

**Profile:
PETER GABRIEL**

MODERN RECORDING & MUSIC

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JUNE 1983
VOL. 9 NO. 6

A Session With MAURICE WHITE

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LAB REPORTS:

Dynacord EQ 270

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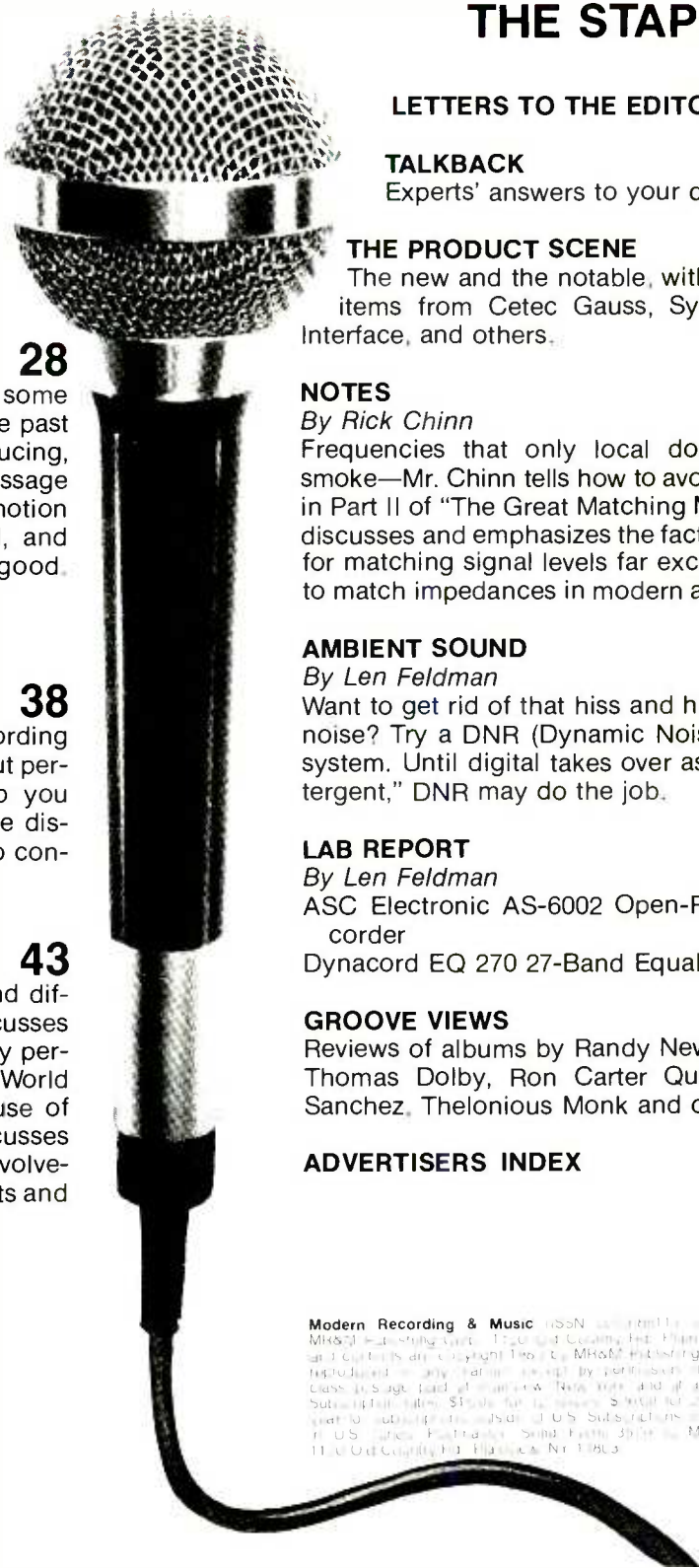
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More on Sloppy Disks

Jeff Perry's letter in our February issue on the quality (or rather, the lack of it) in today's records prompted several responses—some of which appear below. It also prompted us to stick in our own two-cents worth on the subject.

The first penny's worth is this: Asking a store to give you a replacement for the bum disc you bought is probably a waste of time. Chances are you'll simply get another rotten pressing—just like the one you're returning. If you keep it up long enough, you might be lucky enough to get a good one, but the odds are against it. After all, the store probably got its entire shipment at once, and they were all made under the same conditions.

If you want action, return the record to the company that manufactured it, along with a letter expressing your feelings. Of course, this is a major annoyance, as compared to the minor one of just going back to the record store for a replacement disc. However, it's about the only way to get the record company's attention. When record replacements get to be a major annoyance for *them*, something may be done about quality control. In the meantime, you might suggest that if they can't find a single record in their inventory that's worth your investment, you'll take a refund and go elsewhere next time. Once this message penetrates the corporate mentality, something may be done to upgrade quality. But if enough of you don't deliver the message, you can pretty much look forward to many more of the same low-fi pressings coming your way.

Since we promised two-cents worth, here's the rest of it. It is a crime to deprive any artist (or even those damned record companies!) of income by copying a record you have not purchased. Of course, it's a crime you can easily get away with; just borrow your friend's disc, slip in a cassette while no one's looking and...well, you know the rest.

If enough of you do it often enough, pretty soon you won't have to sweat poor quality pressings any longer. Once the record-production process becomes a guaranteed money-loser, you can bet the labels will go out of business. O.K., so that's exactly what some of them deserve. But is it what you deserve?

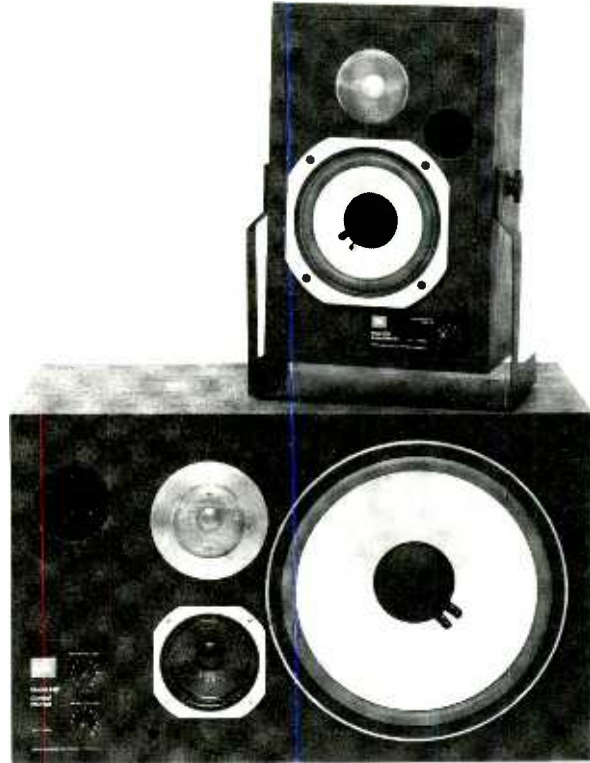
We don't think so. We'd like to think that if a quality product was made available, you'd buy it. We really hope that most of you would rather spend your time creating your own recordings, rather than stealing the work of others. On the other hand, it's so easy to just "borrow" someone else's music, listen awhile, and then re-record something else when you've had enough. Just a handful of cassettes will put you in business, and help put the record companies out of business. Is that what you want?

We think we know the answer to this one, but would like to hear more from you about it. Maybe the record labels would like to hear from you, too. JMW

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The Taping Controversy Continues

I agree with Jeff Perry's letter regarding home taping. I can also see (somewhat dimly, though) the record companies' view, but...can they see ours?

I too tape records, quite frequently, but my reason for doing so is to preserve my rather large record collection, so that I can enjoy it fully in years to come. It also lets me enjoy my record collection in the car. I refuse to purchase cassette recordings. You can't expect mass-produced cassettes that were recorded on a 64:1 duplicator to match the quality of a 1:1 copy from a disc.

I don't borrow or lend albums. Few people are as fanatical about record cleanliness as I am. And, I feel that buying an album in one format should amount to a license to enjoy that album from whatever storage medium I choose to use.

Let me add my own two cents about record quality. I'm not sure I agree with Mr. Perry's charge about warpage, but I must cry loudly (and with feeling) about the surface noise that plagues domestically manufactured records. After listening to a Japanese or European disc—and it doesn't even need to be a Mobile Fidelity Super-Disc—I wonder whether US pressing plants use Kitty Litter instead of vinyl. Or does someone overdub a track of Rice Krispies during mastering?

American record companies should take heed of the plight of the Big Three in Detroit. The Japanese auto industry is eating them alive because their product works, is well-built and is cost-effective. Record production is no different.

—Rick Chinn
Redmond, Washington

know you'll never see again. Of the remainder, some were cutouts and some were commercially oriented artists who will be around awhile.

Yes, I made tapes of a lot of these records. Not only do I enjoy them in the car, but I know that if the tape is ever damaged, I can simply exercise the replacement option on the tape's warranty (something I've never seen on a record), run back to the turntable, and make a new tape from my still-clean disc. What is wrong with this? I don't duplicate 20 tapes and sell them at a profit.

I have a few friends who enjoy these "rare-catch" albums also, and I am happy to lend an album to them on the condition that only one tape is made. This conditional loan is not an effort on my part to prevent bootlegging, but solely to preserve the quality of the disc.

My friends correspondingly lend me their records for taping. Often this results in my attempting to locate the record myself—sometimes successfully, sometimes resulting in that oh-so-familiar "...check with me next month...we ordered it in 1978 (August, I think)..."

I am fortunate enough to live in an area where my most-frequented disc shops not only know me by name, but often break their backs trying to help me find a record. Again—and with feeling—somebody tell me what my failing is, because I just can't seem to understand. How have I sinned?

Lastly, regarding Mr. Perry's quality dilemma, I agree entirely. If I spend \$15.99 on an import, I expect—no, I demand—that it will last awhile. But what Mr. Perry didn't make clear is this: after he has his acceptable quality pressing...does he tape it?

—TJR
Washington, D.C.

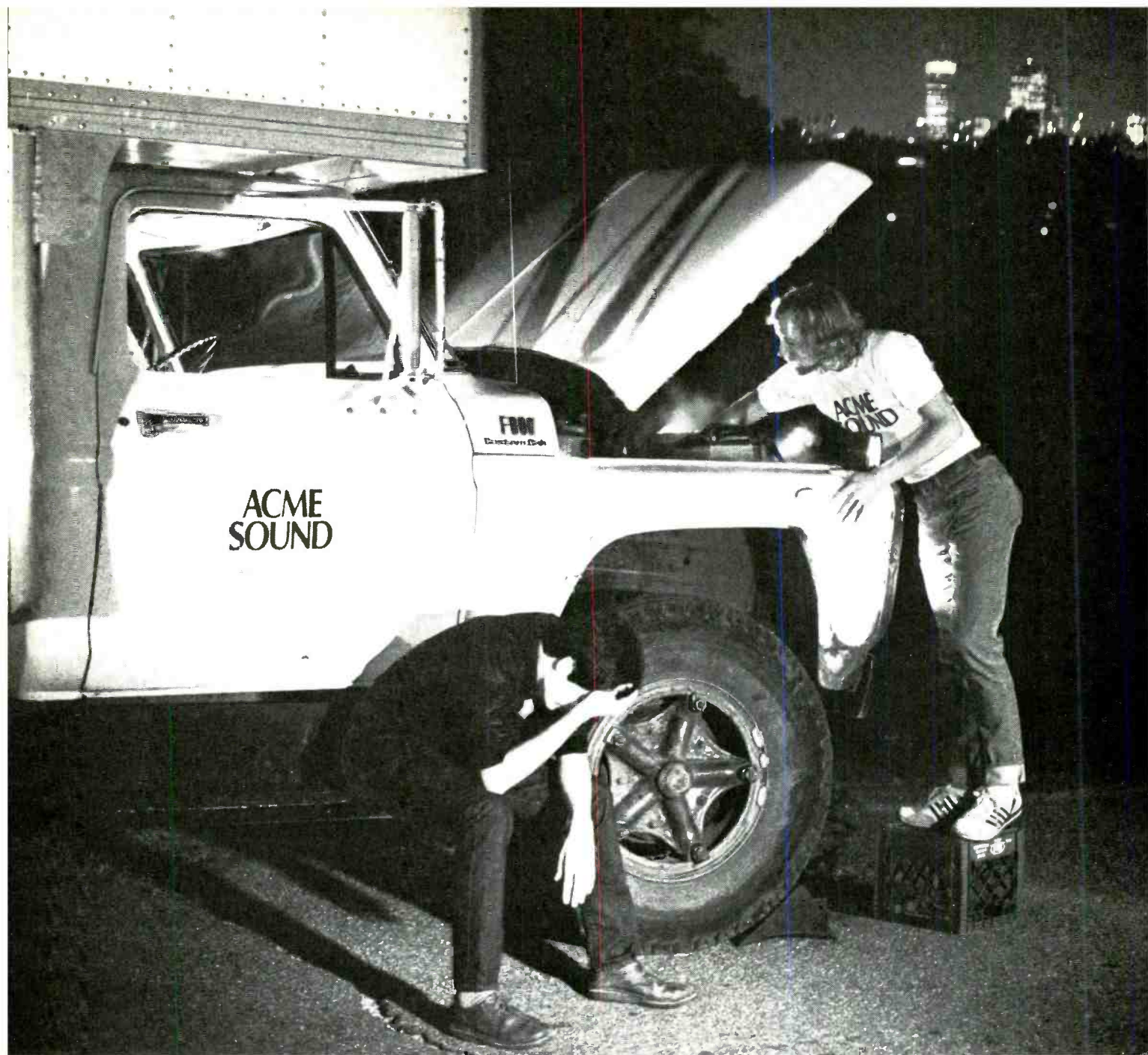
Having invested a lot of money in home audio equipment, I, of course, share Mr. Perry's rage when the stylus goes bouncing merrily across virgin vinyl. As an aspiring musician, I likewise appreciate the viewpoint offered by Mr. Daniels in December—namely that home tape recording is undermining the record industry.

In 1982, I purchased 121 albums (yes, I counted them). Over 70 percent were imports, and most of these were relatively obscure records—the type you chance upon once and

Since TJR's letter is a bit self-incriminating, we've omitted his full name. In living black-and-white, any tape copying that obstructs a record sale is potentially a crime. Copying discontinued records, or one-of-a-kind imports, or discs that the record store cannot or will not order, introduces varying shades of gray into the debate. As for lending a disc to a friend (or friends) so the friend(s) can avoid making a purchase...you already know the answer to this one. In the words of TJR, it's bootlegging. Does anyone disagree?

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I have been reading *MR&M* for some time now and really enjoy the articles by James Rupert for small studio owners. I finally broke down and called the number that he listed for the SBA office in Fort Worth, Texas. Guess what? It's been disconnected! So, being the resourceful person that I am, I called the toll-free information operator and got the number in Washington, D.C. When I called that number, I was informed that I had reached the Environmental Protection Agency! Well, I did eventually get a hold of the SBA, whose number is 800-368-5855.

Speaking of information, please print the address for The Symmetric Sound Systems of Santa Rosa, CA, so that I can find out how to get information on their Graphic Equalizer kits. Speaking of kits, let's see more Craig Anderton money savers for the starving studio owner. Thanks for a great magazine and keep up the good work!

—Greg Moore
Norman, OK

Sorry to hear about the SBA office in Fort Worth (perhaps they should have read Rupert's advice on how to stay in business). As for Symmetric Sound

Systems, their address is 856 Lynn Rose Court, Santa Rosa, California 95404. The phone number is (707) 546-3895.

Making *MR&M* Great(er)

There are two things *MR&M* can do to better serve its readers:

1. Print an index of all articles that have appeared in *MR&M*. Suppose I'm in the market for a power amp. Now, which issues had reviews of power amps? I'm forced to leaf through tables of contents—a dull way to spend the evening.

2. Once we have an index, we need access to this information. Many people do not have a complete collection of *MR&M*. A reprint service would be very valuable to readers, and whatever you have to charge would be well worth it, compared to the expense of buying the wrong piece of equipment, or of evaluating the equipment without the benefit of your reviews. And then there's the time involved in getting the "right sound" without the help of your how-to series, etc.

If it's worth printing in the first place, it's probably worth referring to in the future, and I urge you to consider these two additions to *MR&M*.

—Michael R. Kristofic
Gibsonia, Pennsylvania

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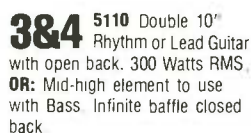
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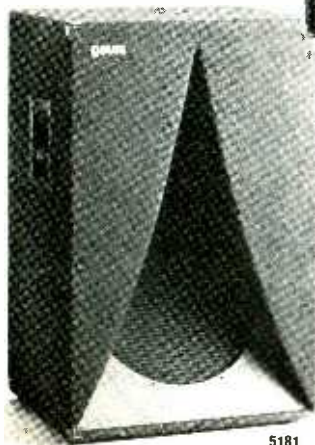
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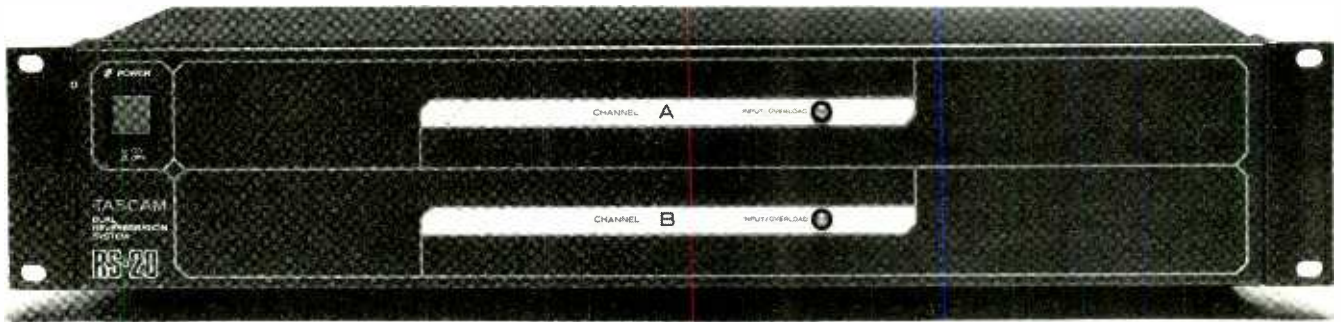
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*No sooner said than done—well, almost. One of our projects for this year is to prepare the index you need. The fact is, we need it ourselves. We've recently acquired *MR&M*, and are just now busily pouring through the back issues to see what's there. We've turned up a gold mine of information, but we need better—and quicker—access to it. So the index project is in the works, and we'll keep you posted on when it becomes available.*

As for the reprint service, that's still a bit of a problem. A limited number of back issues are available at \$2.50 each. Once they're gone, it would still cost about that amount just to pull out our one-and-only reference issue and copy the few pages needed. Worse yet, the photos (if any) don't really survive the copying process very well.

If there is sufficient demand for reprints in the future (say, once our index is available), we can probably work out a deal with one of the microfilm reprint services. We'll keep you posted on this.

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And Still More Advice

I have been reading *MR&M* on-and-off for quite a few years, and have been happy with about 70 percent of the material. I would like to subscribe (finally!) if you could concentrate more on certain areas.

I'm referring to not just testing a single product, but comparing three different types of equipment in the same price range. My main interest is what is the best product for the job—and for the money.

Also, there are a lot of "one-man bands" and trios out there, so I feel you could use more articles on sound systems that these people could use. In other words, review equipment for lounges with a capacity of two or three hundred people. If you could concentrate on that, I personally know of one dozen more subscribers.

—Matt Younger
Miami, Florida

Lately, we've also been reviewing our reviewing, and have some new ideas in the works. But first, let's respond to your request. In a word (actually, eight/nine words), there is no "best" product for the job/money. Newton's seventy-fifth law (still unpublished) says, "You gets what ya pays for."

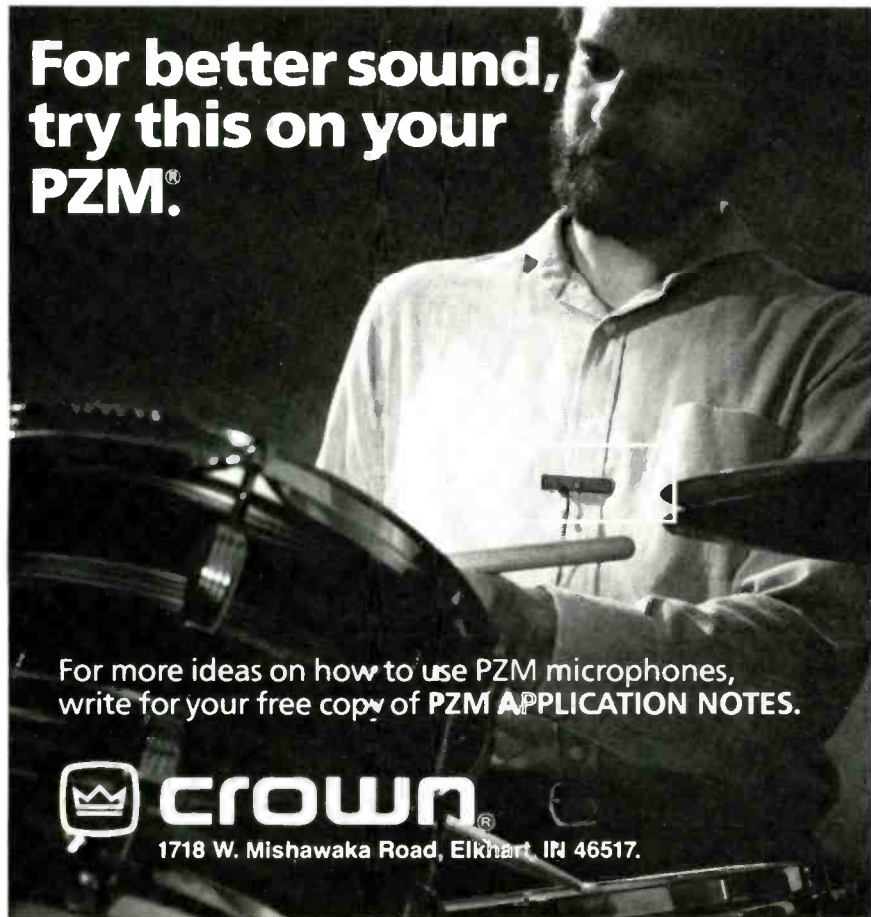
In other words, there are no thousand-dollar values available for five-hundred bucks, if only we'd tell you where to look. If there were, we wouldn't tell you anyway, but would make a killing buying at five and selling at ten (just kidding!).

Given the realities of competition and the marketplace, under- and/or over-priced merchandise usually disappears long before it can get reviewed, since no company can survive for long if it charges too much (or too little) for its products.

But that doesn't completely answer your question, does it? You also asked about finding the best product for the job. There is rarely a definitive answer to this question. The best limiter, microphone, console or whatever is mostly a matter of personal taste. For example, if you ask a professional recording engineer what the best mic for guitar is, you'll probably hear something like this, "What guitar? Who's playing it? Is it a solo? —duet?—part of a rock group? —an overdub?" And so on. If you answer all these questions, you'll get an opinion, but nothing more than that if your informant is truly a pro'.

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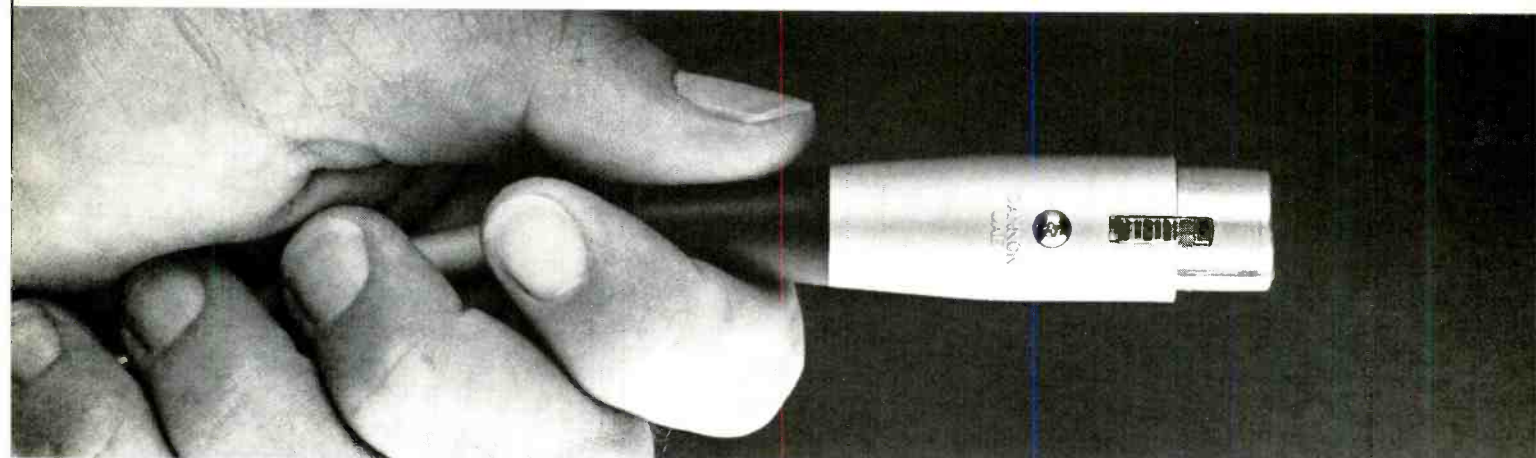


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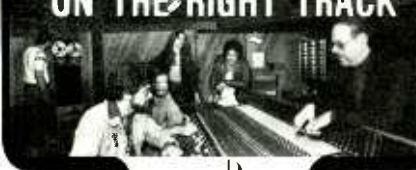
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TREBAS INSTITUTE OF RECORDING ARTS

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help you decide whether the equipment has the features that you need. As another example, a certain compressor doesn't have an adjustable threshold control, and so it costs a little less. You don't really need this control anyway, and are happy to discover a way to save a few bucks. On the other hand, another reader needs an adjustable threshold, and is glad to learn that the device doesn't have one. So which is the best unit for the job? You'll want to answer that one yourself, and our reviews will try to give you the information you need to make the best choice.

In the future, some of our studio-oriented products will be reviewed right in your own backyard—at the University of Miami's 24-track recording studio. Here, we'll be subjecting microphones, speakers and signal processing devices to all the horrors we can dream up. How does it measure on the lab bench? Who cares? How many of you have ever recorded a lab bench? (By the way, what kind of mic' did you use?)

Instead, we'll be concentrating on how does it perform in the studio. Now, about those dozen subscribers....

Where, Oh Where Have They Gone?

I recently made an attempt to write to the Ampex Corporation in regards to purchasing a motor for my Model 1461 reel-to-reel tape deck. The letter was returned to me unopened with a postal stamp on the front stating that the forwarding period had expired. Not knowing where to turn, I decided to write to my favorite recording industry magazine in hopes that you could help me find a motor for my deck. Any information you could supply me with as to how to reach the Ampex Corporation, or someone currently handling Ampex replacement parts, would be greatly appreciated.

—Gregory A. Peter
Rochester, IN

We're not sure why you had trouble getting in touch with Ampex Corporation. However, we did find out that they no longer have a consumer products division. That division is now being handled by another company. Therefore, all inquiries dealing with consumer products (such as your Model 1461 reel-to-reel tape deck) should be directed to Ramparts, P.O. Box 191, Morton Grove, IL 60053.

Compressor Producers

After reading Bruce Bartlett's very interesting and informative article on compression, I would very much like to know more about which companies produce compressors—and also where they can be bought. I presently own a Tascam 144 portastudio and I feel that using a compressor would be a great improvement on my work. I realize that you may not be in a position to recommend a particular brand, but any general information would be helpful.

—M. A. O'Connor
Victoria, B.C.

We received the following response from Bruce Bartlett:

I appreciate your comments. The following is a PARTIAL list of companies that make compressors suitable for home studios. Ask them for product literature and for the addresses of local dealers. Be sure to note whether the product requires a separate power supply or is self-contained. Also find out if the connectors will mate with your cables.

dbx, Inc., 71 Chapel St., Newton, MA 02195. (617) 964-3210.

United Recording Electronics Industries, 8460 San Fernando Rd., Sun Valley, CA 91352. (213) 767-1000.
LT Sound, P.O. Box 1061, Decatur, GA 30031. (404) 284-5155.

Orban Associates, Inc., 645 Bryant St., San Francisco, CA 94107. (415) 957-1067.

Ashley Audio, 100 Fernwood Ave., Rochester, NY 14621. (716) 544-5191.

Spectra Sonics, 3750 Airport Rd., Ogden, UT 84403. (801) 392-7531.

Furman Sound, Inc., 616 Canal St., Suite 29, San Rafael, CA 94901. (415) 456-6766.

MXR Innovations, 740 Driving Park Ave., Rochester, NY 14613. (716) 254-2910.

Symetrix, Inc., 109 Bell St., Seattle, WA 98121. (206) 624-5012.

Audio Arts, Inc., 5617 Melrose Ave., Hollywood, CA 90038. (213) 461-3507.

Also check out the *Pro Audio Yearbook*, Sagamore Publishing Company, 1120 Old Country Road, Plainview, NY 11803; and the *Modern Recording & Music Buyer's Guide*, published annually.

—Bruce Bartlett
Contributing Editor
MR&M

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TALK BACK

Speaking of Equipment Reviews

Is there someone at *MR&M* who has used both the Tascam 244 and the Fostex 250? I would like to know about the assets and liabilities of either. Also, I would like to know if there is much difference in recording quality between the Portastudio-type units and a four-track reel-to-reel of comparable

price. I'm new to the recording game, and am considering buying a Portastudio if I can expect to get a reasonable sound from one. I would appreciate any guidance that could be given in this area.

—Keith F. Hendricks
San Antonio, Texas

This is a job for Feldman Labs! We've just asked Len to do a feature-for-

feature comparison of the Fostex and Tascam all-in-one units, and to extend the comparison to include open-reel tape recorders in the same price ballpark. We'll schedule his report for a future issue. In the meantime, here's a bit of general advice which may help.

Theoretically, an open-reel recorder will give superior results. It's not the reel format that does it, but rather the speed and width of the tape (the higher the speed and wider the tape, the better the specs). It's also quite easy to edit open-reel tapes, and quite impossible (well, it ain't easy) to edit cassette tapes.

Both the Tascam Portastudio and the 250 version of Fostex's system operate at 3¾ ips. (The Fostex 250AV operates at the standard 1⅞ ips, and features a 1-volt monitor output to drive slide-projector programmers.) On most open-reel machines, the lowest speed is 7½ ips.

The trade-offs are cassette simplicity of operation versus open-reel flexibility and, in general, size versus performance. On the other hand, the latest generation of cassette technology is extraordinarily good, and (some) open-reel machines are getting smaller and smaller without giving up too much in performance.

To zero in on the best format, consider your personal needs. Will you be doing a lot of editing? Go for the open-reels. Will you be recording live concerts with a minimum of hardware? Look into the cassette all-in-one systems. (We're avoiding calling them all Portastudios, since that's a Tascam registered trade name.)

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More on Uni-Sync

I recently purchased a model MS-1003 microphone splitter made by Uni-Sync. Each unit is for 10 microphones, and each split has a switch with the words GROUND and OFF-ON next to it. The units came without instructions, and I really don't know what happens when the switch is off or on.

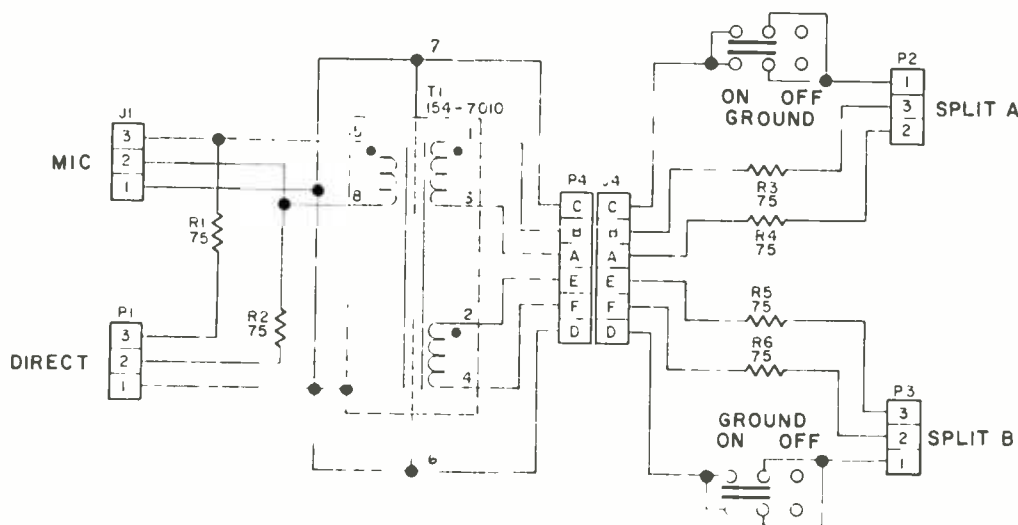
I know Uni-Sync is out of business, so can you tell me if there is someplace else where I can get a service diagram and an explanation of the features?

—Ian Achong
Caracas, Venezuela

The MS-1003 is (or was) a device for splitting the outputs from ten microphones to feed three separate inputs.

observations. (See "Talkback," page 6—Ed.)

One of the prime advantages of the 244 is its parametric equalizers. Yet a critical point concerning equalization has been left out of the manual. Equalization gain should be applied to the signal during recording. In *Modern Recording Techniques* by Robert Runstein, the author points out





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We managed to turn up a schematic diagram, which is reprinted here. The microphone is plugged into J1, and the DIRECT output (P1) goes to the main console. Phantom powering (if required) will be supplied to the microphone through this circuit. The SPLIT A and SPLIT B outputs (P2 and P3) may be used to feed the same microphone output to two other consoles for, say, a simultaneous recording/sound reinforcement/broadcast feed. Depending on the interaction between the various consoles receiving the mic'-signal feed, the ground on/off switches may be used to minimize hum.

Hope this helps. By the way, in case anyone missed our correction last month, Uni-Sync was liquidated in October, 1979, by BSR, its parent company.

Portastudio Equalizers

I recently bought a Tascam 244 Portastudio. After reading Drew Daniels' comments in the February 1983 issue of *MR&M* concerning Tascam's owner's manual, I wanted to respond with some of my own

that "...while recording with EQ does not change the perceived noise level, playing back with EQ does." The novice is not likely to understand this point unless it is made clear (I speak of myself here).

—Robert W. Gray
Baltimore, Maryland

Back off on that equalizer for a minute! Many engineers advise *against* using equalization during recording. For one thing, you're pretty much stuck with whatever equalization you've recorded. You can wind up regretting it later on, especially if you've equalized an early track and then two days later you discover the sound isn't right any more when you go to add vocals. Also, equalization boosts can bring you a lot closer to tape saturation. Since you may not be monitoring the tape as you record, you may not discover the damages until later on.

Of course, if you want to equalize one signal that's being mixed in with others during recording, you must do it while recording. Otherwise, it's usually best to keep your basic tracks as clean as possible and save the fixing till the mix.

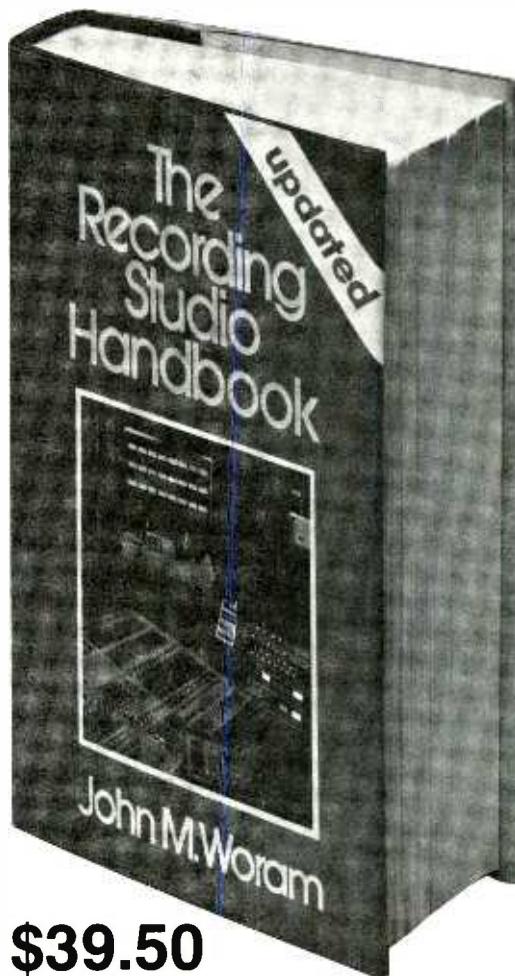
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Studio Notebook # 14

By James F. Rupert

After recently agreeing to participate in a panel discussion at a local small business seminar, I began kicking myself after I hung up the phone. It's one of those things in life that you know is supposed to be an honor to be asked but you'd just as soon that the honor was given to someone else. (It's like the army; I fought and I fought and I fought... but I had to go anyway!) Yet after losing my telephone duel two falls to a submission, I steeled myself to enduring a day that would be highlighted only by rhetoric and interrupted only by boredom.

Boy, was I all wet! The conference was a delightful example of the best of the free enterprise system in action. Not only were newcomers to small business able to pick up invaluable advice from long-time professionals, but on numerous occasions the seasoned veterans found themselves applauding the innovations of those they were there to instruct.

At the end of the panel discussion, I met with a small group of would-be studio owners and tried to answer their questions individually. What I soon discovered was that I was answering a lot of the same questions that I had been asked before in mail from MR&M's readership. I thought this month's installment of the Studio Notebook would be a good opportunity to take a few pages to try and spotlight some of the more common queries and offer a couple of opinionated answers. As usual, some of the questions and answers are based on materials available free from your local office of the United States Small Business Administration. Most are from questions asked me over the last few years.

Let's begin.

Q.) I think I know recording well enough. What are the other basic business skills I'll need to get my studio rolling?

A.) If you're well enough off, you don't need to know any. Just shell out a small fortune to hire somebody else to do everything for you. You'll need to find somebody with a working knowledge of basic record keeping, financial management, personnel management, market analysis, break-even analysis, repair and maintenance, federal, state and local tax structures, legal structures, and advertising and communication

skills. If you can't afford to add quite this many names to your payroll, it might be wise to bone up on these skills yourself.

Q.) What do you think are the biggest problems that a new studio owner faces?

A.) That's like saying, "Describe each pound in a ton." Many of the problems you face are the same for any new business, not just a recording studio. Undercapitalization is pretty common. This means that there is not enough money to carry you through those lean first six months or so. Without backup capital, you've got nothing to fall back on while you're building business and waiting for customers to pay their bills to you. Mismanagement is another killer. It's a lot easier to keep a business rolling than to get it moving in the first place. The SBA advises us to look at a new business as having "zero momentum." Entering a new market, establishing supplier relations, finding proper financing, training new employees and digging up paying clients not only to have to be done from scratch, they have to be done simultaneously. It is no disgrace to say that you might not be able to do all this, but you better find someone who can if you wish to survive in today's marketplace.

Still, if I were pressed to name one problem, the biggest single thing that comes to mind is the number of studios bellying up in the last few years. It wasn't all mismanagement. One of the problems is a very soft market currently. Another problem is the economic fears everybody has at the moment. Some of it is an overabundance of the semi-pro gear flooding the market. Now you can get eight tracks with noise reduction on quarter-inch tape for under \$3000. Can studios with \$10,000 one-inch format eight-track machines keep their prices low enough to compete with this and still be cost-effective? I know there's a big difference in quality of recordings, but ask any small studio owner when was the last time he or she had a client in that was only concerned with quality no matter what the cost.

Don't get me wrong. I'm not saying the day of the wide tape format, master quality professional studios are numbered. What I am saying is that small studios as

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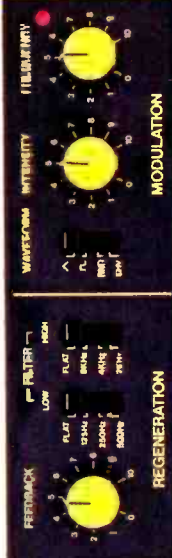
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commercial enterprises have got to be smart enough to adapt everything about their operations and organization to current demands and competitive pressures or die an expensive death. The best way to do that is to have people with experience, education and intelligence running the show. We've now come back full circle to those management skills we talked about in question number 1.

Q.) I've felt some discrimination as a woman trying to go into business for myself. How can I overcome this?

A.) Women are finally making some overdue inroads into business, particularly in owning their own companies. The two biggest things that women as business owners have to overcome are the doubts of lenders and any possible lack of confidence by the public in a woman's ability to effectively run a business. The person who can best take the initiative to remedy this is you yourself.

You must have the self-confidence to prove the others wrong. It also would not hurt to have a thorough working knowledge of the discrimination laws for equal employment and economic opportunity. If you honestly feel that you are not being treated fairly within the limits of the law, don't just shrug it off, do something about it.

On the other hand, do not be discouraged by someone who does not understand your talents and abilities. What you might be interpreting as chauvinism could merely be ignorance. Your belief in your potential might be just the eye-opening education that the would-be doubters need to turn them around to

your side. As you and other women enter business and succeed, the process should become that much easier for the next woman in line.

Q.) I'm thinking of buying an existing studio, but they want to charge me for something called "goodwill." What are they talking about?

A.) Any business you might consider buying that is making profit is entitled to list goodwill as an asset. Otherwise, you could just add up the total worth of the equipment, fixtures and inventory and pay them that sum. Yet you are not buying just equipment, you are buying a business; i.e. an entity that operates to make a profit. You are buying the good name that they have built up in the eyes of their customers. You are paying for the advertising and promotion that the studio has done over the years. You are reimbursing the previous owners for their efforts in building the successful studio you are considering taking responsibility for. (If it was not successful, why would you be considering purchasing it?)

One simple way to figure goodwill dollars is to determine the "payback period," which is usually two to three years. This means that the net profit for that period of time would equal the goodwill value. The length of the payback period is entirely negotiable.

If a more accurate method of determining the goodwill value is desired, the net present value method should be used. This is a much more complicated way of figuring actual goodwill value that is based on the cost of capital and a risk factor. (Clear as mother's milk, huh?) For full details, an accountant should be

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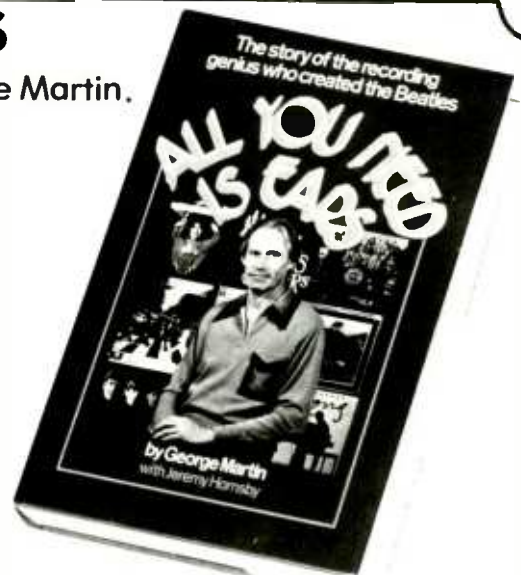
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 - G DCM301 300W Monitor Amp w 9 band EQ — \$349 List \$625
 - H EQ2029 29 Band 1/3 Octave Equalizer — \$259 List \$495
 - I XC1000 Stereo Electronic Crossover — \$269 List \$495
 - J DC200 Koa Guitar with Gold Plating — \$570 List \$1,140
 - K XB112 All-Tube 1-12" "X" amp w Celestion — start at \$449
 - L B215-M Dual 15" MagnaLab Bass Enclosure — \$245 List \$495
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consulted for a professional appraisal of the company to be bought.

Q.) I'm scared of government regulations. How do I find out about federal and local regulations for the recording industry?

A.) Local regulations vary from state to state. Your best bets for nailing down the regulations for your city and state would be to contact your local Chamber of Commerce and your closest field office of the SBA. The SBA office can also provide you with information on all levels of government, with the Internal Revenue Service filling in the gaps on local and federal tax programs.

Q.) Do I have to have a lawyer to start a business?

A.) No, but the smart businessperson gets the best possible advice when first starting out. An attorney, like an accountant or a bookkeeper, is one source of expertise that would be advisable to draw upon. If you plan on incorporating, you will almost certainly need a lawyer to aid you in setting up the corporation. Some states make it mandatory to have a lawyer handle the incorporation process. Check with your local SBA office to see about your state.

Q.) Do I have to get a license to open a studio or any other business?

A.) As mentioned before, there are specific requirements for different states and localities. Your new studio might need several kinds of licenses or registrations. Depending on your city, town or county, you might have to obtain a local business license as well as meet zoning laws, building codes and all other local regulations.

On the state level, if your studio isn't a corporation and your full name isn't in the name of the business, you'll have to register under what is called the "fictitious name law." This applies in most (but not all) states, so please check for the individual particulars. You may also be required to file for a sales and use tax number for collecting, reporting and paying any sales tax paid to you. Recording studios are generally not responsible for any further special local licenses.

Federal licenses can get a bit more complicated. At the very least, you will want to contact the IRS for an employer's identification number and a "Going Into Business Tax Kit." As you might expect, the SBA has a free handout information packet on the entire process or their office staffs will try to answer any possible questions you might have. Remember, this is your tax dollars in action, so go ahead and ask!

Q.) I'm thinking of going into mail order to sell a cassette instructional series. Are there special laws for mail order businesses?

A.) I would recommend that you contact the Federal Trade Commission and ask for the FTC's list of publications. You can then order the information that pertains to your cassette venture and recording in general. The FTC pamphlets will be much cheaper than having a lawyer answer your questions about federal mail order laws.

Q.) How do I find the suppliers with the best prices on

tape, reels, accessories and any other software I'll need?

A.) An excellent source for finding suppliers is the Thomas Register, which you might be able to find at your local library. This publication lists manufacturers by category and geographical area. While you're there, you should ask the librarian if they have a current directory of manufacturers for your state. Keeping your orders from close-by suppliers can help keep your shipping costs to a minimum.

If you can possibly make it to an Audio Engineering Society convention or Consumer Electronics Trade Show, you'll be able to compare competing products and supplier prices firsthand. Let these good people know that you're ready to begin business and you're checking out suppliers and they'll come looking for you from now on.

If this kind of traveling is just not practical for you, try the reader service card contained within the pages of the very magazine you're now holding. Several excellent sources of tape and supplies are regular advertisers in MR&M. Circle their number and see what they can do for you.

Q.) How do I determine prices on my studio's time and products?

A.) The perennial toughie. So much depends on what your competition is charging, the quality you are offering and what the market will bear in your area. For instance, if you're a half-inch eight-track studio with rates set at \$40 per hour, and the guy down the block is one-inch eight-track at \$25 per hour, you've probably got a problem.

Prices vary widely from area to area around the U.S., and often from city to city. The guy with the only studio in a city of 250,000 is most likely sitting a lot prettier than the guy who is one of 40 studios in a city of one million. This is where the market and break-even analysis we talked about earlier comes in. If you can't stay competitive and make enough profit, or if you're not specializing in an area your competitor is weak or nonexistent in, then you shouldn't have jumped into the race in the first place. That's what free enterprise is all about.

Q.) So how do I go about finding out my competitor's prices?

A.) I'm amazed at how often I'm asked that question. Call me old-fashioned, but I think the best way to find out what they are charging is to ask them. Pick up the phone and request that a rate card be sent to you. If you cannot force yourself to establish communication, try contacting any known customers of theirs and asking them if they have any work you might be able to help them with. These customers will let you know soon enough if your prices are in the ballpark or not.

If your prices are competitive, you've still got to offer a reason why they should switch to your studio instead of staying right where they are. Do you have faster turnaround time? Are your payment terms easier? Are you offering better quality for comparable money? Will you pick up and deliver orders to the customer? What makes you a better deal for this client than the studio they've basically been happy with?

The bottom line is that your prices do not have to be

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lower than your competition, but if they are not, you have to be able to show why there is a difference. Otherwise, you're just one more fish in the brook.

Q.) How do I get out of paying taxes?

A.) First, be careful of thinking about taxes in terms of "getting out" of anything. Maybe a better way of putting it would be, "How do I avoid paying more taxes than I legally need to?"

One way is to knuckle down on your basic bookkeeping. Thousands of individuals and businesses pay extra taxes (not due taxes—extra taxes), by not keeping complete and accurate records of all their transactions during the tax year. Have you kept track of the business-related mileage driven in your car that was unreimbursed by the company? Any postage fees you paid? Anything you spent money on for the studio, be it the company's money or out of your own pocket, is a legal deduction. Just make sure it really was legitimately business-related.

One studio I know of (no names, please) saves more than just tax money by making all of its engineers independent contractors. The engineers all are paid a flat fee, and it is up to them as independent business-people to declare this income on their own taxes. The studio saves the cost of insurance, FICA contributions and the extra paperwork of deducting local, federal and state taxes out of their pay and reporting it to the government. This is perfectly legal, and the responsibility is shifted to the engineers to make sure that they pay the due taxes on the monies that they as independent contractors are receiving. The studio is still able to deduct the pay given to the engineers as an operational expense. Uncle Sam should still get his cut when the engineers report the income on their tax forms. Everybody ought to be happy.

This system is perfectly applicable to producers, composers, singers, musicians, narrators, arrangers and repair technicians. They are paid as independent businesspeople in the same way that you would pay a carpenter, garbageman or plumber. When you paid to have a phone installed, did you get the installer's name and social security number so that you could send him a W-2 form at the end of the year? Of course not. The same logic could be applied to other studio-related jobs and save you a few bucks legally in the process.

Check with your attorney for full details on how it can work for you. An attorney can help you design a contract form that will clear up any misunderstandings before they happen... and isn't that the way you want to have it?

Q.) My wife keeps the books and helps clean up the studio building. Even if she doesn't get paid for this, is she still an employee in the eyes of the tax people?

A.) If your wife is not being paid, no. (And why isn't she, Diamond Jim?) She would then be classified as a nonemployee. Since she receives no wages, there would be no withholdings for income tax or FICA. If she did receive minimal wages at any time, she would be like any other employee for tax purposes.

Enough for this month. I hope some of these answers helped clear up a few questions you might have had about your budding studio operations. If there are

STEVE GADD. HOT ON ZILDJIAN.

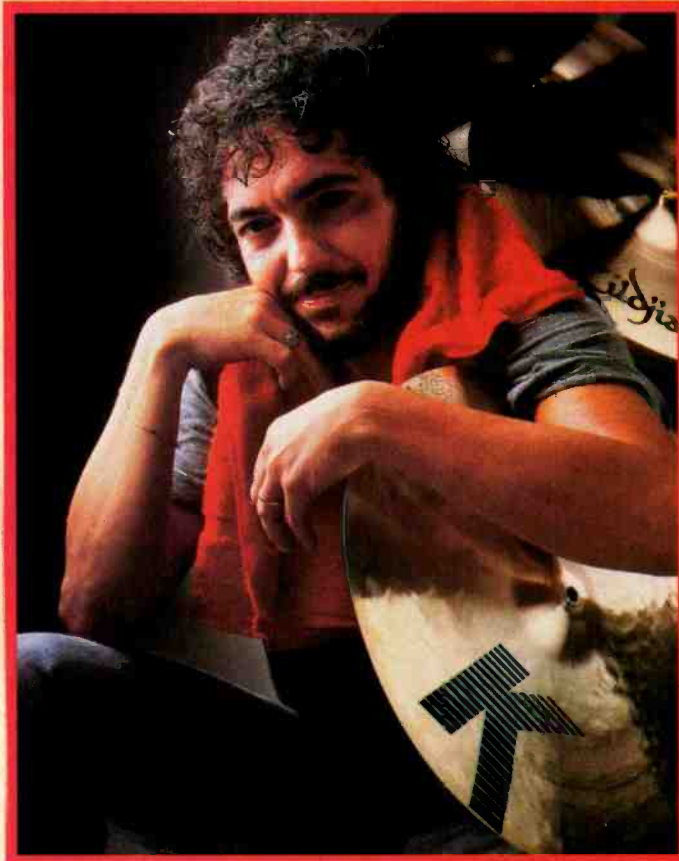
The man is hot! And he should be. No less than Chick Corea put it this way: "Every drummer wants to play like Steve Gadd because he plays great. He plays everything well. He could very well go on to become one of the greatest drummers the world has ever seen." As you can imagine, between his touring and recording, Steve's not the easiest guy in the world to pin down. But he did stop for a breather the other day and we got a chance to talk with him.

On Practice. "I've been playing since I was a kid. As long as I keep my muscles loose, I don't have to practice a lot every day. When I do practice, I just sort of let things happen naturally and then later on try to work it into my playing. Like on '50 Ways to Leave Your Lover... I used my left hand on the high hat for the whole section - it was a little thing I'd been practicing and it just worked out."

On Control. "Sometimes I use light, medium and heavy sticks to do the same drills because the sticks affect my muscles in different ways. You have to use your hand and arm muscles differently to control your playing. It's a subtle thing but it helps me tremendously."



On Effects. "After I graduated from Eastman, I played in a rock 'n roll band. It was keyboard, bass, drums and a lot of homemade stuff. I bought 6 big artillery shells, sawed them into different lengths and hung them on



Steve Gadd, one of the world's most innovative musicians, has paved the way toward new playing techniques for today's drummers.

a rack that I built. I'd use them for the free sections in the music."

On K's. "Art Blakey gave me my first set of K. Zildjian's a long time ago. I love the feel of them. There's something about the way the stick reacts to the surface...it almost becomes part of the cymbal. They're not cold or edgy. They have a very warm and deep feeling. They've got real character. I use a 20" Ride and an 18" Crash Ride with 14" Hi Hats for recording and live sessions."

On A's. "I love to use A. Zildjian's when I play rock 'n roll. When I want to play louder, I add a 16" Thin Crash and an 18" Crash Ride for a full crash sound. The bells on the A's really project the sound in a clear natural tone."

On Zildjian. "Zildjian to me is the foundation. I play Zildjians because that's what's in my heart. I love the sound, the feel, the history... I love the quality and the status of a Zildjian."

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questions you still need answered, drop them to me here at *MR&M*. We will try to answer as many of them as we can in future "all question" installments.

Just be sure to mail in your questions and not to try and call me. I'm not answering the phone nowadays for

fear that it's another invitation to a small business seminar. I wouldn't mind going myself, but I don't think my tookus could take another kicking session after I hang up.

See you next time.



ANNOUNCING

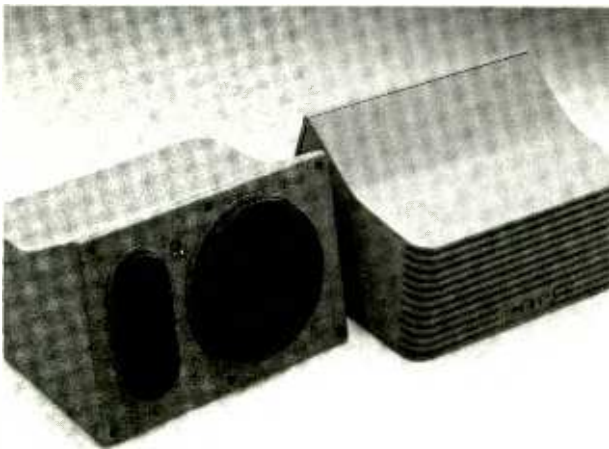
Jim Rupert's Design Contest

In our April issue, we announced a Design A Studio contest. (If you don't have a copy, write to us for a back issue—\$1.95 plus \$0.65 postage.)

The following are the prizes we are offering (with the help of three very generous companies):



The B&W LM1 speaker pair are specially designed for optimum performance in cars and vans, though it is by no means out of place at home. Built-in mode switches adjust performance for car or home. Each unit has a 100 mm bass/midrange driver and 20 mm high frequency driver. Each has been treated to operate under a wide range of temperature and humidity conditions. We've got a matched pair of beige units ready for first-class travel.



In addition to the above three prizes, each winner will also receive **The Recording Studio Handbook** by John Woram, **The Microphone Handbook** by John Eargle, **All You Need is Ears** by George Martin, and **The Techniques of the Sound Studio** by Alec Nesbitt. Each of these books will go to all three winners!

The Shure SM81 is a high-performance cardioid condenser microphone equally suitable for high-quality studio or remote recording applications. Its wide-range flat-frequency response provides exceptional accuracy in recording. The mic features a built-in three position switch for flat, or two levels of bass roll off. We've got one of these great mics ready to go.



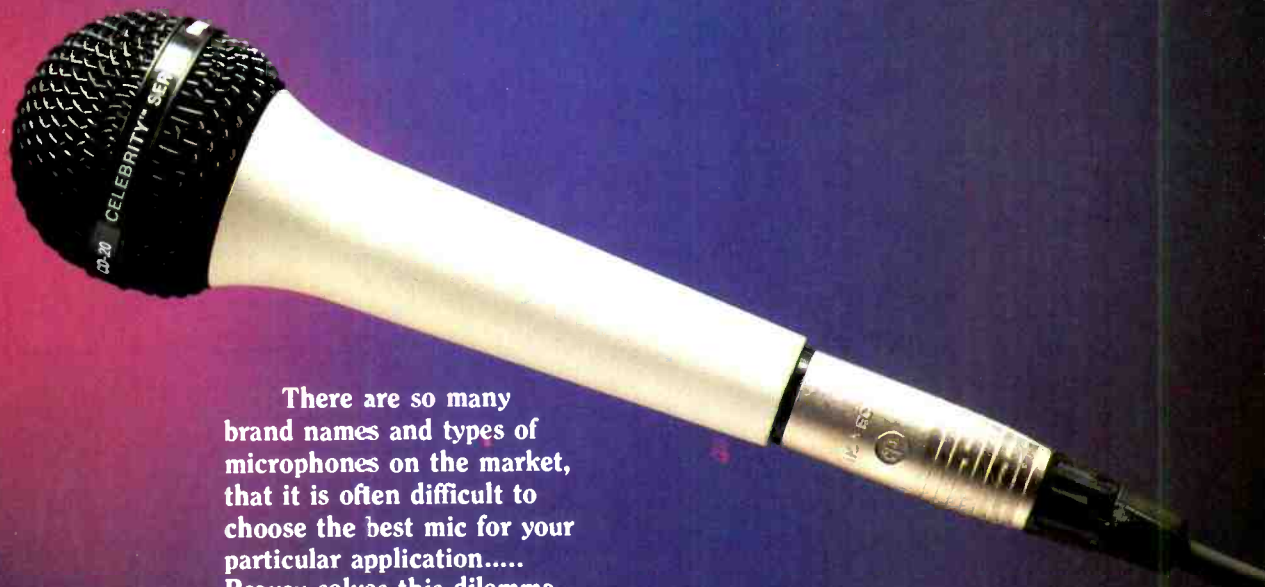
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We invite you to visit your nearest authorized Peavey dealer to take a look (and listen) or write Peavey Electronics Corporation, 711 A Street, Meridian, MS 39301 for a complete Celebrity™ Series brochure.



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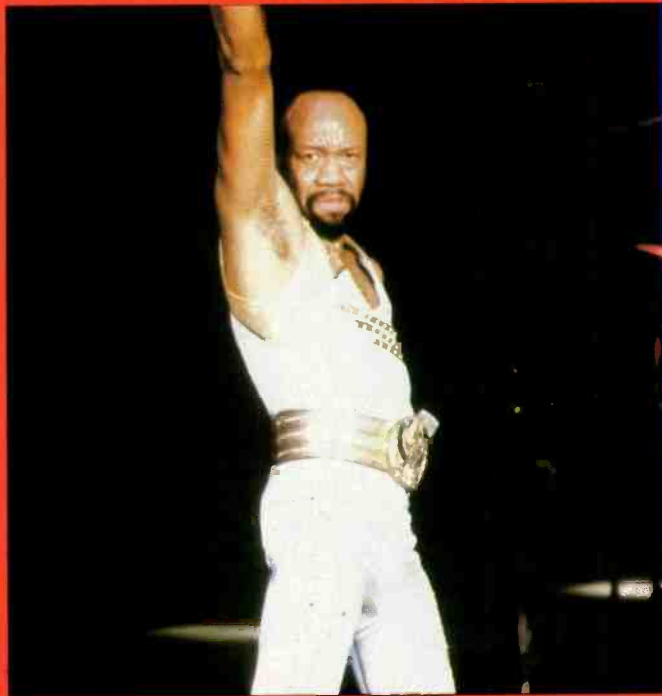
&



Fire's

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Maurice White



Maurice White knows what he wants—and he knows how to get it. For over 10 years White has piloted the groundbreaking R&B group Earth, Wind & Fire without compromising his personal musical and spiritual vision. That's no mean feat in a world where musical trends come and go, eating up previous styles and spitting them out in new hybrids along the way. Earth, Wind & Fire's music does take in everything it meets in its path—fusing funk, pop,

jazz, soul, rock and even Brazilian music—but not at the expense of White's consistently positive spiritual message, the subject of nearly all his music since the band's inception in 1969. Now, with EW&F's 13th album, *Powerlight* (Columbia), on its way to the top of the charts (where all of their records have gone in recent years), White—songwriter, drummer, vocalist and producer extraordinaire of Earth, Wind & Fire—is ready to talk about his music.

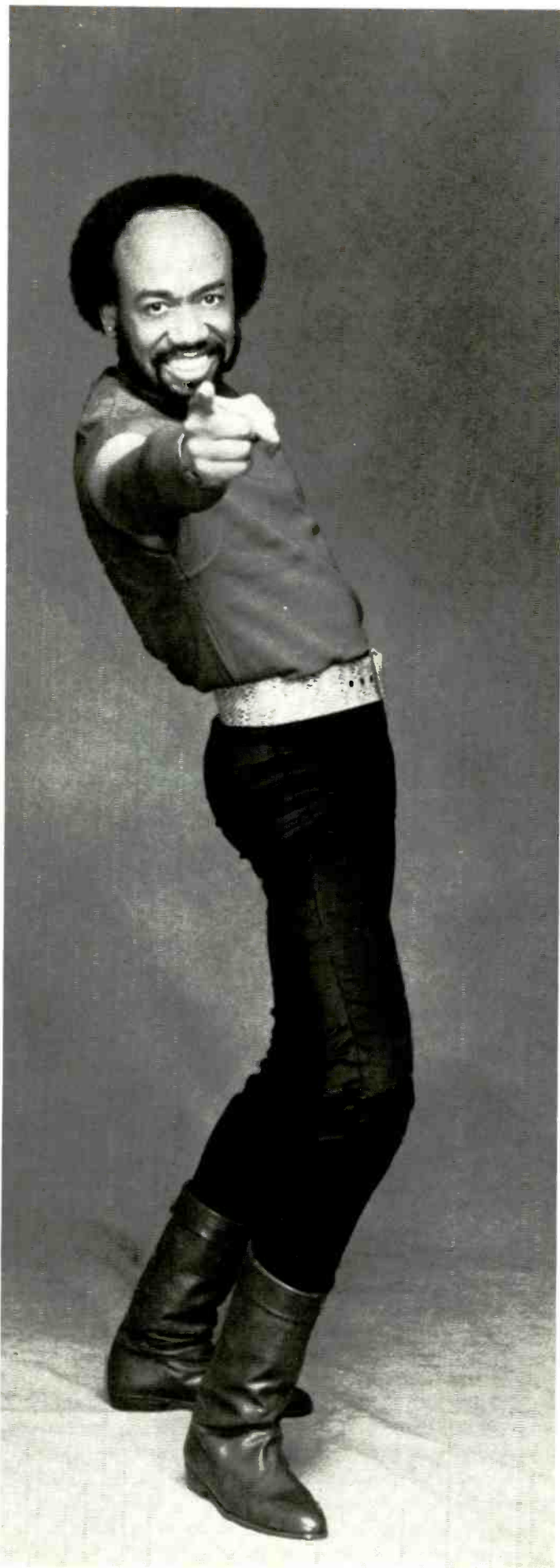
White is the first to admit that he is not the type to veer from a winning concept. He admits in the following interview, held recently during a stopover in New York, that Earth, Wind & Fire has held onto the same basic musical and lyrical ideas since White formed the group. Not that Earth, Wind & Fire hasn't grown or changed with the times, but if one's original notion is to sing about love and universal brotherhood, and to make people dance and feel good when they listen to it, why change it?

White's conversation is sprinkled with optimistic and often "cosmic" statements that may have the less positive-minded snickering or even damning White for not taking a more activist point of view. But there's no doubt when one speaks with him that he means what he says, that these words are coming from his heart and not a clouded head, and that his way of looking at life has worked to make him a calm, content man. That is why it's almost alarming to witness the dazzling, action-packed stage show put on by Earth, Wind & Fire. Not only is the musicianship and performance excellent, the choreography and use of technology are beyond state-of-the-art, making for a total entertainment package rivaled by few. Earth, Wind & Fire means business, and its business is to give its fans musical perfection with an added bonus: a message of good will.

Maurice White formed Earth, Wind & Fire in 1969 after having paid his dues as a session drummer for the legendary Chicago R&B label, Chess Records, where he worked behind such greats as Chuck Berry, Muddy Waters and Billy Stewart. He put in time with jazz pianist Ramsey Lewis and then charted the course—literally sketching out his concepts on paper—for what would become Earth, Wind & Fire. From the beginning, White envisioned a high-tech soul team that incorporated all music and sang of White's philosophies of peace and brotherhood; he has never strayed from that initial vision.

The personnel of the group changed several times in the early years, and the group switched labels from Warner Brothers to Columbia when their early releases failed to chart as highly as White felt they could have. Eventually, Earth, Wind & Fire became an eight-piece band featuring Maurice White, his brother Fred on drums, his other brother Verdine on bass, keyboardist Larry Dunn, guitarist par excellence Roland Bautista, tenor saxist Andrew Woolfolk, percussionist Ralph Johnson, and the amazing vocalist Philip Bailey. By the time EW&F recorded its sixth LP, *That's The Way Of The World*, superstardom was theirs. And has been theirs ever since.

A list of Earth, Wind & Fire's single hits alone is staggering, a virtual checklist of R&B and pop (they cross over easily) top 10 smashes: "Singasong," "Shining Star," "That's The Way Of The World," "Fantasy," "Let Me Talk," and more. But Earth, Wind & Fire has always been more than just another band that collects gold and platinum for its walls. The studio expertise of Maurice White is well known; he's considering one of the top record-producers of the past decade, responsible for a sound so sharp, clean and vital that others go crazy trying to imitate him. But more than that, Earth, Wind & Fire has been an inspiration to many, and no entertainer can ask for more than that.



Modern Recording & Music: What does the title of your new album, *Powerlight*, refer to?

Maurice White: It refers to the power and the light that exists within you. I'm trying to encourage people to utilize that.

MR&M: You've often used the word light and terms such as "going to the light." What exactly do you mean when you say that?

MW: Light is actually the connection to the cosmos, but in this sense, it's the light that shines within us, the light force. That's where I'm really coming from.

MR&M: How does music bring that light to people, as opposed to, say, religion?

MW: I think music brings it subconsciously. It's not something you have to think about. It has a way of nourishing the soul.

MR&M: Do you think that your fans pick up on these messages? If someone is out on the dance floor, do they want to have to think about it?

MW: I'd say about 75 percent probably do pick up on it. Music is multi-dimensional. It can be used in any fashion. I think if you're home by yourself, that's the time to reflect.

MR&M: How important is it to you that listeners understand what you're saying in your songs?

MW: Some will, some won't. Sometimes people don't get the message of a song until three or four years later. But that's OK.

MR&M: When you play a foreign country where the majority of the people don't speak English, like Japan, and you get a positive response and connection with the audience, what is it that they're relating to? It's obviously not the lyrics.

MW: That's a real good question because, in that situation, they're really connected in a more spiritual way only because they don't understand the lyrics. They're listening with their hearts.

MR&M: What kind of tangible results have you had from fans? Do you ever have fans come up to you and say that a song changed their life?

MW: Yeah, that happens all the time. The music reflects people's lives. I've had people who were strung out on dope come over and say thanks for bringing me back, and I didn't know what they were talking about but it was great to know.

MR&M: Most of your songs are apolitical; they're mostly love songs. How do you feel about some of the
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more political and street-wise music coming out now, like Grandmaster Flash's "The Message"?"

MW: Most of our songs are political too, but we just say it in a different way. But I understand what they're saying.

MR&M: On the new album, "Freedom Of Choice" is the most political song.

MW: It's the most blatantly stated. But they all say the same thing.

MR&M: Is there an overall theme to the album?

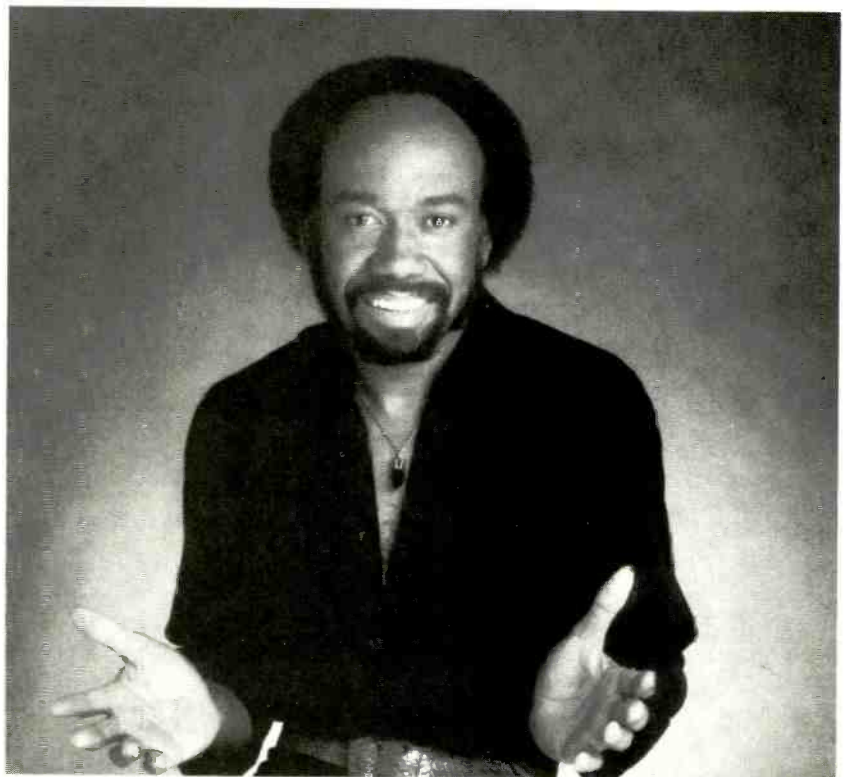
MW: I think the theme is consciousness; we're trying, in our own little way, to bring a smile to people's faces. Basically, we've been talking about the same thing for 10 years.

MR&M: How do you keep finding new ways of saying it?

MW: I don't know (laughs)! It's one of those things that just happens.

MR&M: Were there any specific incidents or events that inspired the music on this album?

MW: Yeah, for instance "Freedom Of Choice" came about because I just wanted people to know where we're really coming from. I wanted to write



a lyric that would go directly to the mind. On each album, everything that people around us go through, politically or what have you, affects the music.

MR&M: What musical changes have you gone through? An article in the *New York Times* mentioned that there was a large Brazilian influence on the album. What are some of the other influences on your music now?

MW: Yes, there's always a Brazilian influence in my music. Maybe it's something that just happens sub-consciously, because I don't really try to do that. I'm always influenced by jazz, as well. My roots are in gospel and I listen to a lot of classical music.

MR&M: How are you affected by the sales of a particular album? Does it bother you if a record doesn't do as well as the one before?

MW: It all depends upon the times. The economy's kind of soft right now so we don't expect to sell four million albums. I think the most important thing is trying to get the product to the people. If we sell two albums, but they're accepted in the hearts of those people, that's the important thing.

MR&M: How does the economy affect what you do musically? Does your record company ever say that you need a more commercial record because you have to be concerned with sales?

MW: They don't ever actually say that, but overall I think they have that view. Record companies are a bit more uptight during a recession. But everybody is. And, of course, we can't tour as often because trying to put a production on the road is a disaster. So everyone has to lay back a bit more and narrow it down.

MR&M: How does the financial situation affect what you do in the studio? Some albums cost a lot more than others to make, so do you have to cut costs in the studio?

MW: I normally just go for what I'm trying to do. I don't let that affect me.

MR&M: When you make a record, do you go with a general concept for it in mind, or does it develop once the album is in progress?

MW: Yeah, sometimes I won't even title it until the songs are written, but I do have a general idea when I go.

MR&M: Do you ever record a song with a specific purpose, such as getting airplay?

MW: Sometimes I'll make records that I know will be single-oriented or a record that will sound good in a club. I'm very much involved in radio

when I make a record. That's why the albums are so diversified; I'll go from one thing to another.

MR&M: Obviously, a lot of work goes into the production of your records, yet sometimes the critics hold that against you, saying that the records sound too polished. How do you respond to that criticism?

MW: Well, critics need a job so they just find something to criticize. The thing is that I love perfection. If there's something that I think needs work, I'll go back in and do it over. Being a producer, I'm really concerned in the studio, and I like to use recording technique.

MR&M: Are you more comfortable in the studio or onstage?

MW: Both. I'm equally at home in both places.

MR&M: The studio where *Powerlight* was recorded, Complex Studios, is your own studio. Was it built to your specifications or did you buy an already built studio?

MW: It was built from scratch; it was an old warehouse. We bought it from the city of Los Angeles. It was all concrete and we converted it into a recording studio. It's tailored to everybody's needs; Fleetwood Mac recorded there, Linda Ronstadt, too.

MR&M: Is there anything special about it, anything that sets it apart from other studios?

MW: Where it's specialized is in the board. It was built by George Massenburg, an engineer I used to use. It is an exceptional board. It gets a very clean sound. It's called a GMM.

MR&M: Do you have any special studio techniques that you use in the making of an Earth, Wind & Fire record that another producer might not be able to do?

MW: I think each producer has his own technique and his own level of working. I usually demo everything before I go into the studio. Then I go in and cut the tracks. Sometimes I'll take three or four weeks just cutting basic tracks. Then I do a lot of overdubs, change things around a lot. Then I usually do strings, horns and synthesizers.

MR&M: Do you do the arrangements yourself?

MW: No, I do it collectively. I usually sit around and sing out parts all day. When we get the synthesizers done, I start messing around with vocals. I put down rough vocals to get an idea of what I'm gonna do.

MR&M: You mentioned that you do a lot of overdubbing, but yet your records all sound so clean, unclut-

tered. Do you go back and strip out a lot of what you overdub?

MW: Sometimes I work with about three or four slaves, so I'll have a lot of tracks for vocals. Sometimes there's like a hundred tracks. What happens is that sometimes I'll record a certain thing and not use it, in order to have the clarity. I put a lot of things on a track; I'll put 48 instruments on a track. Then when I'm mixing it, it all comes together. I'll use certain parts in the song. The whole idea is to keep it centered and not clog it all up.

MR&M: What are some of the problems making a record using so many tracks? Do you ever get lost?

MW: Hard work! Too much hard work. You have to continue to make slaves all the time. Keeps the engineers going crazy.

MR&M: Are any of your songs developed right in the studio as you work?

MW: I'll do that. I love interplay, so sometimes we'll just go in the studio and sit there till we come up with it. But normally when I go in the studio I'm prepared; I have something worked out.

MR&M: You've worked in other studios before you had yours built. What are some of the differences between recording in L.A. and say, a place like Caribou?

MW: I like the characteristics of Caribou, too, because it has another ingredient to offer: the country, the horses; that's really nice. But I feel more at home in our place. And, of course, the boards sound different. Caribou is great for tracking also, but I never did any vocals there. I have different rooms for different things. I use a studio in L.A. called Oceanway for horns and strings; it's really great for that.

MR&M: How much input does the rest of the group have as far as production?

MW: As far as production, that's basically all me. As far as direction of songs, and participation, they all have input.

MR&M: Have you ever considered the possibility of using an outside producer?

MW: I think I would have to be co-producer. I don't think I'm ready to just turn it over to someone else. I think it would change the sound.

MR&M: How involved do you get with the technology of recording?

MW: Very involved. I'm very tight with the engineer, Mick Guzauski. We spend so many hours together in the studio I'm practically living

with the guy. Sometimes it's 12 hours a day, so you develop a working relationship. After a while you develop a trust and know that he knows exactly the kind of sound that you want.

MR&M: Do you have a set way of working or do the sessions differ?

MW: In the beginning, there's a lot of activity because all of the guys are there at the beginning of the song. By the end of the song, it's down to two guys. It starts out with all this roaring and laughing and then three months later it's just one guy sitting there.

MR&M: Obviously the art of recording has changed over the years. When you were a session drummer for Chess Records in the 1960s did you ever imagine that you'd be doing what you are today?

MW: No, I figured I'd be the greatest drummer in the world.

MR&M: What was it like in those days? What do you remember most?

MW: I have great memories. Everyone was still discovering. I had the opportunity to work with some of the greatest people ever; they were all my teachers. I got to play with all of the people I had heard since I was a little cat: Ramsey Lewis, Muddy Waters, Howlin' Wolf, Chuck Berry.

MR&M: You played on all of the hits by Billy Stewart, who I feel is one of the most underrated soul singers ever.

MW: Billy was a driving force. He used to stand in the middle of the studio and sing while we were all playing.

MR&M: You're originally from Memphis, but moved to Chicago. How did that move affect you musically?

MW: I think it was very necessary for me to be in Memphis in order to gain my roots. I had so much music around me as a kid. Coming to Chicago put a cap on it by putting me into a more technical space, making me aware of how to read music. Then I started getting experience in various types of music.

MR&M: Why did you choose to play drums?

MW: I saw a drum and bugle corps walking down the street one day and they had on the shiny suits, and I wanted a shiny suit.

MR&M: Well, you finally got your shiny suits!

MW: Yeah, I got my suit! (laughs)

MR&M: When did you develop the idea for Earth, Wind & Fire?

MW: About 1969, I started thinking in terms of a group. I had it all drawn out. I put it all in a book and then I didn't open the book again till 1975, and there were all these pictures of people. I never knew it would go that way but it did.

MR&M: Did your two brothers (bassist Verdine and drummer Fred) start playing after you did?

MW: Yeah, but we were from a musical family, so it was natural.

MR&M: Has the band stuck to the original concept you had or has it changed over the years?

MW: I think we've stuck to it, but it's changed as the times change. We didn't do anything to change it, but it evolved as the times did. Conceptually, it's all been the same.

MR&M: Did your musical direction change as a result of having your first hits?

MW: We started to lean more toward top 40; before that we were more jazz-oriented.

MR&M: How did it feel when critics started calling Earth, Wind & Fire the most influential R&B group of the '70s?

MW: To be frank it didn't feel like anything; I was more concerned that the people liked what we were doing.

MR&M: Did the stage show change over the years? I can't imagine that the group was ever anything less than totally theatrical onstage. You never came out and played in your street clothes, did you?

MW: No, we never did that. We always had something theatrical going on, even in the beginning.

MR&M: Do you have any favorites among your own songs?

MW: There are always a few that stand out. "That's The Way Of The World" is probably my favorite. Not only because of the song, but because of the memories I have of it.

MR&M: Are you interested in doing videos to go along with the album?

MW: We've been making promotional films for our albums for five or six years, so we were already hip to the idea. When video came along we jumped into it, but at the same time we'd already been into that space, dealing with visuals. Our show is so visual that we always wanted to become involved in something like film.

MR&M: If you did get involved with video more fully, what would you like to do with it? Are you more interested in club play or cable TV play?

MW: Right now there's not much of a market, especially with blacks.

MR&M: That's true, because MTV won't air mainstream black videos.

MW: Yeah, I think we're going backwards. It doesn't make any sense. I think the audience is going to lose in the end. They're setting the same levels as they did in radio. It's just people manipulating each other; it's all economics.

MR&M: Have you ever thought of doing a solo album?

MW: I've been approached for many years about that, but I've been leaning away from it. There's a possibility I might do one with Wanda Vaughn (co-writer of a few songs on the new album), a duet album, in about a year or so. She's the former lead singer of the Emotions. But as far as doing a solo record, everybody's doing that these days. I hate to get on the bandwagon. If I did one, though, I'd try to do something musically [different] from what I do with Earth, Wind & Fire. I think that's what solo albums should be about, not a continuation of what I've been doing the whole time.

MR&M: Are you working on any outside productions now?

MW: I'm in the studio with Jennifer Holliday (star of Broadway's *Dreamgirls*).

MR&M: Do you usually follow what other artists are doing?

MW: I try not to because they influence me too much. It's best to come up with your own thing. I have a general idea of the sound of what everybody else is doing.

MR&M: Have you been impressed by anyone lately?

MW: No, not recently.

MR&M: Where do you see black music heading?

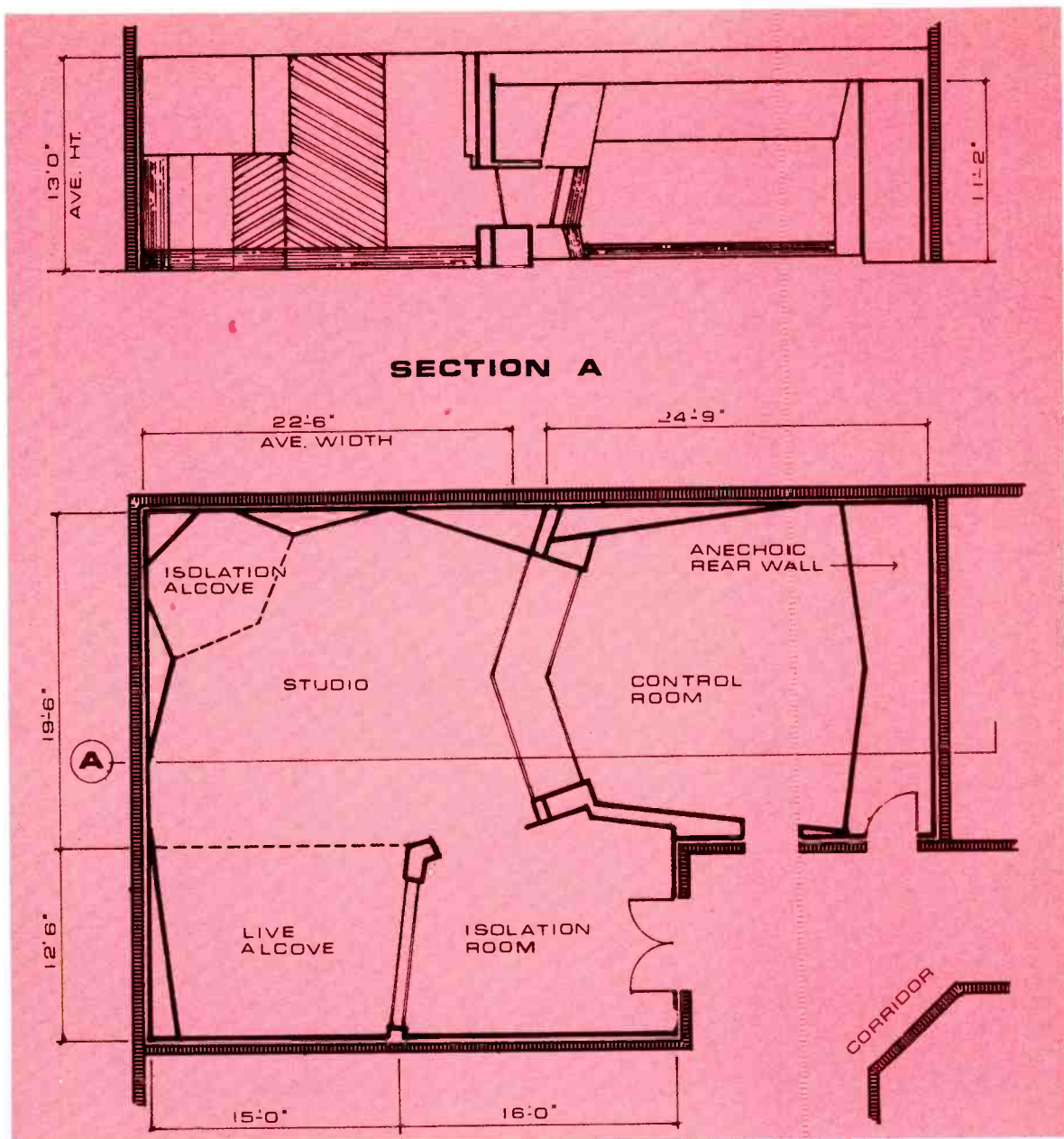
MW: Normally, it's pushed aside because the media tends to favor pop music. Even though black music is innovative, it's never given its due. I think music as a whole will be some combination of acoustic and electronic instruments. I think it'll wind up that way.

MR&M: What do you think of some of the all-electronic music that's out now?

MW: I can't totally relate, because I think music needs that human element.

MR&M: One last question, Maurice: Where is Earth, Wind & Fire headed?

MW: It's hard to say. I think we're headed where destiny leads us. We will move straight ahead on line.



The floor plan of The Complex Studios' Studio B.

The Complex Studio

Consoles: The GML/Nova Research Series 7900 Console, designed by the George Massenburg Labs, is the result of six years of on-site recording system development employing such evaluation techniques as Computer Aided Circuit Analysis/Design and A-B listening tests.

The Studio Monitors are custom 4 band ambient-matched systems which require no graphic, parametric or other correlative equalization to achieve a relative response of ± 2 dB from 40 Hz to 16 kHz. The crossover system utilizes custom 4 Pole Butterworth crossovers and modified tube, VMOS, & bipolar power amps.

Outboard Equipment consists of George Massenburg labs GML Design stereo limiters; Lexicon prime time

digital delays (stereo and mono); Parametric equalization; Kepex II noise gates, and Eventide Harmonizers. **Noise Reduction:** 24 Channels of mainframe (Dolby); 8 Telcom cards and 2 Dolby model 361 units.

Tape Machines: Ampex ATR 124 (24-track); Ampex ATR 102 (2-track); and Nakamichi 680 discrete head cassette decks.

Instruments: Yamaha C-7 Studio Grand available in Studio B.

Studio B: Live Recording—Overdubbing—Mixdown. The studio (approx. 32' x 23') accommodates 10 musicians. The control room is approximately 500 sq. ft.

Sound Stage: Provides auditorium-type acoustics for live tracking. Information and cost for booking upon request.

Studio C: Primarily for Overdubbing and Mixdown, this studio (approx. 20' x 26') can also be utilized for live recording of a small group or combo. The control room is approximately 400 sq. ft.

THE **PRODUCT** SCENE



MUSIC COMPONENT SPEAKERS



Four new musical component speakers from Cetec Gauss are models 5180 and 5181 for bass guitars, and models 5110 and 5120 for rhythm or lead guitars. Model 5180 has an 18-inch bass guitar bottom with 200-watt capability and an 8 ohms nominal impedance with a power response of 40 to 2,000 Hz. It is priced at \$550. Features of the model 5181 are an 18-inch bass guitar bottom with 400-watt capability and an 8 ohms nominal impedance with a power response of 40 to 1,000 Hz. The price for the 5181 is \$795. Model 5110 contains a double 10-inch rhythm or lead guitar speaker with a 300-watt capability and an 8 ohms nominal impedance with a power response of 100 to 6,000 Hz. It is priced at \$550. Features of model 5120 are a 12-inch rhythm or lead guitar speaker with 150-watt capability and an 8 ohms nominal impedance with a power response of 100 to 5,000 Hz. The price is \$330.

Circle 36 on Reader Service Card



THE FREQUENCY ANALYZER



Electro-Harmonix has re-released the Frequency Analyzer, a ring modulator. Any note played into the Frequency Analyzer produces two brand new notes—one above and one below the original note—which are determined by the frequency tuned into the effect by the musician. It can create moving harmony lines so that a singer or solo instrumental player can sound like three musicians. Because it reacts to chords, instantly producing twice as many new notes, the Frequency Analyzer can generate polyphonic sounds for guitar and any keyboard. It can reverse a scale played it, create new fractional notes and unheard-of intervals, and achieve unique clavinet-type effects by blending in a touch of high-frequency shift.

The Frequency Analyzer comes with coarse and fine shift controls to tune the frequencies generated by the effect, a low-pass filter switch, a blend control to combine processed and dry signals, a bypass switch and AC operation. The suggested price is \$230.

Circle 37 on Reader Service Card

STAGE MONITOR MIXER



Interface Electronics' new stage monitor mixer, the Series 310, is modular and plug-in for ease of maintenance, and is built in frame sections holding six modules, making it expandable from 12 to 42 inputs. It provides eight output mixes plus a side-fill pair with send and panpots. Each input can send independently to each output, and each send also has an in/out button and a pre/post equalizer button.

New features include transformerless input; four equalizers (two tunable with wide/narrow switch); high and low frequency cutoffs; five-level LED indicators on each input for instantaneous identification of changes; solo to operator's monitor; master solo to check outputs, and return solo to permit listening to signal after external processors. It also has 10-segment LED level indicators on master's and operator's monitor, slider masters, 6-dB panic buttons on outputs, built-in mic' splitters, input pads, phase reverse, and off/on switches. The price of the 18 in, 10 out Series 310 is \$7,000.

Circle 38 on Reader Service Card

RACK UNITS

A new line of professional equipment from DOD Electronics Corp. will replace all existing 800 Series rack units and expand the line with several new units, featuring redesigned chassis and improved electronics and components. The units will be designated as follows: R815A 15 band Equalizer, R830A Dual 15 band Equalizer, R831A 31 band Equalizer, R825 Compressor-Limiter, R835 Crossover, R875 Flanger Doubler, R885 Analog Delay, R895 Spectrum effects generator, and R900 Digital Delay. Prices will remain almost the same.

Circle 39 on Reader Service Card

THE PLATE SYNTHESIZER



The Master-Room XL-404 Plate Synthesizer professional reverberation system from Micmix Audio Products, Inc. duplicates the reverberation qualities and properties of a plate-type reverberator. The XL-404 is fully self-contained in a 5¼-inch rack-mount unit, designed for recording and broadcast applications. It can also be utilized in sound reinforcement systems, providing the sound of a plate in a highly portable package.

The Plate Synthesizer provides the ability to vary the decay time from 1 to 4 seconds on each channel without damping and does not alter the overall frequency response. Also included on the XL-404 is a four-band equalization section that permits adjusting the sound of the reverb from a warm-sounding plate to one with abundant high-frequency content. A mix control is provided that combines the direct and reverberated signals, along with a switch to select stereo or mono. In the stereo mode, the XL-404 operates in true stereo (as opposed to mono in/stereo out). In the mono mode, the echo density is doubled due to the summing of both reverb channels.

The XL-404 also provides signal monitoring through the 5-LED display for each channel. Signal connections are made via XLR connectors on the rear panel and ¼-inch connectors on the front panel, which are normaled to the rear panel connectors and allow break-in patching. According to the manufacturer, the XL-404 incorporates low-noise circuitry along with a toroidal transformer that provides a superior signal-to-noise ratio. Acoustic or mechanical interference is prevented by triple-shielding, allowing the unit to withstand high sound-pressure levels. This reverb has electronically balanced inputs and unbalanced outputs. A 115- or 230-volt operation can be selected via a rear-panel voltage selector switch.

Circle 40 on Reader Service Card

Recording Techniques **Part 13**

by Bruce Bartlett

“We’re rolling. Take One.” With those words begins the recording session. It can be an exhilarating or an exasperating experience, depending on how smoothly you run the session.

Musicians need an engineer who works quickly yet carefully. Otherwise, they may lose their creative inspiration while waiting for the engineer to get his act together. And the client, paying by the hour, wastes money unless the engineer has prepared for the session in advance.

In this installment we’ll describe how to conduct a pop music recording session. These procedures should help you to keep track of things and to run the session efficiently.

Pre-production

Long before the session starts, you’re involved in *pre-production*—planning in advance what you’re going to do at the session, in terms of overdubbing, track assignments, instrument layout, and microphone selection. The first step is to find out from the producer what the instrumentation will be and how many tracks will be needed. Make a list of the instruments and vocals that will be used in each song. Include such details as the number of tom toms, whether acoustic or electric guitars will be used, and so on.

Next, decide which of these instruments will be recorded at the same time and which will be overdubbed one at a time. It’s common to record

PRODUCTION SCHEDULE

Tape Speed: 15 ips
8 Track
Noise Reduction: dbx
Artist: Muffin
Producer: B. Brauning

- 1. Song: “Mr. Potato Head.”**
Instrumentation: Bass, drums, electric rhythm guitar, electric lead guitar, acoustic piano, sax, lead vocal.
Comments: Record rhythm section together with reference vocal. Overdub sax, acoustic piano, and lead vocal later.
- 2. Song: “Sambatina.”**
Instrumentation: Bass, drums, acoustic guitar, percussion, synthesizer.
Comments: Record rhythm section with scratch acoustic guitar. Overdub acoustic guitar, percussion, synthesizer.
- 3. Song: “Mr. Potato Head.”**
Overdubs: (1) acoustic piano, (2) lead vocal, (3) sax.
- 4. Song: “Sambatina.”**
Overdubs: (1) acoustic guitar, (2) synthesizer, (3) percussion.
- 5. Mix: “Mr. Potato Head.”**
Comments: Add 80 msec delay to toms.
Double lead guitar in stereo.
Increase reverb on sax during solo.
- 6. Mix: “Sambatina.”**
Comments: Add flanger to bass on intro only.
Manually flange percussion.

Fig. 1.

TRACK SHEET

Studio: SUBLIMINAL SOUND
Client: MR. PACKETS PRODUCTIONS
Artist: THE TROLLS
Producer: FLAXY FOOT
Engineer: B. BARTLETT
Album title: SIT-DOWN MUSIC
Speed: 15 LPS
Noise reduction: DOBLY A

Song title: SIDEWALK BLUES (EXPERIMENTAL)

Track 1: BANGO-BASS
2: VOCAL
3: DOUBLED VOCAL
4: EXPONENTIAL HORNS
5: TINKER TOYS (PERCUSSION)
6: SINKY STOMPS
7: FOOT STOMPS
8: SPARE

Song title: THE GRIND

Track 1: BASS
2: KICK
3: DRUMS L
4: DRUMS R
5: LEAD VOCAL
6: RHYTHM GUITAR
7: PIANO
8: LEAD GUITAR

Fig. 2.

the instruments in the following order, but there are always exceptions:

1. Loud rhythm instruments—bass, drums, electric guitar, electric keyboards. The lead vocalist usually sings a *reference vocal* or *scratch vocal* along with the rhythm section so that the musicians can get a feel for the tune and keep track of where they are in the song. The vocalist's performance in this case is recorded, but probably will be redone later.

Once the instrumentation and the order of recording are clearly understood, you can plan your track assignments. Decide what instruments will go on which tracks of the multi-track recorder, and write this information on a *track sheet* (Figure 2). Note that the outer tracks are most prone to dropouts at high frequencies, and so are usually reserved for bass, overdubs, and piano.

You may have more instruments than tracks, in which case you'll have

do this, you re-record several tracks onto one track—a procedure called "bouncing" or "ping-ponging." For instance, you might record bass, rhythm guitar, and drums on Tracks 1, 2, and 3. Then you play the tape, mix these tracks through the console, and record the mix onto Track 4. Next, while monitoring Track 4 in sync mode, you record lead vocal and backup vocals on Tracks 1 and 2. Bounce them to Track 3. Then record lead guitar on Track 1 and piano on

MICROPHONE INPUT LIST

INPUT	INSTRUMENT	MICROPHONE
1.	BASS	DIRECT
2.	KICK	EU RE-20
3.	SNARE/HI HAT	AKG C451
4.	DRUMS OVERHEAD L	SHURE SMB1
5.	DRUMS OVERHEAD R	SHURE SMB1
6.	HITOMS	SENNHEISER MD421
7.	LOW TOMS	SENNHEISER MD421
8.	ELECTRIC LEAD GUITAR	SHURE SM57
9.	ELECTRIC LEAD GUITAR	DIRECT
10.	PIANO	CROWN P2M 306P
11.	REF. VOCAL	BEYER M500
12.	SPARE	

Fig. 3.

2. Quiet rhythm instruments—acoustic guitar and piano.
3. Lead vocal; doubled lead vocal (if desired).
4. Backup vocals (in stereo).
5. Overdubs—solos, percussion, synthesizer, sound effects.
6. Horns and strings.

The planned sequence of recording basic tracks and overdubs is listed on a *production schedule*. An example is shown in Figure 1.

to decide what groups of instruments to put on each track. In a 4-track recording, for example, you might record a stereo mix of the rhythm section on Tracks 1 and 2, then overdub vocals and solos on Tracks 3 and 4. Or, you might put guitars on Track 1, bass and drums on Track 2, vocals on Track 3, and keyboards on Track 4.

It's possible to overdub more than four parts on a 4-track recorder. To

Track 2. Finally, mix the four tracks down to a 2-track recorder.

More instruments can be added by mixing them in "live" along with the tracks you're bouncing. Try not to bounce a track to an adjacent track—the crosstalk between tracks may create a high-frequency squeal.

Keep in mind that tape hiss and distortion increase slightly every time a track is re-recorded. This is called *generation loss*. Fortunately,

noise reduction systems such as dbx can keep the noise down. When doing extensive bouncing, record background instruments first; record instruments that need to be crisp and clean last (such as lead vocal and drums).

If you have many tracks available, leave several tracks open for experimentation. For example, you can *stack* the vocals—record several takes of a vocal part using a separate track for each take, so that no take is lost. Then combine the best parts of each take into a single final performance on one track. It's also a good idea to record the monitor mix on two unused tracks. The recorded monitor mix can be used to make a *work-print* tape for the client to take home and evaluate, or for a cue mix for overdubs.

Now make up a *microphone input list* (as in *Figure 3*). Write a column of numbers at the left side of the list corresponding to each numbered console input. Next to each input number write the name of the instrument assigned to that input. Finally, write down next to each instrument the microphone(s) or direct box you plan to use on that instrument.

Tips on choosing a microphone were given in Parts 3 and 4 of this series (May, July '82). Typically, condenser microphones are used on acoustic instruments, vocals, and cymbals; dynamic microphones are usually used on amplified instruments, drums, and sometimes horns. Cardioids reject leakage better than omnis, but may need some bass rolloff to compensate for proximity effect.

Be flexible in your microphone choices—you may need to experiment with various microphones during the session to find one giving the best sound with the least console equalization. During lead guitar overdubs, for example, you can set up a direct box, three close-up microphones, and one distant microphone—then find a combination that sounds best.

Find out from the producer what kind of sound he or she wants: a "tight" sound; a "loose, live" sound; an accurate, realistic sound, or whatever. Ask to hear records having the kind of sound the producer desires. Try to figure out what techniques were used to create those sounds, and plan your microphone techniques and effects accordingly.

Next, work out the *instrument*

layout chart, indicating where each instrument will be located in the studio, and where baffles and isolation booths will be used (if any). In planning the layout, make sure that all the musicians can look at each other and are close enough to play as an ensemble.

That's a lot of pre-planning. Of course, there are some spontaneous sessions—especially in home studios—that just "grow organically" without advance planning. The instrumentation is not known until the song is done! You just try out different musical ideas and instruments until you find a pleasing combination.

In this way, a band that has its own recording gear can afford to take the time to find out what works musically, before going into a professional studio. In addition, if the band is recording itself where it practices, the microphone set-up and some of the console settings can be more-or-less permanent. This article, however, describes procedures normally followed at pro studios, where time is money.

Setting up the studio

Clean up the studio about an hour before the session starts to promote a professional atmosphere. Lay down rugs and place AC power boxes according to your layout chart. Run cue cables from each artist's location to the cue panel in the studio.

Now, position the baffles on top of what has gone before. Put out chairs and stools according to the layout. Add music stands and music-stand lights.

Place microphone stands approximately where they will be used. Wrap one end of a microphone cable around each microphone-stand boom, leaving a few extra coils of cable near the microphone-stand base to allow slack for moving the microphone stand. Run the rest of the cable back to the microphone input panel. Plug each cable into the appropriate wall panel input, according to your microphone input list. Some engineers prefer to run cables in reverse order, connecting to the input panel first and running the cable out to the microphone stand. That procedure leaves less of a confusing tangle at the input panel where connections might be changed.

Now bring out the microphones. Check each microphone to make sure its switches are in the desired positions. Put the microphones in

their stand adapters, connect the cables, and balance the weight of the boom against the microphone.

Finally, connect the musicians' headphones for cueing. Set up a spare cue line and microphone for last-minute changes.

Setting up the control room

Check out all the equipment to make sure it's working. Clean and demagnetize the tape machines. Thread on some blank tape; put alignment tones on tape. Tape recorders, tape, and alignment tones were discussed in Part 10 of this series (February '83).

Pull all the patches from the patch panel. Normalize the console by setting all switches and knobs to "off," "zero" or "flat," so as to have no effect. That establishes a point of reference and avoids surprises later on. Console systems and operations were covered in Parts 7 and 8 of this series (October, November '82).

Attach a strip of masking tape or paper leader across the front of the console to write down the name of the instrument each fader affects. Also, label the submasters and monitor-mixer pots according to what is assigned to them.

Now turn up the monitor system. Carefully bring up each fader one at a time and listen to each microphone. You should hear normal studio noise. If you hear any problems, such as dead or noisy microphones, hum, bad cables, or faulty power supplies, correct them before the session. To verify the microphone input list, have an assistant scratch each microphone grille with a fingernail and identify the instrument the microphone is intended to pick up. Check all the cue headphones by playing a tone through them and listening while wiggling the cable.

Recording (Tracking)

The musicians are typically allowed ½ hour to 1 hour free set-up time for seating, tuning, and microphone placement after they arrive. Show them where to sit, and work out new seating arrangements if necessary to make them more comfortable. Set up the drums first and tune them. Tuning was described in Part 5 (August '82). Add tissues and tape if necessary to dampen the drums.

Once the instruments are set up, you may want to listen to their "live" sound in the studio and do what you can to improve it. A dull sounding

guitar may need new strings; a noisy guitar amp may need new tubes, and so on.

In the control room, listen to each instrument alone to make sure it sounds reasonably clean and accurate. Work out the instruments' sounds with the producer, adjusting microphone positions as needed. Tips on microphone placement were given in Parts 4, 5, and 6 (July, August, September '82).

As the musicians run down (practice) their first tune, you can set input attenuation and recording levels. Work from the first fader to the last, soloing each one in turn. Then set a rough cue mix and monitor mix. Also, record a work-print tape of the studio monitor mix, either on two leftover tracks or on a 2-track

time is done with the monitor mixer. The monitor mix affects only what is being heard, not what is going on tape.

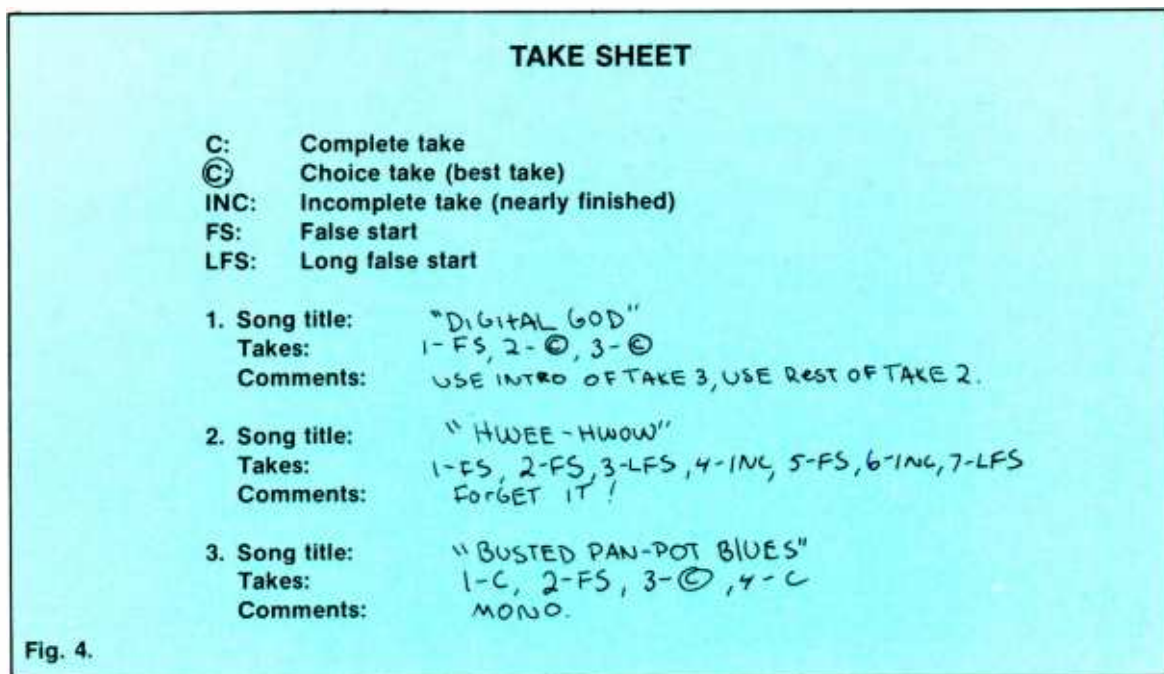
The assistant engineer (if any) runs the tape machine and keeps track of the takes on a take sheet. He or she notes the name of the tune, the take number, and whether the take was complete. A code is often used to indicate whether the take was a false start, nearly completed, a "keeper," etc. *Figure 4* shows a sample take sheet.

Don't use the SOLO function as the song is in progress because the abrupt monitoring change may disturb the producer. The producer may stop the performance if a major fluff (mistake) occurs, but should let the minor ones pass. After the tune is

Wrap each cable carefully and coil the remaining two feet or so around the cable loops. Some studios hang the cable in big loops on the microphone stand.

Another way to wrap a cable so that it uncoils easily is as follows: (1) Connect the two XLR connectors together, (2) hold the connectors vertically in one hand so that the cable hangs in two lengths, (3) fold the cable two lengths at a time, accordion-style, to the length of the connectors, and (4) stuff the folded cable in a cardboard tube. When you undo the cable the next time it's used, it will open out without any kinks or knots.

Put the track sheet and take sheet in the multi-track tape box along with the tape (stored tail out). Label



machine. This tape is for the producer to take home to evaluate the performance.

Now you're ready to record. Briefly play a metronome to the group at the desired tempo, or play a click track through the cue system. Roll the tape in record mode and slate the name of the tune and the take number.

The piano player plays the keynote of the song (for tuning other instruments later). Then the group leader or the drummer counts off the beat, and the group starts playing.

The producer listens to the musical performance while the engineer watches levels and listens for audio problems. During tracking, the recording levels are set as high as possible without causing distortion. Balancing the instruments at this

done, you can either play it back or go on to a second take. The musicians will catch their fluffed notes during playback; you just listen for audio quality.

Record other takes or turns. It's usually less tiring to do only three or four takes of a single song, then run through another song. If a song is not working, you can come back to it later. Try to limit tracking sessions to four hours or less—five hours maximum.

Breaking down

When the session is over, tear down the microphones, microphone stands, and cables. Put the microphones back in their protective boxes or bags. Wipe off the cables with a damp rag if necessary.

the box and the tape for their contents. Normally the studio keeps the multi-track master unless the group wants to buy it.

You may want to remove the outtakes and splice them together on a separate reel. Then, put one foot of paper leader between each of the master takes (keeper takes). Write new tape logs indicating the reels' contents.

Log the console settings by reading them slowly into a portable cassette recorder. At a future session you can then play back the tape and reset the console the way it was for the original session.

Overdubbing

After the basic or rhythm tracks are recorded, overdubs are added.

First you set up the studio and console for the instrument to be overdubbed. (You'll have more freedom in microphone placement because there will be no leakage from other instruments.)

Find the section of the song on tape needing overdubs. Play the previously recorded rhythm tracks in sync mode and mix them using the cue mixer on the console. A musician wearing headphones listens to the cue mix. He or she plays a new part along with the rhythm tracks. This new part is recorded and re-recorded until it is correct. The musician should be quiet when not playing so that extraneous noises are not recorded.

Note that drum overdubs are usually done right after the rhythm session, because the microphones are already set up, and the overdubbed sound will match the sound of the original drum track.

If several open tracks are available, you can record a solo overdub in several takes, each on a separate track. This procedure is called *stacking tracks*. After recording all the takes, play back the solo (in sync mode) and assign all the overdubbed tracks to a remaining open track set in record mode. Match the levels of the different takes. Next, switch the overdubbed tracks on and off (using muting), recording just the best parts of each take. Then erase the old overdubbed tracks to free them up for other instruments.

Sometimes overdubs are used to correct only a few notes of a musical line or solo. A useful technique in this case is called *punching in*. You rewind the tape to a point several bars before the spot where the mistake was made. Play the tape in sync mode and have the musicians play along. You *punch in* the record button just before the mistake, wherever there is a convenient space between notes. Then *punch out* of record mode at an appropriate point as the tape is running. The musician can signal the engineer where to punch in by jabbing his/her finger toward the engineer. Better yet, the musician can punch in and out by using a foot pedal wired to the record-mode relay.

Often it's difficult for a musician to get all the way through a long difficult solo or musical line without making a mistake. In that case, you can punch in and out to record the part in successive segments. Another use of overdubbing is to redo individual

tracks that were unsatisfactory in sound or performance at the original recording session.

To aid communications among the engineer, producer, and musician, you can have the musician play in the control room while overdubbing. A synthesizer or electric guitar can be patched directly to the console, and the direct signal can be fed to a guitar amp in the studio via a cue line. Pick up the amp with a microphone, and record and monitor the microphone's signal.

Mixdown

After all the parts are recorded, you're ready for mixdown. Tape a strip of leader tape along the front of the console to write down the names of the instrument(s) each fader affects. Keep this strip with the multi-track master tape so that you can use it each time the master is played.

Play the multi-track tape. Listen to each track alone and clean it up by erasing unwanted noises. If a noise occurs just before the musician starts playing, erasing the noise may accidentally erase the musical part. This can be prevented as follows: Turn the tape upside down by reversing the reels, then find the track of the desired instrument playing backwards. Play the tape section which came just after the noise. You'll hear it playing in reverse. Just after the reverse part ends, punch that track into record mode, erasing the noise. That way, you avoid erasing part of the musical line. You may want to erase entire tracks or segments that don't add to the song.

After the tracks are cleaned up, play the tape and set the balance, equalization, panning, reverberation, and effects as desired. Mixdown procedures and special effects were covered in Parts 8 and 9, respectively (November, December '82). An especially difficult mix can be recorded a section at a time, and the sections can be edited together.

Monitoring procedures during mixdown are critical for the quality of the mix. Parts 11 and 12 of this series (March, May '83) should be helpful in explaining monitoring requirements.

When the mix is perfected, record it onto a 2-track machine. Then read the console settings into a portable cassette recorder for future reference.

Repeat the mixdown procedure for

all the best takes on the multi-track reels. Then edit, leader, assemble, time, and label the 2-track master tape as described in Part 10 (February '83).

Make a safety copy of the master tape. Note that the master tape doesn't leave the studio until all studio time is paid for. Send the tape to the record mastering company, insured for the whole cost of the production. Include song lyrics, producer's notes, the address and phone number of the engineer and producer, and the names of composers, arrangers, publishers, and everyone else contributing to the project.

So there is your finished product. It's amazing how the long hours of work with lots of complex equipment have concentrated into that little tape. But it's been fun. You have created a craftsmanlike product you can be proud of. When played, it will recreate a musical experience in the ears and mind of the listener—no small achievement.

For more information on studio procedures, the following books are highly recommended:

The Musician's Guide to Independent Record Production, by Will Connelly. Contemporary Books, Inc., 180 N. Michigan Avenue, Chicago, IL 60601.

The Musician's Manual, Mark E. Halloran, Editor. Elsevier-Dutton Pub. Co., Inc., 2 Park Ave., N.Y., NY, 10016. See Stephen Taylor's chapter on "Cutting Demos."

The Recording Studio Handbook, by John Woram. Elar Pub. Co., 1120 Old Country Rd., Plainview, NY 11803.

Home Recording for Musicians, by Craig Anderton. Guitar Player Books, Music Sales Corp., 33 W. 60th St., N.Y., NY 10023.

Handbook of Multichannel Recording, by F. Alton Everest. Tab Books, Blue Ridge Summit, PA 17214.

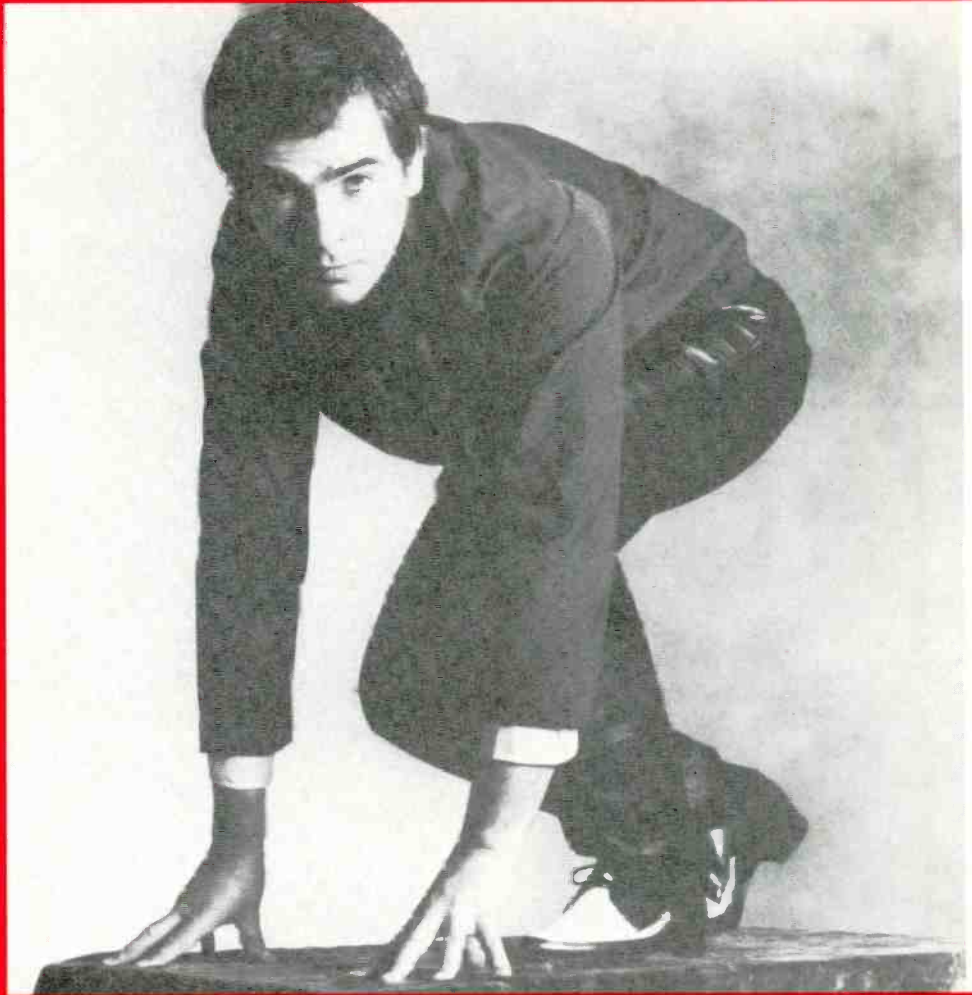
Modern Recording Techniques, by Robert E. Runstein. Howard W. Sams & Co., Inc., Indianapolis, IN 46268.

Teac Multi-track Primer, by Dick Rosmini. Teac Corp., 7733 Telegraph Rd., Montebello, CA 90640.

Sound Recording, by John Eargle. Van Nostrand Reinhold Co., 450 W. 33rd St., N.Y., NY 10001.

peter gabriel

jeff tamarkin



One thing that Peter Gabriel has never been is conventional. He has always looked for another way to do something, and then when he has found it, he's moved along to the next thing. During the 10 years he led Genesis, turning them into one of the world's most highly respected progressive rock bands, he strove to ensure that their music and performance were never anything less than one step ahead of the rest of the "prog-rock" pack. And then, when he saw that he could do nothing else with Genesis, he departed for a solo career, just as the band was on the brink of superstardom.

That was over seven years ago. In the ensuing years, Gabriel has remained ahead of the rest by recording four totally distinct solo albums. Last year, *Security*, his first

album to be called anything but *Peter Gabriel*, was released to unanimous acclaim.

Once again, Gabriel was charting new territory, incorporating Third World rhythms and his highly personalized lyrical themes, while experimenting constantly to make sure that *Security* sounded like no one else's record. He used a remarkable synthesizer, the CMI Fairlight, to achieve much of his sound on the album, and the result was his most commercially and artistically successful album yet—It even yielded a bonafide radio hit with "Shock The Monkey." *Modern Recording & Music's* Jeff Tamarkin spoke with Gabriel in New York shortly after the album's release last year.

Modern Recording & Music:

This is your first album to have a title other than *Peter Gabriel*. But it seems like an afterthought because it is only apparent on a sticker on the album cover. I get the feeling the title, *Security*, wasn't all your idea, and that you'd have just as soon called this one *Peter Gabriel* as well.

Peter Gabriel: Yeah, that's true. Theoretically, it's the world's first disposable title. It was only done because I'd been label-hopping, and the people at Geffen, my new label, were anxious that this album be differentiated from my other albums. So the compromise was to put on a sticker. The title is also on the record label, though, which distressed me a little bit. I hope that it'll be removed in the later editions.

MR&M: Was the title *Security* your idea?

PG: Yeah, but I think that now I would've called it *Contact*. I think that's a better title.

MR&M: Why did you switch labels again? You started on Atlantic and then switched to Mercury. Did that just not work out to your liking or are there other reasons?

PG: Most of the time I've been held by Genesis' contracts, which were not necessarily of my choosing but democratically instituted. That's why I started with Atlantic (Genesis was signed to Atlantic when Gabriel departed the band) and then it [Genesis] returned to Charisma in England, and because they were associated with Phonogram, I went to Mercury in the U.S. Mercury worked very hard at it, but after that, I was free in America, so for the first time I was able to choose my own label. Geffen didn't offer the biggest bucks, but they did seem like the most effective and interesting company.

MR&M: You were quoted as saying that this album, your fourth, is a "compositional advance" for you. What did you mean by that?

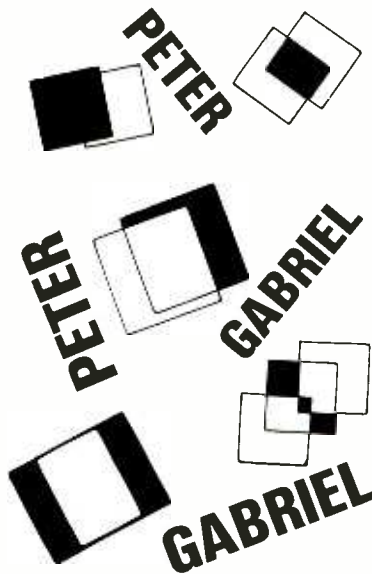
PG: The biggest changes in my music occurred between albums one and two, and then three and four. Some of the ideas I'd begun on the third have been taken further along on the fourth. I've locked into rhythms which are different from what is usually used in rock and roll.

MR&M: What about lyrically? Is there a theme throughout the record?

PG: Not intentionally, but looking back there are things that seem to reoccur in different tracks. There wasn't a single concept, though.

MR&M: In some of the new songs, I find it difficult to understand what you're getting at; the lyrics do not seem to make any obvious points. Would it bother you if your fans had trouble understanding what your songs are about?

PG: No, it wouldn't bother me. If the atmosphere of the words works, then that's the primary importance. Meaning is an added bonus.



MR&M: You've also said before that you see lyrics as pictures. What pictures do you see in this record's songs?

PG: Some of them are concerned with ritual, healing, culture clash, body language.

MR&M: Let's run through the tracks on the album, and get some background on them. The first cut is "Rhythm Of The Heat."

PG: "Rhythm Of The Heat" is actually based on the adventures of Carl Jung in Africa. It was titled "Jung in Africa" at one point, but I found that a bit pretentious. So it became a little more anonymous. I'd been discussing white people's relationship to black music, possibly because of my involvement with the WOMAD (World Of Music, Arts and Dance) Festival. (Note: Gabriel organized the three-day festival in England bringing together rock musicians and non-Western musicians as "a meeting place for artists from all over the world." Among the performers were Gabriel, Robert Fripp, the English Beat, Pigbag, Echo and the Bunnymen, as well as groups from China, India, Indonesia, Egypt, Nigeria and other nations. A special tribute album including some

of these performers and other rock and non-rock acts [Ekome, Rico, Mighty Sparrow, Price Nico Mbarga and Rocafil Jazz, others] is available on PVC Records in the U.S.) The person with whom I was discussing this mentioned an incident with Carl Jung that occurred in Africa, and I researched it. Jung had an obsession with Africa, and many times in Geneva he would sit beside a lake and see pictures of Africa. He went there twice and ended up in the Sudan, which is where he met a particularly fearsome tribe. The party was terrified except for him and a friend. The tribe then went up a hill and started building a bonfire, drumming and dancing. Jung felt that he couldn't really just observe; he felt compelled to participate. So he went ahead a little self-consciously and they were all waiting with spears, though he had just a rhino whip. And he became totally engrossed by it, losing himself. But then he became very panicked and frightened as this thing virtually possessed him. He became so shit-scared that he started running around to all of the drummers, trying to get them to stop, offering them money and beads. That's how he developed the concept of the shadow and being dominated by one's own shadow.

MR&M: Have you ever been to Africa?

PG: No, I'm a living room tourist; I've only seen it from books and old movies, so I'm kind of naive about it. But if I could hear even one bar of someone else's music and learn a new rhythm pattern that I can steal and put in my drum computer, then to me that's fine. There are two ways that this thing (the infatuation with African music by rockers) gets criticized: that it's neo-colonial imperialism, and that it's superficial. My arguments against that are that it's a two-way process—there are a lot of African musicians picking up on Western stuff, using a lot of guitars and modeling themselves after people like James Brown and Stevie Wonder—and that artists everywhere steal mercilessly all the time. I think that is healthy. What's interesting is how it's used and how it's filtered. As for the superficiality, I think people often get it wrong, but end up with something that is different and more invigorating. They infuse their own personalities with what they've stolen.



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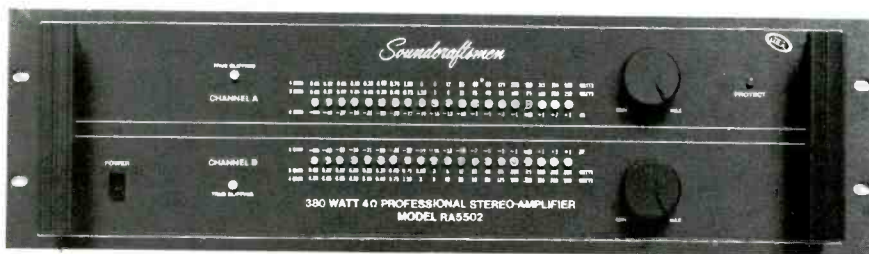


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MR&M: It would be more superficial to pretend you were an African and to try to copy them. But I'm wondering where your interest in this music stemmed from. It's been a growing trend in the last couple of years, with people like David Byrne and Brian Eno becoming totally immersed in it.

PG: I've been influenced by a lot of things, and I am a Byrne-Eno-Talking Heads fan. But to throw my own sixpence worth into it, I was mainly influenced by a soundtrack album to a bad African film in which the music was fantastic. I heard it on Dutch radio about four years ago. When I got that album, I started working on those ideas. They first surfaced on "Lead A Normal Life" and "Biko" on the third album. Rock and jazz have always had a history of taking things from Africa and the Orient, so it's of no interest, really, to get caught up in who's copying whose ideas.

MR&M: You used a group of Ghanaian drummers on "The Rhythm Of The Heat" called the Ekome Dance Company. Where did you find them?

PG: In Bristol [England], actually. I think it's better to look first on your home turf than to look a few thousand miles away for something exotic. They are mainly West Indian, but there are four drummers from Africa including the master drummer. They use principally Ghanaian music as the basis of what they do. They try to incorporate some of the English black culture into what they do.

MR&M: You mentioned earlier an Oriental influence as well. "San Jacinto" has an Oriental melody, especially the percussive part in the beginning. How was that done?

PG: It's all done on the Fairlight CMI synthesizer.

MR&M: That's one of the most amazing synthesizers I've heard; it's the only one that doesn't sound like a typical electronic synth. It seems able to reproduce any sound imaginable. How does it work?

PG: Yeah, it is amazing. It's something I've dreamt of for a very long time. I never thought I'd actually get my hands on one. It generates sound internally, which I never use at all, or you can get external sounds fed into it. So you can take just one note, like a tap on this paper cup (taps a cup) and the computer will then show it on a TV screen, in its wave form.

Then you can manipulate that and then send it back out of the computer to a keyboard. You can then play a tune on the tapped plastic cups. The options are amazing. There are two or three other machines now that do that. They're now the price of a small house, but when the Japanese get to them and they become add-ons to the home computer, they'll be as common as pianos.

MR&M: A machine like that can really revolutionize everything. Anyone will be able to create music out of anything.

PG: I think it's really important and exciting, in the same way that the porta-studio has taken recording into the hands of anyone who wants to make a record. I think it can make sound composition accessible and portable to anyone who wants it. In the past, money, musicians, being able to play the right instruments, getting them to sound right—all these barriers—had to be taken into consideration. And although you can never remove the personality or the relationship between man and instrument, you now have the possibility of people like myself, or anyone, being able to work with anything they can imagine in their heads. So instead of people playing music who *can* play music—in other words an elite—that group will be anyone who wants to play music.

MR&M: Getting back to the cuts, what is "San Jacinto" about? Was that written in the Southwest?

PG: No, in California. It was just a mixture of images from Palm Springs and the swimming pool culture with Indian culture and mysticism and such.

MR&M: The next song is "I Have The Touch."

PG: That was, to borrow the terms used by one reviewer, about a "contact junkie," someone who craves physical contact with people.

MR&M: Really? I got the feeling it was the opposite, about a person who is alienated in crowds.

PG: Well, I think he loves being in it, but *because* he has been alienated. I was reading some good books by a guy named Michael Argyle and he mentioned things like babies being dependent on physical touch. Also he talked about some research that was done in different ethnic cultures. In Puerto Rico, there was something like 257 body contacts in the period of two hours, or whatever it was. In Paris, it was 35, and in London, two,

at the beginning and the end. In India, it's assumed that if you have anything of importance to tell people, you have to hold their hand. So, anyway, I drew up this picture of someone who would get off on any kind of physical contact. He would hunt around for anywhere where he would find that contact: formal cocktail parties and so on. He'd get really turned on by handshaking, but yet all the other people involved would think they were still holding their distance.

MR&M: "The Family And The Fishing Net" is next. That was supposedly inspired by Dylan Thomas, right?

PG: I was reading some of his stuff around then so I know that the style of my lyric writing was affected.

MR&M: There are some interesting effects used on that track.

PG: Well, it starts out with some real Ethiopian pipe music, and then I used the three pairs of notes at the beginning to set up a scale on which the song is written. Some of the background noises include a drain-pipe; and there's an exhaust pipe. Four of us spent about a month chasing sounds, going to all sorts of places to find them. And there's a lot of conventional instruments as well, merged in strange ways. At one point, we started hitting all these things we found in a scrapyard, and then, about the fifteenth object we hit sounded similar to the earlier things we did (the Ethiopian pipes), so we ended up doing all these strange things like scraping an exhaust pipe. They were all put into the Fairlight. There was also a treated sax that was distorted heavily through a little Radio Shack \$9.95 amplifier. We put a lot of sounds through that and got a nice plastic distortion.

MR&M: There are several keyboardists on the album. How do you decide who does what?

PG: It's pretty random. It depends who's around at the time. Sometimes I was just working with David Lord, my producer, who also played keyboards. Then Larry Fast did quite a bit. It's really just who can do it the quickest or who's standing by the machine at the time.

MR&M: Even on the tracks on which there are four keyboardists, you managed to maintain an uncluttered sound.

PG: I tend to over-record things and then do a lot of negative mixing, in other words, wiping things out.

MR&M: The first cut on the second side is "Shock The Monkey," which is getting a hell of a lot of airplay and seems to be your biggest hit yet.

PG: Yeah, I'm amazed, actually. That was Tamla-Motown influenced, in the rhythm. The lyrics are kind of an expanded metaphor thing. It's about jealousy. People have told me that it's about drugs, that it's about animal vivisection. I'm always amazed to find out how versatile a lyricist I am.

MR&M: Was that song a conscious attempt at putting something on the album that is danceable or that can be played on the radio?

PG: I thought there were other things on the album that were just as danceable. No, it wasn't conceived as that. But I still like some pop things like that.

MR&M: Next is "Lay Your Hands On Me."

PG: That's a bit more abstract. The verse images are sort of alienated, and then there's this image of sort of breaking through in the choruses: the laying on of hands and the feeling of warmth coming through.

MR&M: Did you intend that imagery to be religious?

PG: Well, there's a bit of that, but I had more in mind that it would be healing—massages of the non-relief variety. A couple of times I'd been lying face down and someone was above me with their hands maybe 12-15 inches above me, but I still felt the heat. I went in pretty skeptically to those things, but I felt it.

MR&M: "Wallflower": Does that describe being in a prison or institutionalized?

PG: Last year was the 15th or 20th anniversary of Amnesty International, and in England they had a lot of celebrations, documentaries, magazine articles, and so on. I thought I should try to put together some kind of benefit number.

MR&M: In the lyrics it seems as if you're trying to give encouragement to someone who may be incarcerated.

PG: Yeah.

MR&M: Is it possible to help someone that is stuck inside?

PG: No. I mean, there are people walking around the planet that wouldn't be if Amnesty wasn't functioning. I don't always agree with them, and they do have a lot of internal political battles, but I think it's great that they're doing what they're doing.

MR&M: "Kiss Of Life" is the last

track. That has a kind of Latin feel.

PG: Yeah. It just concerns a big Brazilian lady who has sufficient vitality to rise from the dead.

MR&M: Do you have a set writing method or do songs come up in different situations: at home, in the studio, on the road?

PG: Fortunately, home is the studio at the moment. Each album advance I add a little more equipment. I was renting a desk this last time, but since then I've bought an old second-hand desk. I should be pretty self-sufficient next time around. I spend quite a long time on the Lintron, dumping the pre-sets and finding patterns to steal or invent. As those ideas develop, I choose the things that most interest me. There are a couple of exceptions, "Wallflower" being one—that's a more traditional, melodic style—and "Rhythm Of The Heat" being the other—that was written on the Fairlight. I had a whistle looped at the beginning and then you get a scream and a big, fat bass sound, which is actually several instruments merging.

MR&M: You're undoubtedly aware that you have a large cult following. Do you ever feel that you have to cater to that audience's expectations, or do you disregard their conceptions of you?

PG: No, I buy them both a meal. (Laughs) No, I'm writing selfishly, primarily. I write what interests me.

MR&M: Does it bother you that a lot of people still associate you with Genesis and may be annoyed that you don't still perform much material from that period of your career?

PG: It doesn't worry me so much anymore. It has been seven years since I left Genesis, and I feel that I've got something which is very different than what I was doing then. Initially, I was antagonized by a lot of "ex-Genesis" associations, and I felt that I was really working against that. But I recently did a reunion gig with them as part of the WOMAD Festival, and I wouldn't have done that if I'd been very paranoid about that.

MR&M: How did the reunion with Genesis come about?

PG: The festival, which we'd been working on for two years, was fantastic from an artistic point of view. We had 600 artists from 21 countries. There were some great moments, with rock audiences giving standing ovations to musicians from Ghana, and to middle-aged Chinese

classical musicians. We had 7,000 kids playing along with Burundi drummers. But we were relying on 25,000 people a day and we only got 5,000 to 10,000. No one had really tried incorporating non-European music and rock before so we lost a lot of money on it. So Tony Smith, who is Genesis's manager and my co-manager, suggested that we do this one night reunion as a means of raising a lot of money fast.

MR&M: Do you think an idea like the WOMAD Festival—putting together non-Western musicians with rock—could successfully be presented in the United States? I would guess that if a group of Chinese classical musicians opened up for Genesis at a coliseum they'd get apples thrown at them.

PG: I think if it was presented in the right spirit, it could work. We tried very hard with our event to make sure that the rock did not overshadow the non-Western music. You have such a large mixture of cultures in America that I think it would be viable. As long as the people knew they were coming to that type of thing, rather than a rock bill with a convention support act at Madison Square Garden, it would work.

MR&M: The rock audiences have become very intolerant of anything different. I don't know if it's because of their lack of exposure to anything different or if it's racism, but they're very impatient. Once you could have a black blues act open for a major rock band and the crowd would love it. Now, if you try to put reggae or rap on before a rock band, the audience boos them off the stage.

PG: It bugs me that people are so intolerant. I've had that happen to some great support acts that have played with me. And I remember when Genesis was a support act, it was always very hard. But we were encouraged by the festival because everyone said the acts would get heckled and they didn't.

MR&M: David Lord is your coproducer on *Security*. How did you hook up with him?

PG: He was involved with me at an early stage when I was doing demos. He makes some structural suggestions and so on. But once we got into proper recording he was less involved on this last album. He's a very able man; he began as a classical composer.

MR&M: How would you compare working with David to some of the

other producers you've worked with, like Robert Fripp, Bob Ezrin, and Steve Lillywhite?

PG: The most input from a producer was with Ezrin. He was actively involved with arrangements. He's very able, but his taste is very different than what mine is at the present. But at that time, having been in a band and not being sure how I could function as an arranger, it was useful to me to work with someone like that.

MR&M: What about Fripp?

PG: Robert's approach was more laissez-faire. His way of working is different than mine; I think he was a little frustrated working with me and vice versa. It wasn't altogether successful as a producer-artist relationship. I still have great respect for what he does in terms of playing.

MR&M: And Steve Lillywhite?

PG: He was very fresh and energetic. There were other people involved with that album (the third): Hugh Padgham as engineer and Larry Fast doing the electronic production. Now it's just down to David Lord and myself.

MR&M: Do you prefer to take over the production?

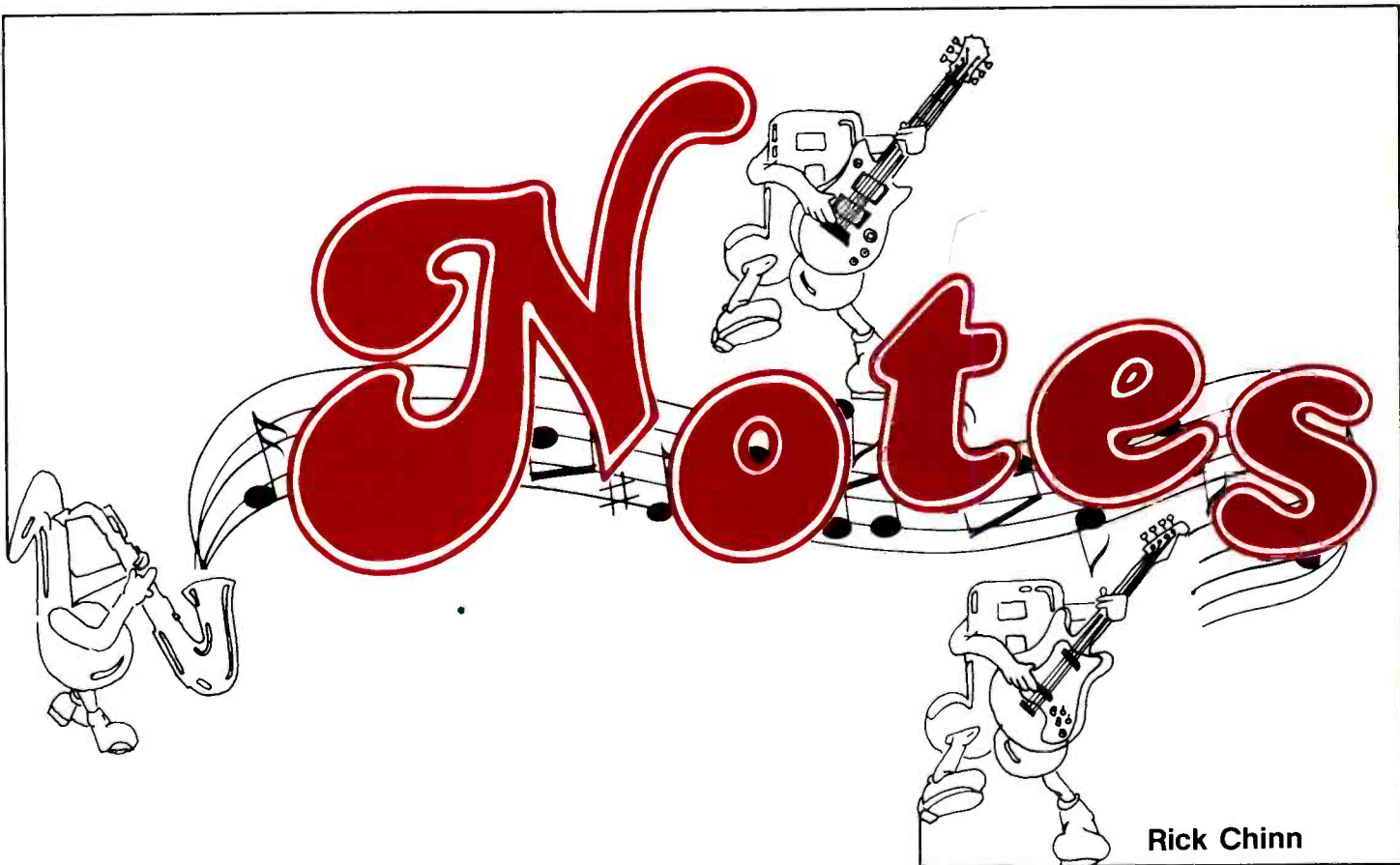
PG: Yeah, because I feel the records have more of me. And I feel better able to realize what lies in the material.

MR&M: What amount of input did the musicians have on this album compared to the others?

PG: I guess it would be a little less, in terms of sound. But I always use the ideas of people I work with; it's not a dictatorial regime.

MR&M: What are your feelings on video?

PG: What interests me is working in a 40 or 60 minute format whereby it's less dependent on getting shown. In other words, in the same way that a single is to be done for AM radio, promo videos are being made for TV stations. And I think they'll grow up in the direction of being the equivalent of an audio album, which is not worried about those concerns, and which can be free to experiment. I think there can be visual people—dancers and film people—who can be equal participants in video music projects. Now they're more flash and less substance. I see a lot of potential in it, though. It's like in the beginning with stereo when you had a lot of trains whizzing from one speaker to the other. Video is kind of in that train whizzing stage.



The Great Matching Myth, Part II

In the first installment of this two-part article, we concluded by pointing out the importance of a circuit breaker or fuse to prevent catastrophe in the event of a short-circuit. Now, let's extend that thinking to a modern solid-state power amplifier.

Most such amps have fairly high damping factors. The damping factor is the ratio of the load impedance to the amplifier's source impedance. It determines the ability of the amplifier to control the motion of the loudspeaker cone (when you use it to drive loudspeakers). This is just another way of saying that if your amp has a high damping factor, it also has a very low output impedance. For most modern amplifiers, this is on the order of about $\frac{1}{4}$ ohm or less (giving a damping factor of $4/0.25 = 16$). In addition to low output impedance, these amplifiers have very definite output current and voltage limits.

If the spec sheet says the amplifier will deliver 200 watts into a 4-ohm load, this will give us a current flow of $I = \sqrt{P/R} = \sqrt{200/4} = 7.07$ amps. We will therefore

measure a voltage across the load of $E = IR = 28.28$ V. If you try to connect a 2-ohm load across this amplifier, then 14.14 amps will flow through the load (that's 400 watts, assuming the amplifier can handle it).

What if we try a load equal to the amplifier's output impedance? After all, the impedances are "matched." Shouldn't this give the best results? If the amp could actually drive a $\frac{1}{4}$ -ohm load to its full voltage capability of 28.28 volts, we would have 3199 watts. (That's right, more than 3000 watts!)

But the spec sheet said 4 ohms. In essence, this means that the maximum current and voltage limits for this amp are 7.07 amps and 28.28 volts, giving us a maximum power output of $7.07 \times 28.28 = 200$ watts. Since the demands of both the 2-ohm and the $\frac{1}{4}$ -ohm loads exceed the maximum current rating, the amplifier is quite likely to do one or more of the following:

1. Get rather hot under the collar.
2. Blow the ac mains fuse.

3. Lose one or more output transistors.
4. Thermal cycle (get hot, shut off, cool down, turn on, repeat the cycle).
5. Blow up.

Clearly then, this is a case where it is not desirable to load the source with its own impedance. In fact, it might even be catastrophic if you did. This brings up another rule:

You will get the most power from a solid-state amplifier if you load it at or very near its minimum load impedance.

Assuming an ideal amplifier, the output power halves each time the load impedance doubles. For our 200-watt amplifier, it will probably deliver 100 watts

sometimes lower. This is high enough to be considered a bridging input. However, for noise reasons, the input depends upon "seeing" a 150-ohm (or so) source; this is the point at which the circuit noise is at a minimum. Remember that the term "noise" means thermal noise, which sounds like white noise.

A typical dynamic microphone, when used close (1 inch or closer) for vocals, will deliver about -40 dBv (average, not peak) at its output terminals. For live music, 30 dB of headroom at the mixer input would not be unreasonable. Thus, the mixer input for this microphone needs to be able to withstand an input signal level of -10 dBv without overload.

This same microphone, when used to close mic' a guitar amplifier at 120 dB, will deliver about -28 dBv.

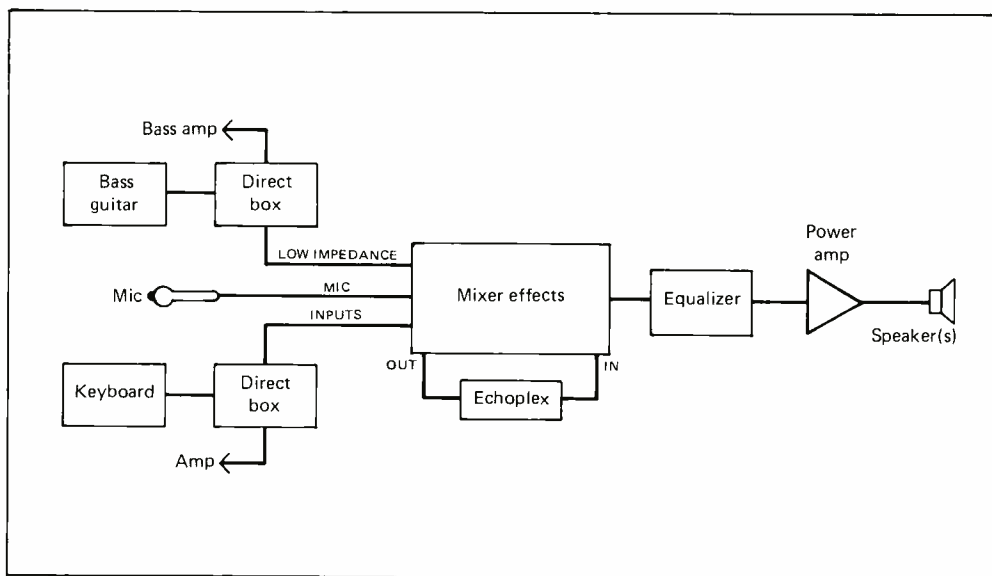


Figure 1. Block diagram of a typical audio system.

into an 8 ohm load. Real amplifiers may deliver 20 to 80 percent more power into a 4-ohm load (compared with 8 ohms) because the amplifier's power supply is not a perfect voltage source.

The Audio Interface

With this under our belts, let's now delve into the modern audio world and examine the interface between the various pieces of equipment in the signal chain of a sound system, from microphone to loudspeaker. *Figure 1* is a sketch of our hypothetical system.

Microphone to Mixer. The first electrical link that any sound system sees from the outside world is the cable coming from the microphone. Most microphones today are low impedance (ha! there's that term again). This means that the source impedance of the microphone is 600 ohms or less. The standard impedance today is 150 ohms for most applications.

The "low-impedance microphone" inputs of most modern mixers have an actual input impedance of about 1000 ohms or so. Sometimes it is higher,

For the same amount of headroom (as the vocal mike), the mixer input must be able to withstand a +2 dBv input signal without overload.

To help the mixer cope with this degree of difference in signal levels, a means of adjusting the amplification of the first preamplifier stage is usually provided, in the form of a control marked TRIM, PREAMP GAIN, ATTENUATION, PAD, etc. Typically, this control may provide sufficient range to handle signals from about -50 dBv to about +6 dBv or higher. Since the microphone's output is almost bridged, nearly all of the microphone's output signal is delivered to the preamp, giving an almost 6 dB noise advantage over matching it.

The mixer's input stage determines, to a large degree, the overall noise level of the sound system. It is important that the TRIM control be set to allow adequate headroom in the input stage (while providing sufficient amplification to get the input signal over the noise), with the mixer's channel fader set at its reference ("normal") setting.

Instrument Signals to Mixer. Two instruments need to be connected into the sound system. Let's

assume that in this case, the mixer is quite a distance from the stage, say on the order of 100 feet. This distance alone precludes running lines directly from the instruments into the mixer's line inputs. Why? If the ground loops don't get you, the treble loss will. Even if the mixer was very close (like on stage), this still might not be a good idea.

The first instrument is an electric bass. For various reasons, the musician wants to bypass his onstage amplifier and go "direct." You might be tempted to just use a wye cord between his instrument and amp, and plug it directly into the board. The problem here is the possibility of ground loops and also of loading the pickups and altering the instrument's sound. The simplest, most reliable thing to do is use a direct box. This makes the output of the bass look like a low-impedance microphone. Now all you need to do is plug it into the mixer, just as if it was a microphone. Sescam, UREI, and Whirlwind Audio all make

For the mixer—

Output Level at 0 VU	+4 dBv (1.23 V)
Output Source Impedance	56 ohms, unbalanced
Minimum Load Impedance	600 ohms
Output Clipping Level	+18 dBv (6.16 V)

For the equalizer—

Nominal Input/Output Level	+4 dBv
Input Impedance	33 kohms
Output Source Impedance	75 ohms
Output Clip Level	+20 dBv
Minimum Load Impedance	600 ohms
Gain Adjustment	-60 to +15 dB

Since the mixer's output level and the equalizer's input level requirements match, there is no level problem. Is there an impedance problem? No. The input impedance of the load (equalizer) is more than 10 times the source (mixer) impedance, so the equalizer's

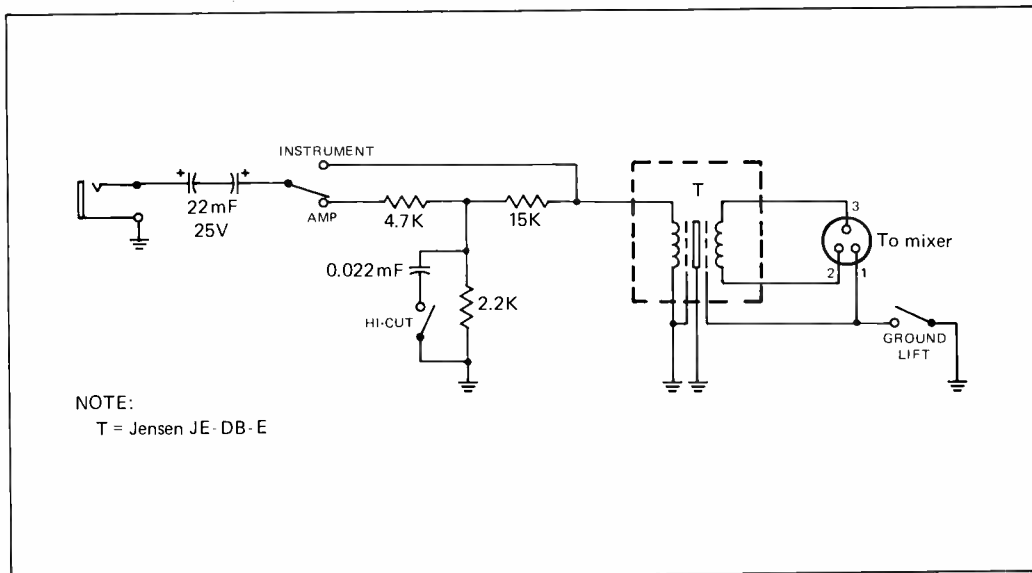


Figure 2. Schematic diagram for a direct box.

suitable devices. In a pinch, a plug-in transformer adaptor like the Shure A95M will work fine. *Figure 2* shows the schematic of a typical direct box.

The next instrument is an electric guitar. So as not to alter the sound anymore than necessary, and to get the benefit of the guitar amplifier's distortion, the best place to connect is at the speaker connections on the amplifier. This is definitely *not* the place you want to connect directly to the mixing console. The problem here is the high currents at the speaker connections. This could cause the whole sound system to go into oscillation, perhaps at a frequency only the local dogs will hear. This usually isn't discovered until something smokes (or the dogs go berserk). Again, use a direct box. This time, you want one that has an internal resistive pad to reduce the level of the signal to something that can be controlled. The UREI 315 is a good example of this sort of device.

Mixer to Equalizer. Reading the spec sheets gives us the following information:

input will bridge the mixer output quite nicely. Everything is just fine here.

Mixer to Effects. As an exercise in futility, let's try to connect an ancient Echoplex to the mixer for effects. There aren't many printed specs on these units, but they were usually connected between the output of an electric guitar and a guitar amplifier. Level wise, we are talking about -30 dBv or so. The input impedance is quite high, about 200 kohms.

Checking the mixer specs again, the effects-send output has about the same specs as the main outputs. Comparing sending impedance and load impedance, no real problem. Being brave, you plug it in and fire it up.

The first thing that greets you is distortion. Wow, tons of sustain in the echo, but it really sounds bad. After adjusting the effects send so the distortion is gone, there is a sound in the speakers that is vaguely reminiscent of Niagara Falls. *Arrrrrrgh!* What happened?

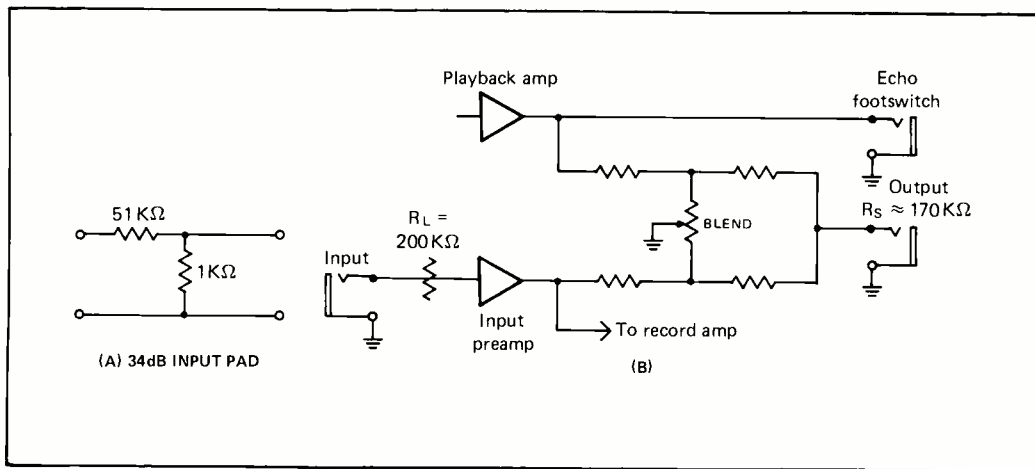


Figure 3. A 34 dB pad (A) and the details of the Echoplex output circuit (B).

Glancing at the mixer spec sheet again, the noise spec leaps off of the page. Oh, oh. The spec sheet says the mixer's noise floor is -60 dBv, which is only 30 dB away from the Echoplex's input level requirement. This works out to be a 30 dB working signal-to-noise ratio. No wonder it was noisy. Suddenly, it dawns on you that the reason for the distortion comes from trying to shove a $+4$ dBv signal into a -30 dBv input jack.

What can you do to cure this situation? Drop the signal level with a pad. What you need is a 34 -dB attenuator. Then the mixer's $+4$ dBv looks like -30 dBv. Now the 'plex is happy. The noise situation also improves because the mixer's output noise is attenuated by 34 dB, along with the signal. The attenuator is nothing more than a voltage divider, and is shown in *Figure 3A*.

Looking at the Echoplex output jack, however, is another story. *Figure 3B* shows the circuitry near the output jack of the Echoplex. (This figure gives a little more of the output circuit detail than was shown in *Figure 5* in the February NOTES.) The jack marked OUTPUT has a source impedance of at least 170 kohms! But the input impedance of the mixer's effects return is rated at 20 kohms, with a sensitivity figure of -30 to 0 dBv (depending on the setting of the effects return control). Here we have a definite impedance problem. The level loss just due to the mismatch alone will amount to about -20 dB.

Fortunately, the Echoplex is rather tolerant of strange loads (because of its purely resistive output circuit). Under these conditions, the output level of the echo unit is about -50 dBv. Gadzooks! Now it looks more like a microphone than an effect. No wonder you can barely hear it with the effects return wide open.

To combat this problem, you can use an outboard preamp device, like the MXR Micro-Amp. Another solution was presented in my February Notes column (use the footswitch jack for an output). Another possibility is to use a high-impedance microphone input (yes, a regular input channel).

Equalizer to Power Amplifier. The power amplifier spec sheet reads:

Input Impedance	25 kohms
Sensitivity	+8 dBv for full output

Output Power	200W/8 ohms, 300W/4 ohms
Minimum Load Impedance	4 ohms

••

Again, like the mixer/equalizer interface, the amplifier's input impedance is much higher than the equalizer's output source impedance. Thus, the amplifier input will bridge the equalizer's output. However, there is a potential for a slight level problem. Notice that the equalizer is operating at a $+4$ dBv input level. Notice too that the amplifier requires 4 dB more signal level than the equalizer will deliver when set for unity gain.

Since the equalizer has a gain control capable of making up the additional gain required, the mixer will not have to come up with 4 dB more signal level. This is desirable, since the equalizer has 2 dB more headroom than the mixer does.

Furthermore, the equalizer can be used to make up slightly more gain than is necessary, say 6 or 8 dB. This will allow the mixer output to operate at 2 to 4 dB less level than otherwise would be necessary. This serves to improve the mixer's output headroom figure slightly. The trade-off here is that lowering the mixer output level puts the mixer's normal operating level that much closer to the noise floor.

Because the amplifier's input bridges the equalizer's output, additional power amplifiers may be driven without regard to their loading effect on the equalizer (within reason). Just connect their input jacks in parallel. Some companies (Yamaha, for example) include parallel-connected input jacks to facilitate this sort of connection. At any rate, the equalizer's 600 -ohm minimum load impedance will allow you to drive $25,000/600$ or 41 amplifier inputs. With 41 amplifiers connected, the overall input signal to the amplifiers will drop by about 1 dB, because the 41 inputs in parallel amount to almost a 600 -ohm load for the equalizer's output.

Amplifier to Loudspeaker(s). The loudspeaker(s) are just a basic two-way 8 -ohm system. If you connect them in series (not recommended), the system impedance is 16 ohms ($8 \times 2 = 16$). Connected in parallel (recommended), the system impedance comes out at 4

ohms ($8/2 = 4$). If you connect them in series, then you can expect 100 W or so into the pair (50 W each), while in the parallel connection you will get around 350 W into both (175 W each). If the amplifier will drive a 4-ohm load (the spec sheet says yes), then the parallel connection is the best way to connect the speakers.

Speaker Cables. The last item on the subject of speakers is wire. A good many folks just use plain old 18-gauge "zip cord." This is not good practice. Let's see why. Checking the wire size table, 18-gauge wire has a resistance of 0.00638 ohms/foot. Sounds pretty insignificant, yes?

The wire's resistance is *not* insignificant. Consider that the wire resistance is directly in series between the amplifier and speaker. If the resistance gets too high, then you start losing more power in the wire than gets to the speaker. Furthermore, the wire resistance degrades the damping factor of the system. Since there are two strands (remember, it takes two wires) per speaker cable run, the effective resistance is doubled. For 100 feet of this wire, the wire resistance amounts to 1.28 ohms. For a 4-ohm system, this will eat almost 36 percent of the amplifier power.

By using larger wire, the effects of wire resistance may be minimized. 14-gauge wire has a resistance of 0.00253 ohms/foot. For the same 100-foot run, the wire resistance is only 0.506 ohms. Now, only 19.9 percent of the amplifier power is lost in the cabling. If you use #12 wire, you only lose 13.5 percent.

To minimize the losses due to wiring resistance (to get as many watts to the speakers as possible) you can do one or more of the following:

1. Raise the impedance of the load. This lowers the current flowing and (thanks to Ohm's law) lowers the voltage drop across the wire. This equates to a decrease in power lost in the wiring.
2. Move the power amplifier so that it is physically very close to the load (speakers).
3. Use the largest wire practical to connect the speakers to the amplifiers.
4. If your speakers are split on each side of the stage, consider putting amplifiers up on each side of the stage.
5. Don't use guitar cords, especially the coiled ones, for speaker cabling. Most of these cords use "tinsel wire" to improve their flexibility. The resultant wire gauge might be somewhere on the order of #35 (0.38 ohms/foot).
6. Don't use 1/4-inch phone plugs for speaker connectors. They are not as well suited for high current connections as other types, such as the XLR connector. They also short out the source when they are plugged in or pulled out, and do not lock. Last, they tempt the unwary into using the nearest cord available (usually a stretch cord), rather than the correct one for a speaker cable.

Some Ground Rules

As you can see, there really isn't much to be concerned about, at least as far as impedance matching goes. What really is important, though, is signal level matching. Summing everything up, here are some simple rules to remember:

1. Connect low impedance sources (outputs) to high impedance loads (inputs) if the low impedance

loads can produce sufficient voltage output to satisfy the needs of the high impedance load.

2. Don't connect high impedance sources (outputs) to low impedance loads (inputs) unless you know for sure that the abnormal load will not be harmful, and there is enough drive capability in the high impedance source to drive low impedance load. As an alternative, the low impedance device may have sufficient reserve amplification to make up the losses. If the high impedance device will not tolerate the excess load, expect distortion as a consequence.
3. Match impedances (source impedance = load impedance) only when this is a condition of proper operation of either or both the source device or load device.
4. To obtain the most power from a solid-state amplifier, load it at its minimum load impedance, but not lower.
5. To get as many watts as possible into a loudspeaker, make the wire connecting it to the amplifier as fat as possible. The wire gets fatter as the gauge gets smaller, i.e. #12 is bigger than #30.
6. Use line inputs directly (plug source straight in) only when the source matches in signal level. To minimize the effects of long cabling, it helps if the source is low impedance.
7. The foolproof way to connect anything to a mixer is to make it appear to the mixer like a low-impedance microphone. The easiest way to do this is with a direct box.
8. If the signal level at the source is much higher than the load wants to see, use a resistive pad. If the load connects directly to a volume control (like in most power amplifiers), then the volume control can serve as the pad.
9. You will get the best noise performance from any piece of equipment if you operate it at a signal level that is as high as possible, while allowing adequate headroom.
10. Your mixer will deliver the best noise performance (lowest noise) when most of the gain comes from the input preamp. This means that you have to set the trim control at a point that allows sufficient gain to put the fader at a reasonable setting, while still allowing adequate headroom.

While modern design practice has all but eliminated the need for matched (in the classical sense) impedances, it has *not* eliminated the need for matched signal levels. In a modern audio system, the need for matching signal levels far exceeds the need to match impedances.

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Ambient Sound

By Len Feldman

When Dolby and dbx Won't Do the Job

I can remember when Dolby B first appeared as a noise reduction system in consumer products. There was a lot of confusion concerning what it could do and what it couldn't do. I used to get letters from recording buffs (amateurs, of course) who complained that Dolby didn't remove that annoying surface noise from the old 78 rpm records that they were trying to transfer to tape. I never (well, hardly ever) got such complaints from professional recordists who, having worked with Dolby A noise reduction for some time by then, understood that companding processes, whether employing a sliding frequency scale (like Dolby) or linear companding (like dbx), could only reduce noise that would otherwise be added during the recording process—not noise that was already part of the program source being recorded.

I would carefully explain to those correspondents who questioned the effectiveness of Dolby NR that to reduce noise from program sources that *already* contained unacceptable levels of it, you had to use some sort of filtering. Of course, if you simply try to cut noise out by turning the treble control counterclockwise (or knocking down the slide controls for the last two or three octaves on a graphic equalizer), you'll get rid of a fair amount of hiss or high-frequency noise, but you'll also cut out a good deal of the musical highs.

The very first engineer to come up with a solution to this problem was one of the pioneers in the field of

high-fidelity sound reproduction, Mr. Hermon Hosmer Scott, whose H.H. Scott Company, having undergone any number of corporate reincarnations under different ownerships, exists to this day. Mr. Scott developed a dynamic filter which he called a Dynaural Noise Suppressor. The idea was actually quite simple, and was based upon psychoacoustic effects that were well known even in the dark ages of good sound reproduction—the 1930s and 1940s. If lots of “highs” are present in the *music* at a given moment, they will mask the hiss and high-frequency noise that's present at the same time. On the other hand, during times when there are *no* highs in the music, why let the amplifier have wideband response to reproduce the hiss? Instead, close down the bandwidth of the system when wide bandwidth isn't required. Mr. Scott's Dynaural Suppressor worked pretty well—for its time. Limitations of vacuum tube technology, however, rendered it something less than perfect. If you think you can hear breathing and pumping with some of today's companding systems, you probably would have described the Scott Noise Filter as “gasping and choking!” That's no criticism of Mr. Scott, but simply a matter of the technological limitations of the time in which he did his work.

More than ten years ago, Richard Burwen took up the challenge of a single-ended noise reduction system based upon dynamic filtering. By that time, we were in the age of solid-state electronics—even integrated

circuit op-amps—and so Dick Burwen's Dynamic Noise Reduction system worked far more effectively than did the old Scott noise suppression devices. Level sensing circuits had been refined, and so had the designs of the dynamic filters themselves. But the end product (which I remember testing some years back) was still fairly expensive and fairly bulky. It found its way into professional recording and broadcast studios where less-than-perfect program sources containing a high amount of high-frequency noise had to be cleaned up before they could be retranscribed for other applications. Consumer versions of the device were also sold by Burwen around that same time.

The latest version of Dynamic Noise Reduction comes in the form of a tiny chip that was introduced by National Semiconductor in the beginning of 1981 (after three years of development work), following a licensing agreement by Burwen. In the brief period since then, DNR (as the system is now called) has become the number two noise reduction system in the world, and it is expected to represent 15 percent of the total market by 1984, according to a spokesman for National Semiconductor. Recently, National Semiconductor celebrated their shipment of 2,000,000 channels of DNR, and *MR&M* publisher Larry Zide and I attended the event to learn more about DNR, its past, and its future potential. By the end of 1983, some 140 manufacturers will be licensed to use DNR, and hundreds of products, largely in the consumer electronics field, will incorporate this noise reduction system. At least one manufacturer, Advanced Audio, offers a stand-alone version of DNR and is expected to have available an 8-channel version of the DNR system for professional recording applications.

How DNR Works

DNR depends upon two well known principles for its operation. The first is that the level of noise we hear from any audio system depends directly upon the system bandwidth. But, as we have already noted, restricting frequency response alone is no solution to a single-ended noise reduction system. DNR employs a second principle in combination with restriction of bandwidth. It is based upon the fact that our ability to hear noise is also dependent upon the program material that is present at the same time. When program sound level is high, it masks low level noises as the threshold of hearing is raised. During those times, system bandwidth can be increased to allow all program material, including high-frequency harmonics or overtones, to be faithfully and completely reproduced by the system.

The DNR system recognizes the masking ability of the program material, extending bandwidth automatically and sufficiently to allow all music to pass through the system. At times when the noise could become audible, the bandwidth is automatically closed down or restricted so as to eliminate noise audibility. DNR employs two matching noise filters for full stereo operation. Both filters are controlled by side-chain amplifiers which determine the amplitude and spectral characteristics of the program material. These electronically-controlled filters operate at low distortion levels over a wide frequency range and have

cut-off characteristics that are smooth and devoid of any peaking. The DNR system employs special "weighting" features. Music containing predominantly low frequencies cannot successfully mask noise that contains much higher frequencies. Masking occurs only for a limited range of frequencies on either side of the tone that's providing the masking effect. As music becomes richer in high frequencies and harmonics, its masking ability improves.

The special DNR weighting filters recognize this fact and allow high-frequency tones to open the noise filter's bandwidth much wider than do low-frequency tones of comparable amplitude. The net result is that a bandwidth is maintained that is wide enough to pass the higher harmonics found in the program material.

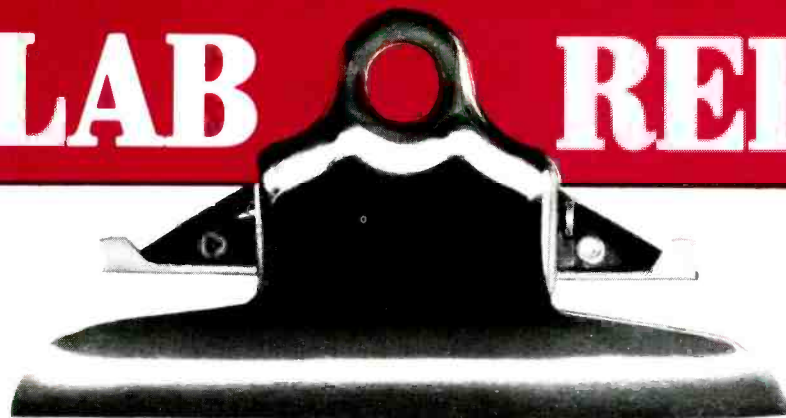
Part of the contribution brought by National Semiconductor to the DNR system in their chip development was the ability to carefully tailor the speed with which the filters can change bandwidth. Improper time constants would have a potential impact on audibility and the creation of new undesirable audible artifacts. Filters have been designed to open fast enough so that the start of a musical transient is not audibly limited in bandwidth. DNR's attack time is less than one millisecond. Similarly, filter release time must not be so abrupt that natural reverberations are cut off in an unnatural manner. DNR's release time is set for 50 milliseconds—long enough to preserve much of the musical ambience but still too short for the ear to detect the presence of noise.

Applications for single-ended noise reduction systems extend beyond the consumer and professional audio fields. The need for eliminating noise that's already present in a program source extends to such fields as video, broadcasting, electronic musical instruments, theatrical sound and audio/visual systems and, as we were surprised to learn, even to certain medical electronic instrumentation. Cardiovascular machines, for example, use the doppler effect for measuring blood flow rate, which is determined by changes in sound. DNR removes much of the background noise, enabling a more accurate analysis and diagnosis.

Is It Too Little, Too Late?

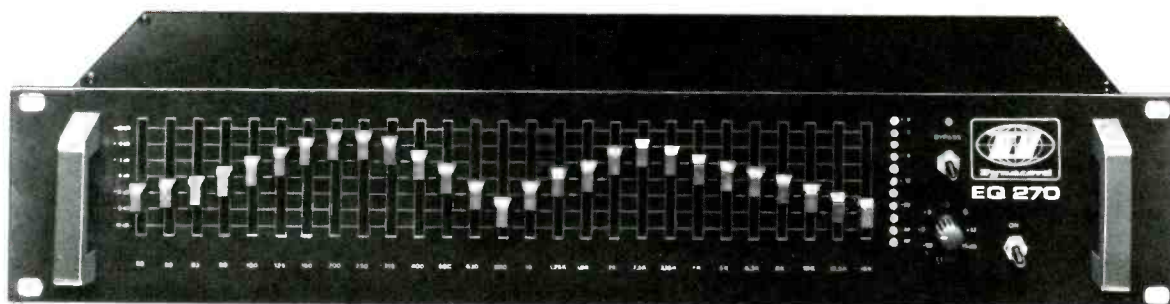
Like myself, you may be thinking, "Who needs single-ended signal processing when we're on the threshold of the digital era, where audible noise will be a thing of the past? Haven't we been told over and over again (in Len Feldman's columns as well as elsewhere) that, come the age of digital, we won't need Dolby and we won't need dbx? And, if that's true, isn't it equally true that we won't need DNR?" Well, perhaps so! But if, in past columns (and my undeniable enthusiasm for digital sound), I've led you to believe that analog sound is on its last legs and will disappear from the scene in a year or two, let me hasten to correct that impression here and now. There still is, and will continue to be, a great deal of analog source material out there, at least for the next decade or even longer. Much of that material is noisy and could do with a little cleaning up. And DNR may well be just the noise "detergent" that can do the job until digital takes over.





LEN FELDMAN

Dynacord EQ 270 27-Band Equalizer



General Description: The Dynacord EQ 270 is distributed by Unicord, a division of Gulf + Western Manufacturing Company located in Westbury, New York. Like the other product we tested for *MR&M* this month, it was designed and built in West Germany. This single-channel third-octave graphic equalizer has 27 separate bands and is intended primarily for use in professional sound reinforcement applications. All of the filter bands employ so-called "gyrator" circuits, in which op-amps with negative feedback applied to them take the place of old-fashioned lumped-constant inductors. This not only saves a great deal of space, permitting this many bands to be incorporated in such a compact, rack mountable unit, but it also insures a superb signal-to-noise ratio since there are no physical inductors to pick up stray hum and noise fields.

Inputs and outputs to the EQ 270 may be balanced or unbalanced. XLR type connectors (female sockets for the inputs, male connector for the output) are used for the balanced mode, while single circuit standard phone jacks are used for input and output connections when the unbalanced mode is used.

Controls & Switches: The 27 front-panel filter controls are of the slider type, with well defined detents for establishing flat settings of each control.

Calibration marks are provided for each control over the range of +12 dB to -12 dB, and each band is marked with its center frequency. The center frequencies selected are standard values: 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800 Hz and 1.0, 1.25, 1.6, 2.0, 2.5, 3.15, 4.0, 5.0, 6.3, 8.0, 10.0, 12.5, and 16 kHz. A vertical column of LED indicators to the right of the 27 filter controls shows signal output levels. The lowest LED is lit whenever the equalizer is active, while the uppermost LED flashes when signal levels exceed overload levels. An input level control is also located on the front panel and is calibrated from -10 dB to +15 dB, relative to unity gain. A bypass switch with an associated LED indicator permits simple front-panel switching from equalized to non-equalized system mode for comparing equalized and unequalized sound. Over at the extreme right of the panel is a toggle power on/off switch.

In addition to the XLR and phone jack connectors on the rear panel of the equalizer, there is also a socket which is intended for connection of an optional remote control foot-switch. When such a remote control foot-switch is connected, it overrides the front-panel bypass switch, but the associated LED continues to function, indicating when the equalizer is bypassed or active in the circuit. A three-pin power cord socket is also located on the rear panel, with power cords for various

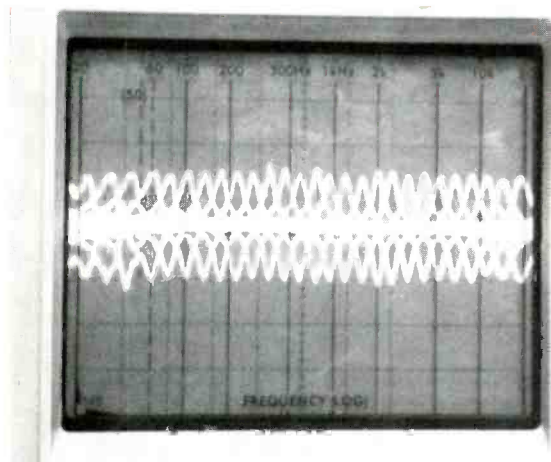
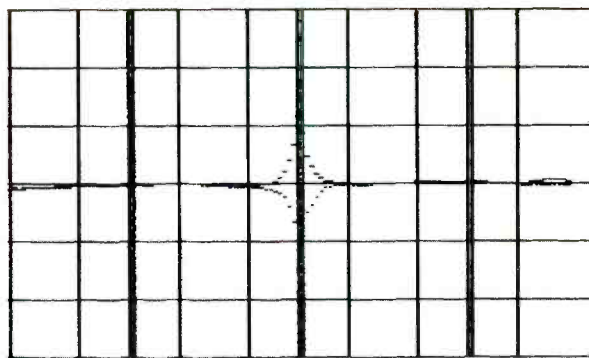


Fig. 1. Boost and cut range of each of the 27 filter bands.

FR



10dB/D L+11.8dB R-11.7dB 1.00kHz

Fig. 2. Detailed analysis of a single (1 kHz) filter band's maximum boost and cut range.

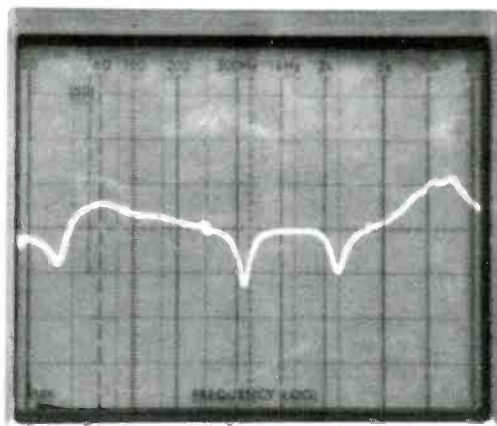


Fig. 3. Complex overall response curve established with the aid of the EQ-270 Equalizer.

countries supplied separately, so that a universal main chassis can be used regardless of the type of power cord required in the country to which the unit is to be exported. In the case of our sample, a hefty three-wire polarized line cord was supplied.

Test Results: Measurement of an equalizer's performance usually involves very few measurements and a great deal of hands-on experimentation and use in order to gain a real feel for the usefulness of the instrument as well as its flexibility. The few measurements we made at the lab bench are summarized in our brief VITAL STATISTICS table. To give you some idea of just how precisely a third-octave equalizer can do its job (as compared, say with a 10-band octave-by-octave equalizer), we used our spectrum analyzer to carefully plot the boost and cut characteristics of every one of the 27 filters. Since this plot, reproduced in the storage scope photo of Fig. 1, is logarithmic from 20 Hz to 20 kHz, you can see how evenly spaced (in frequency) the center frequencies of these filters are.

We examined a single filter band (the one whose center frequency is a 1 kHz) using our Sound Technology 1500A tester and came up with a detailed plot of the maximum boost and cut characteristics of this filter, as illustrated in the video printout of Fig. 2. Notice how high the Q of this (and all the other) filter band is. While we obtained a maximum boost of 11.8 dB and a maximum cut of 11.7 dB at 1 kHz (close enough to the 12 dB claimed), just one octave removed from the 1 kHz center frequency, there was virtually no boost or cut at 500 Hz or 2 kHz. The narrow bands of a third-octave equalizer permit you to really fine-tune a sound system as required.

To further illustrate the fine tuning possible with a 27-band equalizer, we arbitrarily created a complex response curve, as shown in Fig. 3. The narrow notches which we placed just above 500 Hz and above 2 kHz might well be required in a large hall to eliminate specific feedback howls and squeals, thereby permitting greater overall system gain before feedback takes place. Using such narrow notches, the audience will not be aware of any aberrations in overall frequency

response of the system. Had you tried to do the same thing with an octave-by-octave, 10-band equalizer, you might have been able to reduce feedback at the offending frequencies, but you would have attenuated a much wider band of frequencies around the notch frequency, with obvious audible effect upon music or speech.

Comment: The numbers and spectral plots speak for themselves. I can only say that this equalizer is a precision instrument that can be used for professional

voicing of just about any acoustic environment. That being the case, it should be used in a professional way. Any attempt at equalization-by-ear is not likely to result in a properly adjusted set of controls—especially when you are dealing with 27 of them, plus a level control. Ideally, the EQ 270 should be used with a calibrated microphone (preferably positioned at the mixer's desk, somewhere in the middle or towards the rear of the hall) and a real-time spectrum analyzer equipped with third-octave indicators. To try to use this fine equalizer in any other way would be to do an injustice to the equipment and its maker.

DYNACORD EQ 270 27-BAND EQUALIZER: Vital Statistics

SPECIFICATIONS	MANUFACTURER'S CLAIM	MR&M MEASURED
Input voltage levels	-10 dB/+15 dB (re: .775 V)	Confirmed
Input Impedance	47K ohms	Confirmed
Maximum Output Voltage	7.75 Volts	8.0 Volts
Output Impedance	600 ohms	Confirmed
Range of Control per filter	+12 dB	+12 dB (within 0.3 dB)
Harmonic Distortion	Less than 0.1%	0.013% (worst case)
IM Distortion	N/A	0.012
Signal-to-Noise Ratio	95 dB	91 dB (A-wt'd, re: 0 dB)
Dimensions:	19" w. x 3.47" h. x 11.8" d.	Confirmed
Weight:	9.9 lbs.	Confirmed
Retail price: \$550.00		

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ASC Electronic AS-6002 Open-Reel Tape Recorder



General Description: ASC Electronic's Series AS-6000 recorders, manufactured in West Germany, are imported into this country by Hammond Industries, whose headquarters are in Madison, Alabama. At the moment, the product line consists of four versions of the same basic, well-engineered and precision built open-reel recorder, two cassette tape decks, and

a variety of accessories for both categories of products. The AS-6000 series decks are all two-channel three-speed models (either 15/7.5/3.75 ips or 7.5/3.75 1 1/8 ips) and are configured either for half-track or quarter-track recording and playback. For our lab test, we selected the higher speed half-track configuration.

While the AS-6002 seems intended for serious audio

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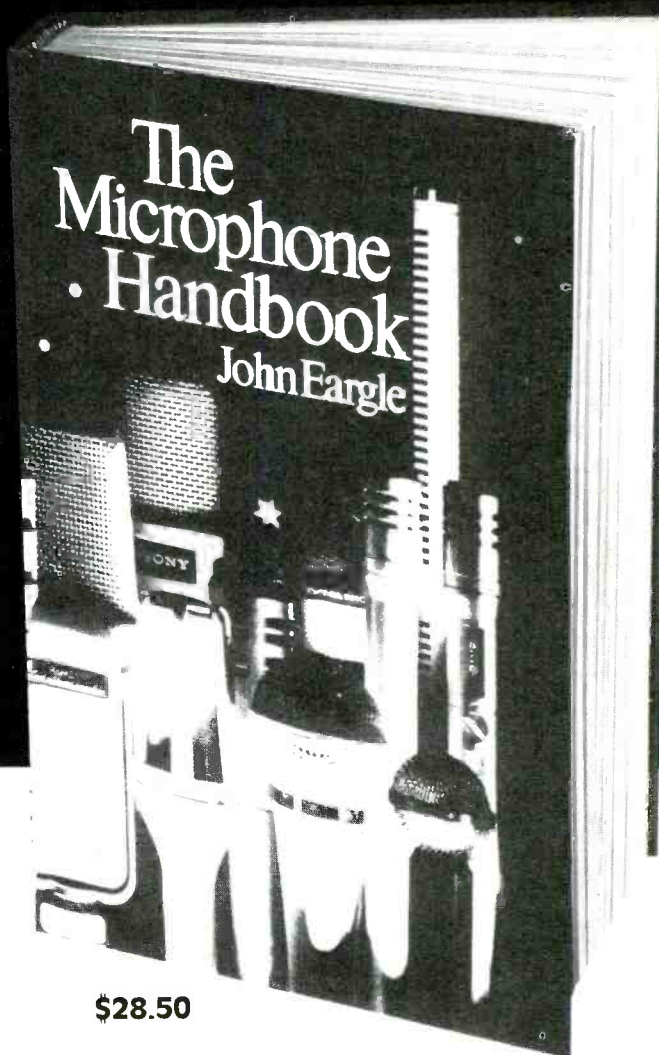
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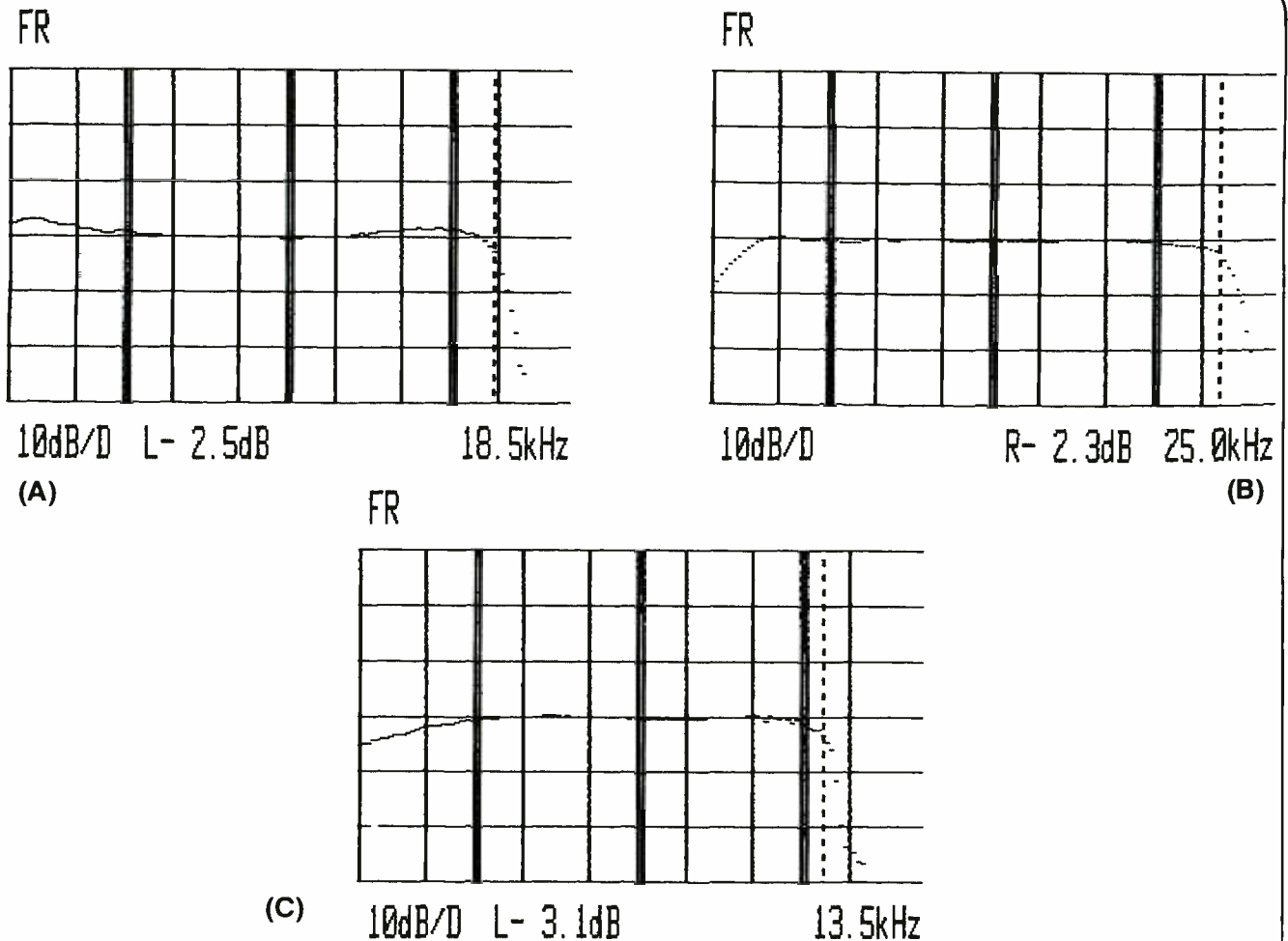


Fig. 1. Record/play frequency response, at 15 ips (A), 7½ ips (B) and 3¼ ips (C).

hobbyists, its features and the precision craftsmanship that is obvious in its construction suggest that it might be just as useful as an auditioning deck in a small studio, or in the hands of music groups who need to record their live-performance efforts using more than a good cassette recorder.

The deck transport employs a 3-motor drive. Spooling motors feature ball-bearing asynchronous outside rotors, while the capstan motor is an electronically-controlled DC type that is totally unaffected by fluctuations in voltage or frequency. The transport system features electronic braking and electronic tape tension regulation. This last feature insures even tension on the tape, regardless of how much tape is wound onto each reel. A three-head system is employed, with separate record and playback heads and a double-gap ferrite erase head. A die-cast tape head mounting insures stable positioning of the heads. An extra playback head can be installed to allow use of both half-track and quarter-track recordings.

Fast rewind cueing is possible, and a special high frequency filter comes into play when cueing is activated in order to prevent high frequencies from damaging tweeters in monitor systems. Both DIN and NAB equalization are provided. (DIN equalization, which also corresponds to CCIR and IEC standards, employs a 35-microsecond time constant at 15 ips and a 70 microsecond time constant at 7½ ips.

NAB equalization uses 50 μsec and 3180 μsec time constants at 15 and 7½ ips; 90 μsec and 3180 μsec at 3¼ ips.)

The AS-6002 features an electronic tape counter. On our sample, the count is given in meters and decimeters, but we are informed that this is being changed to feet and inches for the American market. Peak level meters are used for each of the two channels, and each meter is equipped with a red LED which lights up when the recorder is in the record mode. The deck is able to accept an impulse playback head with which manual or remote control of slide or film projectors is possible. All tape transport controls are operable by means of an optional wired or infrared remote control unit. Electronic echo is possible using a switch position designated for that purpose. In the ECHO mode, part of the playback signal is fed back to the record head and re-recorded and played back. Most effective use of this feature, we found, was at the 15 ips speed. Sound-on-sound recording is also possible, with overdub synchronization accomplished by monitoring the main track via headphones.

Controls & Switches: A headphone jack, together with its level control and two microphone input jacks, is located at the extreme left of the front panel. Nearby are the two record/play level meters which, we felt, were a bit on the small side for a tape deck of this

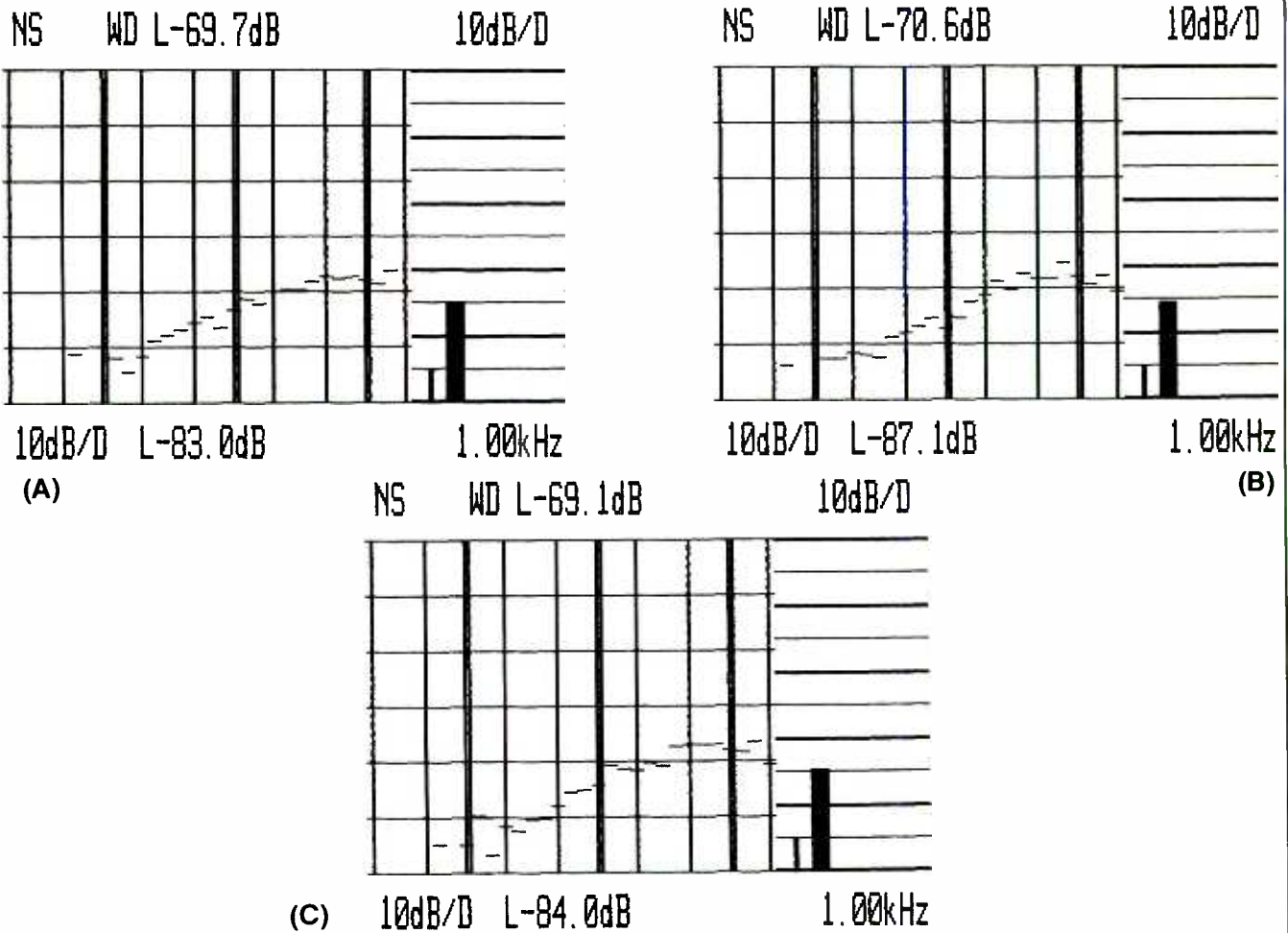


Fig. 2. Signal-to-noise ratio analysis, at 15 ips (A), 7½ ips (B) and 3¾ ips (C).

quality. These meters read post-equalization record signal levels. Dual-concentric rotary controls handle microphone and line record levels, while a master record level control takes care of overall, mixed recording levels. Four three-position toggle switches below the headblock area select source/tape (NAB/DIN equalization), sound-on-sound/normal/echo, lower/upper/stereo tracks and 15/7½/3¾ ips tape speeds. Light-touch tape transport buttons handle rewind, fast forward, play, stop and record. The RECORD and PLAY buttons must be touched simultaneously to enter the record mode. Another button nearby is labeled REP (for repeat), and we found this to be a particularly useful feature. During playback, if the REP button is depressed and held, the tape begins to rewind. The moment you let go of this button, normal forward play resumes. In this way, it is fairly simple to listen to a particular segment of a tape over and over again; a useful feature, especially during editing.

The cue control, electronic tape counter display, reset button and power on/off pushbutton are located directly above the tape transport touch buttons. Tape threading was found to be extremely simple and straightforward on this machine, and a simply-removed head cover provides easy access to the tape heads for cleaning or other adjustments.

As is typical of European audio equipment, input

and output connections can be made via a single multi-pin DIN connector and cable supplied with the unit. In addition, ASC has provided more familiar phono-tip jacks for line input and output connections. There is also a multi-pin socket for connection of a mixer, as well as special sockets for connection of a wired remote control and a projector control. The mixer socket is fitted with a dummy plug, should no mixer be used. Mixer connection is normally made after level controls in the tape deck circuitry, so it is necessary to reconnect that circuit interruption point if no mixer is used. When a mixer is used, the tape deck's own input level controls are not operative.

Test Results: We were told that our sample deck was calibrated for Maxell UD-XL-I tape, and so that is the type of tape we used. The one objection that we have to the owner's manual supplied with this deck is that there are no biasing instructions. Undoubtedly, a more complete service manual is available, but we did not have it when we tested the unit. Accordingly, we had to accept the frequency response (and other parameters) which the deck delivered without being able to tweak bias settings. As can be seen in our table of VITAL STATISTICS, most of the measurements were excellent, even exceeding published claims. This was not true of frequency response, however, especially at the slow 3¾ ips speed. Response curves

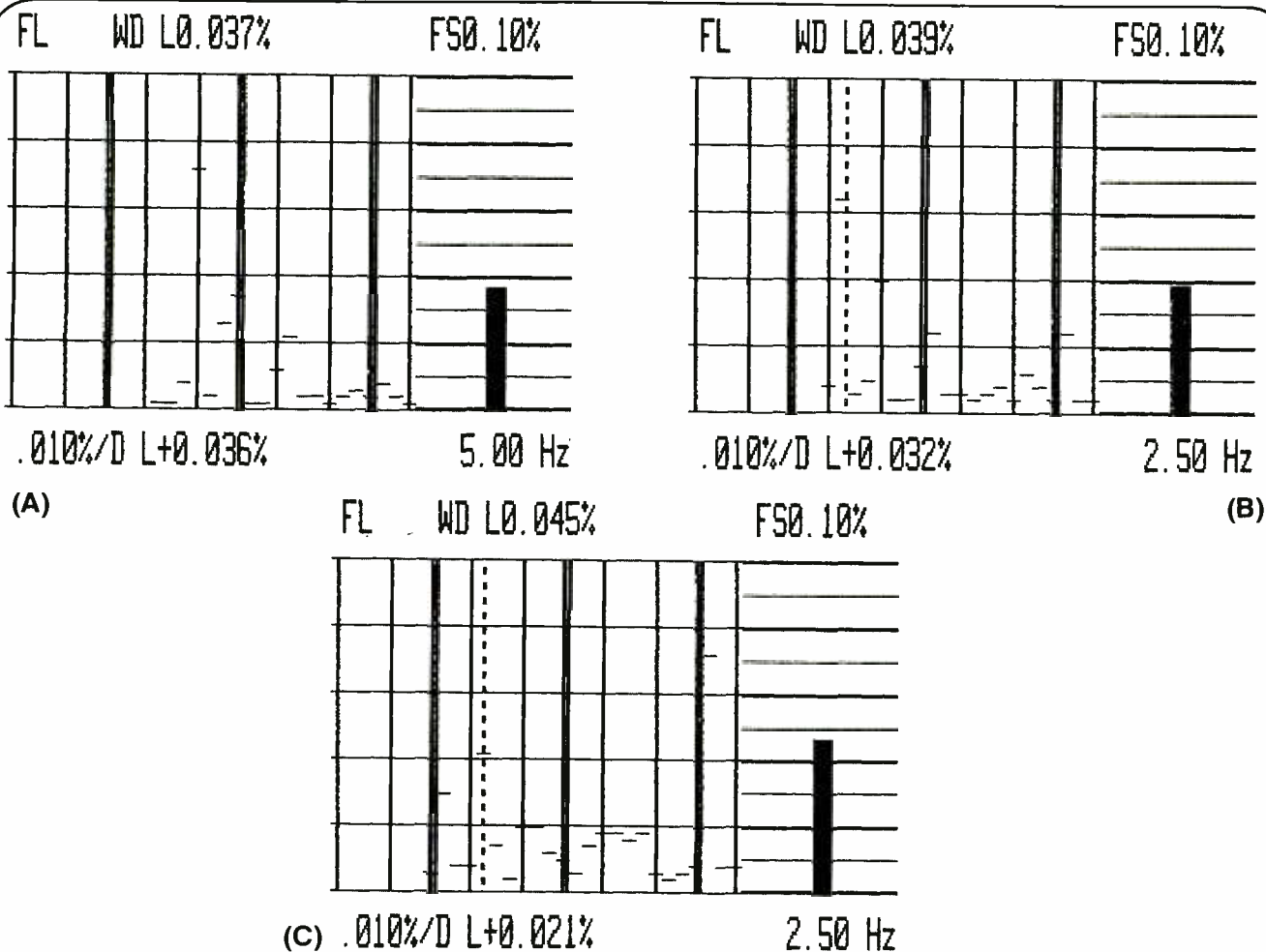


Fig. 3. Wow-and-flutter analysis, at 15 ips (A), 7½ ips (B) and 3¾ ips (C).

at the three speeds are plotted in *Figs. 1A, B, and C*. The curve for 15 ips frequency response was plotted using a record level of 0 dB, while response curves for 7½ and 3¾ ips speeds were made at -10 dB. We are quite certain that overall frequency response could have easily met published figures at all speeds if we had been able to back off just a bit on the bias settings. Our batch of Maxell tape obviously wanted a bit less bias than had been set up during factory calibration.

No such troubles were encountered when measuring signal-to-noise values at the three speeds. Measurements were made with reference to that recording level which results in 3 percent third-order harmonic distortion during playback, and all measurements are A-weighted. In all cases, results were somewhat better than claimed, with readings of 69.7 dB, 70.6 dB and 69.1 dB for the three tape speeds. The same held true for wow-and-flutter, which was consistently lower at each tape speed than was claimed by the manufacturer; even at the more difficult 3¾ ips speed, wow-and-flutter was only 0.045 percent. Signal-to-noise analyses are plotted in *Figs. 2A, B, and C*, while wow-and-flutter analyses and plots are shown in *Figs. 3A, B, and C*.

While ASC Electronic did not publish harmonic distortion specifications for this deck, we normally measure this parameter. Results of these measurements are shown in *Figs. 4A, B and C* for the three

operating speeds. At 0 dB recording level, third-order distortion measured 0.6 percent at 15 ips, 0.39 percent at 7½ ips and 0.94 percent at 3¾ ips.

Comments: Tape handling on the AS-6002 was extremely smooth and stable. I am always impressed by a deck that can provide extremely fast rewind or fast forward tape spooling on 10-inch reels and not yield a tape pancake that is ragged and irregular. No doubt the electronic tape tension adjustment helps here, but regardless of the reason, the whole operation suggests a great deal of precision and care in design and production. The deck is extremely easy to use and all controls seem to be placed just where I would want them to be for maximum convenience during an actual recording session.

I would strongly urge the folks at Hammond to include an addendum sheet (if the manufacturer doesn't want to alter the basic manual), telling customers how to adjust bias. Recorder users willing to invest in a fine open-reel deck such as this are also quite capable of optimizing bias for a given tape if they are told how to do it. At worst, it would at least allow them to ask someone who knows how to tweak the machine to do it for them if they are afraid to go inside themselves. Aside from that minor item, I can find nothing to criticize concerning this excellent machine, but much to commend.

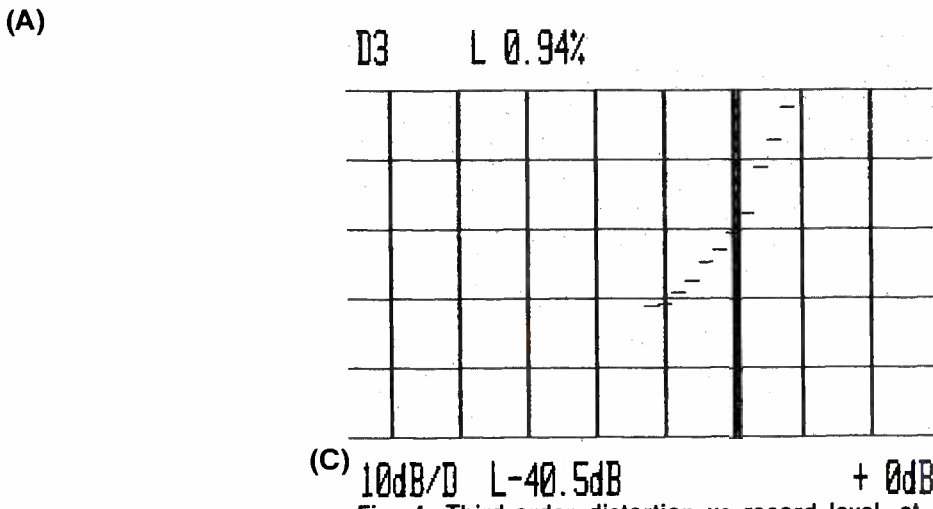
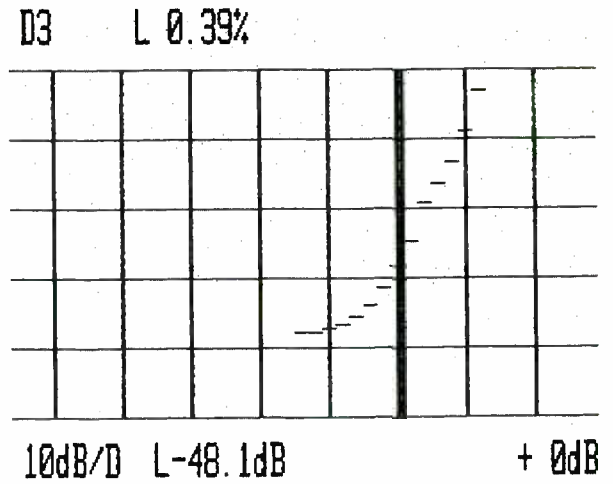
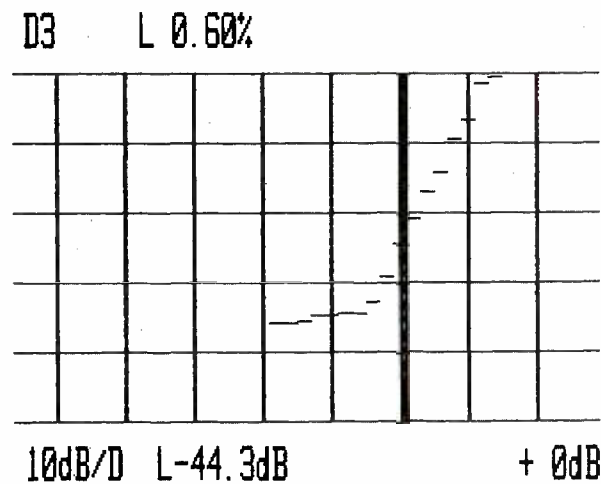


Fig. 4. Third-order distortion vs record level, at 15 ips (A), 7½ ips (B) and 3¾ ips (C).

ASC ELECTRONIC AS-6002 OPEN-REEL TAPE DECK: Vital Statistics

SPECIFICATION	MANUFACTURER'S CLAIM	MR&M MEASURED
Tape Width & Tracks	¼-inch/2 tracks	Confirmed
Tape Speeds	15, 7½, 3¾ ips	Confirmed
Maximum reel size	10½ inches	Confirmed
Number of Heads	3	Confirmed
Rewind Time (3600 feet)	160 seconds	81 sec. (2500 ft.)
Line Input Level	22 mV	23 mV
Line Output Level	1.0 volt	1.0 volt
Equalization	DIN/CCIR/IEC	Confirmed
Frequency Response (Rec/Play)		
15 ips	20 Hz to 28 kHz	29 Hz to 26 kHz (-3 dB)
7½ ips	20 Hz to 28 kHz	20 Hz to 19 kHz (-3 dB)
3¾ ips	20 Hz to 22 kHz	20 Hz to 14 kHz (-3 dB)
S/N Ratio (IEC)		
15 ips	Better than 68 dB	69.7 dB
7½ ips	Better than 68 dB	70.6 dB
3¾ ips	Better than 67 dB	69.1 dB
Wow-and-Flutter (DIN Wt'd)		
15 ips	Less than 0.04%	0.037%
7½ ips	Less than 0.05%	0.039%
3¾ ips	Less than 0.1%	0.045%
Distortion, 0 dB		
15 ips	N/A	0.60%
7½ ips	N/A	0.39%
3¾ ips	N/A	0.94%
Dimensions	16.9" w. x 15.5" h. x 6.1" d.	
Weight	44 lbs (20 kg)	
Retail Price: \$1795.00		

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POPULAR

RANDY NEWMAN: *Trouble in Paradise*. [Recorded, mixed and originally mastered at Warner Bros. Recording Studios, North Hollywood, Calif.; Produced by Russ Titelman and Lenny Waronker; Engineered and mixed by Mark Linett; Mastering Engineering by Bobby Hata.] Warner Bros. 23755-1.

Performance: **Mr. Newman meets the 80s**
Recording: **Some good, some not so good**

In the four years since Randy Newman's last recording, a lot has happened to popular music, and a lot has happened to the American society that spawns popular music. Just as the nation turned away from the South in 1980, Newman has turned his attention away from the South and toward new areas that figure in the national psyche. The results are usually well-focused inspections from both the first-person and third-person perspective.

The crazy state of mind that is Los Angeles (Beach Boys music and street bums); Capetown and its ugly specter of apartheid, and Miami, which Cuban refugees and cocaine dealers aim for with equal zeal, are part of Newman's musical landscape this time out. So, too, are Beverly Hills and San Francisco, as is Vietnam.

Newman explores these physical



Randy Newman

and mental places with rare insight and a keen sense of the absurd.

This is where *Trouble in Paradise* succeeds, and it's a good thing, too, because the recording may not score very high marks for its technical expertise.

Newman and long-time collaborators Lenny Waronker (now president of the Warner Bros. record label) and Russ Titelman have created some nice sounds, but there are some sizable misses as well. Especially nice are the two love songs, with their haunting echoes of Newman's splendid score for *Ragtime*. "Same Girl," the paean to a female junkie, and "Real Emotional Girl," told almost as a breach of confidence, are hymn-like, with a gorgeous solo piano accompaniment (by Ralph Grierson) that is at once rich and full, clean and well-balanced with the vocal line. The treble strings in the latter add a nice touch, softly wistful and filled with Newman's unusual harmonies.

Newman's voice on "Real Emotional Girl," however, is almost too small, and this problem afflicts several cuts. No one ever accused Newman of being able to sing well, or project strongly, and more than once his voice sounds weaker than on just about any of his earlier recordings. He sounds lost behind the techno-punk arrangement and instrumentation of "Mikey's," for example, although this may have been intentional because of the "lost soul" theme of the song.

The sound separation is pretty good throughout, but some of the instrumental work is swallowed up on occasion—the percussion in "Christmas in Capetown," and the horns in "There's a Party at My House," for example.

All this probably means little, however, to those who have been waiting for the next Randy Newman album. And there is plenty to commend: a wide variety of musicians and singers to back up Newman (Linda Ronstadt, Don Henley, Bob Seger, Paul Simon, Rickie Lee Jones, Lindsey Buckingham and Christine McVie help in the singing), some beautiful musical fragments, and some especially pungent lyrics. "I Love L.A." is Newman's answer to "Life in the Fast Lane" and/or "Hotel California," while "My Life Is Good" is to Southern California as "The Serial" is to Marin County. "Song For the Dead" is ostensibly about Vietnam,

but it could be a warning to us all about Central America.

Actually, there is a lot to like on *Trouble in Paradise*, enough, in fact, to more than compensate for the technical shortcomings. SR

ULTRAVOX: Quartet. [George Martin, producer; Geoff Emerick, engineer; Jon Jacobs, assistant. No other info on recording is on album.]

Performance: **Polished to a warm glow**

Recording: **Keyboards panoramic, vox inhumana**

Keyboards has always been the key word for Ultravox, the influential British quartet who've been at the game much longer than most of the contenders in the recent wave of pop-synthesists. While their contemporaries digest the band's arrangement and song construction techniques, Ultravox, with the help of producer George Martin, are taking their work with keyboards a step further, learning to make them 3-D.

On *Quartet*, a digitally mastered disc, the keyboards on the ten songs reflect the bright, clean sound that is generated from recording by direct input. A masterful layering of tracks gives unusual depth to the sound, as well as breadth. It is as if a cushion of air has been pumped into the mix. Far from sounding antiseptic, (a sometimes useful trait of direct input), the keyboards cover much ground, ranging from a warm, soaring feel on "Reap the Wild Wind," to the deep, almost menacing fullness of the organ tones found on "Hymn" and "Visions in Blue." Some of the cuts feature Billy Currie's well-placed sequencer lines, which have a bright, exceptional vibrancy.

While taking a back seat to the keyboards, the guitar still provides a crucial component in Ultravox's sound. Often adding an undercurrent of feedback or blistering-sustained leadwork, the guitar adds an edge to a sound that, with its absence, might suffer from a too tame classical influence.

The bass synthesizer, manned by Chris Cross, is often mixed in front of the guitar, and has its own spring-tone edge, insistently keeping the music danceable, a task shared by Warren Cann on drums.

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With so much care given to the presentation of the instruments, it's strange to report that the sound quality of the vocals on *Quartet* consistently falls short of its potential. Midge Ure's voice, if not wide in range, is deliberate in passion, and deserves a warm, natural exposure. We're never treated to the fullness of the human voice on the album; perhaps the strangely hollow treatment of the vocal is an intentional gesture. Dry, with ever present reverb, the voice sounds receded, a characteristic that especially stands out on a cut like "Hymn." Here the keyboards are imbued with a cathedral-like dimension; the pipes surround us, but the vocal sounds like it's being delivered from beneath the floor.

It's interesting that Ultravox, pioneers in the keyboard-dominant segment of new wave, are not exploring the current mania with poly-rhythms and primitivism. I guess it proves that they're pursuing a musical vision unaffected by trends, continuing to adorn their straightforward songs with an uncluttered, seamless approach. SB



Ultravox

NAKED EYES: *Naked Eyes*. [Tony Mansfield, producer; Haydn Bendall and Jules Bowen, engineers; recorded at Abbey Road Studios, London; mixed at Eel Pie Studios, Twickenham.] EMI America ST-17089.

Performance: **Techno-pop mainstream**

Recording: **Priceless**

Yes Virginia, there may still be a place in today's music for Burt Bacharach and Hal David. This



Naked Eyes

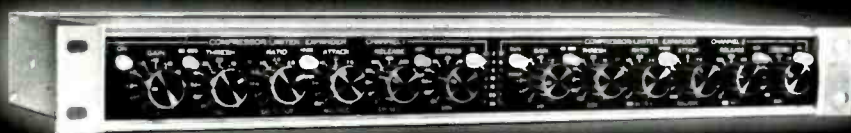
dynamic writing duo from days of yore has been flattered in a remake of "Always Something There to Remind Me" in a techno-pop style on the album *Naked Eyes*. It just goes to show you how analogous and adaptable this new form of musical expression is—even to a late sixties toe-tapper.

Naked Eyes is techno-pop mainstream. It is completely true to the image of clean, crisp tracks utilizing pointed electronic effects for color. From instruments like varied keyboard synthesizers to other artificially enhanced sound producers such as Simmons drums and Linn programming, this is a coupling of control room wizardry that rarely leaves even more conventional acoustic instruments unenhanced. Pete Byrne and Rob Fisher (the Naked Eyes boys) have written the remaining nine of the *Naked Eyes* collection, which feature Byrne's vocals. All tracks have a popular appeal and Tony Mansfield should be commended for having kept his producing very sophisticated and palatable to a broad audience.

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wheel is your basic popular lyric and melody that is complimented, enhanced, strengthened and broadened by the creative direction of the juiced instrumentation.

EMI, alias Abbey Road studios, shows off on this newest of trends with the same immaculate and innovative way they introduced us to the Beatles. The incorporation of Eel Pie Studio (with notable owner Pete Townshend) for mixdown, shows, among other things, that exemplary quality was foremost in this production.

If you have been one of those suffering from the transition from mainline rock and roll to new wave and punk, then techno-pop may just be the connecting link you need. And the easy nature of *Naked Eyes* makes it a primo example of beginner's techno-pop. MR

THOMAS DOLBY: *Blinded By Science*.

[Side One produced by Tim Friese-Greene & T. Dolby; Side Two produced by Thomas Morgan Dolby Robertson; no engineer listed; recorded in England.] Capitol (Harvest/Venice in Peril) MLP-15007.

Performance: **Poindexter falls down the rabbit hole**

Recording: **Clean, full-bodied, semi-sweet**

One might have assumed that Thomas Dolby, wunderkind synthesist who has recorded with a diverse range of artists (including Foreigner, Joan Armatrading and Lene Lovich), would have used a solo shot on vinyl to blast us with a full barrage of his skill at synthesis. Yet on *Blinded By Science*, a 5-song mini-LP, Dolby holds his electronic wizardry in smooth check; no swamp of synthesizers distracts us from a pleasant surprise—Dolby's talented singing, songwriting and arranging. The machines never overshadow the vocals on the album; they truly serve the music, whether they're presenting striking structures that anchor a song or indispensable atmospherics that add sheen to a mood. Dolby, in fact, doesn't demonstrate any dependence on synthesizers here, opting to use "real" violin, flute, brass and guitars.

On "She Blinded Me With Science," the radio cut that successfully crossed over and is heard on AOR and black stations, Dolby puts forth a contorted

Nat Hentoff

Hot, Pungent and Personal: Poncho Sanchez and Thelonious Monk

The intertwining of jazz and Latin music can be found now all over the country, and will increase because there are more and more Americans with diversely Latin heritages. Some of these jazz Latin bands are infectiously buoyant—like an all-woman salsa combo I heard recently in San Francisco. Salsa, yes, but the horns had heard Charlie Parker and Dizzy Gillespie.

But many of the more stimulating groups just don't get recorded, while others are on Latin labels that aren't generally distributed. Finally, however, a crisp, crackling, passionate and precise combo has been cut on a widely available label—Poncho Sanchez, *Sonando*, on Concord Jazz.

Conga player Sanchez, born in Texas of Mexican parents and raised in California, worked for a long time with the late Cal Tjader, and is now on his own. The instrumentation for this set, which should bring Sanchez gigs from around the nation, is multi-colored percussion, saxophone, flute, trumpet, and trombone. There is the necessary tight (but not stiff) ensemble thrust, and the solos are bold and blazing. Especially dig trombonist Mark Levine.

The recorded sound is persistently satisfying—the clean bite of the congas and timbales, the ardently clear voices of the horns, and the chant-like energy of the background vocals. Dizzy Gillespie might think of getting together with this band for one of his future Pablo dates.

For some time, it's been evident that there is a considerable thirst in the land for jazz reissues. The more distinctive sessions are in demand, of course, but there are a lot of those that haven't been available for a long while. One of the

reasons for the demand is that more and more relatively young listeners are moving from rock to jazz, and they want to hear the roots.

Fantasy, which owns such vintage jazz labels as Riverside and Prestige, recently released forty titles in its *Original Jazz Classics* series. (The sets are issued on their original labels.) And the response has been very strong indeed.

After all, those too young to have bought Thelonious Monk's *Brilliant Corners* (Riverside) when it came out need to get it now if they want a reasonably representative jazz collection. With Monk, in this session that significantly broadened his audience back then, are Sonny Rollins, Ernie Henry, Oscar Pettiford, and Max Roach. It is indeed a brilliant series of explorations and surprises on such tunes as "Pannonica," "Bemsha Swing," and "I Surrender Dear."

The most forceful, witty, and unmistakably original soloist is, of course, Thelonious, but the others are up to the formidable challenge Monk always used to set. The engineering is very good for the horns, though the rhythm section could have had more presence. However, this is quibbling when the music is so durably compelling.

PONCHO SANCHEZ: *Sonando*. [Carl Jefferson, producer; Phil Edwards, engineer.] CONCORD JAZZ CJP-201.

THELONIOUS MONK: *Brilliant Corners*. [Orrin Keepnews, producer; Jack Higgins, engineer.] RIVERSIDE OJC-026.

yet danceable portrait of modern "emotion," where the powers of love and lust are reduced to scientific terms of chemical interaction. The computerized drums are mixed way up front, with the synthesized bass fitting so closely with their rhythm and timbre that the two sound like one pulsing unit. Dolby keeps this song very open, letting all the sparsely applied components accentuate its quirkiness. Reeling with eccentricity, the professional voice-over mutters and fumes in concert with Dolby's smooth tenor and Mirium Stockley's wavering soprano, which is blended with a similarly pitched, Arabic-flavored keyboard line.

Dolby shows his skill at creating sound effects that help detail his well-defined vision on "One of Our Submarines"; he uses dense layers of keyboards and a wistful, echoing vocal to establish the tone of the song, augmented by noises appropriate to a submarine voyage. Dolby is careful here, as everywhere, not to let the sounds pierce or jump out of place in the mix. Even the Morse Code introduction to "Windpower" is perfectly understated, and thus accentuates the gritty funk bass line that follows it. Raw enough to make you wince, this line is in turn contrasted by a jazzy flute and doubled vocal, showing Dolby's knack of juxtaposing differently timbred sounds and rhythmic devices to produce densely variegated yet cohesive music.

Thomas Dolby's mini-LP serves as an effective calling card for his talents. It reflects technical knowledge, a lyrical sense that can cover ground with humor and gravity, and musical sensitivity. SB

ORCHESTRAL MANOEUVRES IN THE DARK: *Dazzle Ships*.

[Rhett Davies and Orchestral Manoeuvres in the Dark, producers; OMD, Rhett Davies, Ian Little, Keith Richard Nixon and Brian Tench engineers; recorded at The Gramophone Suite, Gallery Studio and Mayfair Studio, U.K.; mixed at The Manor Studios, London; mastered at The Master Room by Arun Chakraverty.] Epic L 38543.

Performance: **Audio production art**
Recording: **Listening nirvana**



Thomas Dolby

An individual more profound than I once said, if you don't like the Rolling Stones...you don't like rock and roll. Attempting to tread into the realm of profundity (and more likely to step in something a tad more gooey and smelly), let me hereafter be credited with having said, if you don't like OMD, then you ain't a recording engineer.

Who knows why either statement needed to be made. They were, though, and that one definitely needs clarification.

Case in point is the OMD (Orchestral Manoeuvres in the Dark) LP title *Dazzle Ships*. Incorporated herein are the very reasons any of us became attracted to this business in the first place.

Dazzle Ships is the ultimate in creative expression, not to mention a keen example of the expression available in multi-track recording. This has to be an engineer's listening nirvana. All the various elements of sound effects, radio production, music recording and mixdown trickery are wrapped up into a combined whole.

To appreciate *Dazzle Ships* you have to listen real close. Then you have to listen to it again; then again. Remember, we're talking creativity here. This isn't simple correct microphone placement on drums and guitars. This is not an exercise in proper head room and noise reduction. Unlike the ordinary form of pop music, which is built on familiarity and repetition with choruses and

hooks, the OMD's begin at point A and take you progressively through to Z before moving on to their next topic...dare I say song. Not really, because song is wrong. These are not songs, these are audio production works of art.

The instrumental credits alone elicit the creative bent of this product. Not wanting to bore you with the mundane, I have chosen a few worth quoting: "Toy Piano, Premier Military Bass Drum, Texas Instruments 'Speak and Spell' Machine, Sanyo Short Wave Radio, Typewriter and the Bugle on ("This is Helena") courtesy of BBC Records/RAD 126."

Categorically, this album is technopop. It is extremely clean and well-recorded as you will notice immediately. This is an album of musicians, by and for engineers. You will probably find the whole adventure of listening to this album exhilarating. I did. On the other hand, my wife thought it was boring.

MR

JULIO IGLESIAS: *Julio*. [Produced by Ramon Arcusa, no engineering information.] CBS Records FC 38640.

Performance: **Slick**
Recording: **Too much reverb on the soloist**

The art of the popular male baritone lives on in international star Julio Iglesias' first album for CBS. But there are problems.

This album has his smooth vocalizations almost smothered in artificial studio reverb. There's a tight soft-rock band behind Iglesias but quite a bit of string sweetening has been laid on top, resulting in big—too big—arrangements of new and old English, French, Spanish, Portuguese, Italian, and German songs. This is sad, because Iglesias has a way with these songs. His performances are fresh and vibrant. Even so tired a selection as "Begin the Beguine" gets a new lease from him. Of the nine other selections, I'd single out the Portuguese "Abracame" (Wrap Your Arms About Me), the Spanish "La Paloma" (The Dove), the French



Julio Iglesias

"Nostalgie," and another Spanish song, "De Niña a Mujer" (From Childhood to Womanhood), as reasons enough for Iglesias' popularity. Only "Wo Bist Du" (Where Are You) fails. It's excessively repetitive, with a hard-driving small choral background that adds nothing.

Iglesias knows how to sell a song. He is a true pro. I, for one, want to hear more from him. But all that reverb makes him sound as if he is singing in the shower, and I know he's better than that.

Finally, among the things said on the otherwise sparse liner notes, is the statement that, "this album celebrates an historic series of concert appearances...in the United States." That could be inferred to mean that there are recordings here that were made at these concerts. Not so, These are all studio recordings.

LS

PLACIDO DOMINGO: *My Life for a Song.* [Produced by Milt Okun; arranged and conducted by Lee Holdridge; Mike Ross, engineer.] CBS FM37799.

Performance: **Opera star understands pop/rock**
Recording: **Clean, close-in sound**

In the world of classical opera, Placido Domingo is a superstar. His entry into the popular music field with CBS Records' *Perhaps Love* (done with John Denver) went gold. So it's hardly unusual to have a follow-up album of ballads, expertly done by this great Spanish tenor. Of the ten selections, four are new: "I Don't Talk To Strangers" (Webber/Rice); "The Songs of Summer" (Mancini); "There Will Be Love" (Placido Domingo, Jr.), and the title song, "My Life For A Song" (Holdridge). Among the oldies and not-so-oldies are the remaining six: "Besame Mucho"; "Autumn Leaves"; Blue Moon/Moon River" (medley); "Remembering"; "I Couldn't Live Without You For A Day," and the John Denver staple, "Follow Me." Complete words for all the selections, in English, French, and German, are included in the album.

Domingo is clearly enamored of these songs. He understands the contemporary music forms, and his formidable vocal talents serve them well. CBS' engineering has placed him close-in forward with only some reverbs around his voice. The Lee Holdridge conducted orchestra is spread out a bit behind the soloist. The master taping and disc transfers are excellent. Surfaces are reasonably quiet and without distortion.

Does a truly great voice, combined with professional modern arrangements, make for a good recording? It does. LS



Sundries

By Bert Whyte

Bert Whyte is well-known in the recording world for his engineering abilities. He brings his recording expertise to us through these reviews. Equipment used for these reviews—Acoustat Eight electrostatic loudspeakers—each driven by a separate

Levinson ML-3 amplifier. Levinson ML-6A preamplifier, Lux PD 555 vacuum turntable, Dennesen air-bearing lateral tracking tone arm. Grado Signature Seven and EMT/van den Hul phono cartridges. Listening room treated with Sonex in a "live end/dead end" configuration. Speakers are in the "dead end." Comb filter effects are eliminated and, in essence, the speakers are in an infinite room.

Beethoven—32 Variations on a Waltz by Diabelli/Piano Sonata #31 in A-Flat, Leonard Shure, Piano, Audiofon 2001, stereo, 2 record set \$29.95.

Audiofon is a record company founded by Peter McGrath, who operates Sound Components, a successful high-end audio dealership in Coral Gables, Florida. Peter's Audiofon label specializes in piano recordings of very high order. A case in point is this recording of the fiendishly difficult Diabelli Variations. Leonard Shure has a well-deserved reputation as a fine artist, yet not quite in the top rank. You would never know this from his bravura traversal of the Variations and the Sonata #31 as well. His playing is near flawless technically, but imbued with such elan and ardor as to make for very exciting performances. Shure elicits great sonority from his Baldwin, abetted by a superior recording. Peter used a spaced pair of Bruel & Kjaer 4133 omni-directional microphones, feeding into special mic cards in a Levinson ML6-A preamplifier. The preamplifier fed a Studer/Levinson ML-5 tape recorder operating at 30 ips. No noise reduction nor any type of signal processing was employed. The record was cut from the master tapes by the renowned Bob Ludwig of Masterdisc. This "purist" approach was taken further than usual by using the mastering recorder to feed the signal to the cutting amplifier.

All this painstaking work is evident in a piano recording that is ultra-clean, with wide dynamic range and razor-sharp transient response. The great resonant authority of the bass chords is especially notable. The locale is the University of Miami's Gusman Hall, acoustically designed by Cyril Harris. The recording is a shade on the dry side, but this is a very big sound, with clean, precise articulation of every note. Record surfaces were moderately quiet. A high-quality phono cartridge and

arm, properly aligned, is a requisite for optimum tracking of this very dynamic and altogether splendid recording.

Poulenc—*Gloria for Soprano, Choir and Orchestra*, Sylvia McNair, Soprano. *Concerto for Organ, Strings and Timpani*, Michael Murray, Organ, Robert Shaw, Cond. Atlanta Symphony Orchestra and Chorus, Telarc DG-10077, stereo, \$17.98.

The Poulenc *Gloria* is headlined on this disc, and while there is no question that this is a beautiful work for soprano, choir and orchestra, recorded with excellent balances and a spacious ambience, it is the *Concerto for Organ, Strings, and Timpani* that is the real gem on this recording.

This work is probably the most interesting and exciting in the rather limited repertoire for organ and orchestra, and is a piece of greatly contrasting dynamics, ranging from massive outpourings from the full organ to rather introspective lyrical sections with some exquisite melodies.

The recording locale for the *Concerto* was the Cathedral of St. Phillip in Atlanta, Georgia. The organ is a 94 Stop—112 Rank instrument installed in 1962 by famed organ builder Aeolian-Skinner—who built the organs in Boston Symphony Hall and Mormon Tabernacle, among others.

I would judge the decay time of this Cathedral to be about 2.75-3 seconds, enough to give a spacious acoustic perspective, without the loss of definition and articulation that makes so many over-reverberent organ recordings quite amorphous.

The string body of the Atlanta Symphony Orchestra was placed forward of the organ pipes, with the timpani in the center, behind the strings. The organ, strings and timpani were recorded with three Schoeps omni-directional microphones in a left-center-right spaced array. Soundstream digital recording was used.

With this set-up, at up to a *forte* output the organ is slightly recessed, with the strings having more projection. However, at *fortissimo* and beyond, the strings have to strive mightily to balance properly against the thunderous sonority of the organ. The timpani punctuations are sharp, explosive and well-defined. Overall, a very clean exciting sound and, if you have sub-woofers, the digital

mastering affords low-frequency organ pedals that will shake your room. Organist Michael Murray, who has made several memorable organ recordings for Telarc, gives a stellar performance here and the string section of the Atlanta Symphony Orchestra plays with the proper balance of good execution and bowing along with good expression and intonation. The string sound is clean and smooth, and overall imaging and localization is excellent. If you are not familiar with this Poulenc *Concerto* but you like organ music, you are in for an exciting experience.

Dionne Warwick—*Hot! Live and Otherwise*. Mobile Fidelity Sound Lab MFSL2-098, stereo, 2 record set \$29.95.

This is another of Mobile Fidelity's big "presentation albums"—a two-disc set showcasing the song styling of Dionne Warwick.

The album is typical of today's multi-track recording technology—very "up front" in perspective as you might expect with such close miking—with lots of equalization and other signal processing.

The result is a big, brash, brassy sound with great impact and presence.

In the effort to achieve this type of sound, there is the inevitable mix-down from the original multi-track. In the final mix, much "embellishment" and other sonic manipulation can be incorporated according to the desires of the artists and producer.

This may account for the fact that the basic rhythm and percussion sound is heard in a slightly reverberant perspective, while the strings, winds, and brass are in a more reverberant envelope, and Dionne's voice is in an even *more* reverberant field! This layered reverb is quite distinct and one supposes it is deliberate.

If you like the lady, this is a most generous sampling of her talents. She has a supercharged emotional approach that comes over with a bang, especially on the ballads with which she is closely identified. Side Two—"Hit Record Medley"—is perhaps a highlight of the album with such standards as "Walk On By," "The Look of Love," and "Close To You" styled in Warwick's inimitable fashion. As usual, Mobile Fidelity has effected a superb half-speed transfer, very clean and punchy, and surfaces are immaculate.

Respighi—*The Birds/Brazilian Impressions*. Antal Dorati conducts London Symphony Orchestra, Open Reel—7½ ips, stereo, \$10.95. Barclay-Crocker—Mercury/Golden Imports MER 75023.

It is nice to see that Barclay-Crocker, those indomitable champions of open-reel tapes, are still holding their banner high.

Open-reel tapes are in decline, most probably because of the difficulty of producing good duplicates and the basically higher cost of open-reel tape recorders. Yet, if one is to compare a high quality compact cassette recording (and some are very good indeed) with a Barclay-Crocker Dolby-B open reel tape, it is simply no contest. The signal-to-noise ratio of open-reel tape is better than Dolby B cassettes and even on a par with Dolby C cassettes. Dynamic range and low frequency response of the open-reel tapes is quite audibly superior to cassettes. Barclay-Crocker have now refined their duplication process where their open-reel recordings are of consistently high quality. In addition, they now have access to the Philips and Deutsche Grammophon catalogs, and thus their productions have high musical values as well.

This Respighi tape is full of the colorfully impressionistic music so typical of this composer. Not as dynamic as his *Pines of Rome* or *Feste Romane*, *The Birds* and *Brazilian Impressions* are cast in a gentle, more lyrical mold. Dorati's performance is warm and expressive and he elicits great string playing from the London Symphony Orchestra in musically depicting the various bird songs. This music was recorded by my dear friend and colleague, the late Bob Fine. He typically used his three omni-directional microphone spaced-array technique to record this music. The venue was Watford Town Hall, in a suburb of London, and, as usual, Bob gives us a lovely spacious perspective with brilliant orchestral detail. This recording was pre-Dolby, and while the Dolby B encoding of this tape helps to keep hiss fairly low, a judicious touch of a DNR noise reduction unit helps to further reduce the noise without compromising the fidelity of the recording. Tapes are available from Barclay-Crocker, 11 Broadway, New York, New York 10004.

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