with another producer on a future project?

DS: I think I'd find it difficult now because I'm so set in this odd way of recording. I think more traditional producers might be a bit freaked out.

MR&M: Do you see yourself as a [potential] producer of other bands?

DS: Oh yes. I want to work with all sorts of people. But I just don't have the time at the moment.

MR&M: Do you consider your role more that of producer or musician/performer?

DS: I don't know really. It's all mixed up together. I write half the songs with Annie and I also play. As far as the production of Eurythmics, Annie will make suggestions—as a musician would in a studio—but I have the ultimate say.

MR&M: Why, when you became Eurythmics, did you and Annie abandon many of the traditional instruments you formerly played?

DS: Because you become cliched. When you know an instrument inside out, all the various riffs, all the Jimi Hendrix guitar solos, it's very difficult not to allow those things to influence your playing style, and it limits your writing. It's difficult to describe, but if you've been playing something for 15 years, you've [exhausted] all your inspiration from it. So, for writing, I turned to an instrument that I didn't know how to play.

MR&M: The synthesizer?

DS: Keyboards in general.

MR&M: Do you compose all your songs on keyboards?

DS: Yes, because I don't know how to play. I play it live, but I don't know what I'm doing. I just memorize what I did before.

MR&M: What effect does Annie's classical music training have on your creative partnership and Eurythmics' sound?

DS: She understands what I do musically. I'm the catalyst for spontaneous work—walking into a studio with nothing written down and coming out with a song—and Annie is more methodical. She works everything out ahead of time. Together, it's perfect. She lays her music within the framework of what I've created and together we edit her lyrics.

MR&M: What happened to the Tourists? You had some success with your cover version of the Dusty Springfield classic, "I Only Want To Be With You!"

DS: That's just it. We didn't write the songs for the Tourists. We were frustrated. We wanted to write our own stuff.

MR&M: That band was rooted much more in conventional rock 'n' roll.

DS: It was like a typical early Jefferson Airplane kind of thing. The Byrds. Very 60's psychedelia.

MR&M: What are your thoughts on the music scene today?

DS: I think that as soon as the industry sees something sells, they wreck it by trying to sign up every possible [band] that sounds slightly like it. There are some greatly inventive groups like Blancmange and Simple Minds, but all we really get are the Kajagoogoos—some manufactured and marketed thing with the most expensive synthesizers and the prettiest looks. I don't relate to that sort of thing very much. But the trouble is that this stuff gets sold as new music in America, and then Americans think that's what new music is. And it's not.

MR&M: Have you ever consciously set out to try to make a hit?

DS: No. Whenever we've even fooled with the idea, it comes out sounding terrible. You can't really say what a hit is.

MR&M: How do you account for the current success of the album's title track?

DS: I don't know, really. When I hear it on the radio now it sounds like a hit. But while we were making it we couldn't know. We weren't saying "let's do this or that because it will make the song a hit." If anybody knew that formula right off, they'd be instant millionaires. I think what makes a hit is what I said before: getting the feeling right. Like "Love Me Do" by the Beatles. Who remembers the individual instruments? You remember the simple words and the general enthusiasm.

MR&M: What you're saying is that by doing things your way you're more likely to create a record...

DS: That has longevity, because we didn't have some great producer like Alex Sadkin come along and get an amazing sound from an ordinary song.

MR&M: Is there any instrument or type of equipment that was beyond your reach two years ago, but which you'd like to use now?

DS: I'd like to use a Stick bass. But basically I'm more interested in making a sound out of things that you find around the house and mixing them with cheapo synths and organs. A lot of our album features a 1950 Farfisa organ that Annie bought in Austin for $50.00.

MR&M: Is it true that your warehouse days are over—that you and Annie have purchased a large 16th century church in North London?

DS: Yes. We call it The Church. Bands come and hang out, and everyone wants to record there because it's sort of funky and doesn't feel pressurized like an expensive studio. It just feels like a great hangout place with lots of instruments lying around. So far, we've got in it a secondhand 24-track Soundcraft desk, which we've linked together with our old Soundcraft desk, a few little compressors and lots of funny instruments we've collected over the years—South American percussion pieces and things like that. There's a dance studio, film studio, and we have our own offices. And, we plan to start our own label. As soon as we get back from the States, we'll begin recording our next album there: in our own time and our own church.

jeff tamarkin

THE PRODUCERS

paul rothchild & george martin

Paul Rothchild produced all of the original albums by the Doors except their final studio album, *L.A. Woman*. Having thus been involved with that classic rock band from the beginning till nearly the end, he witnessed the rise and fall of one of the most brilliant and enduring musical phenomenons of the past couple of decades.

Rothchild has recently reunited with the remaining three members of the original Doors, Robby Krieger, Ray Manzarek and John Densmore, to produce *Alive, She Cried*, a compilation of "live" recordings made by the group at various locations during the late '60s and 1970. One listen and any Doors fanatic will agree that this album represents some of the finest Doors music ever released. Included are two never-before-heard cover songs: Van Morrison's "Gloria," and the blues standard "Little Red Rooster." Also included are superb renditions of such classics as "Light My Fire" and "Love Me Two Times."

Rothchild was introduced to the music of the Doors by the wife of then-president of Elektra Records Jac Holzman. Although he recalls that the first set he witnessed by the Doors was "terrible," they more than made up for it with the next one, and the Doors were signed. Rothchild, finding lead singer Jim Morrison to be a "brilliant intellect," believed the group would go far. Rothchild turned out to be somewhat of a prophet as their first single, "Light My Fire," and first album, *The Doors*, went as far as they could, straight to number one.

In the following interview, Rothchild recalls his work with the legendary Doors.

Modern Recording & Music: How did the idea for the live Doors album, *Alive, She Cried*, come about?

Paul Rothchild: The Doors thought it would be a good idea to go back and look at some of their live material. We decided to go into the vaults and see what we could come up with, and we went through every tape we could find. Then we discovered that some of the original 8-track masters were missing. We finally found them unmarked in a 13-story Bekin's warehouse in L.A. after literally going through millions of boxes. We went through hundreds of thousands of tapes at Elektra Records' storage facilities and not one scrap turned up from the Doors' missing material, although we found some other very interesting stuff. Eventually the search led to Bekin's, and we located 72 8-track masters. That was the beginning of the assembling of this album. We'd been working off the rough 2-track mixes that we found at Elektra, so we already knew which recordings we wanted to use.

MR&M: Why now, after all these years of the tapes lying dormant?

PR: I'm sure we would've done this album even if the current fame of the Doors wasn't as strong as it is. But in light of the renewed interest in the group and Jim Morrison, there's a whole age group that is brand new to the Doors.

MR&M: Why do you think a group like that, defunct for over a decade, is so popular with young kids?

PR: A lot of things happened coincidentally, including the release of the Doors book by Danny Sugerman and the promotional work done by the Doors themselves. But the key to it started around six or seven years ago, when the punk movement started looking for its own roots and discovered that the Doors were one of the strongest roots to that music. All of a sudden when people from those groups started to be interviewed, the name Doors kept popping up as an influence, just like the groups of the mid-'60s cited their roots as being Chuck Berry, the Everly Brothers, James Brown, etc. The new groups looked back and saw the Doors, the Velvet Underground, and other experimental groups like that. Once they started talking about it, the radio stations started playing the source music and a whole new bunch of listeners discovered this very wonderful American music.

MR&M: What was your background before producing the Doors and how did you come to work with them?

PR: I produced classical and jazz records, then got into producing folk music at Elektra when it was still a very young label dealing with cabaret folk like Theodore Bikel and Oscar Brand. I signed people like Tom Paxton and Phil Ochs. Then I found and signed the Paul Butterfield Blues Band, which was the first electric group on the label. After that, Jac Holzman, the head of Elektra, signed Love, who were playing at the Whisky in L.A. The opening act at that show was a group called the Doors. Jac's wife saw them and learned they'd been signed to CBS for six months, but they didn't do anything with them and CBS didn't renew the contract. Jac called me and told me I had to come out and see this group. I did—and they were terrible. It was one of the worst shows I'd ever seen in my life. But I always give a band a second chance so I stayed around for the second set and then I heard pure, brilliant genius. It was original. The lyrics came from people who actually thought about themselves, the world, the inner space, and all of those very important things at the time. In that set I heard "20th Century Fox," "Light My Fire," "Hello I Love You," and "The End." When I heard "The End," I said "This group may not be famous because they may be too intellectual for everybody, but they have to be recorded." So we signed them and went into the studio. The sessions for the first album lasted six days.

MR&M: What were your first impressions of Jim Morrison?

PR: I thought he was really an amazing person. I'd met musicians who were fine people, but he was the first besides Michael Bloomfield who was a stunning intellect. He was well read and sensitive to things around him and within himself. He was unafraid to reveal himself, to put the vulnerable side of himself on a stage. That was bravery to the extreme in those days when everybody was posturing. He was up there exposing his soul. He became one of my very dearest friends. As the years went by and he started to have more access to money and fame, that's when he started running into trouble. During the first album the trouble showed itself in a delight for LSD. But as time went on, through subsequent records, the acid became minor, as did drugs of any kind, and alcohol became his drug of choice. That was the ultimate factor in his health failure and ultimately his heart failing.

MR&M: How did his drinking affect the music the Doors were making?

PR: By the *Morrison Hotel* album, it was very hard to work with him. The three other Doors were at their wits' end by that point. Jim was not even interested in the studio anymore. He was starting to be uncomfortable in his position as rock star and sex symbol. He kept getting more and more involved in his poetry and wanted to focus his career on the poetry and films. It was very difficult to get him to rehearse and much harder to get him into the studio. Once there it was even harder to get him to come up with the energy needed for a good take. I finally left before the *L.A. Woman* album because I was bored with what was going on on that album except for two tunes: "Riders On The Storm" and "L.A. Woman." The rest I thought was just boring shuffles and sounded like lounge music. I told them the only way they'd get back on track was having to do it themselves. It turned out that my read of the situation was exactly right because they did turn out a very good album, although to this day I still think those two songs were the only good ones. They did put energy into the other songs, though.

MR&M: What were recording sessions like with the Doors?

PR: The first album was pretty much a documentary album because it was the tunes they'd been performing for the better part of a year and a half at that point. They were pretty well worked in. I made some rhythm and arrangement suggestions but rarely made lyric suggestions. I did a lot of editing and gave it better shape. For the second album on, my contribution grew and grew as the material became fresher and fresher. At the risk of sounding self-congratulatory, I think you could say my contribution was at least equal to all of the Doors on every record. I started drawing on my classical background and they recognized that I was bringing in very valuable stuff.

MR&M: It must have been exciting being a producer during that period and watching the technology explode every year.

PR: We actually did bridge the technological revolution in the '60s. The first album was recorded essentially 3-track, which was a boon then because it meant you had ultimate

control over the vocals. It meant you could mix and take care getting the balances right. That first album, we took the three instrumentalists with their four musical parts—Ray Manzarek was covering the bass with his keyboards because the Doors had no regular bassist—and we made a stereo mix on 2-track of those 3 tracks, and then we put Jim's vocal on the third. There was a fourth track on the machine—it was a 4-track machine—and we used that for special effects. Like on "20th Century Fox," I put the band on a wooden platform and had them march in time to the music. Occasionally we used that tape for sweetening. By the time we got to the second album, the Beatles had come out with *Sgt. Pepper's*, which was just so new in its approaches that it encouraged us to just pull out all of the stops and go as far into experimental music as we possibly could. At that point, the 8-track machine was brand new and we got into the first "production music" I had ever done in my life. From that point on, every new album was a move into the cutting edge of musical theory. By the time we got to *Soft Parade*, we were trying to expand to the largest possible audience we could. We got into strings, horns, etc. It did draw a large audience to the Doors but at the same time it caused some of the original fans to say they were no longer a singles rock and roll group, the same as had happened to the Beatles. *Morrison Hotel's* definite purpose was to go as far back to the original format as we possibly could. The Doors all agree that that album was their favorite. The second album was their second favorite, although it was the smallest seller. It's one of the most progressive, experimental albums they did, but it didn't have a single on it. The first had better material, but the second (*Strange Days*) was a better realized record. By *Soft Parade* they were like an aging actress who still had talent, but time had started making their presence a little shoddy. That's when makeup starts being applied in an attempt to hide the most critical flaws. Jim's lack of involvement was the most critical flaw for the Doors. It was the most difficult record to make and the least satisfying. *Morrison Hotel* was a return to the spirit. Jim got very much involved again.

MR&M: What were the differences between recording the Doors "live" and in the studio?

All of a sudden when people from those (punk) groups started to be interviewed, the name Doors kept popping up as an influence, just like the groups of the mid-'60s cited their roots as being Chuck Berry, the Everly Brothers, James Brown, etc. The new groups looked back and saw the Doors, the Velvet Underground, and other experimental groups like that. Once they started talking about it, the radio stations started playing the source music and a whole new bunch of listeners discovered this very wonderful American music.

PR: The same as with any group. In the studio you were able to select every note, either by editing or overdubbing. "Live" performances are frequently extraordinarily flawed. The audience may have had a wonderful time but maybe the singer had a terrible night. So when you remove the visuals and the excitement of the night, what you're left with is the cold, unforgiving tapes. So when you make a "live" album you look for that 20 percent of the performances that were great.

MR&M: How much touring did you do with the group?

PR: I was on the road with them about 30 percent of the time. I was still producing tons of records at the time so I wasn't able to go on every tour. But I was on all the tours when tape was spinning. I didn't go on the longer tours.

MR&M: Were you surprised when Jim Morrison died?

PR: He died only a few short months after several friends of mine died. I was producing Janis Joplin's *Pearl* album when she died. So it was almost like hearing a news report; it almost didn't affect me. Somewhere I knew that the bottom line to Jim's excessive lifestyle was either going to be very impaired health or his death. I started to steel myself against those emotions because it was just too painful. I didn't feel the actual hurt till almost a year later. It was one of those things when you sit down and shake your head and say, "Yeah, well, what can you do?" You become immune. How many times can you get hit in the face? By the fourth or fifth punch you're groggy; it no longer means anything.

MR&M: What was it like getting back together with the other ex-Doors to put together this "live" album?

PR: One of the great delights in my life was getting back together with them to make this new album. Not one of them has laid back on his laurels. Not one has become a drug addict or an alcoholic. Every one of them is a better person than he was back then. Each one is pursuing active careers. Robby Krieger has gone from being one of the greatest guitar players of his age to being one of the greatest guitar players I've ever seen in my life. Ray Manzarek has never stopped and is now moving on to other areas of avant-garde film, video, and his own new record. John Densmore recently performed in a one-man show doing a piece of Sam Sheppard's called *Tongues* and another one called *Skins*. It was one of the greatest pieces of experimental theatre I've ever seen. So not only have I gotten to make a great new record, I've rediscovered some friends, and we're all back in each other's lives.

james f. rupert
michael roberts

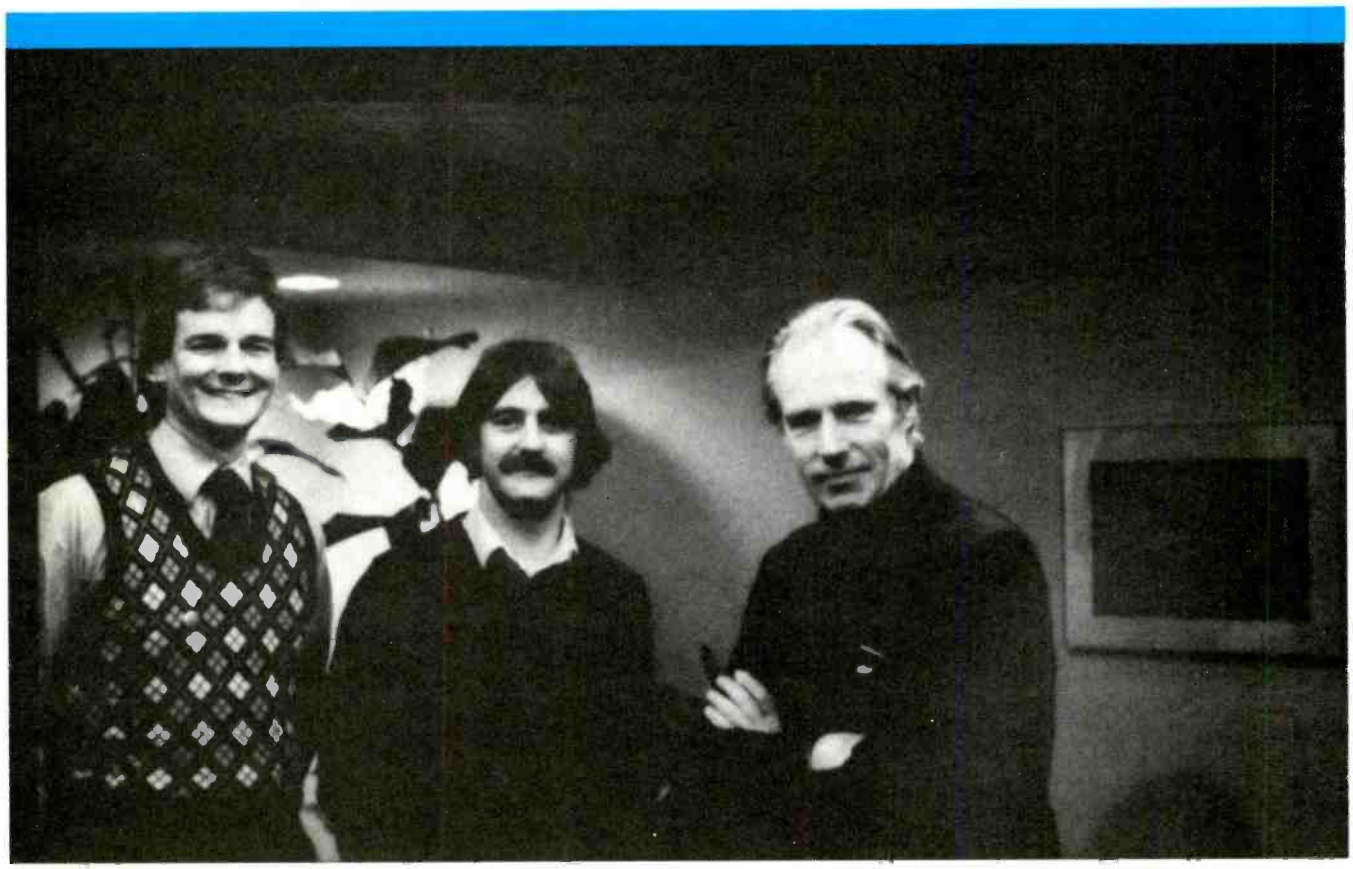
"...I was lucky to come across some very good people."

—George Martin

On a cold November day in 1950, the music and recording industry paid no particular attention to a young man in his twenties bicycling to his first day at work at London's EMI Studios. Almost 33 years later the young man who began as a twenty dollar a week assistant to the head of Parlophone Records has become one of the most respected and sought after record producers in the world today.

The career of George Martin has developed into the stuff of legends. After assuming the position of Artist's manager at Parlophone, following the retirement of former manager Oscar Preuss, Mr. Martin became a vital factor in the success of EMI Studios. In 1963, George Martin produced the top chart recordings for 32 of the 52 weeks of that year, with total EMI domination of the #1 position holding sway for 43 weeks. Beginning with comedy recordings featuring the likes of Peter Sellers, Dudley Moore and Peter Ustinov, Mr. Martin has gone on to work with a diverse range of artists including the Bee Gees, Judy Garland, Mahavishnu Orchestra, Matt Monro, Cheap Trick, Ella Fitzgerald, Ultravox, Cilla Black, America, Sophia Loren and four lads from Liverpool, England, who require no introduction.

During his tenure at EMI Studios (later to officially change its name to what had become its unofficial pseudonym of "Abbey Road" Studios), Mr. Martin also met his wife-to-be, the former Judy Lockhart-Smith.



At Air Studios: (left to right) Brian Cowling, technical engineer; Malcolm Atkin, chief technical engineer; George Martin.

George left EMI in 1965 to form Associated Independent Recording (AIR) with former Abbey Road associates Peter Sullivan, John Burgess and Ron Richards. In so doing, Mr. Martin and company became the pioneers of the modern independent recording producer. AIR Studios in London (coined "The Producer's Studio"), was opened in 1969 with a second studio complex built later at Montserrat in the West Indies.

Having released his autobiographical book, *All You Need Is Ears*, Mr. Martin is currently working on his second book, tentatively titled *Making Music*.

MR&M met with Mr. Martin at AIR Studios London earlier this year. We had been gently but firmly advised by his staff not to dwell on his career with the aforementioned musical group from Liverpool, as he had discussed them *ad nauseum* in the past.

As nervous as this interviewer was, walking into AIR's imposing Oxford Street offices, we were soon put at ease by the kindness, wit and graciousness of Mr. Martin and Studio Administrator Mrs. Do' Bell.

Regular readers of James Rupert's writings in *MR&M* know of his idolization of the accomplishments of George Martin. After completing this interview, Rupert is pleased to report that rarely has such idolatry been so well founded.

Modern Recording & Music: Could you give us a little background on AIR Studios?

George Martin: The studios were built in 1969. AIR Records started as a company in 1965. We'd all been working as producers for other record companies up until that time. There were four of us—four producers—that got together to start AIR. Of the four, only two remain. The others have fallen by the wayside. In 1969 we started to build a studio of our own because the studios we worked in were alright, but not one of them were what we thought a good studio should be. And so we coined the phrase "a studio for producers, built by producers," because most of the studios built up until that time had been built by engineers for engineers or even by back-room boys for back-room boys. Certainly not for producers. So that's what AIR became.

This place we're in now presented a great deal of problems at the time because it was actually a banqueting hall of an old department store. But it was an ideal location for a studio—right in the heart of London.

MR&M: What kind of problems did you run into?

GM: As for problems associated with the work, it had tremendous rumble factor because there are three underground (subway) stations here, a lot of traffic nearby and it is a steel-frame building. So all the studios had to be really isolated from sound. Yet the studios rapidly became the best ones in London.

MR&M: Did you begin by specializing in music recording?

GM: We used to do a lot of film work in the early days, but now we've gotten so much into rock'n'roll music, I think we've actually abandoned our film work for over a year now.

MR&M: You have more than just this one complex, don't you?

GM: Associated with AIR Studios London is AIR Studios Montserrat, begun in 1979 out in the Caribbean. There's a kind of interplay between the two studios in that we have technical engineers and (recording) engineers going out there "on loan" so to speak, and coming back broken men (*Laughs*). We've got a nice interchange of technical facilities between the two. They're very closely aligned, they have the same kind of equipment. In fact, Montserrat was a guinea pig in a way. We had a special desk that was designed for them by Rupert Neve which has now become standard at the studios here.

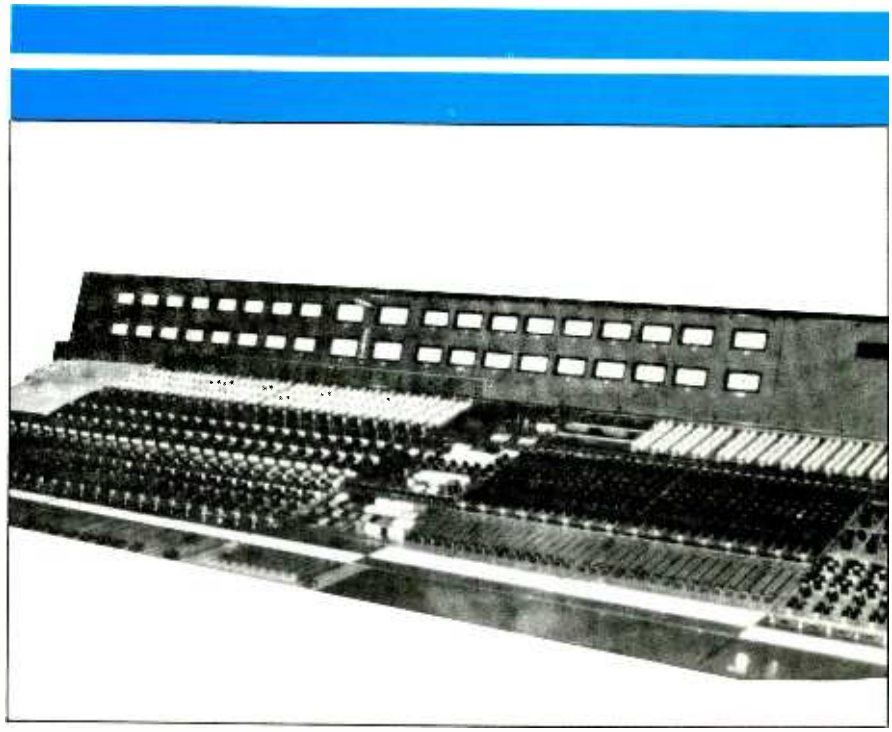
MR&M: You obviously would rather work here than any place else in the world.

GM: Sure. Well, I mean it's a studio that's been built to our concept. I feel comfortable here because everything we do is to my way of thinking and the people are nice here even if they don't get paid too well. (*Low grumbling from others in room.*)

MR&M: Has the world's economic situation affected your business here?

GM: The recession? We've been pretty lucky, really. We've been keeping a fairly full order book here. I think we've had to work harder to get it. It has been tougher, but we're okay. I'm hoping we've gone through the worst of it. We're still doing very nicely in Montserrat, too, which is a "dollar" (based economy) country. But we're very conscious that people are lowering their rates in order to bring in clients.

It's an unhealthy thing because while people are lowering their rates they cannot lower their overheads, and their overheads are going up because of the high cost of technology. Now, if you talk about digital, it costs twice as much to have a digital recording outfit as it does analog. All the hardware continues to go up in price, all the toys you buy, all the outboard equipment—incredibly expensive! I don't really know how some of the studios in America are keeping alive, because they're cutting their prices to the bone.



Air Control Room Two, Neve console.

Our technology is such that we're so governed by vision that people may be bored with just sound in the future, I don't know. It's impossible to chart definitely, but certainly "sound-only" people, I think, are becoming something of dinosaurs. I think you're looking at the last of the dinosaurs now.

MR&M: I'm glad you mentioned digital. There's a lot of debate about analog and digital technology in the industry today. Do you have any preferences here at AIR?

MR&M: We use both. We actually have been experimenting with different digital multi-tracks. We haven't decided on a system yet because I'm examining them all. We've been using the Sony digital two-track for mastering, and I like that, but I'm still looking at the multi-tracks.

MR&M: From a personal level, not necessarily a commercial level, what has been the most satisfying project you've been able to work on in your career?

GM: In my career? (*Whistles*) That's 32 years we're talking about.... Well, a lot of things stand out in my mind, but it's very difficult to take one and single it out from the rest. I mean look at all the ten years worth of Beatles stuff.

MR&M: I was trying to avoid that word, actually.

GM: People say, "What's your favorite Beatle track?" Well, I don't know. We recorded about 300 tracks. You asking what the most notable thing is, is kind of like that. It could be one of those or it could be something that most people haven't heard of. For example, a recording I made with the Winter Consort called *Icarus* is one of my favorite albums, but I don't think many people have heard of it. A recording with the Mahavishnu Orchestra and the London Philharmonic called *Apocalypse*, which was probably one of the most difficult records I've ever made and certainly I'm glad I did it here at AIR because the facilities that I needed were almost unattainable anywhere else. First of all I had to have a symphony orchestra, which meant accommodating 75 people. Plus a rock band, Mahavishnu, which was a very loud rock band with a very good rhythm section. Michael Warden on drums at that time. Michael Tilson-Thomas was conducting the London Symphony. Very, very complicated music. A time signature of 7/8 was considered to be really, really ordinary and we had 15/16 bars alternating with 9/8. The rhythms and the music were very complicated. We tried starting off doing it live because we felt that it was necessary for everybody to feel together. But from the very first moment I knew it was impossible, because the weight of sound of the backing group was about 16 times that of the whole symphony orchestra, and we realized we'd have to separate them. So we put the band in one studio, number four and put the orchestra in number one. We connected them aurally with headphones and also with video screens. We recorded the whole thing on 24 tracks together, alongside each other. Sometimes we overdubbed. Mainly we did it like that, in two studios at once.

At that time I couldn't think of any studio which could offer me those facilities. I was very glad I had that flexibility. It still is one of my favorite recordings. There's a track on it called "Smile Of The Beyond" which is a very slow one in which Gail Moran, who was the keyboard player with Mahavishnu, sang. She is a very fine musician.

MR&M: Have you ever regretted a studio assignment you've accepted?

GM: That I regretted getting into? No, I can't think of anything in particular because I always suss out things well in advance. I get a lot of people asking me to make albums with them, which is very flattering. But I say to them, there's no point in going to the studio unless I like the music and unless I think they're going to be successful *without* me. And if they're going to be successful without me, I'll ride along with them.

In the old days, of course, I was looking for new talent which I hadn't heard before. I don't do much of that now. Most of the people I record have got a track record. But in the days when I was looking for brand new "off-the-peg" talent that hadn't been touched, then I was lucky to come across some very good people. And the ones I didn't record were the ones I rejected. And that was the way it worked.

MR&M: Haven't you been working on a charity project with Peter Townshend?

GM: Yes, it's a charity called the "Prince's Trust," which is Prince Charles' own charity. He takes a very active interest in it. It's a charity designed to help young people in this country, both black and white, to get started on some career or profession. We've even helped bands to get instruments, that kind of thing. In this day of high unemployment where young people just leaving school find it difficult to get anything, it's a good charity. So we put on a concert which the Prince came to...which his Royal Highness came to, I should say. We're just mixing the sound with the video right now. This will be mixed for television and video and possibly an album, I would think.

MR&M: What type of music do you prefer listening to in your free time?

GM: I get so much in my working life that I don't listen to a great deal at home, but when I do it's classical music. I invariably put on a bit of Mozart or a bit of Debussy or a bit of Bach if I'm just relaxing.

MR&M: Is there anything you've never worked on but would like to?

GM: It's an awful thing to say, but I don't think I have. There's nothing *really* I want to do now, I think I've done it. I mean, there's a lot of things that I haven't done, but I think I have done an awful lot of different things.

MR&M: If a novice came to you

and asked for advice in getting into recording and producing, what advice would you give them?

GM: In one word: Don't!

MR&M: That's been a really popular answer for everyone we've asked that question. Why?

GM: Mainly because it's a terribly crowded profession. In fact, a terribly *over*crowded profession. I'm not sure really what the future is going to be. I'm very concerned about it because I think we're in a very great state of flux at the moment. I think recording as we know it is changing very quickly. And the entertainment business is changing very quickly, also. I'm not sure that records as they are now will be around as much in ten years time.

MR&M: Are you referring to the rise in video?

GM: I'm talking video and I'm talking of compact discs and I'm talking of people's habits. If you look at the trend of people's habits, then playing records has gone down in popularity as opposed to playing with, say, video games for a start. That's one aspect of it. Our technology is such that we're so governed by vision that people may be bored with just sound in the future, I don't know. It's impossible to chart definitely, but certainly "sound-only" people, I think, are becoming something of dinosaurs. I think you're looking at the last of the dinosaurs now.

So my advice to young people is, "Don't particularly rush into it." Look around and see what you're going to do. If you decide to go into it, make sure you're good. Because you've got to be *very* good to break through the tremendous amount of competition—the good people that exist here today.

MR&M: How does one go about having George Martin produce their music? Do a lot of people send you unsolicited tapes?

GM: They do. A lot of people who haven't started in the business send me tapes and it's useless really. There's no point in my starting out now. I've done my service. I might listen if someone says they're really fantastic, but I don't think I would ever record them because I'm too busy. It takes a long while to make records nowadays. You can only do so much in a year.

Anyway, I'm getting old and sick and tired and it's about time I packed it in. Let the young people do it.

MR&M: Are you considering retiring, seriously?

GM: (*Pauses*)...I'm considering not working so hard. There's an awful lot of other things I haven't done that I want to do. This year I haven't had a real holiday and I'm sort of anxious to have a little bit more time.

A very good friend of mine is Quincy Jones. He and I are much of an age. He's a bit younger than I am, I think, and he works incredibly hard. When I last spoke to him I said, "You know, Quincy, it's time you eased up." He said, "Look who's talking!" As we talked about it he said he's got so much on his plate, he's got certain projects to do—he's running his own label, he's producing Michael Jackson and Donna Summer, and so on. Then he said, "Well, I've got this to do. I know what I've got to do and then after I've done all those things... Man, I'm going to sit down for a bit."

I feel rather like him. I've my commitments which carry me through until about next May, and I'll be working solidly until May, and then...and then I want to sit down for a bit—I think.

denny andersen

So You Wanna Be a Rock'n'Roll Star: Part II

In Part I of this series we took a look at what it takes to make a demo effective. We looked at the way record companies conduct their search for new talent, zeroed in on what they look for in demos, and offered a few suggestions to help you begin incorporating these qualities into your own tapes.

Now it's time to talk strategy.

The first thing to do is take a realistic look at yourself and determine what your strengths are. What's unique about you that makes you commercially attractive? Is it your lead singer's personality? Your guitar player's distinctive style? Your sister's tuba playing? Whatever it is, you have to identify it and bring it into clear focus on your demo tape.

I'll give you an example. Quarterflash started out as a bar band that played a wide range of musical styles—everything from 30s swing to original rock. Lead vocals and solos were passed from player to player in order to create a show with as much variety as possible. When the band decided to make a demo and go after a recording contract, they narrowed the focus down to their strongest commercial assets—their original rock material and sax player Rindy Ross. The demo consisted of their three best original tunes, arranged to showcase Rindy's lead vocals and sax work.

Okay, so you've identified your commerical strengths and focused your energy on them; the next step is to decide the best route for getting them down on tape.

The big question here is whether you should plan to book session time in a professional studio or whether to invest in a small demo studio of your own. There are advantages and disadvantages to either approach.

Recording your demo at home gives you unlimited time to experiment and become comfortable working in a studio environment. It forces you to learn the recording process from the ground up—a potentially valuable experience for the aspiring recording artist.

On the other hand, you almost certainly won't be able to afford a home recording set-up that can match the technical specs of a good professional studio. You'll have to work much harder and longer to come up with a professional-sounding demo at home. You might be better off spending your time and energy on musical development.

Only you can decide which route makes the most sense for your particular situation. With Quarterflash, we went the home studio route because it was better suited to our specific needs. But with another band it could easily have made more sense to simply book a few hours of session time. The important thing is to explore all your options before you make your decision, and then take the approach that works best for *you*.

Preparing For Your Demo Session

I cannot overstate the importance of adequate preparation *before* you go into your session. I won't harp on this; it's simply an absolute necessity if you are to succeed. Enough said? Good, let's get to work.

Start with your material. Remember, the number one thing the record company will be listening for is *original material with strong commercial potential.* (It may be helpful for you to review Part I at this point.) Pick your three best songs. Putting more than three or four songs on a demo is a waste of time—the A&R people won't listen to any more than that anyway. It will be assumed that you've put your best stuff first, so if you haven't hooked them with the first song or two they won't bother listening to the rest. (Try going through a hundred tapes before lunch tomorrow and see what *you* do!) If you do hook them with a short tape and they want to hear more, they'll let you know.

Arrange each song into a tight commercial format, as discussed in Part I. If you plan to record material you play onstage, be sure to take an extra careful look at your arrangements. Live arrangements tend to be stretched out—longer intros, extended solos, repeated verses—and there's a tendency to hold back for the big climax at the end. For your demo recording the arrangement should be much tighter. You want your hooks right up front; you want everything condensed down to its hottest essence. This isn't always an easy thing to achieve—especially if you've very familiar with the material and used to hearing it a certain way. Any re-arrangement of something you're used to is likely to seem strange at first. Don't be tempted into putting a fifteen-minute guitar solo on your demo just because you're used to hearing it in the song. If you find you really can't work a song into a tight commerical arrangement, scrap it and pick a different one. Be ruthless with yourself. The record company

is not going to give you one hundred and fifty thousand dollars to record something they can't sell.

Once you've selected your very best material and worked out the basic arrangements, it's time to rehearse. Rehearsing for a recording session is a little different than rehearsing for a live performance. While you may opt to just set up in the studio and record everything "live," with everyone playing together, the more common approach is to break the recording down into separate overdub sessions. Generally, the basic rhythm track (drums, bass, rhythm guitar) is recorded first. Then the background sweetening, lead vocals, and solos are added separately in overdubs. Keep this in mind as you rehearse. Spend some time working with the rhythm section alone. Listen carefully to what each of the instruments is doing, and work toward a tight, punchy feel with lots of energy. Remember to leave plenty of space for the other parts that will be laid over your rhythmic framework. Don't let the rhythm section get too cluttered. There's a natural tendency for musicians to embellish their parts as they become more familiar with them. This can work to your advantage, but don't let it get out of hand. You may find you can achieve a more powerful recording by working "backwards," toward simplicity rather than embellishment.

Once the rhythm section is solid, go through the background vocals separately. Then do the same with the solos, sweetening, and so forth. Breaking the tune down like this can be very helpful, even if you don't plan to do any overdubbing at all. You can save yourself a lot of trouble by isolating problem areas in rehearsal instead of discovering them unexpectedly in the middle of your session.

During your rehearsals, take some time to check your equipment. Demo musicians rarely have brand new gear in tip-top condition; their equipment is often road-battered and poorly maintained. In a live show you'll never notice that rattle in your amp handle or a squeaking hi-hat stand, but in the studio they can give you fits. It's not at all unusual to spend the first couple hours of a session eliminating stray rattles, buzzes, and resonances from the band's equipment. It pays to get your gear into shape *before* you go into your session—especially if you're booking time. Spend a couple of free hours at home going over everything.

Drummers should be especially conscientious about this. The first thing the engineer will do is set up the drum sound. Nothing will kill your session faster than a set of poorly maintained, improperly tuned drums. Your ability to quickly achieve a good clean drum sound can keep everyone's momentum up and establish a positive atmosphere for the entire session.

Studio Musicianship

You're all set: You've zeroed in on your commercial strengths, you've rehearsed your material into shape, and you've checked and double-checked your equipment. So what can you expect the actual session to be like? Is there anything unusual about playing in a recording studio that you should know about?

You bet there is. Playing in a recording session is very different from playing in a club or in a rehearsal room. Studio playing is really an art unto itself—as different from playing live as sculpture is from painting. This can throw you quite a curve if you're not expecting it. All too often the first demo session winds up being little more than a very expensive lesson in basic studio musicianship. Since you want to avoid that, we'd better take a quick look at the peculiar demands of studio playing and see what you'll be up against in there.

To begin with, playing in the studio has a whole different *feel* than playing live. The whole atmosphere is much more precise and carefully controlled. Onstage or in rehearsal you can get away with more mistakes; a little slip or glitch goes right by, often unnoticed, and then it's gone. In the studio the slips are more apparent, and that little glitch will come back to haunt you during playback. As a result, the musicians tend to focus all their concentration on not making any mistakes, and the spark and energy in the music suffers accordingly. You will have to strike a delicate balance between precision and spontaneity—and that can get tricky.

You may find yourself playing alone, either separated from the other musicians in an isolation booth or adding your part later in an overdub. You'll be playing along with the others in your headphones, but you may not have the benefit of eye contact and body language to keep you in precisely the same groove. If you're overdubbing you'll have to match the subtle, unyielding tempo fluctuations of the previously recorded tracks. All this may cause you to play a little stiffly—the music won't seem to "breathe" quite as naturally.

Studio work is exhausting, often in a very insidious way. It's hard to stay fresh and objective after hearing the same song over and over for hours at a time. Even without major hitches, you should be prepared to do a lot of waiting around—waiting for technical adjustments to be made, waiting to overdub your part, waiting for a myriad of tiny delays. In a live show things move along in a more or less continuous musical stream. In the studio the musical flow is constantly being interrupted. You'll have to work at staying sharp and maintaining your performing "edge."

Understand right from the start that you'll be cooped up in a little padded room, listening to the same song for hours on end; you'll be expected to perform under pressure in an unnatural and exhausting musical environment. At this point you may rightly point out that this sounds like some especially perverse new form of torture! Welcome to the glamorous world of the recording artist. Actually, it can be a lot of fun—if you're prepared for it.

A contract-winning demo doesn't come easy. It requires consistency and precision, coupled with that elusive spark of energy that makes the music come alive. This is an extremely tricky balance to achieve, yet it's the crux of the whole recording process. Even the best artists and producers must constantly confront this same fundamental challenge. Their sessions are the same as yours in this most vital respect. In the end it doesn't really matter whether you're working with a four-track deck or a state-of-the-art digital studio—a great song recorded with sensitivity and skill will transcend your immediate technical limitations and touch the listener. And that, of course, is the name of the game.

In Part III we'll begin going through the actual recording process, step-by-step, with the emphasis on getting big-league results from a basic 8-track home studio.

len feldman

Ambient Sound

Multi-channel TV Sound—A Status Report

By the time you read this, the United States may well be on its way towards beginning TV stereo broadcasting. Before I get into that, though, let me explain the slightly modified format of this column. The publisher and editors of *MR&M* and I, in a recent discussion, concluded that audio and video recording are becoming more and more intertwined, what with such video innovations as Beta HiFi (the first really good stereo sound available on home video recorders), VHS HiFi (still a few months away, but now firmly established as a competitor to Beta HiFi), the combining of PCM processors with VCRs (an approach being followed even by small, low-budget recording studios who can't afford pro' digital equipment that larger studios employ) and more. It seems altogether fitting, therefore, that I should expand the scope of this column to include subjects that are either audio- or video-oriented—or both. After all, the name of this publication, *Modern Recording & Music*, was never meant to rule out recording on video tape and, these days, there's plenty of music recorded for TV—both for over-the-air broadcast and down-the-cable transmission. Anyone who has witnessed the overnight success of Warner's MTV will attest to that.

So much for old business. Now for the audio/video subject at hand—a status report on Multi-Channel TV Sound. To understand just where the matter stands, it's necessary to review a report issued by the FCC on July 29th, 1983, which dealt with the Commission's Docket #21323. In essence, the Commission has proposed to permit television broadcast licensees to use the TV audio baseband for a variety of uses in order to provide a broad range of services.

The FCC decided that it should further relax restrictions on audio subcarrier transmission by television stations. It proposed to allow both commercial and noncommercial stations to engage in unrestricted operations using a wide range of technical systems, subject to other applicable provisions of its rules. Among the now-prohibited broadcast-related uses that would be allowed are multi-channel and stereophonic sound for regular programming, provision for program-related information for viewers with impaired hearing or sight, storecasting and background music. Non-broadcast related uses could include paging services, electronic mail delivery, facsimile services to offices, and even such unusual uses as control of traffic lights and signs.

The Commission pointed out that the potential for use of the broadened audio baseband is great. Each of the 786 commercial stations and 273 noncommercial stations now on the air could be providing subcarrier services. Thousands of hours of service could be provided at virtually no additional technical cost to the stations, according to the FCC.

Earlier in 1983, in another rulemaking decision, the FCC expanded the permissible use of FM subcarriers (so-called SCA service) to include a wide variety of broadcast and nonbroadcast services. The new proposal for TV broadcasters is similar to the uses authorized at that time for FM radio. The TV rulemaking docket goes back to 1977. In 1979, the Commission proposed to permit use of TV audio baseband subcarriers for cueing and coordinating purposes in electronic news gathering. That proposal was formally adopted in 1981.

Another Marketplace Decision

In the status report, the FCC said it proposed an "open-market" approach to permit licensees to exercise their own discretion in selecting services to offer the public. What this means is that the proposed rulemaking would eliminate restrictions on the use of TV audio subcarriers without actually specifying any uses or standards. This is the same sort of position that the FCC took more than a year ago with respect to AM Stereo broadcasting. Many industry experts maintain that the slow progress being made in the field of AM Stereo is, in large part, due to this marketplace type of decision. Radio stations are reluctant to get behind a specific AM stereo system (there are

four systems that are in the competition), and receiver manufacturers are reluctant to incorporate a single system (since it may not become the system of choice). While radios with circuitry for decoding all four systems are possible (some have been shown by Sansui and Sony), such multi-system receivers are obviously more costly to produce.

In view of the possible ramifications of such a marketplace decision, the Electronic Industries Association (EIA), in cooperation with the National Association of Broadcasters (NAB), have adopted a course of action through their Multi-Channel TV Sound Committee which, they hope, will prevent the same kind of stalemate in stereo TV sound that has occurred in the case of AM stereo. The EIA committee has been at work on the problem of standards for stereo TV and other additional audio services for TV for more than four years now. They have been testing three basic transmission systems: one proposed by the Electronic Industries Association of Japan (EIAJ), another by Zenith Radio Corporation, and a third by a small engineering firm called Telesonics, based in Chicago. After modifications to some of these systems, all have been shown to provide reasonably good stereo reception, and all make provision for at least one Secondary Audio Program (SAP), which might take the form of a second-language dub (for movies, etc.) or even a totally unrelated audio program.

However, all three systems, introduce a signal-to-noise degradation of approximately 15 dB. In the case of the SAP channel, total signal-to-noise ratio in a Grade-B signal contour (suburban reception) is only 26 dB. The EIA committee has proposed that some form of companding be incorporated right from the start in any stereo TV or subsidiary audio channel broadcasting to offset this loss in S/N ratio. As you might have guessed, several proponents came forward with companding noise reduction systems. At the moment, they include Dolby, dbx, and a modified form of CBS's CX. A fourth contender is Straight Wire Audio, who represent a modified version of the well-known Telefunken High-Com companding system.

During the first technical tests of the three basic transmission systems, modifications were made to at least two of the systems. Accordingly, additional tests had to be conducted. As for the companding system listening tests, these have had to be repeated recently, too. First tests simply used random noise, such as that which would occur at the aforementioned Grade-B receiving site. In fact, however, noise that appears in the audio channels of a TV receiver includes other impairments, generally caused by video signal interference in the audio channel or channels. Such impairments are variously described as "buzz" and "buzz beat" and are of a more coherent nature than simple random white or pink noise.

As of this writing, the EIA MTS Committee is racing against time to complete all remaining tests, both of the basic transmission systems and of the four proposed companding systems. Once the data is amassed, it will be disseminated to various segments of the industry (such as broadcasters, receiver manufacturers, etc.) who are then expected to vote for the best system. The Committee hopes that if the industry as a whole can agree upon a single system before the FCC issues its actual rulemaking decision, the expected marketplace decison will not have the devastating effect upon stereo or multi-channel TV that it has had upon AM stereo.

Why the deadline? Simply because the commission will set a 90-day period for comments, followed by another 30 days for reply comments. That puts the FCC decision sometime before the end of 1983. Once a marketplace decision is made, the EIA Committee can no longer function, for it would then be regarded as in violation of this country's antitrust laws. That may sound strange to you, but such are the mysterious ways of our legal and judicial system.

What does all of this mean to those of us who are involved in audio recording? A great deal! Once stereo TV arrives, mixing requirements are going to be radically different from what they are in mono TV production. For example, CBS Technology Center has been demonstrating what they call "triphonic" TV sound, in which dialogue tracks are all mixed to a center channel which remains with the TV receiver in a home setup, while background music and other sounds not related to the actors' dialogue are channeled to left and right stereo channels. The third channel output could, of course, be derived from an L+R mix or, in a more sophisticated approach, be transmitted via that SAP channel I talked about earlier.

The Role of Cable TV

Cable TV operators, or at least some of them, have had stereo available to them in one form or another for some time. The most popular approach, as far as the home viewer/listener is concerned, has been to convert the stereo signals to an FM radio frequency (between 88 and 108 MHz), thereby allowing the viewer/listener to tune in to the stereo sound on his or her stereo FM system while watching the cable picture on a TV set with its volume turned down. There are indications that some or all of the transmission/companding systems now being tested for over-the-air use may cause problems if adopted for cable use. Initially, cable operators chose to ignore the work of the EIA MTS Committee. Now, however, with FCC decisions imminent, the Cable companies have shown a greater interest in what is going on in the committee. Many feel that the technical problems (for cable) inherent in the chosen system will ultimately be resolved so that viewers won't need a separate kind of setup for cable stereo TV and another type of setup for over-the-air stereo TV.

Many television set makers have been studying the three proposed transmission systems for some time now, and are ready to produce stereo TV sets just as soon as they can tool up—once they know which system is to be favored. From all indications it appears that a serious start for TV multi-channel audio in this country will take place in the Spring of 1984. Stereo TV has been widely and enthusiastically accepted in Japan (where it has been available for nearly five years) and in West Germany (where it has been available for two years, using the completely different system developed by the Germans for the PAL TV system used in Europe). My guess is that once it is introduced here, with the additional possibilities offered by the SAP channel, we should see a further tie-in between good audio and video. And that means a broader scope of audio recording activities—for serious amateur recordists and professionals alike.

len feldman

Lab Report

Orban 245F Stereo Synthesizer

General Description: The Orban Stereo Synthesizer is a signal processor that turns any monophonic signal source into a pseudo-stereo program. The resulting pseudo-stereo is created in such a way that it does not degrade the quality of the mono recording.

Synthetic stereo in the Orban 245F is created by a complementary comb filter derived by a patented phase cancellation technique. The spectrum of the incoming audio signal is divided into five bands, each approximately two octaves wide. These bands are alternately placed in the left and right channel outputs to produce a convincing stereo illusion of channel separation, depth, directionality and even channel balance.

One of the chief virtues of a device such as this is that it provides complete mono compatibility. This occurs because the electrical sum of the two output channels is proportional to the mono input to the synthesizer. A listener/user can recover the original mono signal simply by summing the two "stereo" channels. This means that FM mono listeners, for example, will hear the original mono source when listening in mono to an FM stereo station that employs the synthesizer for creating a stereo effect with mono program sources. It also means that, in the case of a stereo disc that was mastered using the synthesizer, lateral modulation on that disc will also represent the original mono signal, since lateral modulation is the sum of the left and right stereo channels.

Control Layout: All of the controls on the slim front panel of the Orban Stereo Synthesizer are clustered near its center. Two DIMENSION controls at the left vary the relative positioning of the comb-filtered frequency bands. A STEREO/MONO switch just to the right of the dimension controls allows for a quick comparison between the original mono sound and the stereo-synthesized outputs. A SEPARATION control further to the right on the panel allows for reduction of the apparent stereo separation by partially re-mixing the channels together. According to Orban's instruction manual, this control may prove useful in permitting more natural headphone listening or in reducing the vertical excursion of a disc cutter during the making of a master disc. Reduction of apparent separation will also tend to increase mono loudness in FM stereo broadcasting.

A GAIN control located to the right of the separation control is located between an active-balanced input stage and the signal processing circuitry of the syn-

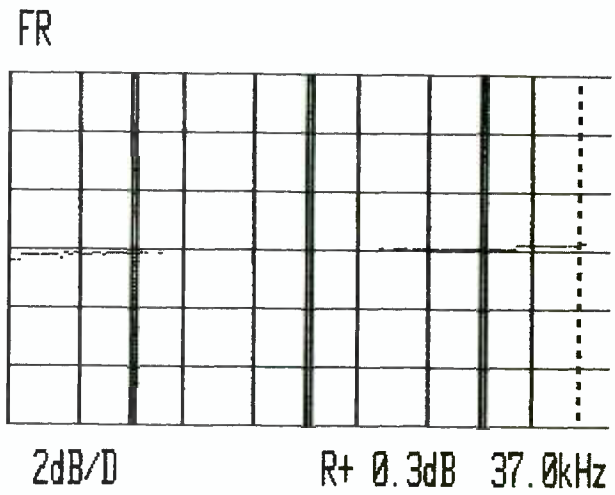
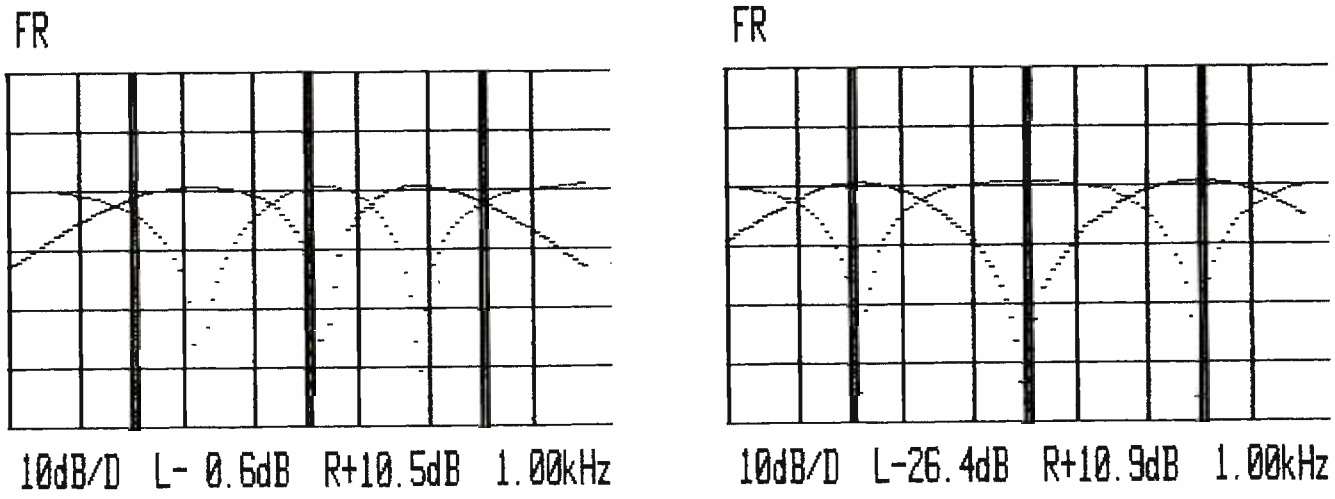


Figure 1. Frequency response of the 245F with switch set to mono. Vertical scale is 2 db/division. Sweep is from 20 Hz to 40 kHz.



A) B)

Figure 2. Plot of left and right channel response, with LOW and HIGH dimension controls set to "10" and "0" (A) and to "0 and 10" (B). SEPARATION control is at maximum.

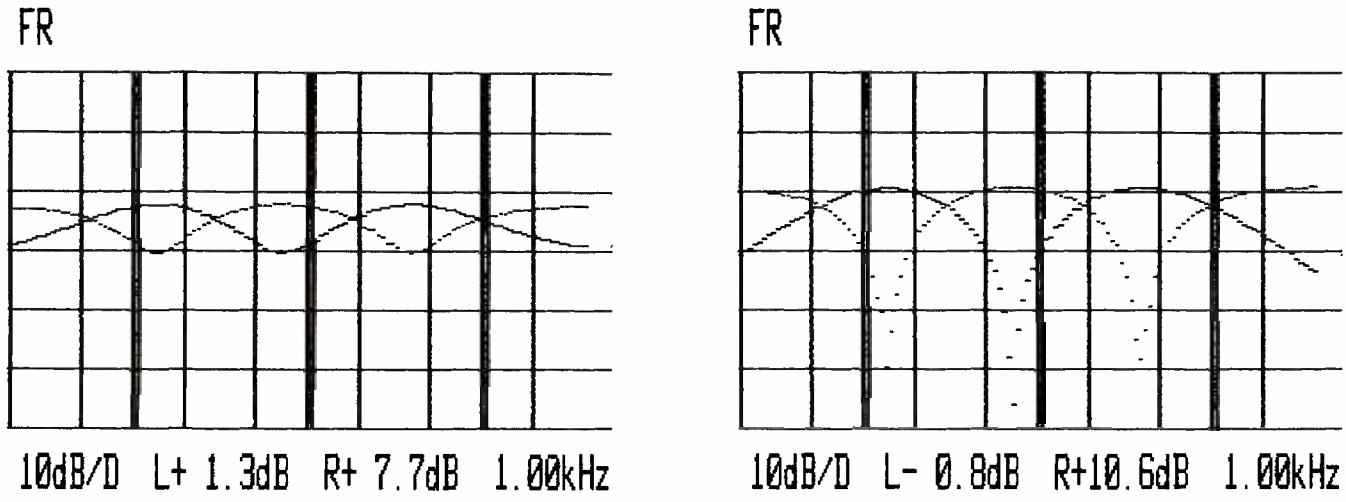
thesizer. Therefore, while this gain control cannot prevent overload of the input stage due to excessive drive levels, it will alter overall gain of the system to match levels of other program sources or to accommodate succeeding equipment into which its output is to be fed. In its full-open position, the gain control will provide 9 dB of signal gain from input to output. A power switch is located at the right of the front panel.

With the synthesizer in the signal path, its power must be turned on even if the stereo/mono switch is in the mono position, since the signal goes through several active stages even when stereo synthesizing is bypassed.

Test Results: There are relatively few meaningful measurements that can be made on a device such as the Orban 245F. These are tabulated in our VITAL STATISTICS chart at the end of the report, and all of them essentially equaled or bettered the manfacturer's published specifications. Frequency response, with the selector switch set to mono, was essentially flat throughout and beyond the audio spectrum, as indicated by the response plot taken with our Sound Technology 1500A test system and reproduced in *Figure 1.* Harmonic distortion, with the switch set to mono, hovered around the negligible 0.01 percent mark at all audio frequencies—well below the 0.1 percent limit set by Orban in its published specifications.

Our frequency plotting system enabled us to depict the action of the comb-filter, channel splitting circuitry of the synthesizer graphically, since that instrument allows the superimposition of two response plots (in this case the left and right channels) on a single graph. To obtain the response plots shown in *Figure 2A* we set the LOW and HIGH dimension controls at 0 and 10 respectively, with the SEPARATION control set to maximum (10). For the plots of *Figure 2B*, we reversed the settings of the low and high controls, while maintaining the setting of the separation control at its maximum. Comparing the results of *Figures 2A* and *2B*, the shift in frequencies at which maximum separation between channels occurs is clearly evident.

In *Figure 3A* we plotted response for both channels again, this time having adjusted all three controls to their mid-points. Here, the effect on degree of separation is apparent, while further shifts of frequencies of maximum separation are less apparent but nevertheless evident. Finally, in *Figure 3B*, we left the two dimensions controls set to their mid-positions, but increased the separation control once more to its



A) B)

Figure 3. Response plots, as in Figure 2. However, dimension controls are both set to mid-point ("5"). Separation is set to 5 (A), and to 10 (B).

maximum setting. Note that only the amount of maximum separation has increased, while center frequencies (those frequencies at which the maximum difference in amplitude between channels occurs) remain as they were in *Figure 3A*.

Comments: Being something of a purist myself, I questioned how effective a stereo synthesizer could be, no matter how cleverly it was designed. Having listened to this device with a variety of program material, I must confess that my respect for Orban Associates has grown tremendously. Of course, much is dependent upon the nature of the program source and, as suggested by Orban, each type of program material requires a somewhat different setting of the 245F's controls for optimum stereo synthesis. We found, as did Orban, that if a single "best compromise" setting is desired (in other words, if you don't want to keep readjusting the dimension controls with every change of musical material), that best setting is around 3.0 for the LOW dimension control and about 7.0 to 8.0 for the HIGH dimension control.

As an experiment, since our lab is fully equipped with FM stereo generating equipment, we fed the outputs of the stereo synthesizer to our FM stereo signal generator, picked up the resulting program material on a high-quality FM tuner, and conducted a series of A-B comparison tests with the FM tuner set to the mono mode. The comparison tests were made by switching the Orban 245F's Mono/Stereo switch back and forth between the two settings. Once we adjusted all gains correctly, there was no audible difference, confirming Orban's claim regarding mono compatibility of the sum signal derived from the two synthesized stereo channels.

Of course, a more important test is the one we conducted with the tuner set to its FM stereo mode and the synthesizer set to simulate or synthesize a stereo effect. I won't claim that the effect delivered was as good as some of the best stereo program material I've heard on records or over the air, because it wasn't. But I will say that the effect (call it stereo, synthesized stereo, or whatever you please) was a good deal better than some of the poorer stereo mixes I've heard in recent years that were "real" stereo to begin with. And that, believe me, is meant as a compliment to the Orban designers. If you have need of a stereo synthesizer for whatever purpose, this is definitely one to listen to and consider.

ORBAN 245F STEREO SYNTHESIZER: Vital Statistics

SPECIFICATIONS	MANUFACTURER'S CLAIM	LAB MEASUREMENT
Frequency Response (Stereo sum signal)	20 Hz to 20 kHz, ±1 dB	20 Hz to beyond 40 kHz
Total Harmonic Distortion	Less than 0.1%	0.009% at 1 kHz; 0.01% at 20 kHz
Signal-to-Noise Ratio	Better than 80 dB	78 dB (82 dB A-weighted)
Available Gain	9 dB mono; 14 dB peak, stereo	Confirmed
Absolute Overload Level	+26 dBm	+26 dBm
Maximum Output (into 500 ohm load)	+19 dBm	+20 dBm
Power Requirements	115-230 V 50/60 Hz, 2 VA	Confirmed
Rack Panel Requirements	1¾" x standard 19"	Confirmed
Shipping Weight	7 lbs.	Confirmed
Suggested Price:		

Circle 35 on Reader Service Card

ken pohlmann

Hands On

The Technics SV-100 Digital Audio Processor: An Equipment Profile

The Technics Digital Audio Processor is representative of the first digital audio products to be designed specifically for the consumer market. It is expected that the Compact Disc and digital tape formats will gradually push the LP and the analog cassette and open reel into antiquity. There is no precedent for such a technological and marketing coup. The historical changes from cylinder to disc, from 78 r.p.m. to 33⅓ r.p.m., the introduction of the audio cassette, and even the sudden transition from monaural to stereo are not comparable in the scale and sheer dramatic change to the coming transition from analog to digital audio.

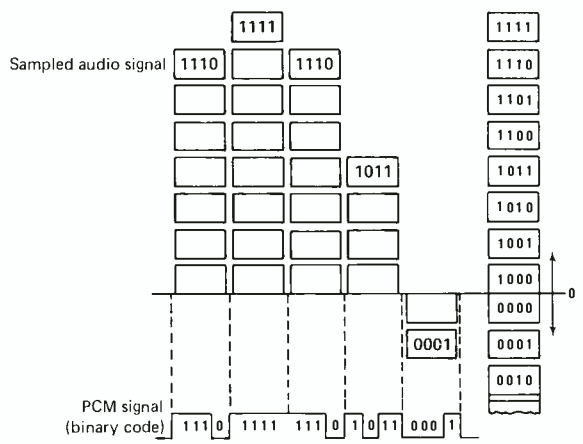
The early digital products will long be remembered simply for being the first of their kind, but more to the point, in terms of immediate survivability, how does the sound quality of these digital products compare to current analog products, especially with regard to price? In other words, are they competitive, and are they competitive enough to stand against a century of analog recording technology? The Technics SV-100 processor offers the perfect opportunity to judge a new product on its merits alone and venture a guess as to its future.

The art of recording entails the study of aesthetics, musicality, creativity, and a host of scarcely definable parameters. The science of recording is simply a matter of information—primarily, how to store information. In the past, the audio community, and the world in general, has relied on analog methods of storage and has been well-served. But as the technology-created "Age of Information" accelerates our desire and need to deal with data, we devise vastly more efficient ways to store information. Of course, these ways are digital. Circuits pump data through communications networks like the heart pumps blood through the arteries, while the computer-brain coordinates all activity and accumulates the information it has experienced and created. The situation is not much different in the audio community; to keep pace with the accelerating data flow (or in this case, the demand for higher fidelity music reproduction), audio technology is increasingly turning to digital solutions.

Information Storage

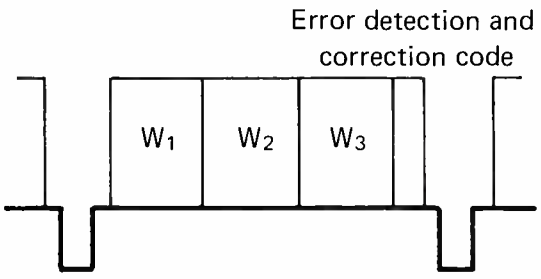
Although many digital information-carrying schemes are possible (and much more elegant ones remain to be devised), the one most currently popular is the Pulse Code Modulation system. PCM samples an analog waveform and takes a discrete value from a quantizing scale closest to the analog value to form a binary code; the sampling rate determines high frequency response and the length of the quantizing table determines signal-to-noise ratio. *Figure 1* illustrates sampling and quantizing and shows how the resultant bit stream may be multiplexed to form a stereo channel. Familiar forms of analog distortion such as harmonic distortion, wow-and-flutter, tape hiss, etc., are not present in a PCM signal. However, the nature of PCM creates its own digital artifacts. For example, quantizing noise occurs in lieu of an analog noise floor, and there has been discussion about the sound of extreme high frequencies in digital recordings. For most listeners, digital artifacts are much less obvious than analog distortions, thus proving the utility of employing digital means such as PCM for storing audio information.

Another factor of critical importance in information storage is the recording capability of the recording medium. The bandwidth of the medium determines how much information may be stored per unit of medium. A digital signal demands a very large bandwidth medium; for example, a PCM recorder sampling at 44,056 samples per second over a 14-bit scale



NOTE:
This chart is an example of 4-bit quantizing.

Figure 1. Sampled audio data and the resultant PCM signal.



NOTE:
W_1, W_2 and W_3 are sampled and quantized signal.

Figure 2. Conversion to NTSC format with standard vertical and horizontal TV signals added.

requires a bandwidth greater than 2 MHz. This far exceeds the capability of an analog recorder and necessitates the development of new storage media. Laser discs and fixed-head tape machines have been devised, but a particularly ingenious technique borrows video technology, which requires high bandwidth digital storage. Specifically, the audio data is fitted into a video signal format and fed directly into a video recorder as if it was video information. The result is a cost-effective medium using widely available hardware.

Video, Minus the Picture

The Technics SV-100 uses both PCM and video technology to achieve high performance at a modest cost. It is a 44.1 kHz sampling rate, 14-bit system which accomplishes the digitization of the audio signal and converts the bit stream to a video format. From there, the signal is applied to a separate video recorder for storage. Upon playback, the video recorder outputs the signal to the SV-100 for conversion back to audio. The only video involved in this VCR system is the signal that has fooled the VCR into storing the data; there is no video picture, only high quality digital audio. The mechanism of the conversion is shown in *Figure 2*. The binary code is converted into a standard EIA/NTSC TV signal, with standard vertical and horizontal TV sync signals added. After conversion, the signal leaves the SV-100 for any EIA/NTSC recorder (Beta or VHS), which is the standard in the U.S. and Japan, but incompatible with the European CCIR/PAL or SECAM. Thus the SV-100 can only be used with an EIA/NTSC recorder; it will not operate with a CCIR/PAL or SECAM recorder. (Our digital audio cassettes or video cassettes wouldn't work there either [sorry, Wolfgang].) During playback, the signal is retrieved by the video recorder and sent back to the processor where it enters a buffer while error checks are performed; data is clocked through a D/A converter and low pass filter and passes to a conventional audio playback system consisting of amplifier and speakers.

Specs

The SV-100 is a beautifully portable package. Much of the circuit complexity has been distilled into two large-scale-integration (LSI) chips used for the digital signal processing. The MN 6601 takes the binary data from the A/D and adds error detection/correction code and performs the conversion to a video signal. The MN 6602 is used during playback to perform error detection, convert the video signal to PCM, and send serial data to the D/A. Together, these two chips are the equivalent of about 500 conventional ICs. Other chips include the A/D and D/A, and support chips. This technological emphasis on size (and price) reduction results in the SV-100's small package. Its dimensions are about $10 \times 10 \times 4$ inches, it weighs about 7 pounds, and it can operate from an internal rechargeable 12-volt pack, or an external AC adapter (SH-V100). When used with a portable recorder such as the Technics PV-A110, a very satisfactory remote recording package is obtained; the processor has an 8-ohm headphone output and volume control, low impedance microphone inputs, and high impedance line level inputs. For those who already own a VCR, the SV-100 is the logical choice; also available is the SVP-100, a single package with both recorder and processor.

The specifications for the SV-100 are impressive—and typical for a digital recording device. The 14 bit quantization provides a signal-to-noise ratio of 86 dB, crystal data clocking yields unmeasurable wow- and-flutter, harmonic distortion measurements are less than 0.01 percent, and there is an essentially flat frequency response from 20 Hz to 20 kHz.

Of course, these are analog check points, and can only partly appraise the quality of a digital device. The SV-100 is simple to use and the controls are unambiguous. There are on/off and record mute buttons, headphone output and microphone input jacks, headphone potentiometer and potentiometers for record level, and record channel balance. Slide switches provide playback mute, selection of two playback modes, and switching of function of the flourescent bar graph meters from stereo levels to tracking and battery level. All other signal connections are RCA phono jacks and provide for video in and out, audio in and out, and copy out. A hard-wired remote control unit provides full function command. Recording time is only limited, of course, by the duration of the video cassette. My experiences showed that the slowest speed may be used without affecting sound quality in any way; intuitive speculation leads me to wonder if slow speed recordings might ultimately exhibit more drop-out problems after repeated playbacks.

The SV-100 satisfies most expectations one might have of a semi-pro machine in terms of its utility. Most routine features are designed into the SV-100 and recording is a simple task. One conspicuously absent feature is the ability to monitor the output signal while recording; one must be content to listen to the input and trust the rest to the bits. Of course, digital equipment will necessitate some retraining of engineer's recording technique; gone is the need to put as much level as possible on the tape. Indeed, with digital, the 0 VU mark must be considered to be a real danger signal since overloading would lead to clipping of the signal by the quantizer. Perhaps a peak indicator would be helpful, as would an error indicator. The SV-100 has no error correction indicator to show when correction is occurring; such an indicator would be useful to quickly ascertain bad tape, etc. Editing also

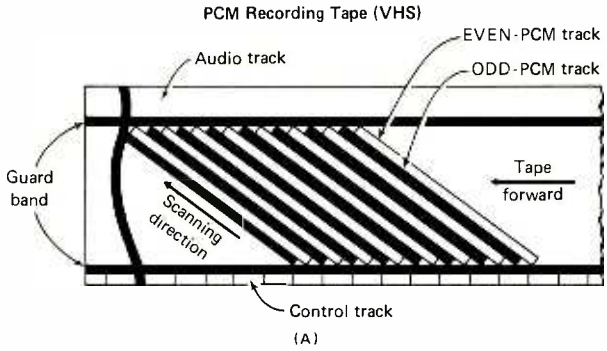


Figure 3. The NTSC TV signal is recorded on a VHS format video cassette recorder; tracks are the same as those used in video recording.

presents a problem and, aside from the record mute for erasure, there is little else to be done since the razor blade is taboo.

Some Hands-on Experimentation

Of course, for tape recorders, the proof is in the recording. I was able to use the SV-100 in conjunction with the Technics PV-A100 portable video recorder to make several recordings under a variety of conditions to assess its capabilities. After running a number of brief measurements to ascertain that the demonstration unit was indeed up to specifications, I began my experiments by taping from analog LPs, FM radio broadcasts, and consumer cassette and open-reel machines. Playback revealed that the SV-100 clearly meets or exceeds the performance of any analog consumer format. The noise floor, distortion levels, and dynamic range of these formats are inferior to those of the Technics audio processor. A one-generation copy of these sources did not add any discernible noise. Careful A/B comparisons did reveal a difference between the analog masters and the digital copy: The high frequency response of the digital copy differed from the originals in a way that is very hard to describe.

Much has been written about the "digital" sound of high frequencies, and some of it is perhaps accurate. After listening to many digital master tape recordings, I have learned to recognize a "hardness" in the extreme high end that seems to increase as the number of quantizing bits decreases. Fourteen bits does seem to produce an undesirable artifact in the high end while, with sixteen bits, the artifact is much less. Otherwise, comparison with consumer formats shows that the digital system adds or subtracts nothing. In other words, it is superior to these systems. If anyone intends to purchase a recorder for off-air taping or re-recording of tape or disk collections, the SV-100 would be quite suitable—provided the slight artifact in the extreme high end frequency response is not objectionable. Parenthetically, I might note that the sometimes funny sound on analog LPs pressed from digital master tapes seems to point to a problem with analog equipment—specifically, I think, its inability to cope with the extraordinary transients and dynamic range of digital recordings. The hard high end is usually not apparent on analog LPs, probably because it is beyond their recording range.

Live Recording Tests

A more demanding test for a recorder is the live recording of musical material. I tested the SV-100 in both orchestral and operatic performances. Although it is not intended to be a professional recorder, I pitted it against both semi-pro and professional-quality machines. In an orchestral recording of a live performance the SV-100 was compared to a tape made on an MCI 110B 2-track tape machine at 15 ips with Dolby A and it compared quite favorably. Once again, it is difficult to compare a professional analog recording with a digital one. Obviously, both are of high sound quality and the differences are difficult to verbalize. In completely subjective terms, I would say that the analog recording sounded "warmer," in a way that made the digital recording less desirable by comparison.

In comparison to the sound in the concert hall itself, the question is even more difficult; the analog recording does add audible distortion and noise, and the digital recording is free of this, but that 14-bit sound is discernible and troubling. Of course, these comparisons were made over recording studio quality equipment that surpasses most consumer playback equipment. When one stops to consider the product that eventually reaches the consumer, many of these questions become moot. The tremendous advantage of digital audio is also apparent when one considers the analog generation loss. With digital recordings, the same bit stream present in the studio can appear in the consumers' listening room.

Another recording test presented itself when I made simultaneous recordings on the Technics SV-100 and a Technics 10A02 closed-loop tape recorder of a recording of the opera *Un Ballo in Maschera*. I used a pair of the new Bruel & Kjaer studio microphones, which are truly digital-quality microphones. After reviewing both analog and digital recordings, and weighing their relative merits, the digital recording was chosen to be the master from which a radio broadcast would be prepared. The digital recording captured a fuller, more live sound, and presented the large orchestral climaxes with more impact. In other words, it was a more realistic recording of a live opera performance.

Some commentators have debated digital tape recorders' inability to record sounds as they disappear into the noise floor. Although that phenomenon does exist, it was certainly never present in these live recordings, where all ambient sound was always within quantization range. In general, I am not particularly impressed by the argument that analog machines have a hidden additional S/N ratio because they can record an extra 25 dB into the noise floor. Even if the analog dynamic range of 72 dB is augmented by 25 dB, it still only matches the range of a 16-bit digital machine, and with the digital machine, a fourth of the signal isn't dirty. Our 14-bit digital recording was perfectly adequate for radio broadcast; the SV-100 served its role as remote recorder with true professionalism. (Unfortunately, at the end of the performance, my friend Luciano Pavarotti auto-

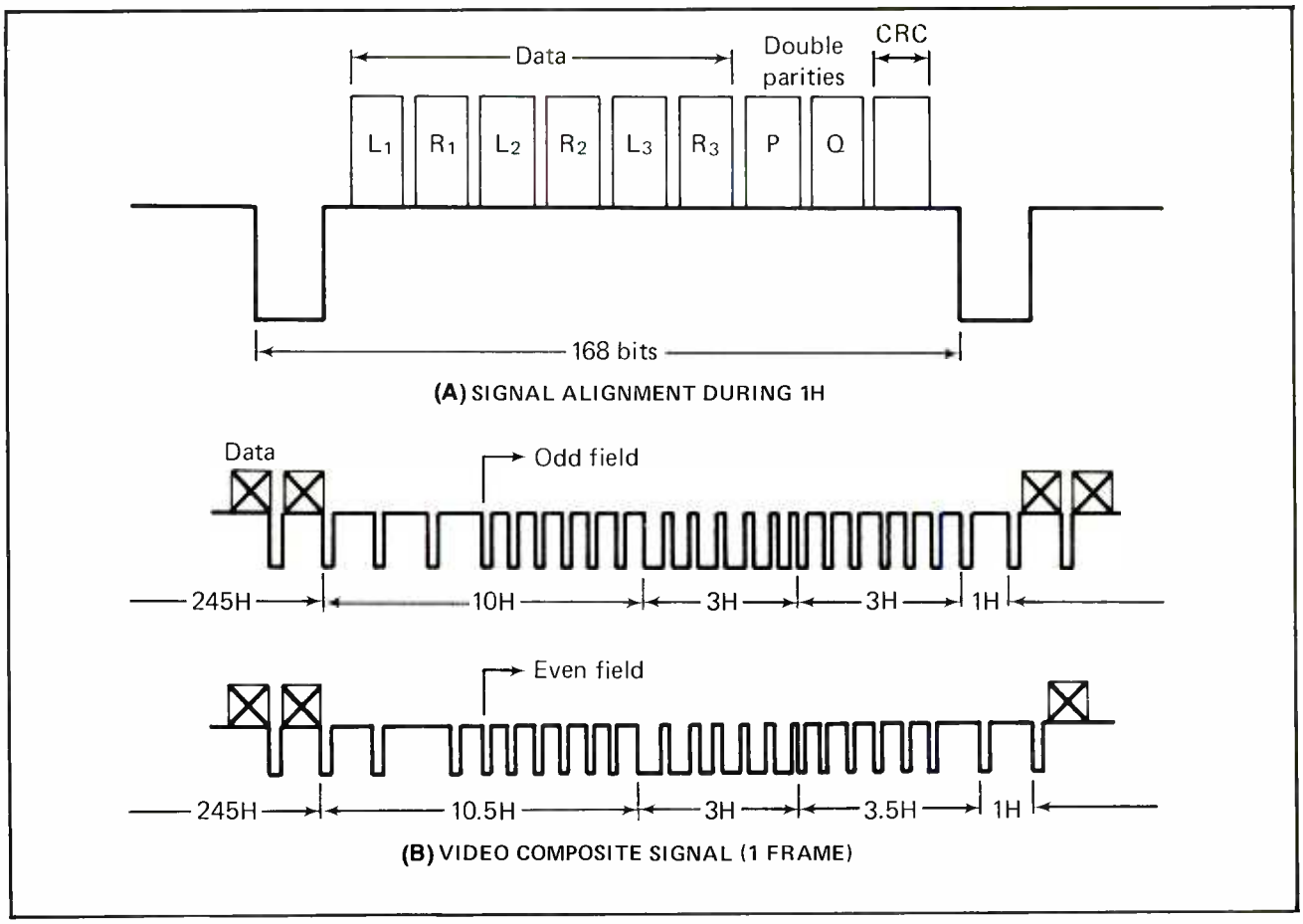


Figure 4. Retrieval of NTSC signal. A) shows the signal alignment during signal distribution on one horizontal scanning line, and B) shows one frame of composite video signal.

graphed our Bruel & Kjaer microphone box, so I guess B & K will have to let me keep these demos.

A Final Test, and Some Conclusions

A final listening test came during a visit to Peter McGrath's Sound Components high fidelity shop in Coral Gables, Florida, containing one of the best listening rooms in South Florida. Aided by golden-eared friends John Monforte and Mark Goode, our eight ears keenly compared the SV-100 to the Sony PCM F1. Mark Levenson amplifiers and Magnepan speakers with ribbon tweeters provided a highly accurate listening environment; we listened to master tapes from both digital machines and, through comparison to analog recordings, identified the digital artifacts in both digital machines that detract from their performance. At 14-bit quantizing, the Technics and the Sony sounded identical, and added the extreme high frequency artifact to recordings of analog LPs of the utmost quality. When the PCM F1 was switched to 16 bits, it outperformed the Technics' 14-bit quantization, and much of the artifact disappeared. At 16 bits, the difference between a digital copy and a high quality analog source was scarcely perceptible, thus showing that even a modestly priced digital machine matches the performance of highest-priced analog equipment. The fact that the first digital products to reach the market already meet state-of-the-art analog technology, and bring that level of technology to within reach of the consumer, is remarkable.

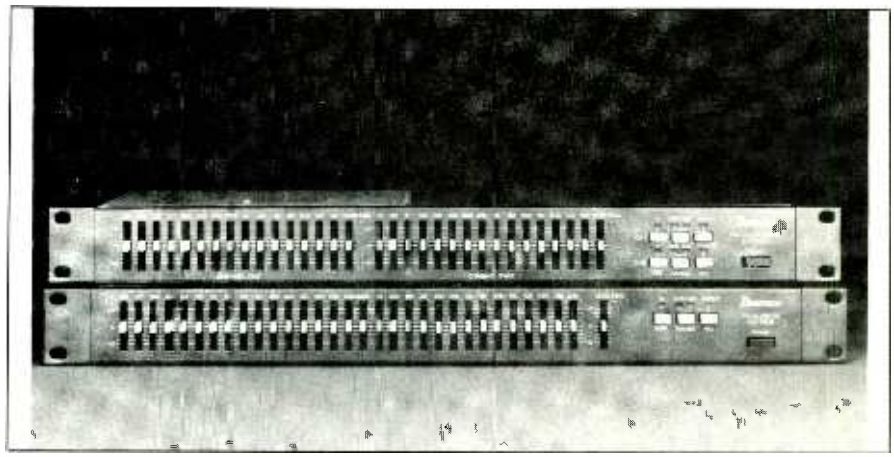
When I say "within reach," it becomes a question of price, the question which must ultimately determine the success or failure of a quality product. In the case of the SV-100, its suggested price is about $900, though I have seen it selling for $750. It is not the ultimate recording device, it does not equal the finest analog recording equipment, and it is even slightly inferior to digital equipment costing many times more. But the SV-100 *is* a technological triumph. It is a digital consumer recorder that challenges analog professional equipment. For modest cost it brings astonishing performance to the consumer market and brings the expectations of that market to a much higher level. Of course I am wary of a 14-bit standard—just as I would be wary of a 16-bit standard if I would listen to 18 bits....But that's not really the point. High fidelity evolves one step at a time, and the SV-100 is another evolutionary step forward.

The Market Place

what's new in sound and music

IBANEZ GRAPHIC EQUALIZER

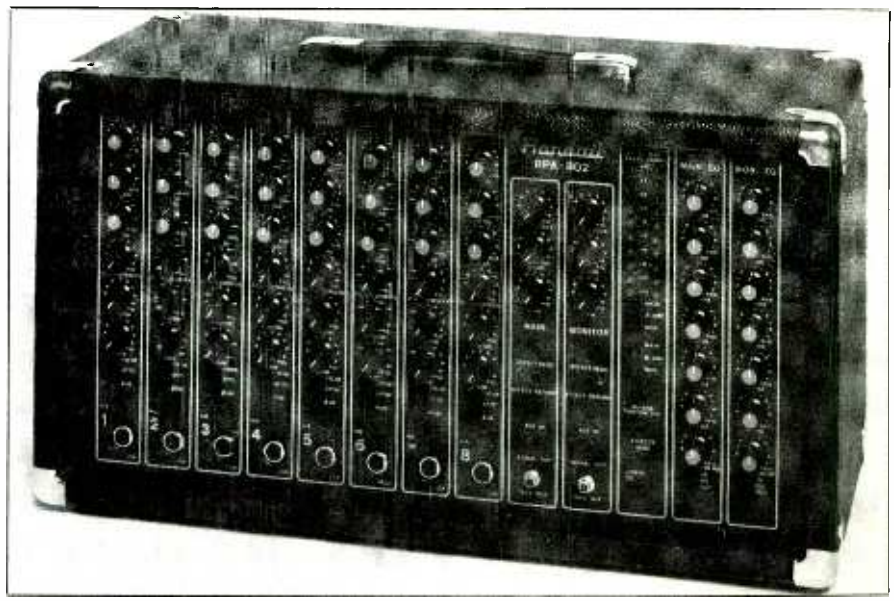
The Ibanez GE1502 Dual 2/3 Octave and the GE3101 1/3 Octave Graphic Equalizers are of professional quality and fit into a single rack space. Both units feature an EQ In/Out switch and a high-pass three-pole rumble filter, switchable for PA applications. The range of boost and cut is selectable between ±6 dB for subtle equalization curves, and ±12 dB for more extreme control. LEDs indicate all switched functions and channel overload. The GE1502 and the GE3101 each carries a suggested retail price of $325.00 and an Ibanez one year warranty.



Circle 36 on Reader Service Card

RANDALL DUAL POWERED P.A SYSTEM

Randall Instruments' RPA 802 eight-channel dual powered P.A. system contains two separate power amplifiers each rated at 120 watts RMS. Each individual channel and all master and monitor sections are on separate printed circuit boards. These are all interconnected by a daisy chain and plug assembly, and any individual board can easily be removed or replaced. Both front and back panels are made of heavy gauge aluminum to minimize ground loops and hum. The noise level of the unit is on the order of -90 dB. Frequency response is essentially flat from 20 Hz to 20 kHz when bypassing the low filter. High-input signal level without front-end overloading is a feature that solves many setup problems. A stereo headphone jack is provided for output monitoring and may be switched to monitor either power amplifier separately. Other features include three effects loops, two ten-LED bar graphs, two seven-band active equalizers, as well as three EQ controls for each channel.



The system is also available in six and twelve channel models.

Circle 37 on Reader Service Card

OBERHEIM UPDATES DRUM MACHINE

Oberheim Electronics, Inc. now offers optional drum sounds and retrofittable new features with expanded memory for the DMX Programmable Digital Drum Computer. The DMX has been expanded with new software and more than double the memory capacity. The new software allows for over 45 new features, including 5000+ Event Internal Programming Capacity, 200 sequence patterns, 100 songs, Programmable Tempo displayed in frames-per-beat, Song and Sequence Length displayed in minutes and seconds, and Selective Cassette Interface for loading single sequences or songs from tape. The retail price of the DMX remains at $2,895.00. Current DMX owners should contact their nearest Oberheim service center for the new DMX memory expansion update. The charge for the update is $150.00, including installation. All of the voice cards in the DMX are interchangeable with any of the other sounds in the expanding DMX Sound Library. Some of the new optional percussion recordings include congas, timbales, cowbell/clave, a complete set of electronic drums, as well as special sound effects. Each of these voice cards can be installed quickly and without tools. The majority of voice cards retail for $100.00 each.

Circle 38 on Reader Service Card

SOUNDCRAFTSMEN AMPLIFIER

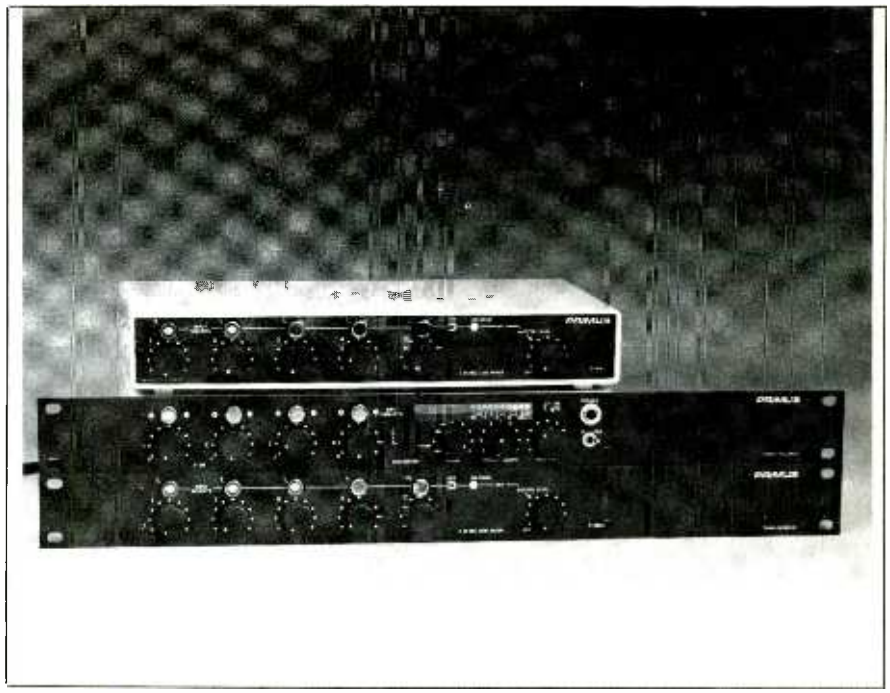
The Model A2801 is the latest in Soundcraftsmen's series of Power MOSFET Stereo Amplifiers. Engineered with the current demands of CD dynamic range in mind, the A2801 features high continuous power and excellent dynamic headroom. The A2801 is rated at 140 watts-per-channel at 8 ohms, 205 watts-per-channel at 4 ohms, and will operate continuously into impedances as low as 2 ohms without triggering protective circuitry. As with all Soundcraftsmen amplifiers, no current-limiting is employed in the protective circuitry, thus avoiding the sonic degradation associated with current limiting. Front panel features include Truclip indicators for each channel, which light only when the special comparison circuit detects a distorted waveform. Power switch, Protect Indicator LED, and carrying handles are included on the 19-inch rack-mountable front panel. The speaker connectors are heavy-duty five-way binding posts. Genuine Oak or Walnut veneer side panels are available at extra cost. The A2801 retails for $549.00.

Circle 39 on Reader Service Card

RAMKO AUDIO MIXERS

Ramko's P-4M and P-5MX mic/line mixers are the latest addition to their Primus audio group. Both are offered in mono and stereo versions and are available in 1¾-inch tabletop or rack mount configurations. The P-4M provides four mixing channels and six balanced inputs with selectable high/low shelving equalizers for channels 1, 2, or all. Other features are selectable Peak VU solid-state meter ballistics, phone driver, phones, master and monitor controls, and cue on all inputs. The P-5M is designed to function as both an expander for the P-4M (which combined will provide 11 inputs and 9 channels), as well as a stand-alone five-channel mixer with send/receive on each channel. Both units feature XLR-type connectors, balanced inputs and outputs, and gain select on all inputs (mic thru +26 dBm, S/N of -83 dB). Distortion is .008 percent and Frequency Response is 10 Hz to 20 kHz, +0, -1.5 dB. All units utilize conductive plastic controls, long-life switches, and are covered by a three year warranty.

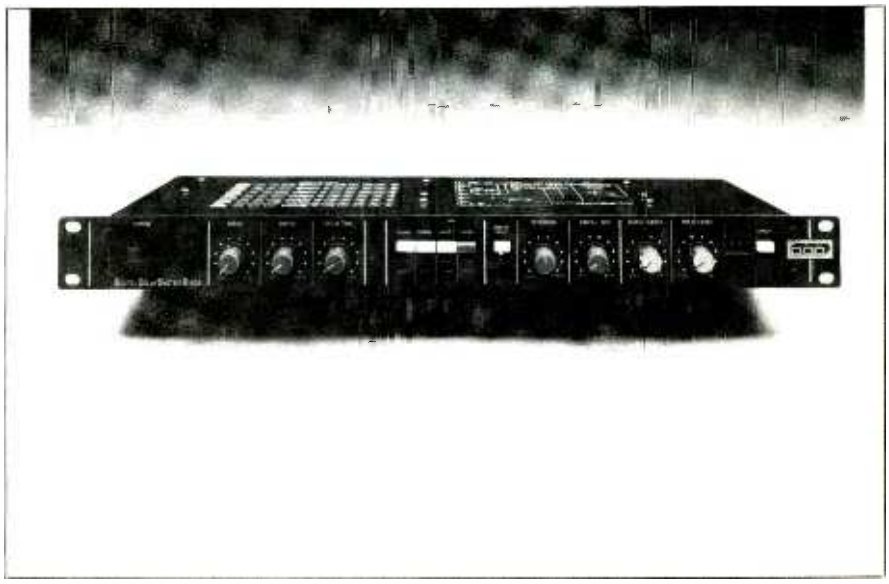
Circle 40 on Reader Service Card



DOD DIGITAL DELAY

DOD Electronics' new R-908 Digital Delay is a full-function, PCM digital signal processor with up to 900 milliseconds of delay. The R-908 features a selector switch panel for fast and easy settings including flanging, chorusing, doubling, and echo. Careful attention has been given to the design; it works equally well in the studio, on stage, or in the rehearsal hall. The sweep width of the R-908 is 10 to 1, making it useful for all flanging and chorusing effects. Also, the sweep and filter circuits are engineered so there is no "dropping out." Suggested retail price is $399.95.

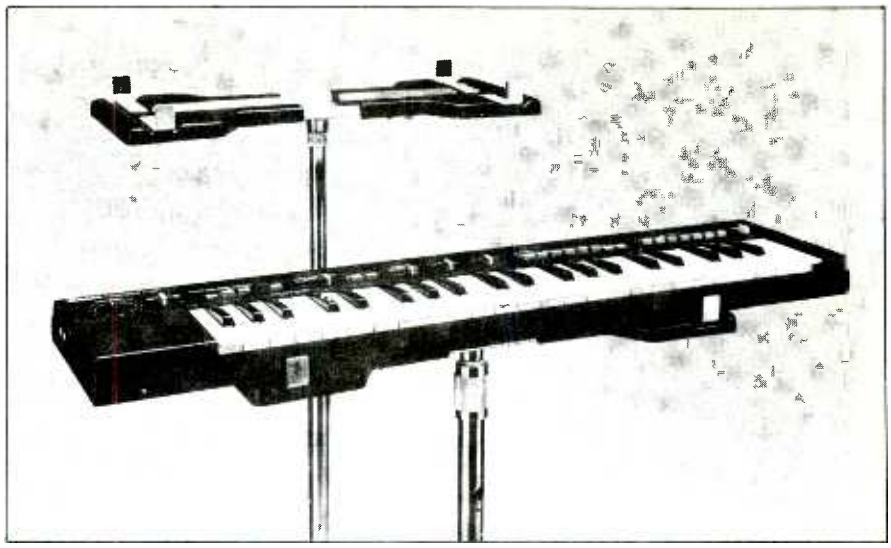
Circle 41 on Reader Service Card



PAL MINI-KEYBOARD SUPPORT

PAL and Associates' Stand-It Professional Mini-keyboard Support is the latest addition to their musical instrument accessory and equipment line. The Stand-It is made of high quality metal and formed plastic parts that assemble into a rugged and dependable mini-keyboard support. It screws directly to the top of most microphone stands and is adjustable to the widths and depths (from 10½-in. wide by 5-in. deep to 27-in. wide by 8½-in. deep) of most of the popular mini-keyboard case dimensions including Casio MT, Yamaha PS and PC series, etc. Adjustments are made by loosening thumb screws, setting the "end pads" and angle clips to fit the mini-keyboard desired, and re-tightening the thumbscrews. No tools are required. Stand-It retails for $39.95, including a one-year money-back warranty against defective materials and workmanship.

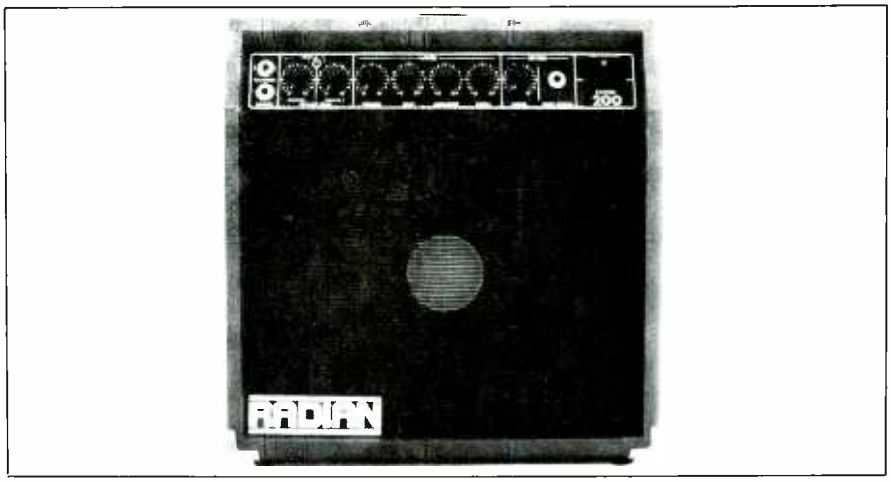
Circle 42 on Reader Service Card



ENTERTEC GUITAR AMP

Entertec's new 20-watt guitar amp, the Radian 200, has two separate channels with manual or footswitch-controllable channel switching. Features include separate channel preamp gain controls, controllable overdrive on channel one, master volume control, active bass, midrange, and treble equalization, reverb, and effects patching on either or both channels. The Radian 200 has a 10-inch speaker and puts out 20 watts RMS. It's well-suited as a practice amp at home or on the road, and has a suggested retail price of $224.95.

Circle 43 on Reader Service Card



EDCOR HEADPHONE AMPLIFIER

Edcor's four channel stereo (or mono) headphone amplifier, the HA 400, has four separate stereo amplifiers that offer extended frequency response, low distortion, and ample power output. The amplifier has both phono and tape level inputs.

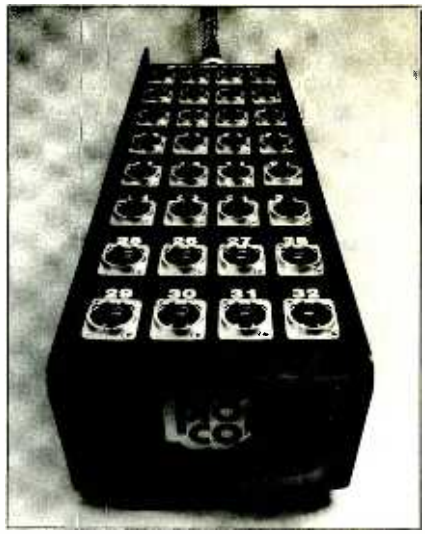
Circle 44 on Reader Service Card

PRO-CO SOUND'S EXPANDED LINE

Pro-Co. Sound has expanded its line of HELIX multipair audio cables (MAC) to include stage boxes constructed of 12 and 16 gauge steel for strength and superior shielding. All connectors are located on a recessed top panel for convenience and protection, with the channels clearly identified by bold numbers silkscreened with epoxy paint. Male and female XLR connectors and unique latching phone jacks are available. The fan-out at the mixer end is color-coded and numbered for quick identification, and double-thick heat-shrink jacketing is used at stress points. XLR and phone plug connectors are standard, with all line sends wired for balanced lines.

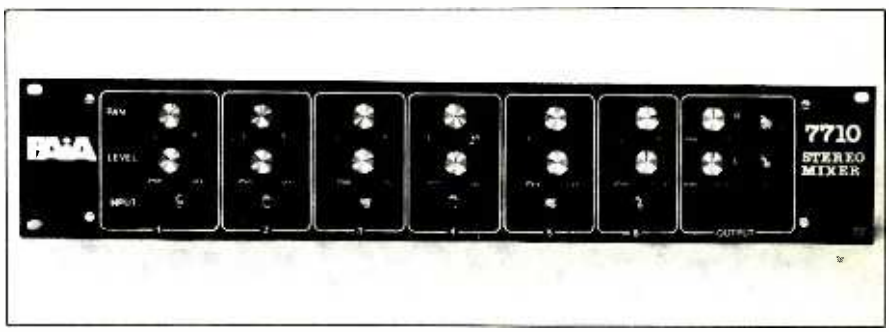
All HELIX MAC products use custom-built cable with individually shielded pairs to eliminate noise and crosstalk. A separate stage box ground wire is provided to maximize shielding effectiveness, and the matte-black PVC jacket is abrasion resistant. Carrying handles and triple strain relief with clamps and cord grips are also featured. The standard HELIX line now includes 6-, 9-, 12-, 16-, 20-, and 32-channel models available in a variety of lengths, with or without line sends as desired. Many non-standard configurations are also available on special order.

Circle 45 on Reader Service Card



PAIA SIX INPUT MIXER

PAIA's Model 7710 Stereo Mixer is intended for utility applications such as keyboard mixing and rhythm unit drum sounds mixing. It includes individual level and pan pots for each channel, and master gain controls for left and right channels. Low noise op-amps and careful circuit board design minimize noise and hum pickup, while all pots and jacks mount directly on the circuit board to eliminate point-to-point wiring. Electrically and physically compatible with other devices in the PAIA Studio Series, the 7710 Stereo



Mixer runs off an external power source (such as the PAIA 7700 Power Supply) and is available in kit form for $59.95 plus $3.80 postage and handling.

Circle 46 on Reader Service Card

SAMSON DIGITAL DRUM MACHINE

Samson Music's MFB-512 Digital Drum Machine produces real drum sounds consisting of bass and snare drum, low, medium, and high toms, ride cymbal, open and closed hi-hat, and hand-claps, all of which are digitally stored in the MFB-512. Up to 64 separate rhythm patterns and 64 separate fill-in patterns can be programmed. These can be combined into eight chains, making the total capacity 2048 measures. A factory-installed Nicad battery insures that programmed patterns and chains remain in the unit's memory when the AC power is turned off. There are three ways to plug into the power source: Mono out, Stereo out, and two five-pole DIN outputs. When using the DIN connection cables supplied with the unit, the user can connect each drum sound separately into the mixer. Start and Fill-in inputs are supplied on the back of the unit for easy accessibility in a live situation. There is also a Trigger In/Out on the back of the unit which allows the MFB-512 to be synchronized with other synthesizers. The MFB-512 is suited for home recording and live use, and lists for $650.00, including an AC adapter and two separate five-pole DIN outputs.

Circle 47 on Reader Service Card

1/4 Notes

MAKING TRACKS

The first solo LP for singer-composer **Christine McVie** is set for release in late January, 1984. McVie is currently nearing completion of the recording of the album at **Mountain Studios** in Montreux, Switzerland... Recent activity at **New River Studios:** the **Bellamy Brothers** mixing their new album for **Warner Bros. Steve Klein** is producing, **Dennis Hetzendorfer** engineering and **Ted Stein** assisting... **Bee Jay Recording Studios** has been cooking right along with the return of **Pat Travers** to conclude work on his new album for **Polydor Records. Barry Mraz** is producing with **Andy de Ganahl** at the board... **Polygram** recording artists **Rubber Rodeo** began recording this past month at **Bearsville Studios. Hugh Jones** is producing and engineering... Bearsville is also hosting **Warner Brothers' King Crimson** for preproduction with **Robert Fripp** producing, **Brad Davis** engineering and **Ray Niznik** assisting... At **Unique Recording:** Producer **Arthur Blake** remixing material for recording artist **Stevie Nicks** for release on **Modern Records.** Jazz innovator **McCoy Tyner** is recording a new album for **W. E. A. Records. Peter Robbins** is engineering with assistance from **Steve Pecorella. Ballistic Kisses** is also in the studio mixing tracks with D.J./producer **Ivan Ivan** and engineer **Jay Burnett**... Teaming up for their second album together, **George Duke** and **Stanley Clark** recently mixed their LP for **Epic Records** at **Fantasy Studios.** Clark and Duke produced, **Tommy Vicari** engineered with **Mike Herbick** assisting... **CBS'** artist **Rodney Franklin** was also at Fantasy for overdubs on his up coming album. It was produced by **Stanley Clarke** and engineered by **Eric Zobler**... At **The Automatt: Herbie Hancock** remixing *Chameleon* lp for **CBS.** Hancock is producing and John Nowland engineering... Jazz guitarist **Larry Coryell** has recently released a recording featuring his transcriptions of **Stravinsky's** orchestral works, "The Firebird" and "Petrouchka." The project was digitally recorded by **Nippon Phonogram** and was produced by **Teo Macero**...

ON THE ROAD

Lionel Richie has embarked on his debut concert tour of 40 American Cities and dates in Hong Kong, Japan and Hawaii. The tour will run through the middle of December... **King Sunny Ade** and his **African Beats,** who have recently completed an extensive tour of the U.S., will be performing two songs in the forthcoming film *O.C. and Stiggs,* by director **Robert Altman**... **Warner** recording group **Dio** recently took off on their first headline tour. U.S. dates will be followed by a tour of Great Britain and Europe, with U.S. dates resuming upon their return in December... Rock group **Blotto** will be touring the midwest and northeast to promote their recently released Sony Video 45. Sony Video 45's of various artists including **Elton John, Rod Stewart** and **Duran Duran** will also be shown during each show... **Westwood One** will be sending its **Concertmaster** mobile recording studio to N. California to record a one-time-only series of concerts by a band consisting of **Sammy Hagar, Neal Schon, Kenny Aaronson** and **Michael Shrieve.** Westwood One will then produce an exclusive 90 minute radio concert special featuring the quartet. There are no plans to take this project beyond this tour... Pianist/composer **Michele Rosewoman** will present "New Yoruba, A Musical Celebration of Cuba in America," at the **Public Theatre** on Monday December 12. The 14 piece ensemble will feature Cuban folklorist **Orlando "Puntilla" Rios** with his bata group. The festival will also feature: **Oliver Lake, Howard Johnson, Rufus Reid, Bob Stewart** and others... **James Newton** will perform at **Carnegie Recital Hall** Saturday, December 3rd.

& MUSIC...

EURYTHMICS: *Sweet Dreams (Are Made Of This).* [Produced and engineered by D. A. Stewart, A. Williams, R. Crash.]

Performance: **Tip of iceberg is very hot**
Recording: **Miraculous**

Like an unexpected comet, the Eurythmics streaked into our aural atmosphere this year with bright,

enduring melodies, the strong clear burst of Annie Lennox's voice, shimmering keyboards and trails of creative ornamentation that protected the duo from a staid place beside most synthpop bands. *Sweet Dreams*, on musical merit alone, is one of the year's most refreshing surprises, but even more endearing is the fact that the album was recorded in a warehouse attic on a half-inch 8-track with two microphones, a few effects, a spring reverb and a space echo.

The album has an improbable spaciousness to it (due partially to the extensive use of the reverb and echo), instead of a cramped or compressed feel that might be expected from the use of half-inch tape.

The wide horizons of Eurythmic sound are defined mostly by contrast. Lennox's voice, earthy at the lower end of her range, is often harmonized with her piercingly ethereal soprano, and although demonstrating strength and control that is nowhere near its peak or breaking point, it retains a plaintive vulnerability. The keyboards (layer upon layer of them) carry smooth, almost subsonic tones companioned with highly resonant, nearly brittle lines doubling structural interplay. In songs like "This City Never Sleeps," random sounds swoop through the relaxed r&b groove, balancing rather than breaking up the feel. The startling tonal flatness of the flute and percussion on "I've Got An Angel" make brash strokes against a canvas of ultrasmooth synth strings. This formula of contrast holds up even on the title track radio hit, which alternates passages of dense keyboards with measures that are empty except for a simple backbeat and Lennox's voice.

Lyrically, patches of light and dark thoughts pervade the logic of *Sweet Dreams*, making for an overall effect that, without falling into pessimism, is bittersweet.

SUSAN BOREY

CULTURE CLUB: *Colour By Numbers.* [Produced by Steve Levine; digitally mixed by Steve Levine and Jon Moss.]

Performance: **Easygoing**
Recording: **Going easy**

Why are people so unkind to Culture Club? If they hadn't been seen before heard, most folks would have filed their gentle melodies under Soft Rock instead of New Wave. No matter what you think about Boy George, you've got to admit that he can sing and that the songs that are centered around his budding croon are musically cohesive, creative and catchy.

With their first release yielding three top ten singles (a feat equaled only by the Beatles), it's no wonder that we find the Club mining the same easy-listening-with-heart vein on *Colour By Numbers*. The ten songs showcase the band's strength in arranging—an innocent flair for freely mixing all sorts of musical idioms within the framework of their soft mood. "Karma Chameleon," leading off the album with a spritely reggae/rockabilly mixture accentuated with country & western

harmonica, demonstrates how well this works; the band sounds right at home with the cross-cultural blend, and the song flows right as rain out of your radio. On "It's a Miracle," a scat-filled funk bridge is securely glued in place beside the sugar-harmonied pop base; on the serious ballad, "Black Money," a smoky saxophone climbs out of the mix.

The band is not obsessed with originality, you see. Most of it has been done before, but Culture Club seems content to shape the old riffs into their desired ends without trying to somehow cover this fact up. Despite its closeness to Stevie Wonder's "Uptight," "Church of the Poison Mind" romps along with its own charming abandon, complete with vampy horns.

No dependence on synthesizers is apparent. "That's the Way" approaches pure Gospel with acoustic piano for its sole accompaniment, and Boy George steps out of the spotlight to give guest vocalist Helen Terry a chance to certify the feel in a few earthy measures.

Culture Club continues to carve their own niche and, through a mixture of courage and luck, it looks like they'll have plenty of time to process musical ideas into commerical recyclings.

SUSAN BOREY

JAMAALADEEN TACUMA: *Show Stopper.* [Produced by Jamaaladeen Tacuma; engineered by Phil Nicolla; recorded at Studio 4, Phila., PA, 1982, 1983. "Tacuma Song" recorded at Alpha International Studios, Phila., PA, 1983; engineered by Bruce Weeden.] Gramavision GR8301.

Performance: **Music that will always matter; honest and fine**
Recording: **Lacks nothing**

Jamaaladeen Tacuma is an innovative electric bassist. After playing a major role in Ornette Coleman's post-1975 ventures in electric harmolodics, Tacuma has emerged with that formidable influence (along with James Blood Ulmer and Ronald Shannon Jackson) as a composer-bandleader of imposing presence and authority—unmistakably Coleman-influenced, but very much a creator of tomorrow's cutting edge.

Tacuma's playing style is articulate, clear, and pleasingly lyrical, and his several previous recording experiences as sideman matched him with overseers whose productions have conveyed these qualities nicely. Most notably, he has recorded three times with Ornette Coleman. First, on the landmark *Dancing In Your Head* for the John Snyder supervised A&M/Horizon label, then for the daring, Snyder-owned Artists House label on *Body Meta*, a record mastered by Masterdisk's Bob Ludwig and released on virgin vinyl, and lastly on the recent Antilles release *Of Human Feelings*, a digital recording widely acclaimed musically as a landmark descendant of Dancing....

The record of discussion here, Tacuma's debut as a leader, derives much of its flavor from his previous bouts as sideman, but just as important, much of its authority is due to the grace of sensitive production and the Gramavision penchant for meticulous mixing, mastering and pressing. This record company does its best to plainly show how important its artists are.

Insofar as Tacuma writes and arranges most of what he performs as leader, the choice of himself as producer was a good one. Tacuma does do one Ornette Coleman piece, "Tacuma Song," but this is a solo performance, and so was better left to his conception as well.

Technical preparation for the recording studio seems to have been minimal because the only atmosphere to any of the tracks is that created by the various instrumental combinations themselves. With electric bass either leading the proceedings or taking at least an equal stance in the finished mix, the challenge for the engineer seemed simply to capture all the instruments honestly—the squawks, fret noises, blares, and spontaneous intonations. An engineer's excessive cleanliness can hinder real magic, but not so here. All is appropriately readied for mixing engineer David Baker, who operates beautifully in keeping Tacuma up where he belongs. In the face of other electric strings, horns and mighty percussion throughout the set, Baker's finish is seamless; his touch is central to hearing how really well the musicians understand their roles in Tacuma's forward-paced compositions.

Side one features Tacuma's band, Jamaal, made up of electric bass, electric guitar, drums, alto saxophone and percussion. The tracks draw heavily from Coleman's brand of electricity, but also incorporate African and Caribbean elements. In this regard, a Talking Heads, King Sunny Ade or Rick James fan should feel just as comfy as a staunch avant-gardist when listening to this material.

Side two seems to be a compilation of Tacuma's most recent musical fantasies, as he cavorts in different musical settings with artists like pianist Anthony Davis, saxophonist Julius Hemphill, trumpeter Olu Dara, and guitarist James Blood Ulmer. "Show Stopper," featuring Hemphill and Dara, pairs a catchy theme reminiscent of many a classic Blue Note session with towering improvisation as current and fiery as next week's news today. "Tacuma Song," the solo piece, is not just a sensitive display, but for our purposes here, a good example of how an album "hand-pressed on pure KC-600 vinyl using 40 second cycle times" can effectively avoid hum and surface noise. "From the Land of Sand," highlighting Tacuma with a tight percussion backdrop, and "Sophisticated Us," with James Blood Ulmer's patented jagged-edged guitar, close this diverse yet remarkably cohesive session.

Jamaaladeen Tacuma is clearly ambitious, and with *Show Stopper* is trying to please many different tastes. While similar attempts get most people nowhere, this attempt gets Tacuma everywhere. Operating in many settings with as many compositional directions, Tacuma beams energy on all fronts. His playing and his players are marvelous, and his authentic versatility is unquestionable. Fortunately, Gramavision has adorned all this talent with an exemplary recording and package. To further the good word on this one is a pleasure.

MICHAEL FISHMAN

THE FUGS: *The Fugs Greatest Hits, Vol. I Pronto Punk.* [Harry Smith, original producer; recorded in New York City 1965, 1966; Tape Remastering, RCA, New York City, 1980; Disc Mastering, Masterdisc, New York City, 1982.] JEM Records PVC 8914/(AD 4116).

Performance: **It don't get no weirder than this**
Recording: **State of the anti-establishment art**

Once upon a time, in an illusion of patriotism and innocence (and with good will toward anyone who wasn't a pinko), there was America. It was content to be the big brother of the world, have the bomb, John Glenn

and know that good girls don't. These were the standard bearers of the age. Yet, there was a whole generation of wiseacres developing who were set on screwing up the whole thing.

In those days of yore, when Ronald Reagan was still an actor, the Beatles had come to America and America had gone to Vietnam; there were above-ground nuclear tests, while underground a subculture of neo-poets and quasi-musicians were contriving a world all their own, promoting sex, drugs, peace and poverty.

Today, at just about the time we had all outgrown that stuff and built our own hypocritic social standards, comes another generation of malcontents calling themselves punks. And here we go again.

There is therefore a history lesson to be had in *The Fugs Greatest Hits, Vol. I Pronto Punk*. In fact, the Fug's Story on the inside is worth the purchase price alone. Outside of that, it is a big joke. By their own admission, the now defunct Fugs knew it. What PVC, Adelphi and JEM Records seek to resurrect from a collection of '60s swill so contemptible that Dr. Demento wouldn't even play it, is a score on the '80s punkers.... It just may work.

Nostalgia being what it is today (and I guess what it is everyday), reminds many of us who lived in that volatile era of the mid-60's of the groups like the Fugs that existed. This collection contains the outtakes of four albums that were produced (excuse me, bad choice of words), that were recorded in 1965 and 1966 by the group.

The stuff is junk. Lyrically, it would be outrageously consumed by a locker room full of junior high boys with their pre-pubescent reactions to dirty words and obscene thoughts. Musically, it is innovative, yes; unorthodox, yes; creative, they said it not me, and definitely horrible. But the Fugs were anti-establishment, daddy-o, to the max. This is a prime example of the mockery that generation made of recording. In the condition they were in, a record was the result of turning on a tape recorder and letting it record what you were doing. If you were at all lucky, the live mic' would be in front of a partially coherent individual who would inspire the rest of his comrades toward uninhibited vulgarities onto the tape. This was accompanied by a variety of musical instruments—which musically they did play correctly. (Note the positive emphasis of that last statement.) You can recognize chords and notes and they are within reasonable octaves with percussion and all that. They just are not played in an order we associate with being popular. In those days, and even in these days, this was/is popular.

The record has its value as a collector's item. When volume II is issued, this set will have all the ingredients to astound and embarrass even your closest friends. If you were privileged to be living in San Francisco, Texas or the East Coast in those days when the bohemian bands were all the rage, if you frequented any of those coffee house dives where the Fugs might have played, then you deserve a copy—better yet, a set of *The Fugs Greatest Hits*.

From any look to the past, we can see where we were. We can evaluate the direction we took, capitalizing on the positive and learning from the negatives. I don't think we learned a whole lot from the Fugs. But my, didn't we have a helluva good time?

MICHAEL ROBERTS

CLEO LAINE: *One Rainy Day.* [Ken Gibson, producer; recorded in 1979 in London, England; engineer not named.] DRG SL 5198.

Performance: **Cleo the lioness strikes again**
Recording: **Fusion, but comfortable**

This is what the industry calls a concept album. The dozen songs included were composed by Darryl Runswick to lyrics by Kerry Crabbe and were written expressly for an album by Cleo Laine depicting what she refers to in the liner notes as a cycle in a woman's life. This puts it on common ground with Robert Schumann's "Frauenliebe Und Leben," and what Schumann accomplished on one level, Runswick and Crabbe have accomplished on another.

Cleo Laine has always been a singer to whom the dramatic has appealed. Her interpretations of songs from Shakespeare and of the role of Bess in Gershwin's "Porgy and Bess" (recorded for RCA with Ray Charles) showed as much of the actress as the singer. Her interpretation of theatre songs by Noel Coward only strengthened the ties. Lately, Cleo has been going off in a myriad of different directions that only her vocal equipment and dramatic prowess would allow. She has flirted with the concert repertoire while still maintaining her skills as a pop singer, all the time being sure that her jazz roots showed through. Here they show more in the company she keeps than in her singing: One of Britain's better clarinet/saxophone players, Tony Coe, is much in evidence on this album.

The recorded sound has a lot of the bristling character of a jazz session with the intensity of a rock date—catch the percussion track on "Shall We Get Married." And yet there is a general MOR character to the sound that gives one a feeling of comfort without descending into the nebulous chasm of Muzak. Another particularly nice touch is the economy used throughout, which leaves the Cleo Laine unadorned vocal equipment a lily ungilded at a number of poignant moments in the work.

If there's anything that troubles me about this album it's that it is what it is...a concept album. There's no old standard tunes to hang onto like an old friend. Each of these dozen songs you'll probably be hearing for the first time when you first hear this LP. As a concept album it also does not seem to exist outside of that utilitarian concept for which it was intended. Cleo has been performing separate songs from the album on tour, but as a cycle it seems to exist only in that form. I could make recommendations such as getting a good filmmaker like Ken Russell to hang a good film on it, either for TV or for theatrical release. But then that's not what Cleo Laine intended or I'm sure that's the form *One Rainy Day* would have taken. The sole consolation is that even if it only does exist as a cycle, once one has the record one can hear it at will.

JOE KLEE

MICHAEL STEARNS: *Planetary Unfolding.* [Susan Harper, producer; unknown engineer; recorded at Continuum Studio, Los Angeles, CA.] Continuum Montage CM 1004.

Performance: **A sweeping redefinition of synthesized music**
Recording: **Enveloping**

Remember the days of yore when synthesizers were first introduced

into recording studios? A revolution was supposedly in the making; pop and jazz music would never be the same; even Bach would be "switched-on." Those times have come and gone. Synthesizers do currently turn up in recordings from every musical genre, but, alas, as singer Gil Scott-Heron would sing, "The revolution will not be televised."

That has something to do with the fact that few synthesizer players have ever tried to explore the most novel possibilities offered by the instrument. Most rock bands treat the synthesizer as an oversized piano/organ.

Michael Stearns is made of stronger stuff. He plays a "Serge" synthesizer, utilizing the broadest possible spectrum of orchestral effects imaginable. In fact, on this recording he sounds like the master of several orchestras playing *simultaneously*.

Yet, and this is a remarkable paradox, he chooses to create the tonal colors and symphonic currents one would associate with late nineteenth, early twentieth century classical composers (particularly those in the English and German traditions). There are parts of *Planetary Unfolding* that remind me of Delius or Mahler scored for giant synthesizer. Great washes of deep bass notes well up where one would expect French horns to declare themes.

Planetary Unfolding is considered "program" music by its composer and sole performer. Stearns views his synthesizer performances as attempts to portray journeys within human consciousness. I think he succeeds quite well in a form often given over to pseudo-Zen inspired muzak. The composition extends over two entire sides of this recording and is performed entirely on synthesizer except for the beginning of side two. Some unidentified female vocals are added to the mix along with tapes of bird songs.

The overall effect of this recording is one of majestic calm. The quality of silence in my listening room was altered after the finish of side two—quite a compliment to the power of Stearns' compositional and performing skills.

Planetary Unfolding consists of bits of live performances recorded on a Teac 3340 at 7½ ips (without noise reduction). Parts of different tapes of various performances were then dubbed onto an eight-track unit. The sound is shimmeringly lucid, enveloping. The rich textures of the "Serge" synthesizer are shatteringly present. The production is as elegant as the music.

Continuum Montage records are available through the mail. They carry a modest selection of synthesized music perfect for interior journeying. Write to them at 3640½ Watseka Ave., Los Angeles, CA 90034 for further information.

The last word on the otherworldly glories in Stearns' music is aptly stated in the quote from *The Wizard of Oz* that the composer uses to title the second movement of *Planetary Unfolding*: "Toto, I've a feeling we're not in Kansas anymore."

NORMAN WEINSTEIN

CHICO FREEMAN: *The Search.* [Bob Cummins, producer; unknown engineer; unknown recording site.] India Navigation 1059.

Performance: **Inspirational**
Recording: **No frills**

Collaborations between sax players and jazz vocalists have proven to be a *very* mixed blessing over the years. Grover Washington, Jr., Pharoah Sanders, and even John Coltrane have tried their hand in recording with vocalists to varying degrees of success. Chico Freeman's new album simply towers above all previous efforts. And much of its success has to do with vocalist Val Eley.

No liner notes disclose her identity; the press release kit said just about nothing about her. Yet she is unquestionably one of the most electric and individual vocalists in any musical genre I've heard in years. She possesses a silky smooth tone that never tranquilizes, an unerring sense of time, and a cool sensuality. Plus, she knows how to creatively interact—not merely decorate—with Freeman's flute and sax playing.

Her achievement is all the more remarkable where the listener realizes that Eley sings lyrics worthy of the K-Mart School of Occult Cosmology. Take the title cut which opens side A. "Somewhere there is peace of mind, you have to go inside..." sings Eley with such lyric freshness and emotional density that one tends to forgive the utter triteness of the phrases utilized. She wrings every atom of meaning from these phrases and then allows breathtaking solos by Freeman on sax and Kenny Barrons on piano. Freeman develops

his solos with finesse, allowing himself to dart, swoop, cry, swivel. Barrons is more the traditional romanticist, establishing lovely layers of chords, doing for Eley what John Hicks has done for Betty Carter. Meantime, Cecil McBee provides that thick and brooding bass line that is his signature and Billy Hart proves once again that he is the most underrated drummer in the land. The cut ends with a smashing call and response between Freeman's sax and Eley's vocal scatting that carried me to musical satori-land. The whole crew deserves five stars and a free ticket to Paradise for playing with such grace and agility.

There are four cuts on the search; each is that pluperfect.

"Illas" is a moving song with a Latin tinge supplied by Nana Vasconcelos' berimbau and percussion and highlighted by the colorful vibes of Jay Hoggard. Freeman proves himself as distinguished a player on flute as on sax while Eley does a sweepingly brilliant job singing about cosmic consciousness. "Close To You Alone" is a ballad for after midnight and "Soweto Suite" replaces cosmic lyrics with down to earth political protest against racism in South Africa. It is worth noting that "Soweto Suite" has the most angular and dissonant sounding work by Freeman on sax wrestling with Eley's voice. The cut introduces a refreshing anger and pain into a session which *almost* runs the risk of transcendental blandness.

The recorded sound is somewhat dry, not flashy, not digitalized. Every instrument is mixed intelligently and articulated clearly. The sound is not as atmospheric as one might expect from an ECM or Windham Hill production, but the stately grace of the performance more than makes up for any lack of studio sophistication. Billy Hart's drums could have been recorded more brightly, but that is a minor complaint. The production values fit the music well.

Jazz lovers should search as long as they need to for *The Search*. This groundbreaker redefines the interplay of sax and voice in a manner both inspiring and illuminating.

NORMAN WEINSTEIN

ERIC ROSSER: *Making a Night of It.* [Eric Rosser, producer; recorded live at Bear's Place, Bloomington, IN, Oct. 11-12, 1982; Wayne Gunn and Jack Burke, engineers; final editing at Audio Village, Bloomington, IN; mastered by Jim Loyd at Masterfonics, Nashville, TN.] RedBud 1010.

Performance: **Lively, yet low-keyed**
Recording: **Basic and casually atmospheric**

Live albums, generally speaking, emanate from smoky jazz clubs, cavernous arenas or mammoth outdoor festivals. And, as a rule, they are recorded by individuals or groups with several studio albums to their credit. The "live album" is most often the artist's third or fourth effort, and these products are as traditional—and as carefully timed and placed—as mistletoe. Eric Rosser's *Making a Night of It* is different on all accounts.

This live LP, featuring Rosser playing well-known pop and blues standards unaccompanied, on an Ellington Upright piano, was recorded in some unassuming nightspot in the hinterlands. And, one assumes, this is Rosser's first album. But his unpretentious, take-it-for-what-it-is piano-bar album is nonetheless a refreshing, if not altogether distinctive, offering from a young man who loves to play the piano.

In some piano bars, the music is either an excuse to bring people together or an afterthought. But from the sounds of things, Rosser's renditions of show tunes and old favorites ("Over the Rainbow," "Georgia on My Mind," "St. James Infirmary," "Summertime") captivated the crowd at Bear's Place for two autumn evenings. Rosser has wisely chosen not to delete the muffled voices, clinking glasses and shouted-out requests from the final mix. Obviously, the presence in the club of recording equipment and engineers didn't inhibit the audience.

The sound of the piano, as in most such establishments, is off in the distance—not too close in the mix, not too distant—but readily discernible to the listener at home. As for the recording itself, the highs and lows are often imprecise, owing no doubt to the acoustics of the room. But, don't forget, we're not discussing Art Tatum or Keith Jarrett.

Maintaining an easy repartee with the audience, consisting largely of his friends, Rosser plays a nice mixture of familiar tunes. His melodic sense is well defined, but his playing shows insufficient harmonic movement to breathe new life into these roasted chestnuts—assuming, that is, that this was his intent. Dynamics, since these songs are so short, are provided by his between-songs patter, and a framework for the LP is created by the pianist's decision to begin and close the program with Rodgers and Hart's "Bewitched, Bothered and Bewildered." Rosser's one original tune, "Eric's Instant Blues," is marred by weak left-hand rhythms, but the melody is catchy; an extended piano-bar engagement should rectify matters. Rosser hits stride on "Mack the Knife," using time changes, ostinatos and syncopation to good advantage. While hardly ornate, Rosser's keyboard technique is serviceable and, all in all, entertaining.

These songs stir memories, and not only for the audience. On the back cover, the pianist tells his life story in music, starting in the first grade, in honest, sometimes amusing fashion. *Making a Night of It* is unobtrusive music to be played at home for friends when lights are low and spirits are high. If that doesn't sound exciting enough for you—well, you had to be there. GENE KALBACHER

African Dances. [John Storm Roberts, producer; no engineer listed; no recording sites given.] Authentic Records 601.

Performance: **Infectiously foot-tapping**
Recording: **Surprisingly decent in mono**

Now that modern African rock stars like King Sunny Ade and Prince Nico are an accepted presence on American FM radio and on record racks, it's time to listen to the *roots* of their music. And there are numerous recordings of modern African music to choose from on labels like Nonesuch, Folkways, and Everest. The peculiar charm of this anthology rests with its exclusive focus upon *dance* music. Add to this a fine job technically cleaning up some African vintage recordings that were in some instances five decades old, and you get the sense of this album as *the* place to begin seriously listening to African music.

It is difficult to pinpoint the highlights in this collection of sixteen cuts by as many artists. Here are simply some notations on a few charmers that caught my attention. The album opens with the "OK Jazz Orchestra" from the Congo. The brass and sax ensemble playing amazed me for its similarity to the sounds produced by Salsa orchestras in Cuba and New York. There's also some lovely single string guitar on the selection following that evokes the modern stylings of King Sunny Ade. A rough-hewn vocal by Dele Ojo reveals the Yoruba roots of a tribal sound that Ade also has been active in recently rearranging for American ears. A women's vocal group from South Africa sings in a plaintive lilt that crosses all language barriers. My favorite song on side two is a joyous romp by "Dick Ngoye & Party" featuring beautifully interwoven male vocals backed by acoustic guitars and soda-bottle (!) percussion.

Whatever one's choice of favorites, each of the sixteen tunes is rhythmically charged with the power to get one's toes tapping. The culminative effect of this album is to make most modern disco sound like music for meditation.

This said, I'd like to address the technical questions pertaining to

nat hentoff

Timeless Improvising by Jazz Giants

From the morning after the concert in Toronto, reports came to New York and other cities of the astonishing doings that had just taken place. Charlie Parker, Dizzy Gillespie, Charles Mingus, Bud Powell, Max Roach—a quintet from Olympus! Oh sure, as befits genius, there had been some hassles—like Bird found he'd forgotten his horn and had to borrow a plastic also. (This was before anybody had heard of Ornette Coleman.) But man, what music! Everybody lived up to his world-wide rep. So we were told.

And then, Mingus actually brought out a record of that night at Toronto's Massey Hall on his own label, Debut. The rumors and reports turned out to be true. It was startlingly brilliant jazz, the very apotheosis of bop—and beyond. The album, *The Quintet—Jazz at Massey Hall*, has been hard to find in recent years. But now, as part of Fantasy's marvelously abundant reissue program of *Original Jazz Classics*, that night in Toronto is available again. Although there had been times, and would be again, when these bristling jazz legends would jam dissonantly into each other on gigs, they worked together that night with mutually enlivening respect and maybe even affection.

While the sound is, after all, three decades old, whoever was handling the controls that night fully caught the excitement and kept it in balance. You can hear it all, and I expect you'll want to keep hearing this set because this is the most continually exultant interplay between collective and solo improvisation since the Louis Armstrong Hot Fives.

Mingus, of course, also recorded his own groups on Debut, and one particularly memorable session was *Mingus at the Bohemia* with one of Charles's Jazz Workshop combos. The Bohemia was a rather dark, often crowded Greenwich Club which saw, among other phenomena of the 1950's, the instant stardom of Cannonball Adderley, and the growing sovereignty of Miles Davis.

No unit, however, was as unpredictable and self-challenging as Mingus's. The personnel on this album included trombonist Eddie Bert, tenor saxophonist George Barrow, pianist Mal Waldron, drummer Willie Jones—and, as a special guest, Max Roach.

Listening to the range of Mingus originals and his total restructuring of standards, it's clear to me that not only have his bold melodies, cliche-free harmonies, and continually resilient rhythms retained their freshness and unhyped drama, his music as a whole is still more original and more deeply satisfying than a large proportion of present-day "advanced" jazz. No matter how far "out" Mingus and his colleagues went, they always swung, and they always had a story to tell. They didn't just conjugate concepts.

Of particular fascination is "Percussion Discussion" with Max Roach and Mingus, and the Mingus originals, "Jump, Monk" (a profile of Thelonious) and "Work Song." The sound throughout is clear and resonant, and it's a pity there are no engineering credits. This, too is part of Fantasy's invaluable *Original Jazz Classics* series.

CHARLIE PARKER, DIZZY GILLESPIE, CHARLES MINGUS, MAX ROACH, BUD POWELL: *The Quintet—Jazz at Massey Hall.* [No production or engineering credits.] Debut OJC-044 (DEB-124).

CHARLES MINGUS: *Mingus at the Bohemia.* [No production or engineering credits.] Debut OJC-045 (DEB-123).

sound quality raised by a reissue like this. There are two schools of studio thought about cleaning up old and primitive masters from thirty or more years ago. There's the school that says, "Let's exaggerate depth, rechannel into stereo, add a few special effects." Cheap reissues of ethnomusicological stuff often have this processing done to them. I once had a field recording of a voodoo ceremony "reprocessed in stereo." Perhaps I received twice my share of a hex as a result.

The other school of studio thought suggests that as little tampering as possible should be done to the originals. Keep mono...mono. Don't layer studio reverb. This is the school producer John Storm Roberts belongs to. And my symphathies rest with this approach. The sound is sometimes scratchy and fuzzy—but is decently clean throughout. The pressing is of good quality and the record sounds fine with my noise reduction filter turned on while I listen and with the treble turned down. Only moments of percussion suffer in this listening.

John Storm Roberts knows how to sensitively produce a reissue of African dance music. He is the author of what is unquestionably the most knowledgeable (yet relaxed) book on Black music I've ever read, *Black Music of Two Worlds*. Listeners to this album will want to search that book out in their local store or library.

For those unable to find this release at their local outlets, write to Original Music, 123 Congress Street, Brooklyn, NY 11201 for ordering information. "Original" is a much abused word in the music business. But this truly is. And what emotionally joyous release one can experience moving to the beat of these songs! The colonialists had it backwards; it is we who inhabit the "dark continent."

NORMAN WEINSTEIN

Classified

- **PRODUCTS**
- **EQUIPMENT**
- **SERVICES**

Classified Rates
$1.00 per word.
Minimum $25.00.
Copy must be received at Modern Recording & Music, 1120 Old Country Road, Plainview, NY 11803 by the 15th day of the 2nd month prior to cover date (for example, the April issue closes February 15th). Payment must accompany order. Phone numbers count as 1 word. Zip codes are free.

DISPLAY ADVERTISING
$40.00 per column inch.

"SYNTHE-SOUND" Musical Products/ CABLEMATIX Division, P.O. Box 148, Poquonock, CT 06064. Musical, Recording and Broadcast Cable Assemblies, Custom Cables and Cable Systems, Bulk Connector and Cable Sales.

AKG "THE TUBE," 414/P48's. Yes, we have them! **ERS, Inc. (412) 221-2737.**

THE RECORDING BOOK THAT IS ROCKING THE MUSIC INDUSTRY

"Practical Techniques for the Recording Engineer" by Sherman Keene is endorsed by major Colleges, Universities, Recording Schools, Studios, Musicians and our Correspondence Students around the world. Recommended by reviewers of the MIX, Re/P, Guitar Player and other top publications. THE BOOK: hard cover, 380 pages, 28 chapters (4 on computer assisted mixing), illustrations. $29.75 ($31.69 in Calif.) plus $2.50 shipping.

THE CORRESPONDENCE COURSE: certificate course using two textbooks, corrected and graded homework, unlimited dialog with the author via cassette, Basic, Intermediate and Advanced levels.

THE CURRICULUM: for schools only, Teacher's manual (lesson plans for two textbooks, charts, suggested session content), Student's Workbook, Final Exams.

FOR INFORMATION OR TO ORDER contact:

S.K.P.
1626 N. Wilcox No. C-677
Hollywood, CA 90028

Order by phone using Visa or Mastercharge by calling (805) 969-6639.

Mixers, Equalizers, Limiters, Pre-Amps, VCA's, Power supplies, parts, and more . . . . . CATALOG

NEW AUDIO KITS

Modular design featuring plug-in construction. Design your own combination of functions. Write RODCAR ELECTRONIC SALES 214-351-9895
9983 Monroe Drive Dallas, Texas 75220

YOUR OWN RECORDING SCHOOL/STUDIO

National audio educational franchises now available for private ownership! Operate fully equipped school/studio in your community. State approved courses developed over a 14 year period. Turnkey business including studio construction, equipment, pretraining, marketing, advertising, grand opening and ongoing assistance. Low initial investment! **Dawn Audio, 756 Main St., Farmingdale, NY 11735. (516) 454-8999.**

Interface House/Mon Console, 40 Parametric Inputs, 12/2 Discrete Balanced Outputs, w/case $10,500; Interface House Console, 12 Balanced Mic/Line Inputs, 8 Balanced Outputs, w/case $2500; UREI 521P X-over 4-way $300 ea.; UREI 527 1/3 Octave EQ $350; Yamaha F1030 X-over 3-way $150; Masteroom XL-305 Reverb $500; Phase Linear 700B $375 ea.; Phase Linear 400 $250 ea.; Crown D-75 $225 ea.; EVM-12L Speakers $65 ea.; Lexicon Prime Time $600. **(305) 776-4915.**

Advertiser's Index

SUBSCRIBER SERVICE

CHANGE OF ADDRESS

Planning to move? Please let us know six weeks in advance so you won't miss a single issue of MODERN RECORDING.

Attach old label and print new address in space provided. Also include your mailing label whenever you write concerning your subscription to insure prompt service on your inquiry.

MODERN RECORDING
1120 Old Country Road
Plainview, NY 11803

Attach Label Here

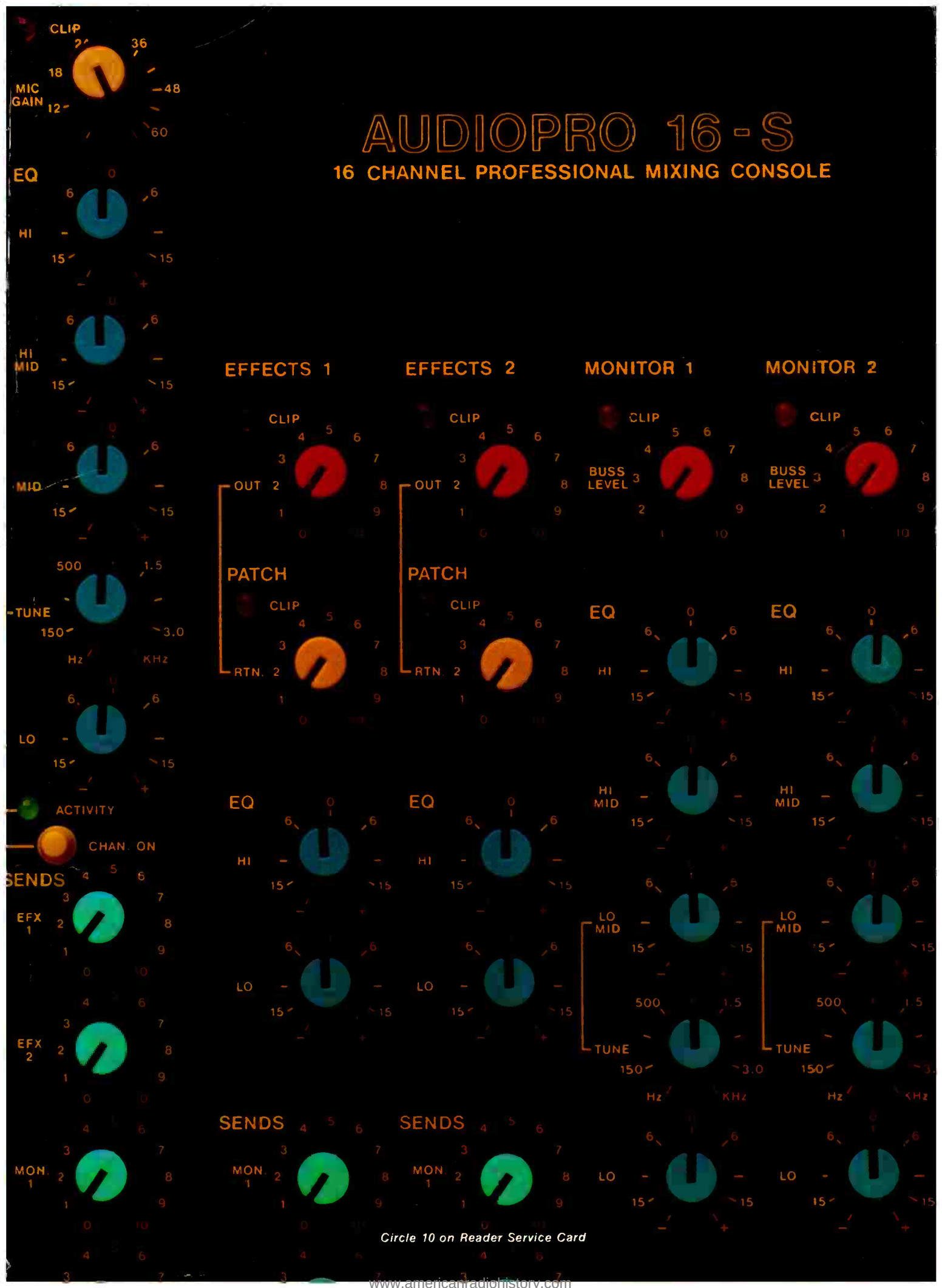
▼ *New Address Here* ▼ *Please print*

Name _____

Address _____

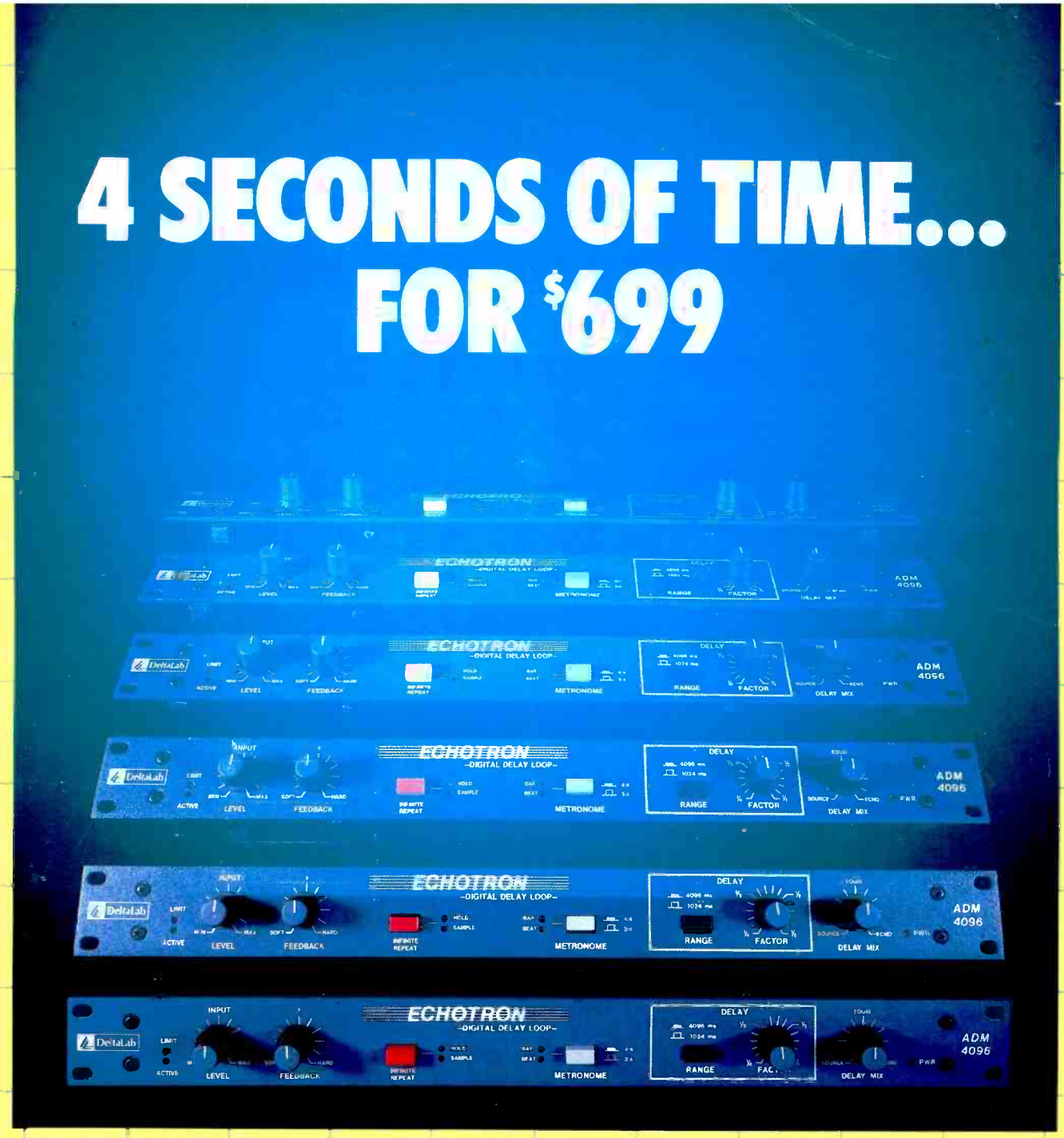
City _____ State _____

Date ___/___/___ Zip _____



Circle 10 on Reader Service Card

4 SECONDS OF TIME... FOR $699



THE ECHOTRON FROM DELTALAB

The ECHOTRON™ is designed for DeltaLab's consumers who have requested a solid state digital delay loop with long delay capability.

The delay range is from 256ms (¼ sec) to 4096ms (4 **sec**) all at full bandwidth (16KHZ), allowing you to produce "short" to extremely "long" high quality echoes.

The unit also offers Infinite Repeat capabilities for storing sound digitally, without any signal degradation. Sound on sound can be added by using the feedback control, in conjunction with the Infinite Repeat, allowing you to produce over four seconds of repetitive high quality audio digitally. You can even sync your favorite drum machine to it. This is simply amazing !!!

All for a retail price of $699.00.* Visit your dealer today and check it out !!!

DeltaLab

Music & Electronics . . . Naturally!

*Manufacturer's Suggested Retail