

**PROFILE:
BRIAN ENO**

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MODERN RECORDING & MUSIC

OCTOBER 1982
VOL. 8 NO. 1

RECORDING WITH
SQUEEZE



RECORDING TECHNIQUES, PART VII

REPORTS:

- 100m GFA-1A Power Amplifier
- 171 Graphic Equalizer
- Heiser UPM-550-1 Universal Level Meter

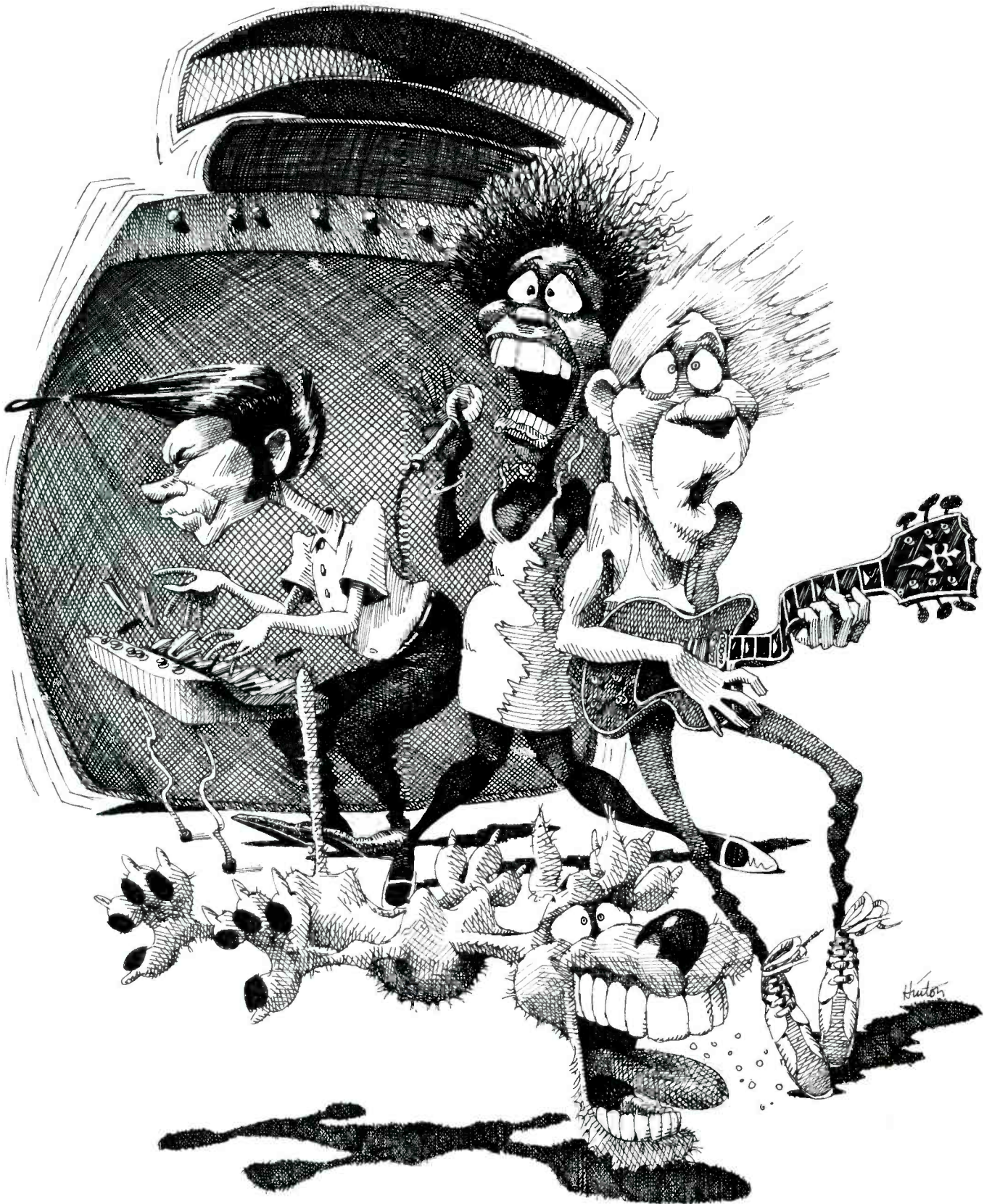
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MODERN RECORDING & MUSIC

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Mistakenly grouped with the British punk bands that appeared in the late '70's, and teetering on the brink of commercial success since their 1978 top-10 hit, "Take Me I'm Yours," Squeeze has, it would appear, finally achieved the success they deserve. Prime movers Difford and Tilbrook spoke with *MR&M* after a short tour in support of *Sweets From A Stranger*.

PROFILE: BRIAN ENO

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Having been a member of Roxy Music, a group some say helped start the "art-rock" movement, Eno went on to redefine the words "ambient" and "discreet." A fusionist of the first order, Eno discusses his enigmatic music here with *MR&M*.

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Someone new in the rotation: a hearty welcome to Mr. Chinn who debuts this month with a look at musical instrument amps, *other than* Fender.

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Squeeze Cover Photo. Ebert Roberts
Squeeze Color Photo. Courtesy of A&M Records
Squeeze B&W Photos. Ebert Roberts

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What Can You Get From Your Gate

I have recently built Jon Gaines' NOISE GATE project which appeared in the November, 1981 issue of *Modern Recording and Music*. The results have been excellent! I am using the gate to trigger a sine wave (70 Hz), thus stimulating a bass drum.

My problem is that when the gate is in the "off" state it still passes an audible amount of the 70 Hz signal on my P.A. system. With an input of 1.8 V, a signal level of 45 mV appears at the output. How can I obtain more attenuation from the gate?

For the time being I am cascading two gates. Are there any modifications I can make? I have already paralleled two FET's, but I need more attenuation.

—Bob McLaughlin
Coldwater, MI

We spoke to Jon Gaines about this question. He said that every FET will have a different "OFF" resistance. Even within one manufacturer, different FET's will have different characteristics. He recommends that you try to select different FET's to find one which has an unusually low resistance. He feels that that is about the only thing you can do. So keep trying!

Jon also mentioned to us that he has recently moved, and that if anyone has been trying to write to him at the address that was given in the article we printed, those letters would not have reached him. If you need or want to write to Jon, send your letters to the following address:

*Jon Gaines
P.O. Box 3099
Federal Station
Rochester, N.Y. 14614*

Mistakes

Regarding the review of our Tascam 34 four track recorder which appears in your August 1982 issue (pages 66-69), I would like to point out a few errors.

Most notably, the cover refers to the deck as the 34 four track recorder, which may cause readers to confuse this deck with the old A-3440. This error is compounded further by the photo of the A-3440 which accompanies the article. Also, the price was listed incorrectly. The 34 carries a retail price of \$1,700.00. I hope these errors will be acknowledged and corrected in the future.

Despite the errors, we were quite pleased with the review.

—Tay Hotta
Advertising Manager
TEAC Corporation of America
Montebello, CA

Though we are sorry for any confusion we may have caused, we did have a reason for referring to the recorder as the "34-4." We hoped to distinguish it from the other 34 recorders with tracks numbering other than 4. Actually, the 34 refers specifically to a four track recorder, and the 32 to a two track, the 38 to an eight you say, along with the photo being incorrect, we probably did cause a few short circuits in quite a few heads out there.

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CIRCLE 13 ON READER SERVICE CARD

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Stopping Feedback

I want to congratulate you for your magazine. It's really interesting, especially in the columns dedicated to answer the questions of the readers [Letters to the Editor, and Talkback]. I have a specific question: Which devices are actually used to eliminate feedback in P.A. systems?

—Mauro Farabegoli M.
Caracas, Venezuela

In an acoustical environment that is not plagued by serious reflection problems, the most effective feedback preventatives are the proper choice and relative placement of microphones, monitors, and house speakers. To obtain maximum possible level before feedback, graphic EQ's are generally employed in the feeds to monitor and house speakers. Since feedback will occur at lower levels for some frequencies, these troublesome frequencies can be "notched out" of the signal with a graphic EQ of suitable resolution (32 band, 1/3 octave).

There are (or were) frequency- and phase-shift anti-feedback units, but

these are (or were) very expensive as compared to a set of graphic EQ's.

Recommended Reading

I just spent a good portion of my weekly salary having my 4-track tape machine repaired. I would appreciate it if you, or any of your other readers, could recommend a book concerning the troubleshooting and repair of stereo and multi track tape machines.

Also, last fall I spent my Wednesday evenings in an Audio Engineering class taught by Peter Weiss and the time was really well spent. I'm looking forward to more of his contributions like "The Electric Primer."

Thanks a bunch for a great magazine.
—Frank S. Hedl
Bronx, NY

The following response is straight from the pen of Peter Weiss:

First of all, Frank, thank you for your kind words and for your contribution to the class. I have a book title for you, but first a few words of friendly advice: You should make an honest assessment of your own troubleshooting and repair skills and facilities (test equipment, tools, etc.) If you feel you have both of these areas well covered, dive in. If you have any reservations at all in either category, in the interest of protecting your investment, you would probably be better off leaving the work to factory authorized repair people.

Now for the book info: You can write to either or both of these two sources, stating make and model number of your deck:

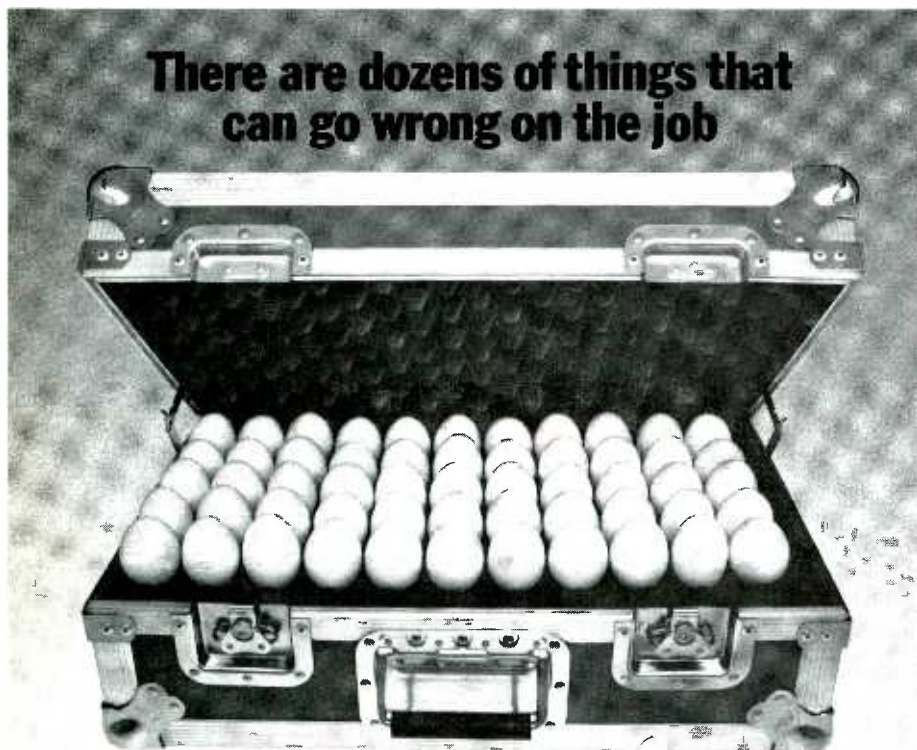
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P.O. Box 7092
Indianapolis, Indiana 46206

Or, try Tab Books:

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Blue Ridge Summit, Pa. 17214

—Peter Weiss
Contributing Editor
Modern Recording & Music

MODERN RECORDING & MUSIC



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CIRCLE 62 ON READER SERVICE CARD

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* The ADM 256 offers 256ms of delay at full bandwidth. Also available is the ADM 1024 with over 1 full second of delay (full bandwidth) for under \$700.

Where is Yamaha Now?

I have subscribed to *MR&M* for over four years and enjoy it very much. Could you tell me how to get in touch with the customer service department of Yamaha? I wrote to them at 6600 Orangethorpe Ave. in Buena Park, California, but never received an answer to my letter. One of my customers has a Yamaha TA-60 amplifier which I would like to repair for him but I need a schematic diagram, and if possible, a power transformer. I would appreciate any help you can provide

and keep up the good work on the magazine.

—Roland Jordan, Jr.
Southland Recording & Sound Co.
Selma, Alabama

The problem may be that Yamaha used to be referred to as Yamaha International, and now is referred to as Yamaha Electronics. They suggested that you call them at 800-854-3264, and ask for the Parts Department. They are still located at 6600 Orangethorpe Ave.,

Buena Park, California, but if you mail anything to them, remember to address it to Yamaha Electronics. We suggest you call, though, to see about getting the schematic diagram that you need and the power transformer.

A Driver From Reliance

In reference to Matt Wallace's letter "Finding a Driver," which appears in the August 1982 Talkback column, there *was* such a driver reviewed in the July 1982 issue of *Popular Mechanics*. It is made by Reliance Electric Manufacturing Company, Incorporated, Route 2, 1024 North Lake, Brantley Maitland, Florida, 32751. The price is \$39.95 each. Its model number is Acoustic 2000 AC.

Construction Articles

Thanks for your great magazine. As an instructor of electronics, I have found your magazine to be an excellent reference on many occasions.

After reading Jeffrey Schnaidt's letter to the editor in this month's issue and after talking with some of my students concerning the letter I decided to write and tell you of two suggestions which we have concerning any "construction articles."

First, when you print a construction article, have the author check the schematic, parts list, component layout, and PC board layouts **ONE MORE TIME** when they are in final form before going to press. Check for such things as R23 instead of R25... C36 instead of C38. Such mistakes as these are easy to make but often very difficult and expensive to find and correct during construction.

Second, when it is necessary to reduce or enlarge the size of a PC board layout in order to get it on a page, please note that fact in the text or by the picture. An IC pin layout can be rendered useless by the slightest enlargement or reduction in the layout size.

Thanks again for a great magazine. Keep up the good work.

—Charles G. Finfgeld
Ft. Wayne, IN

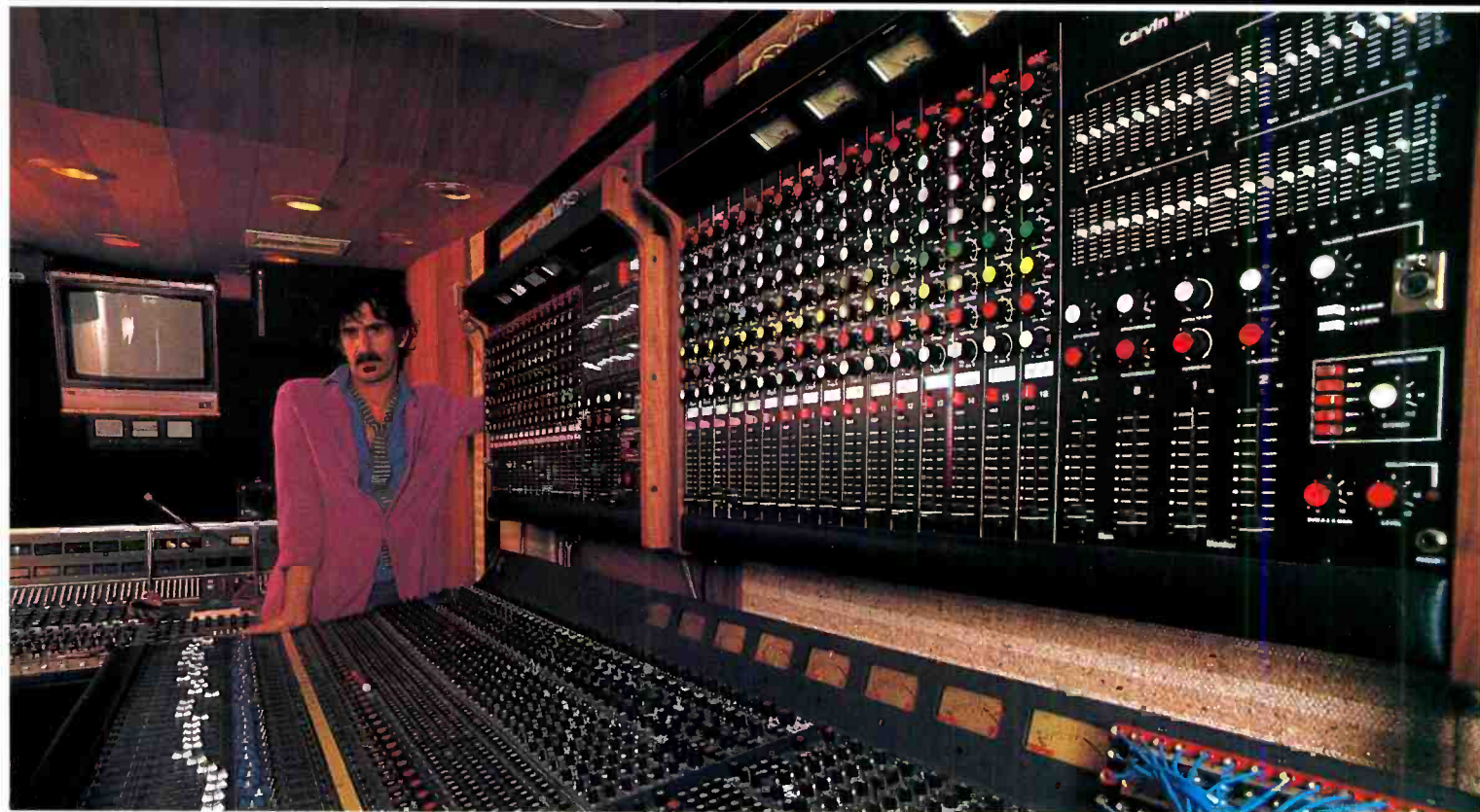
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FRANK ZAPPA

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TALK BACK

Mixer Mix Up

First, let me say that *MR&M* is a great asset to us poor lay people. Secondly, I need a little help with a mixer that I'm using.

On my Kelsey Pro-Club +3 the effects send and return seem to be mono. If I use a mono unit, won't the stereo mix cancel out, or should I use a stereo unit elsewhere in my patch? How does this work?

—Joe W. Berry
A/V Director
Fairmont Park Baptist Church
LaPorte, Texas

First, you're correct in assuming that the effects send and return is mono. As added information, the send output will drive a balanced or unbalanced load of 600 Ohms or greater and the return input will accept signal levels from any typical effects unit whether balanced or unbalanced with a source impedance up to 10 K Ohm. The sole purpose of the panable effect on the console is to enable you to assign the effects to the left or the right mix.

Second, your question of a stereo mix cancelling out in mono is somewhat ambiguous. If you were using a stereo mixer and you had no mono output, your best approach would be to pan your main out and input channels either all left or all right. Although some people question using a "Y" jack on the left and right main out, this may work, for all you're doing is summing both channels together. You may run into some phase reactions by doing this, however, which may make the total mix sound inferior.

If you have any other questions that need clarifying, don't hesitate to drop us a line.

—Rolf-Dieter Burckhardt
Engineering Department
Kelsey Division of DMI, Inc.
Hawthorne, N.J.

I have seen the terms "M-S" and "Matrix" mode used to describe a method of recording large ensembles of performers such as big bands and choral groups. Would you please explain what the "M-S" mode is, how it differs from "X-Y" recording methods and what advantages and disadvantages this technique offers?

—Robert MacArthur
Long Grove, Ill.

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Power Capacity						
Continuous program	150 W	300 W	300 W	400 W	300 W	600 W
Continuous sine wave	75 W	150 W	150 W	200 W	150 W	300 W
Sensitivity	98 dB SPL	103 dB SPL	105 dB SPL	100 dB SPL	98 dB SPL	100 dB SPL

JBL Professional Products Division

X-Y stereo miking (see *Figure 1*) refers to an arrangement in which two cardioid (directional) microphones are placed coincidentally (or nearly so) with the angle between their axes being 90°.

The M-S (middle-sides, see *Figure 2*) technique employs two microphones, one cardioid, the other bidirectional ("Figure 8"), placed coincidentally with their axes at 90° to each other. The cardioid mic is placed with its axis and "live" end towards the center of the source.

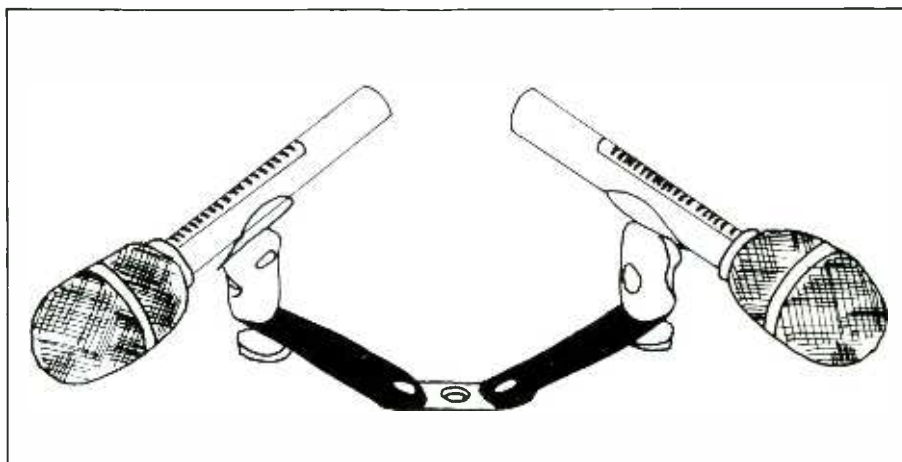


Figure 1. Typical X-Y stereo miking placement.

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The "Figure 8" mic is placed so that the "front" half of its pickup pattern is pointing stage left. The signals from the two mics are combined in a matrix in such a way that the signal from the "left" output of the matrix contains the signal from the cardioid mic plus the signal (in-phase) from the Figure 8 mic. The signal from the "right" output of the matrix contains the signal from the cardioid mic plus a phase-reversed version of the signal from the "Figure 8" mic.

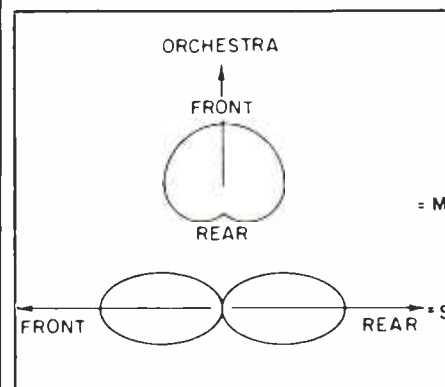


Figure 2. A stereo microphone, set for M-S recording.

Since the signal from the cardioid mic appears in phase at both matrix outputs, the signal will "appear" in the center of the stereo spread. The "Figure 8" mic is essentially dead at the sides, and therefore picks up very little of the same information that is picked up by the cardioid. The two lobes of the "Figure 8" pickup pattern are out-of-phase with respect to each other, and when combining the "Figure 8" and cardioid signals, the phase of the total "Figure 8" signal must be reversed for one half of the stereo signal in order not to produce a "hole" in the stereo spread.

—Peter Weiss
Contributing Editor
Modern Recording & Music

WHEN STEVE SMITH RIDES HIS ZILDJIAN, YOU'RE IN FOR AN EXCITING JOURNEY.

Steve grew up just around the corner from The Zildjian factory. Of course, for the past few years he hasn't been around all that much, what with his touring with Jean Luc Ponty, Ronnie Montrose and of course the enormously successful group, Journey. However, recently Steve took a break in his wild schedule and had a chance to sit down and talk with us.

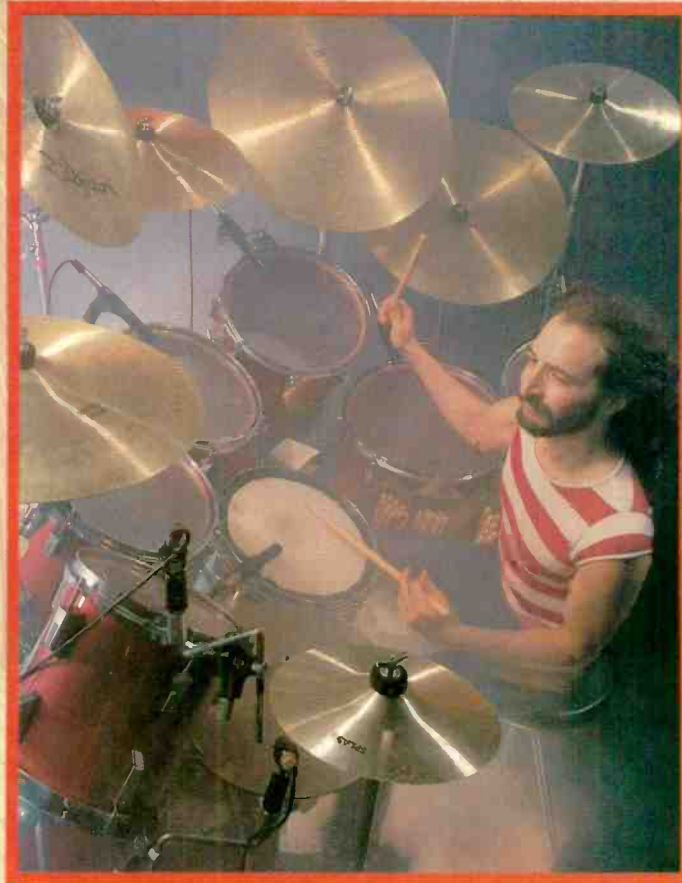
On Starting Out.

"I started out playing in the fourth grade when I was nine years old and had a really good teacher. When I was in high school I got serious about playing and I got a job as a paper boy to save money to buy cymbals. My teacher used to bring me to the Zildjian factory so I could go in and pick out my own set of cymbals."

On Rock and Roll. "After college I had a lot of experience playing jazz and fusion and I had virtually no experience playing rock and roll professionally except for some high school rock things. I really wanted to follow that direction, because

nowadays a drummer has to play rock and roll as well as jazz in order to be well-rounded as a musician."

On Zildjians. "The kind of music we play with Journey demands a lot of power. I've found that the cymbals in the Zildjian rock line are the only ones that can



Flying high with the success of Journey, Steve Smith is one of the most versatile and talented drummers in music today.

really do the job for me — that can carry the big halls and not sound thin. Zildjian cymbals have extraordinary projection but at the same time they have this wonderful, full musical tone. I also particularly like the Ping Ride — I got my first one back in the eighth grade and I've been playing one ever since."

On Career. "You know if you should get into music. It's something you can just feel. If you have to ask yourself the question, then don't bother. Being a musician isn't just a career it's a way of life."

"I find that most successful musicians don't think about success as much as they think about being a good player or songwriter."

To try to focus on success is a little too contrived and usually just doesn't work."

If you're a serious drummer, chances are overwhelming that you, like Steve, are already playing Zildjians. Zildjian: a line of cymbals played by drummers on six continents — a line of cymbal-makers that spans three centuries.



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MARK IV™ MONITOR

Features and specifications subject to change without notice.

www.americanradiohistory.com

It is the purpose of any musical performance, live or recorded, to successfully communicate with the listener. To attain that goal is often a challenge — even for the most experienced musicians, sound personnel, and stage crew. At Peavey we realize the criteria to be met before this goal can be obtained.

MARK IV™ MONITOR MIXER

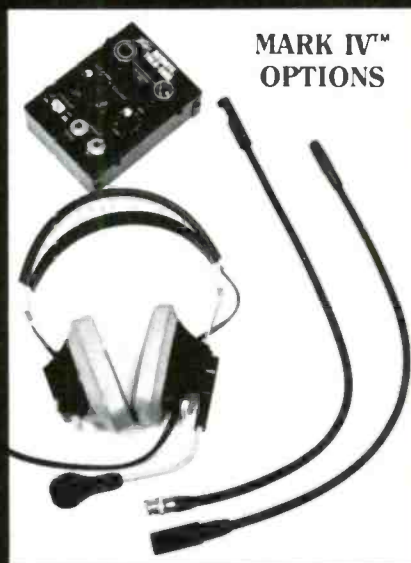
First, the musician must be satisfied with the blend and balance of the on-stage monitor mix. In most concert type situations, the musicians may demand anywhere from two to six separate monitor mixes. Our new Mark IV™ Monitor Mixer can supply this need with up to eight individual monitor mixes.

The Mark IV™ Monitor Mixer is available in 16 x 8 or 24 x 8 configurations and features transformer balanced inputs and outputs, 8 unbalanced outputs, PFL/Solo headphone system, 10-segment LED ladder displays for each of the 8 outputs, auxiliary inputs and low-cut controls for each mix and a unique PFL/Solo patch. The PFL/Solo patch is a highly desirable feature that enables the monitor engineer to patch any of the mixes back into the switched inputs so that externally equalized or processed signals can be monitored. This is a feature which is not usually found on custom-made monitor mixing systems costing \$15,000 or more.

Each channel of the Mark IV™ Monitor Mixer features LED status indication of -10 dBV and +10 dBV, an input gain control, 4-band equalization, built-in mic splitter, phase reversal switch, PFL and mute switches, and 8 color-coded rotary level controls which correspond to color-coded slider level controls in the output section.

To make the most out of the Mark IV™ Monitor Mixer's capabilities, we have equipped the mixer with two separate built-in communication systems. By utilizing our optional headset or "gooseneck microphone," the monitor mix engineer can communicate with the musicians through any of the 8 separate monitor mixers. This

talkback system will help alleviate the problems musicians sometimes have in establishing the proper on-stage mix, especially if a previous sound check was not possible.



A second communication link can also be established by the monitor mix engineer between the stage crew and lighting personnel by utilizing the optional Talk/Comm "slave" units. The Mark IV™ Monitor Mixer's front panel utilizes an LED indicator to alert the engineer as a call function and also shows when intercom is active.

MARK IV™ MIXING CONSOLE

Next, the house (main) system must be able to deliver crystal clear, noise-free sound reproduction to the associated equalizers, power amps and horn/loudspeaker enclosures. For the main PA, our new Mark IV™ Professional Mixing Consoles offer the sound engineer the necessary performance, flexibility and functions to do almost any sound job.

The Mark IV™ Professional Mixing Consoles are available in 16 or 24 channel versions (16/24 x 4 x 1) and feature transformer balanced inputs and outputs, PFL headphone system, 10-segment LED ladder display for all outputs, channel and sub output LED indicator (-10 dBV and +10 dBV), internal reverb and effects/reverb return to the monitors. The console also utilizes a 24 volt phantom

power supply, variable low-cut controls on each sub (20 Hz to 500 Hz), and in-line patching facilities between the sub outputs and the sum.

Each channel of the Mark IV™ mixing console features an input gain control, two pre-monitor sends, 4-band equalization, effects/reverb send control, pan control, "push/push" channel assignment switches, pre and post EQ, send/reverb patching and PFL (pre-fade listen) switch.

The Mark IV™ Professional Mixing Console has two complimentary communication systems for use with our Mark IV™ Monitor Mixers, headsets, gooseneck microphone and Talk/Comm "slave" units. The Mark IV™ Series intercom system allows communication between the "house" and monitor mix engineers as well as stage, lighting and other associated concert personnel.

Both the Mark IV™ Monitor Mixer and the Mark IV™ Professional Mixing Console feature gooseneck lamp connectors (BNC) with dimmer controls for use with our optional gooseneck lamps. This option allows superb visibility of the mixers in poor lighting situations.

The Mark IV™ Series Monitor Mixers and Professional Mixing Consoles are the successful result of our extensive research and development efforts as well as constant "monitoring" of the needs of professional sound reinforcement companies and soundmen. This outstanding series of mixers represents, we believe, truly exceptional and professional products that will outperform competitive products retailing for many times the price.

For complete information on the Mark IV™ Series write to: Peavey Electronics Corp., P.O. Box 2598, Meridian, MS 39301.



PEAVEY ELECTRONICS CORP.
711 A Street Meridian, MS 39301

© 82

CIRCLE 20 ON READER SERVICE CARD

Studio Notebook #9

By James F. Rupert

At last we've come to the chapters that everybody has been clamoring for, namely how does one get the bread to get your studio operation off the ground.

Even in today's bare-bones economy there are boatloads of possible outlets to gain the mazuma necessary to launch the Good Ship Recording Business. Yet do not interpret this to mean that this same elusive financing is easy to come by. If you like (or even if you don't), you can compare it to a Rubic's cube: The directions to approach it are many, the methods of actually solving it are few.

Step into the shoes of a money lender for a moment. (Go ahead I'll wait.) Everybody settled in? Now imagine a shining-faced young entrepreneur sprints into your office and says he or she (we'll say it's a "he" so that the ladies are not offended if this portrait gets insulting in a few paragraphs) needs to borrow several cups of money for a new business he has been thinking about starting. This future Rockefeller is bubbling over with enthusiasm as he describes his love for his craft and his plans for the future. As he is speaking, your thoughts begin to drift to the day when you will have to report on the status of this young man's loan to the board of directors that will hold you responsible for any decisions you make. Certainly the loan applicant has ambition, drive and a dream that has indeed worked for others. But is that enough? With thousands of dollars hanging in the balance, would you risk your job and loan even your best friend that kind of money without wanting to learn more about the dreamer as well as the dream?

The answer is, of course, "No." No matter what avenue you pursue for business financing, you're going to have a lot of explaining to do to the man with the dollars. I've heard people complain, even after they've been accepted for a loan, how the entire process was one long procession of applying your lips to the lender's derriere. Nothing could be further from the truth.

Whether it's your local banker or your rich Uncle Louie that you're putting the bite on, you are going to be forced to make an accounting of your plans, your potential and yourself. The business may be an excellent idea, but are you the person to bring it off?

The following is a list of questions that should be answered in written presentation form for whomever you are seeking money from. When the money lender is through studying it, the fewer questions they have about you and your quest, the better the chances of him coughing up some bucks. Anything you can do to make you and your presentation look polished and professional brings you that many inches closer to your goal.

I realize the last thing you wanted to see this installment is another list or chart, but if you are going to

go into business you had better get used to them. Throughout these question listings you will find hints and tips on the kind of answers and information that bankers want to hear. Just try to remember that bankers don't want to trip you up, they only want to be certain you're sure of every detail of your studio's business plan. Believe it or not, they're there to help. All questions listed were gathered through interviews with several institutional loan officers as well as solid suggestions offered through the United States Small Business Administration. By contacting your local office of the SBA you can receive free assistance in assembling your presentation, as well as a ton of other helpful information and guidance throughout the life of your business operation. You might also be surprised to discover that the mention of any SBA assistance you've received just might bring a pleased and relieved smile to the lips of your loan officer.

Let's start by examining why you've chosen a recording studio to risk your future upon.

CHOOSING A BUSINESS:

In what business have you had previous experience? (List anything that might reflect expertise in recording, electronics and business management.)

Do you have any special technical skills which may be used in your new studio? List all educational and special training experience for all partners.

RETURN ON INVESTMENT:

How much will you have to invest in your business? What will be your net profit? (Profit after all expenses and costs.)

Will the rate of return on your investment compare favorably with the rate that may be obtained from other investment opportunities?

CAPITAL REQUIREMENTS:

What income from the studio can reasonably be expected in the first six months? The first year? The second year?

What is the gross profit (profit after materials cost) you can expect on these volumes of business?

What expenses, including your own salary, can you forecast as being necessary? ("Studio Notebook #2 & 3" August '81 and October '81.)

Is the net profit and salary adequate for future expansion and the effects of inflation?

Have you compared this income with what you could make as an employee at another studio?

Are you willing to risk irregular and/or uncertain income for the next year? Two years?

Have you made an estimate of how much capital you will need to open and operate this business until income equals expenses?

PHANTOM POWER

by *Pearl*[®]

With all the potential problems in performing why make power one of them!

Eliminate the power problem with Pearl's four new Phantom powered electret condenser microphones. They're designed to be used with an advanced power supply (PW-48, operated by an AC Adapter for trouble free power at all voltage levels. A battery operated power supply (PW-18) for 1 or 2 Phantom powered microphones is also available with a condenser coupling for leakage free operation.

A few of the many advantages of these new models are:

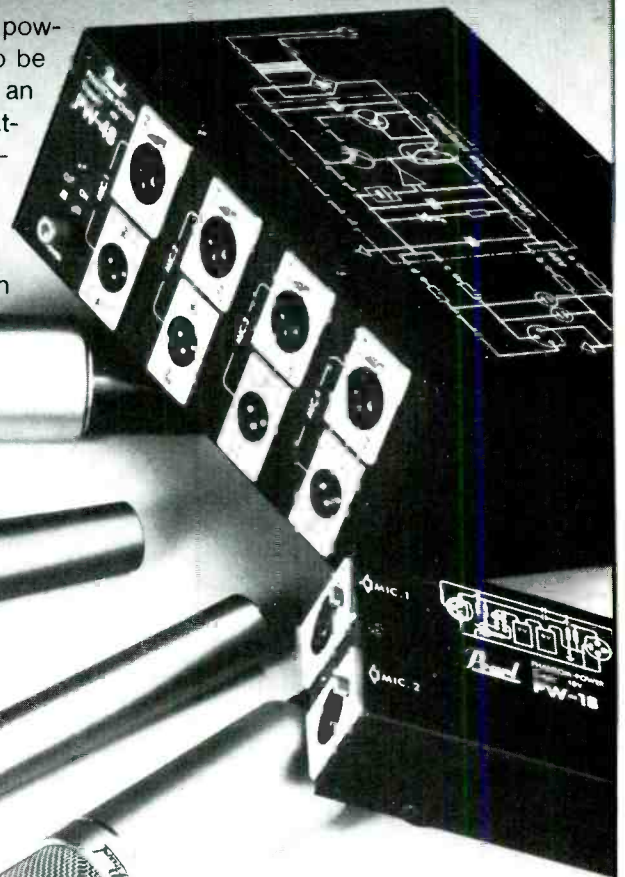
- an internal amplifier (no output transformer needed)
 - output voltage 3.5V at maximum SPL
 - current drain less than 3ma
 - 0.5% total harmonic distortion at high levels
 - internal attenuator switch increases maximum level allowing you to mike brass and percussion instruments cleanly
 - supply voltage is 12VDC to 48VDC (006P 9V battery with CR57-CR55)
 - CR45 with internal pop filter included
 - CR57 right angle unidirectional cardioid polar pattern
 - CR55 unidirectional cardioid polar pattern.
- Both CR55 - CR57 have a condenser element isolation system minimizing both stand and hand held noise.

The sound produced is both wide range and musical extending from 30 to 20,000 HZ, coupled with the quality and durability you have come to expect from Pearl. You will be making your best sound choice when you choose Pearl Phantom Powered Microphones.

A product of
Pearl International, Inc.
408 Harding Industrial Dr.
Nashville, Tennessee 37211

Write for complete specifications on these and other new exciting Pearl products.

Sold in Canada exclusively by NUCO Musical Instruments, Ltd., Markham, Ontario.



YOUR MONEY:

How much have you saved which you can put into the business immediately? (All partners.)

How much in the form of assets have you saved (stocks, bonds, real estate) in which you could, if necessary, sell or borrow upon to obtain additional funds?

Do you have a financial reserve available for unexpected needs?

How does the total personal capital (from all partners) compare with the estimated capital requirements?

SHARING OWNERSHIP:

Do you lack management and/or technical skills which can be supplied by one or more partners?

Do you need the financial assistance of one or more partners?

Have you investigated the advantages and disadvantages of sharing ownership of your proposed studio through the differing business organizational structures? (Sole Proprietorship, Partnership, Corporation.) (See "Studio Notebook #8," July '82.)

LOCATION

Have you considered population, labor supply, competitive trends and possible income in relation to the selection of the city or town in which you plan to locate?

In considering the area of the city or town in which you plan on locating your studio, have you considered where your business is most likely to flourish? (Do you need a high visibility, retail 'walk-by' area? Is it wise to locate right next to a train depot with all its adjacent noise?)

Are you familiar with zoning ordinances, parking facilities, traffic flow and vandalism incidence in the area you have chosen?

What about the physical aspects of the studio building? Type of lease? History of the site? Has the building remained unoccupied for any length of time and why? How much renovation and restoration has to be done to the building? How much will the landlord pay for and how much are you stuck with? (Every building generally will have a furnace in the colder areas of the country, but what about air conditioning?) Have you checked out the building codes and requirements for your municipality?

PROBLEMS OF BUYING:

What share of the market do you think you will get?

How much of this will be in the different aspects of your business? (Music recording, A/V production, Commercial recording, Jingle composition and recording, Tape Duplication, etc.)

Will the tape and supplies you'll be using be selected according to cost budgeting or customer preference as to certain name brand prejudices?

Have you set up a model stock assortment to follow in your buying?

Which really works out cheaper for you: Buying large quantities of tape and supplies infrequently or small quantities frequently? (Be sure to weigh price differentials for large orders against capital and space tied up.)

Have you decided which merchandise and supplies to purchase from manufacturers? From Wholesalers?

Have you planned to make your account more

valuable by concentrating your buying?

Have you worked out a stock control plan to avoid overstocks, understocks and out-of-stocks?

PRICING YOUR STUDIO SERVICES AND PRODUCTS:

Have you decided upon the price range for your studio's services?

What prices will you have to charge to cover your costs and obtain a profit?

How do these prices compare with prices charged by the competition?

METHODS OF SELLING:

Have you outlined your promotional policy?

Have you studied the promotional methods established by your competitors?

Why do you expect customers to come to your studio? Price, quality, speedy turnaround time or other factors?

Are you going to do out-of-the-studio selling yourself? Who is?

Are you going to advertise in newspapers? Magazines? Direct Mail promotions? Radio? Television?

PERSONNEL:

Will employees supply skills you lack?

What skills are necessary?

Have you written job descriptions for prospective employees?

Are satisfactory employees (engineers, technicians, narrators, singers, musicians) available locally?

What is the prevailing wage scale?

What do you plan to pay?

Would it be advantageous or disadvantageous to hire someone now employed by a competitor?

Have you planned your training and follow up procedures?

MANAGEMENT PROBLEMS:

Are you going to sell on credit to any clients?

Do you have the additional capital necessary to carry accounts receivable?

Are you planning on any other policies for your studio operation? Describe in detail.

Have you a plan as to how you will organize the work, including the distribution of your own time and effort?

RECORD KEEPING:

Have you planned a bookkeeping system?

Have you planned a merchandise control system?

Have you obtained any type of standard operating ratios for the recording business which you plan to use as guides?

What additional records do you feel are necessary?

Do you have a system to keep a check on costs? (Costs of operating, overhead, wages, costs of tape and supplies.)

Do you need any special forms or records? Can they be bought from stock or must they be custom printed?

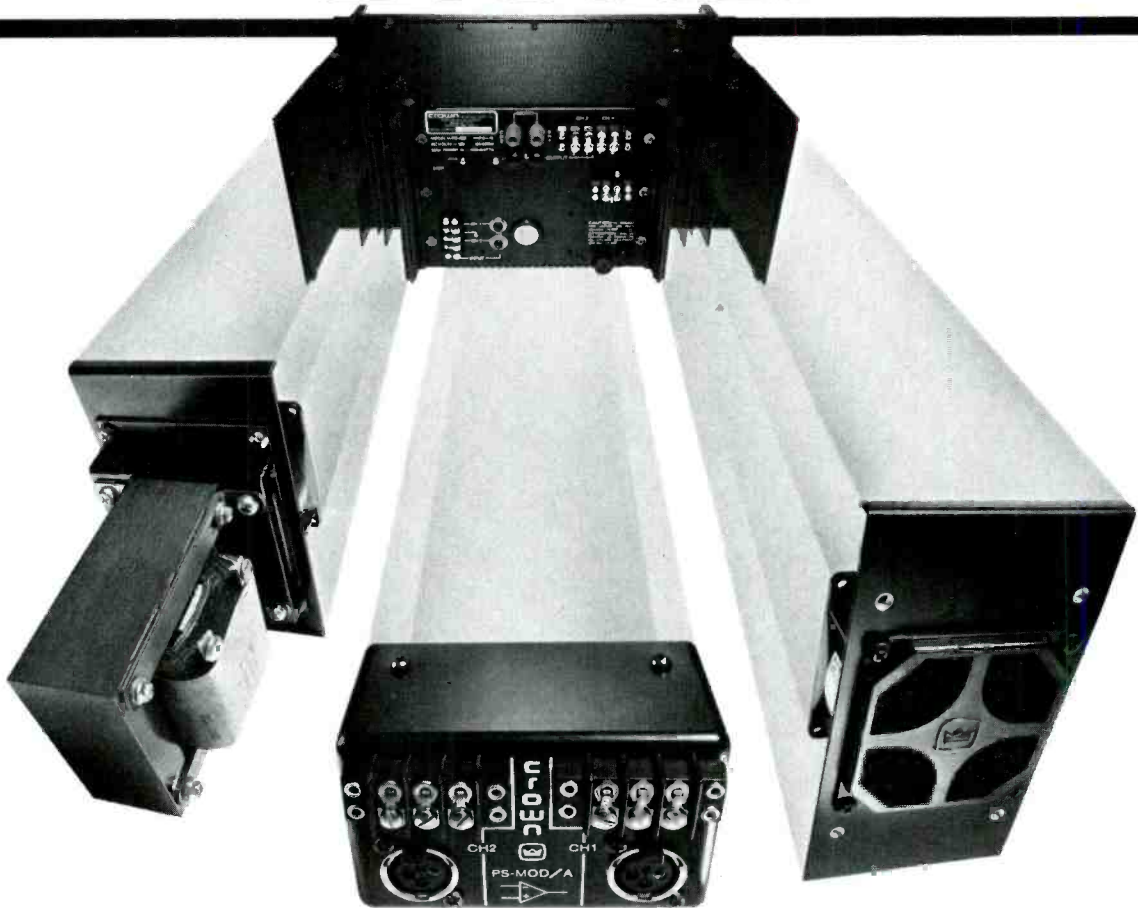
Are you going to keep any records yourself? Hire a bookkeeper? An accountant? Have an outsider come in only periodically?

LAWS AND REGULATIONS:

Is a license to do business necessary in your city, county or state?

Have you checked with the police and health department to see how they apply to your business and building?

POWER. PRECISION. CHOICE.



Build yourself a stronger reputation by selecting the unique flexibility and professional performance of two new Crown power amps: the PS-400 or the PS-200.

Choose only the special, low-cost options you need: plug-in balanced input, active or passive; 70-volt transformer; dual fans. Install them easily, quickly, anytime, in any combination – thanks to the fresh, innovative design of these amps.

Built-in features make these amps the first choice of professionals: instant mono/stereo conversion, terminal strip connectors plus phone jacks, IOC™ and signal-present indicators, low-frequency protection, and much more.

Select the power level you need. For full-time, reliable performance, both amps are built in the best Crown tradition. PS-200 rated (FTC) at 135 watts per channel into

4 ohms, PS-400 at 260. Mono ratings into 8 ohms are 270 watts (PS-200) and 520 (PS-400).

Introduce yourself to the new Crown MULTI-MODE™ output circuit, a new, three-deep design that eliminates audible distortion, and introduces a degree of precision sound reproduction that will delight performers and audiences.

Complete information on specifications and prices, for the amps and the optional accessories, is now available from Crown. For quick action, simply fill in the blanks below and send this corner of the ad to Crown.

Name _____

Address _____

City _____ State _____ Zip _____



PS-200



crown®



PS-400

...WHEN YOU'RE READY FOR REAL!
1718 W. Mishawaka Rd., Elkhart, IN 46517, (219) 294-5571

Will your studio operations be subject to interstate commerce regulations?

TAX AND INSURANCE:

Have you worked out a system for paying the withholding tax for your employees?

Have you worked out a system for handling sales taxes? Excise taxes? State and Federal taxes?

How about fire insurance? Got any Windstorm insurance? Use and occupancy insurance?

How about liability insurance and protection from damage suits?

Do you have workman's compensation insurance? Burglary and holdup insurance?

If you should fall sick or injured, have you considered 'Key-Man' insurance?

Any other hazards you should be insured against?

KEEPING UP TO DATE:

How do you plan to keep up with improvements in your industry?

Are current conditions good or bad in the recording industry in the U.S. (For God's sake be optimistic!)

PERSONAL STATE OF AFFAIRS:

List all past credit dealings, include credit cards, for all partners and possible co-signers on the loan.

List all holdings and assets for each partner and co-signer. (Real estate, automobiles, stocks, bonds, securities, bank accounts.)

List character and personal references for each partner. (Personal friends, former employers and co-workers, creditors, clergymen, former business partners.)

FUTURE OF YOUR BUSINESS:

Describe in detail why your city and/or area of the country needs the services your new studio will provide. (If you can, provide affidavits from prospective clients expressing interest in your services. Also rate and fee comparisons, new areas of production other studios are not serving, and any other advantages you are offering and needs not currently being met. This is the part where you spread it on thick, but a word to the wise: Make sure you can substantiate any claim you are making. Every one will be checked out by the man with the bread on the other side of the desk.)

Whew! I know this sounds like a lot but this is only the briefest of glimpses into what information the lender might require of you. The order in which you gather and present the information does not necessarily have to follow the format and sequence listed here, just make sure all the answers are there in as natural and flowing of a sequence as possible. Also note that these questions do not include detailed listings of the equipment and supplies to be bought and hard figures of exact money totals needed to be borrowed. Final sums needed and what percentages of funds will go where in your business is another story for another time.

Next installment we'll be taking a hard look at some of your options as to whom you will be making this pitch to among the sources of money available to try. After typing these questions, I'm hoping by the next article that my fingers will be grown out to their natural length again.

See you next time.

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Because you are ... creatively involved in how sound is produced and reproduced, and are serious about creating and recreating music both live and recorded.

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\$15.00 for 12 issues—Save \$8.40. \$26.00 for 24 issues—Save \$20.80.
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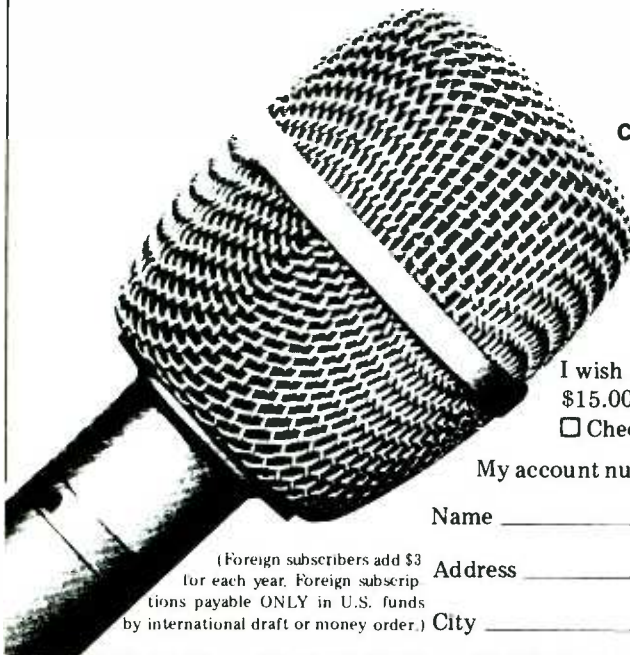
My account number is: Visa Mastercharge

Name _____ Exp. Date: ___/___/___

Address _____

City _____ State _____ Zip _____

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Hear today & Here tomorrow

Just two of the range of Europe's best selling sound reinforcement boards—now available in the United States.



SOUNDTRACS™ 16-6 MONITOR

Possibly unique in specification, certainly in price. Incorporating all the necessary facilities for versatile 'on stage' monitoring. Can be linked to all '16 Series' boards by way of multi-pin connector and cable to provide a full 16 channel sound reinforcement mix.

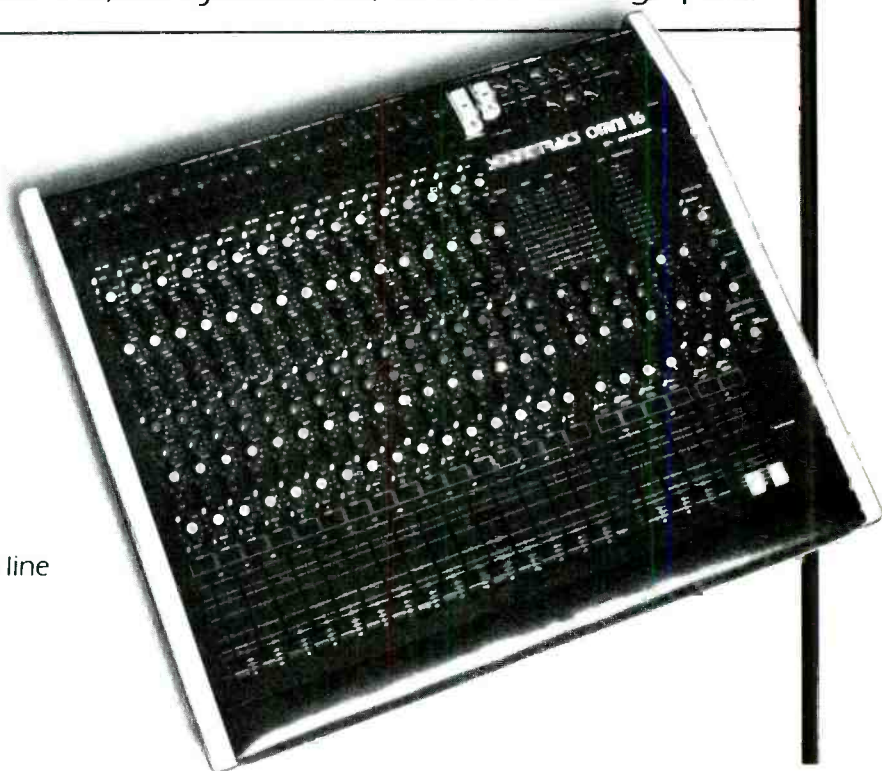
- Phase reverse
- Master/master interlink
- Talkback to any of the six groups
- Balanced inputs/outputs
- 6 separate sends to masters
- Channel mutes and solos

Also available: 16-2, 16-4, 16-4-2, 24-4-2, 3 way crossover, 10 band stereo graphic.

SOUNDTRACS™ OMNI 16

Available either in a studio version (as shown) or as a mobile unit in flight case, the Omni 16 combines compactness with ease of operation and an exceptional track record of reliability. A number one choice for 16 channel sound reinforcement or 16 track recording at a very affordable price.

- Unique monitor/mix switching
- Balanced inputs/outputs plus unbalanced line
- Three Aux rails
- 100mm faders
- Line up 1K oscillator plus separate output



Full color brochure and technical specs from:

SOUNDTRACS™

Soundtracs Inc. 262A Eastern Parkway, Farmingdale, NY 11735 (516) 249-3669

CIRCLE 23 ON READER SERVICE CARD

www.americanradiohistory.com

THE **PRODUCT** SCENE

By Norman Eisenberg

REVOX UPDATES CASSETTE DECK



The Revox B710 MKII cassette deck includes Dolby-C and a new peak-reading bar-graph meter which reads up to +8 dB. A remote control option permits tape/source switching along with control of transport functions. As in the earlier B710, all transport functions are microprocessor controlled. A four-motor direct-drive system is used. The deck has three heads, and a unique hinged headblock is credited with providing absolute stability in the azimuth plane. Other features include a die-cast aluminum alloy transport chassis; mic/line mixing; internal 24-hour clock programmable for start/stop in record or play; headphone volume control; automatic sensing of tape types; and more. First published specs, characterized as "conservative in the Studer Revox tradition," are: S/N, better than 72 dB, IEC A-weighted at 3 percent distortion with Dolby C on; frequency response, +2, -3 dB, 30 Hz to 20 kHz with metal and chrome bias tapes; wow-and-flutter, 0.035 percent WRMS. Price of the new deck is \$1,995.

CIRCLE 36 ON READER SERVICE CARD

POWERED MIXER



A new six-channel powered mixer, the model 619 from Biamp Systems of Beavertown, Oregon, provides 350 watts of power (over 400 watts by IHF ratings). The power amp section is designed to drive multiple speakers "with ease and efficiency," while Biamp's exclusive "autolimit" circuitry with peak light is said to allow the unit to sound up to four times louder than normal because the amp will not clip, pump or breathe when limiting. Other Biamp innovations incorporated in the 619 are a turbulent flow heat exchanger for cooler operation, and a thermal compressor that turns down the sound if the unit gets too hot rather than turning the unit off and stopping the performance. Other features include a stereo magnetic phono input, RCA-type tape recorder input and output jacks; headphone jack; input pad to optimize control settings and prevent input stage overload; nine-band graphic equalizer; and built-in reverb with constant current drive.

CIRCLE 37 ON READER SERVICE CARD

SANSUI SHOWS HIGH-END DECK



Three heads, Dolby C and B and computer control are highlights of Sansui's new top-of-the-line D-970 cassette deck. The last feature, called "Compu-Trec," automatically optimizes bias, recording reference level (sensitivity) and equalization for any tape. The process takes only five seconds, and it may be observed on the LED level meters. Also featured is Sansui's proprietary "Dyna-Scrape filter with hold-back tension servo" which is credited with keeping wow-and-flutter down to 0.025 percent while also making for low modulation noise and low dropout frequency. Many circuits are direct-coupled for good transient response. The four-digit tape counter doubles as a real-time clock. The take-up reel has magnetic braking. An auto-record-mute option automatically creates four-second intervals between recorded segments. With metal tape, frequency response is spec'd as ± 3 dB, 30 Hz to 22 kHz. S/N is given as 81 dB (above 1 kHz) with metal tape and Dolby-C on. Price is \$650.

CIRCLE 38 ON READER SERVICE CARD

PORTABLE STEREO MIXER

For on-location broadcast applications in ENG/EFP situations Sony offers its MX-P42, described as an ultra-compact but fully equipped portable mixer. The unit measures about 10½ by 8 by 3 inches. With its six C-cell batteries it weighs 8 pounds, 10 ounces. The unit has two pairs of stereo inputs; one pair provides a line level of +4 dBm into 600-ohm circuits with 16 dB of headroom, while the second pair is switchable for levels of either -20 dBm or -64 dBm into a 600-ohm circuit. Up to four separate audio sources may be combined to stereo outputs. Mic sensitivity is switchable to -70, -60, -50 or -40 dBm, and line input is switchable to either -20 or +4 dBm. Features include onboard compression/expansion, panning for stereo imaging, automatic level control for optimum mixing, solo functions on all four inputs and filters for low-cut (selectable at either 80 or 160 Hz) and for 11-kHz high-cut. All filters provide 18 dB/octave attenuation. The expander's threshold level is variable from -40 dB to -10 dB with attack time of less than 50 microseconds, and recovery time of 0.1 second.

CIRCLE 40 ON READER SERVICE CARD

RAMSA EXPANDS CONSOLE LINE



The Ramsa line of consoles (from Panasonic's Professional Audio Division) now includes two recently added mixing consoles, with three more about to debut. The former two are the WR-8724 and the WR-8724/16. The WR-8724 features twenty-four input channels and ten meters, one of which may be switched between echo left, echo right and solo for any channel. This console has four group, two master, one mono master, two send and two echo buses for a total of eleven inputs. It also includes 100 Hz and 10 kHz EQ controls on the echo return section. Totally independent mono outputs are provided from each of the four groups, and from the left and right outputs. For the soloing of channels during sound checks, the mixer has a switchable solo-to-main mono output function with its own level control. Another level control handles solo monitoring. Price of the WR-8724 is \$8000. The WR-8724/16 is similar but includes only sixteen input modules in a 24-channel mainframe. Its price is \$6650.

CIRCLE 41 ON READER SERVICE CARD

MULTI-PURPOSE TEST SET

An audio oscillator, decibel meter and frequency counter are combined in the new compact LofTech TS-1, offered by Phoenix Audio Laboratory, Inc. of Manchester, CT, for easy use in basic alignment, calibration and testing of audio systems and equipment. Intended applications include level calibration of mixing consoles and tape recorders; verifying frequency response accuracy of mixing consoles, recorders and outboard equipment; verifying signal levels in the audio chain in the event of equipment trouble. Price is \$249.

CIRCLE 42 ON READER SERVICE CARD

ISSI TIME COMPRESSOR



From Integrated Sound Systems, Inc. (ISSI) of Long Island City, N.Y. comes word of its TDM-8200 Stereo Slave which, coupled with ISSI's TDM-8000 Audio Time Compressor, permits stereo tracks to be compressed without altering the original pitch and tone. The combination of these two units is credited with avoiding unwanted effects that occur when two time compressors independently process one channel each of stereo music. The TDM-8000/8200 is designed to produce a stable, time-synchronized stereo image by making intelligent logic splicing decisions between channels. Explains ISSI: "Vocal and instrumental sounds that are common to both channels will remain stable with respect to stereo image, and processed stereo sound tracks can be played in the monaural mode, without cancellations or other adverse effects." Suggested applications include real-time radio and all audio stereo post-production work. Radio applications include stereo FM and stereo AM. Production work includes television sound tracks and remastering of material for video discs and video tapes. Intended for use with Type C broadcast video recorders, three-quarter-inch variable speed video cassette decks, variable-speed turntables and audio tape machines, the TDM-8000/8200 compresses stereo music up to 1.5 times while maintaining frequency response of 20 Hz to 15 kHz, dynamic range of 81 dB and no more than 0.3 percent of THD, IM and noise. Prices are \$4,995 for the TDM-8000 and \$2,800 for the TDM-8200.

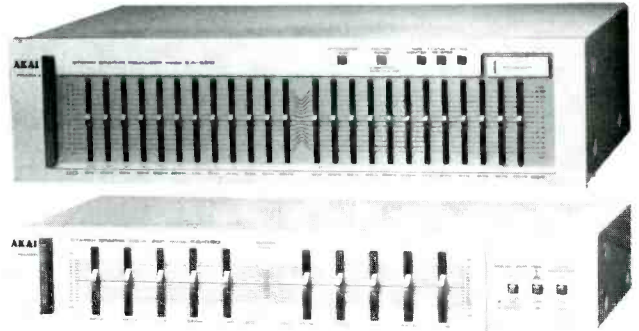
CIRCLE 43 ON READER SERVICE CARD

CLASS A MONO AMP

The BX-1 from Yamaha is a single-channel Class A power amplifier rated for 100 watts of continuous power RMS into either a 4-ohm or 8-ohm load. Other important specs include signal-to-noise ratio of 123 dB, and THD of less than 0.002 percent from 10 Hz to 20 kHz. The BX-1 is 10.1 inches wide, 9.1 inches high, and 19³/₁₆ inches deep. Price is \$2000. (You need two for stereo.)

CIRCLE 44 ON READER SERVICE CARD

TWO EQUALIZERS FROM AKAI



New from Akai are two stereo graphic equalizers. The EA-G90 is a 12-band per channel model (\$280) that provides both a ± 12 dB and a ± 6 dB variable control range. In addition, it has a switch to reverse the compensation curve when using the equalizer for noise reduction. An attenuator switch will reduce sound level to half if and when needed. Frequency controls are illuminated, and the center illumination on each control changes from green to amber depending on the dB control range selected. EQ defeat and tape-monitor switches are included.

The EA-G30 is a five-band per channel equalizer with +12 dB control range on frequency centers of 100, 330, 1 k, 3.3 k and 10 k Hz. Its frequency controls also are illuminated in use to show the EQ curve at a glance. It has tape-monitor and EQ defeat switches. Price is \$130.

CIRCLE 45 ON READER SERVICE CARD

ROAD DEBUTS NEW MIXING CONSOLE

Two pro mixing consoles have been announced by Road Electronics, Div. of Rickenbacker, Inc. of Santa Ana, CA. The RS-2308 has eight input channels, and its master section includes right and left stereo outputs and a monitor output. Midrange is variable from 100 Hz to 10 kHz. The RS-2412 provides twelve input channels; outputs include left and right stereo plus A and B monitors. Its high midrange is selectable from 1 kHz to 10 kHz. Both mixers include transformerless differential input amplifiers; balanced XLR inputs as well as unbalanced $\frac{1}{4}$ -inch jack inputs; "parascan" tone networks; channel gain control; monitor send buses; linear input and output faders on mains and on monitor; patching for channel in/out; external effects and EQ; 8-band graphic equalizers; 600-ohm balanced output capability; LED indicators; master presence, reverb, effects blend controls; and more.

CIRCLE 46 ON READER SERVICE CARD

"SUPER-DYNAMIC" LIMITER



Said to have been engineered to meet the challenge of the digital era is the new F601 Super-Dynamic Limiter from Audio+Design Recording, Inc. of Bremerton, Wash. The device is intended to "more than match" the dynamic performance of a 16-bit PCM system to allow maximum modulation of the system without fear of overload, while ensuring that wanted low-level signal is well clear of the digital distortion range. The F-601's dynamic range is said to be better than 100 dB referred to optimum limit threshold. In addition to its use as a PCM input protector, the new unit also is suggested for use in protecting transmitters (TV, FM and AM), where optional output filtering is also available; as a unity gain limiter for mastering and disc cutting; and for voice-over applications. In this use, the F601 pre-establishes a music-to-voice ratio that is maintained automatically regardless of operator error. Switchable functions include pre-emphasis; asymmetry; unbalanced/balanced (transformerless); clipper in/out; voice-over in/out; meter gain reduction/output. Occupying one inch of standard rack mount space, the F601 is available as a dual mono/stereo package at \$1490, and as a mono version at \$990.

CIRCLE 47 ON READER SERVICE CARD

SPECIAL EFFECTS DELAY

DeltaLab Research, Inc. of Chelmsford, Mass. has introduced its Effectron series, described as high-end digital delay equipment at affordable prices. The ADM 256 (\$499) is a full bandwidth, wide dynamic range, special effects digital delay processor that features flanging, doubling, chorusing and echo effects with up to 256 milliseconds of delay. Identical to it except that it provides the user with over one second (1024 ms.) of delay is the ADM 1024 (\$699). Its capability, says DeltaLab, extends beyond that of "our performer series DL-4."

CIRCLE 48 ON READER SERVICE CARD

KITS MAKING A COMEBACK?

The present wave of cost-consciousness, as applied to audio gear, may be influencing a "mini-trend" in do-it-yourself kits for building equipment. At one time, of course, audio kits were a major factor in both consumer and pro equipment. They declined in popularity during the 1970s, although the major kit producer, Heath, continued to offer all manner of equipment in this form. Right now this particular field appears to be expanding—slowly but significantly.

For instance, Sound Concepts—in addition to its model SX-80 CX decoder (which includes a peak expander for use with non-CX recordings) mentioned in July's [1982] "Product Scene"—is also offering two more kits. The IR-2200 is an image expander priced at \$95 in kit form. The factory-wired version costs \$169. The VSP-1 is a stereo synthesizer for use with any monaural source (including the audio from video sources). Kit price is \$90. Factory-wired, it costs \$159.

Some of I. M. Fried's speaker systems are available as kits, including an O/2 subwoofer, C/2 satellites and supertweeter. Cost is \$1000 as compared to \$3500 for a factory-built version. The kit version does involve building your own cabinet from plans supplied.

Elements and plans for building several speaker systems including twelve for concert, musical instruments and monitor applications are described in a 30-page catalog, available postpaid for \$2 from Gold Sound Loudspeaker Kits, P.O. Box 141, Englewood, Colorado 80110. Over 150 components are listed from such companies as JBL, Gauss, Audax, SEAS, Electro-Voice, etc.

The Hapi 2 is a state-of-the-art preamp designed by Stew Hegeman and marketed by Adcom. It has no tone controls but it does have a bandwidth of 2 Hz to 350,000 Hz, and its phono stage employs flat-gain passive EQ. Gain stages are op-amp designs with transient response and gain controlled over the entire bandwidth. Individual components and subassemblies are tested and adjusted prior to shipment. In kit form, the Hapi-2 costs \$479; factory-assembled, \$650. A Hegeman power amp also is in the works.

Hafler's offerings include two preamps and two power amps, with a digital tuner on the way. Preamps are the DH-101, \$200 as a kit or \$300 factory-wired; and the DH-110, \$300 in kit form and \$400 wired. Power amps are the DH200 (100 watts per channel), \$330 as a kit and \$430 wired; and the DH-500 (225 watts per channel) and costing \$600 as a kit or \$750 preassembled.

NEWSICALS

P.A. EQUIPMENT

Roland has gone for the small mixer market with the introduction of the Boss KM-04 Micro Mixer. The KM-04 has four high impedance input channels with level controls, and a single high impedance output with an LED overload indicator. The unit's straight-forward design, tiny size (5" x 3½" x 1½"), and low cost make it suitable for a number of applications including multi-keyboard mixing.

CIRCLE 50 ON READER SERVICE CARD

Gold Line, who are best known for their cost-effective, hand-held, octave-band, real-time analyzer, have moved up-market with the introduction of their new Model 30, 1/3 octave real time analyzer. The Gold Line philosophy still includes cost-effectiveness as a prime criterion, but the level of performance of the Model 30 is fully professional thanks to the use of a microprocessor and some sophisticated circuit design. The heart of any RTA is its filters, and to achieve a high level of performance and stability, the Gold Line 30 uses a Switched Capacitive Filtering technique which references back to the unit's quartz crystal master oscillator, and which is not subject to any of the drift or stability problems of conventional analog filters. On the operational side, the Gold Line Model 30 will display spectrum information in either flat, A-weighted, or optional user-weighted modes with resolution of 1, 2, or 3 dB per step of display. The thirty frequency bands are displayed with vertical columns of 10 LEDs each, and the unit features an Auto Level feature to maintain the display around the "0" reference line. Three integrating time constants are provided and the unit can simultaneously display average levels with a bar and peak levels with a dot. The unit also measures sound pressure levels up to 129 dB SPL and displays them in a three-digit window. Six memory

registers are provided for storage of various response curves, and the unit can be instructed to average a combination of these stored curves, with weighting if desired, and display the averaged response on the display. Rounding out the picture are a built-in pink noise generator, a mic input with phantom power, and a line input.

CIRCLE 51 ON READER SERVICE CARD

Roland Corporation has entered the "big board" market with the introduction of two new audio mixing consoles recently added to the Roland Studio System line. The RM-1200B and RM-1600B models feature 12 and 16 balanced microphone inputs respectively. Designed primarily for sound reinforcement, the boards have a stereo main mix bus with a mono output derived from summing the stereo main outputs. Each input additionally has two monitor sends, each switchable pre- or post-fader for foldback or effects send use, a post-fader effects send, a four-band equalizer plus a 2-frequency high-pass filter, stereo panpot, and a Cue button to allow headphone soloing of each input. Cue buttons are also provided for each mixing buss, effects return and aux return. A patch send/return point is provided for each input channel, and four line-level inputs with level control and panpot are provided for effects returns or auxiliary inputs. Metering is via vertical, fluorescent bargraphs with switchable VU or peak ballistics; meters are provided for the program, cue, monitor, and effects output. The Roland mixers are designed for a nominal +4 dB output level with headroom to a +24 dB (12.3 V) maximum output level.

CIRCLE 52 ON READER SERVICE CARD

New from Gold Line is a dual function metering system, the Model DMS 500. The new unit is a 1¼" rack-mount

package which houses two LED meters which may be switched to either peak or RMS indication. The unit can be calibrated for either line-level metering or power amplifier output metering for amplifiers up to 550 watts output; the two channels are independently calibrated.

CIRCLE 53 ON READER SERVICE CARD

WIRELESS MICROPHONES

Telex has expanded their line of professional wireless microphones with the introduction of two new, handheld, VHF mic transmitters. In both models the compressor and transmitter circuitry and the omnidirectional antenna are incorporated into the mic housing for optimum esthetics. The Telex system uses some 30 dB of compression on transmission and the corresponding expansion on receive to achieve maximum signal-to-noise ratio. Both models are powered by alkaline or NiCad batteries, and operate on standard frequencies in the 151 and 154 MHz bands or on a special frequency anywhere in the 150-176 MHz range. The WHM-300 is a cardioid electret mic with flat frequency response, equipped with separate on-off switches for RF and audio; the mic is intended for use by lecturers and others who have need to switch off the mic without the thump associated with turning off the RF on a radio mic. The WHM-400, on the other hand, is designed for use by singers and other entertainers and has no switches since the mic would usually be controlled by an off-stage mixer; the mic itself is a cardioid dynamic with moderate proximity effect for the bass reinforcement favored by many vocalists.

CIRCLE 54 ON READER SERVICE CARD

MUSICAL INSTRUMENT AMPLIFIERS

A familiar name to many musicians is Road Electronics, now a division of

Rickenbacker Inc., who have just introduced four 75 watt RMS amps, two lead amps and two bass amps. All amps feature three band EQ (bass, treble, and Road's Panascan mid-range), a stereo headphone jack, an extension speaker jack, and an effects patching loop. The Road L-120 is a single channel lead amp with reverb, high and low sensitivity input jacks, and controls for input gain, input volume, reverb, and master volume in addition to the three-band EQ. The SL-120 is identical, except for the addition of a second input channel for a second instrument or for presetting a second



sound using the amp's channel switching function. Both models feature a single 12" speaker. The Model B-120 is a single channel bass amp with a single, heavy-duty 12" bass speaker in a bass reflex cabinet. The SB-120 bass amp features a second, switchable input channel and upgrades the speaker to a single 15" speaker for extended low frequency response.

CIRCLE 55 ON READER SERVICE CARD

KEYBOARD INSTRUMENTS

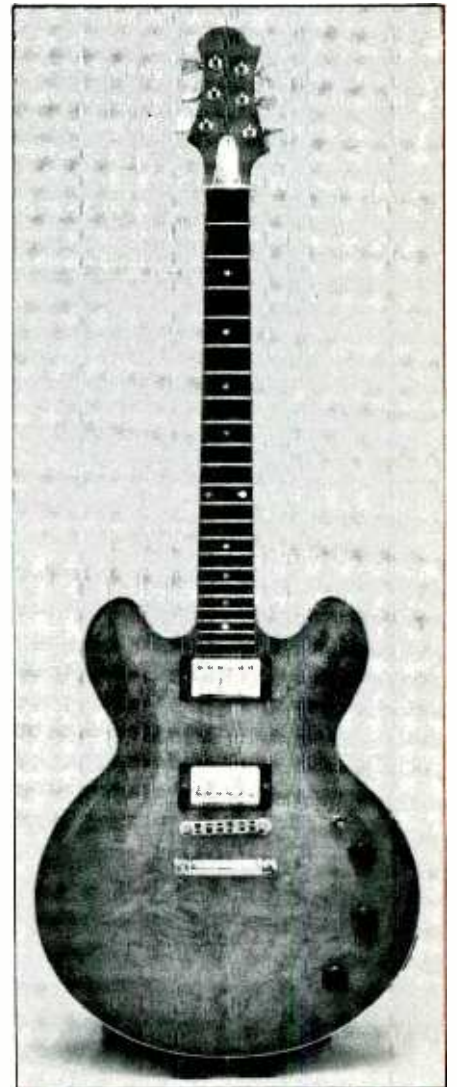
360 Systems has announced the introduction of a new instrument, known simply as the Digital Keyboard, which goes beyond conventional synthesizer technology to use the sounds of real, acoustic instruments stored digitally. This idea is not entirely new, but the 360 Systems unit is unique in that the sounds are all stored internally on memory chips rather than being stored on floppy discs; in practical terms, this means that each sound is immediately accessible via a selector switch rather than requiring the user to reload from a floppy disc every time he wishes to change sounds. The Digital Keyboard accepts up to 16 different sounds which may be selected from a proposed initial library of some 60 or so sounds; 360 Systems intends



to continually update their catalog of sounds and can potentially offer a custom chip service for users who have very individual needs. As a user's needs change, his selection of available sounds may be updated as easily as buying the memory chips for the new sounds he needs and plugging them into the unit. In use, one or two instruments may be selected at a time, with two instruments available on either a split keyboard basis or a dual instrument per key basis, and the switching between sounds is instantaneous so that a user may switch between variations on a given basic sound for greater realism than is possible with a single instrument sound. For example, 360 Systems plans to offer three different trumpet sounds, one bright, one soft, and one muted, which the user can access with the push of a button. To provide greater flexibility, the unit has built-in signal processing including a delay line and a chorus effect for simulating a double tracked instrument, a filter with variable frequency and resonance which is activated via footswitch and is assignable to either or both of the sounds being played, and a vibrato with variable speed and depth. In addition, the 360 Systems Digital Keyboard has a pitch bend wheel just like conventional synthesizers, and a pitch fine tune control to allow the pitch of a pre-recorded track to be matched. The proposed initial catalog of sounds includes most of the usual orchestral instruments, with the strings available as solo instruments or as unison trios or duets, plus two acoustic and five electric guitars, some seven different organ sounds, and more unusual sounds such as steel drums, bagpipes and a calliope which is promised to be slightly out of tune for authenticity. Most of the proposed list should be available by late 1982 with continuing new additions in the future, the emphasis being on sounds not available from conventional synthesizers.

CIRCLE 56 ON READER SERVICE CARD

The classic is a custom-made, semi-solid body guitar from Steven Guitars, Inc. The carved top of The Classic is fancy maple while the carved back is either Honduras or "korina" mahogany. The lower bout of the guitar is an extra-full 15", and the guitar may be finished in blond or sunburst lacquer. The buyer may specify one of several scale lengths, and fingerboard materials include Brazilian rosewood, ebony, and curly maple. The Stevens Classic uses Seymour Duncan pickups exclusively.



CIRCLE 57 ON READER SERVICE CARD



Recording Techniques

Part 7

by Bruce Bartlett

The Mixing Console

Up to now in this series, we've covered acoustics, musical instruments and microphone techniques. We're at the stage where the microphones have been chosen and placed, and are plugged into the mixer or mixing console. Now it's time to take electronic control of the sound—to manipulate the music at your fingertips, like a conductor directing an orchestra.

Mixing consoles may appear complex and intimidating at first, but are straightforward to operate once the functions of the various parts are understood. To help you "play the console" as easily as a musical instrument, this article will describe console systems and components. More information is available in manufacturers' data sheets and operation manuals.

First, let's distinguish between a mixer and a mixing console. A *mixer*, (1) amplifies the signals from several microphones; (2) controls their relative volumes; (3) blends all the signals into one or more composite signals; and (4) sends the composite signals to tape recorders, P.A. systems or monitor amplifiers. *Mixing consoles* have other functions such as equalization or tone control, panning or stereo positioning, separate mixing for monitor speakers and headphones and control of special sonic effects. Other names for mixing consoles are "mixing boards," "record-

ing consoles," and "mixing desks" (British).

Inputs and Outputs

A mixer or console can be specified by the number of inputs and outputs it has. For example, an 8-in, 2-out mixer (8 x 2 mixer) has 8 inputs for microphones, which can be mixed into 2 output channels (buses) for stereo recording. Similarly, a 16-in, 8-out mixing board (16 x 8) has 16 microphone inputs and 8 output channels for multi-track recording.

Consoles also accept line-level inputs (about 0.3 to 1.2 volt) as well as microphone-level inputs (nominally about 2 mV). Typically, the line inputs are fed from the outputs of a multi-track tape recorder.

Microphone inputs can be low impedance or high impedance. Low-impedance inputs are intended to be used with low-impedance microphones (150-600 ohms); high-impedance inputs should be used with high-impedance microphones (about 40 kilohms). Low-impedance microphones are preferred for serious recording because

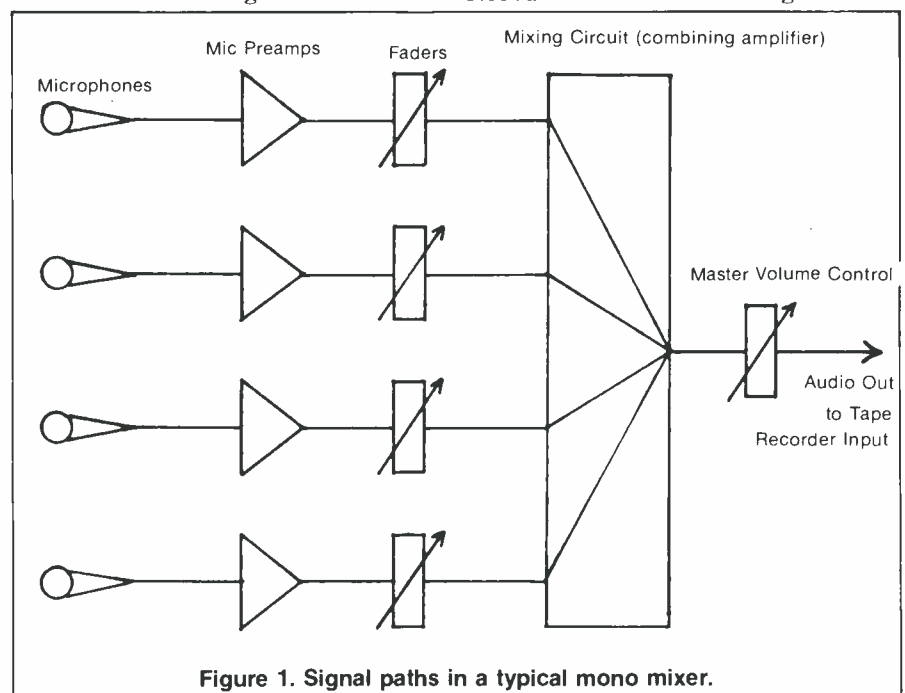


Figure 1. Signal paths in a typical mono mixer.

Obsession with Excellence...

**"The PL80 is the
only mike I'll use!"**

The consistently high quality of Crystal's standing-room-only concerts is a demonstration of her obsession with excellence and it says a lot about the equipment she chooses to use.

The PL80 was designed for entertainers. Entirely new applications of available computer-assisted technology were used to ensure that the PL80 performed exactly as it was originally designed to. Extensive field testing with groups like Journey and stars like Crystal Gayle were used to check the designs every step of the way. That is Electro-Voice's obsession with excellence.

The result is an entertainer's microphone that sounds exactly like you want it to. Its crisp high end and modest bass boost enhance a performer's voice without compromising the performer's vocal quality. And it sounds that way on stage, not just in a sterile test environment.

"I've used a lot of other mikes in my career and without doubt the PL80 gives my voice a truer sound than I could ever get using any other microphone." That is Crystal Gayle's obsession with excellence, and her statement says it all! Give your voice the sound it deserves. Get your voice a PL80 at your Electro-Voice PL microphone dealer!



*Crystal Gayle insists on using
the Electro-Voice PL80 microphone.*



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they allow long cable runs without hum pickup or high-frequency losses.

Some consoles have simplex powering or phantom powering—a voltage applied to the microphone-connector pins to power condenser microphones.

Signal Flow

The signal from each microphone flows in the console through circuits that modify the signal or route it to various channels. There is a signal flow or signal path from input to output. First, let's look at each stage of the signal path in a simple mono mixer. Then we'll build up to the signal stages in a multi-channel console. We'll take this route because a knowledge of simpler units is needed to understand a complex console.

The signal flow in a typical mono mixer is shown in *Figure 1*. First, the signal from each microphone is amplified by a preamplifier (one for each microphone). Then the amplified signals go to potentiometers (*pots* or *faders*) that control the loudness of each signal. You adjust the pots to

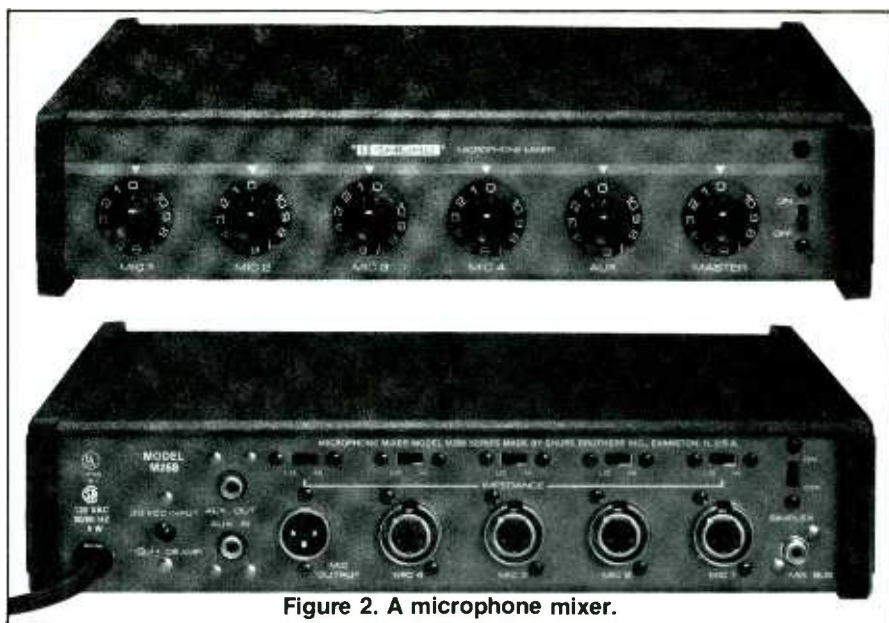


Figure 2. A microphone mixer.

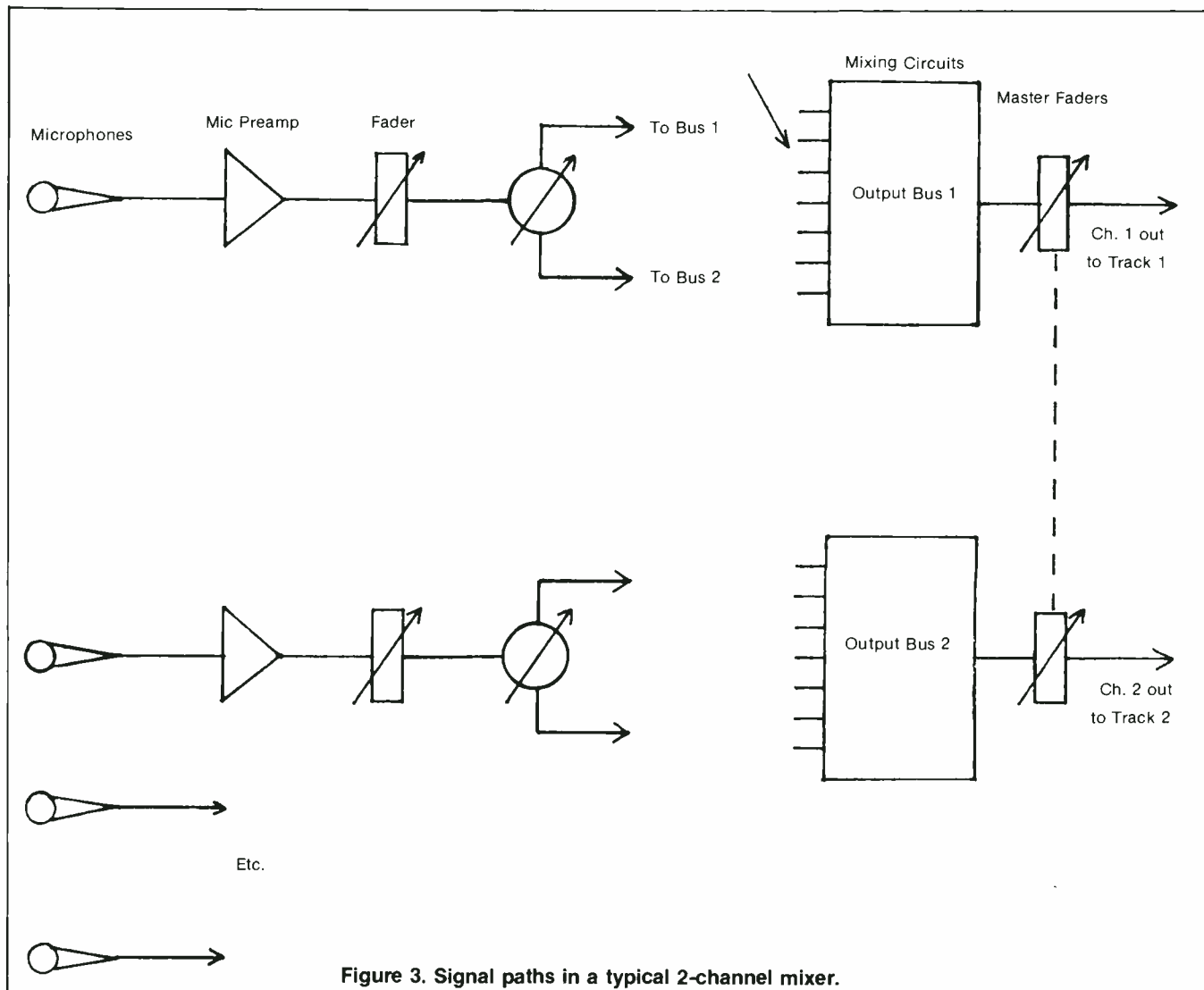


Figure 3. Signal paths in a typical 2-channel mixer.

MAXELL IS PLEASED TO PRESENT AN EVEN HIGHER PERFORMANCE TAPE.



If you're familiar with Maxell UD-XL tapes you probably find it hard to believe that any tape could give you higher performance.

But hearing is believing. And while we can't play our newest tape for you right here on this page, we can replay the comments of Audio Video Magazine.

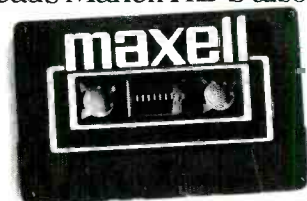
"Those who thought it was impossible to improve on Maxell's UD-XL II were mistaken. The 1981 tape of the year award goes to Maxell XL II-S."

How does high bias XL II-S and our normal bias equivalent XL I-S give you such high performance? By engineering smaller and more uniformly shaped epitaxial oxide particles we were able to pack more into a given area of tape. Resulting in a higher maximum output level, improved signal-to-noise ratio and better frequency response.

To keep the particles from rubbing off on your recording heads Maxell XL-S also has an improved binder system. And to eliminate tape deformation, XL-S comes with our unique Quin-Lok Clamp/Hub Assembly to hold the leader firmly in place.

Of course, Maxell XL II-S and XL I-S carry a little higher price tag than lesser cassettes.

We think you'll find it a small price to pay for higher performance.



IT'S WORTH IT.

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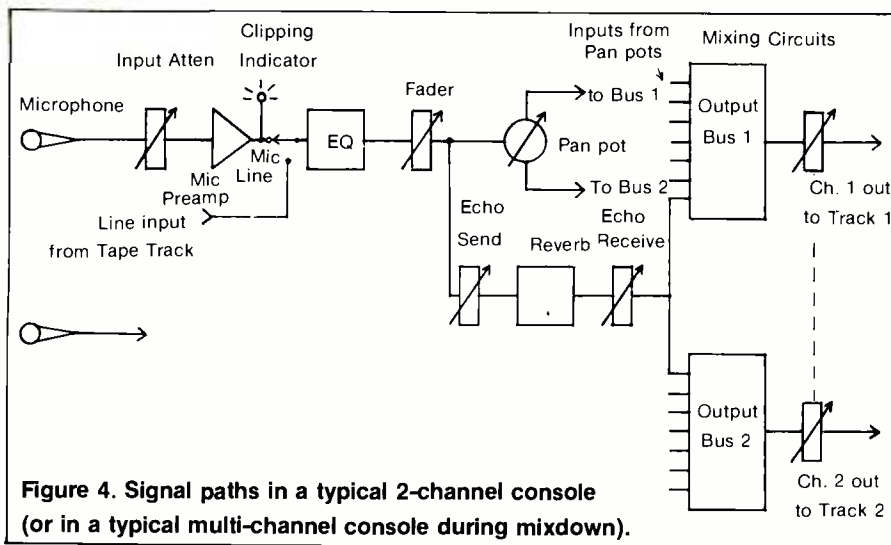


Figure 4. Signal paths in a typical 2-channel console (or in a typical multi-channel console during mixdown).

make some instruments louder, some softer, so that they blend in a pleasing balance. The microphone signals combine into one signal that is controlled in level by a master volume control. This composite signal goes to the mixer output for connection to a tape recorder or monitor system.

Figure 2 is a photograph of a commercially available 5 x 1 mixer. It has four microphone inputs (switchable low or high impedance), one auxiliary input, and one output available at aux level (nominally 0.3 volt) or microphone level. Other features include simplex powering for condenser microphones and a mix bus to interconnect multiple mixers.

Figure 3 shows the signal flow for a typical 2-channel stereo mixer. For clarity, only two microphone input channels are shown. The microphone signals are amplified and adjusted in level as before. Then each signal runs through a pan pot, which creates a stereo effect by assigning each instrument to a particular location within the stereo spread.

How does a pan pot work? Imagine you're listening to music on a stereo system. You can hear a "sonic image" of each instrument in various positions between the stereo pair of speakers. The pan pot places the sonic image of each instrument at any left-to-right point between the speaker pair.

To do that, the pan pot divides the instrument's signal between the two output channels. Channel 1 goes to the left speaker and Channel 2 goes to the right speaker. If the pan pot is rotated all the way to the left, the signal goes just to Channel 1 (the left speaker). If the pan pot is rotated full right, the signal goes to Channel 2 (the right speaker). If the pan pot is set in the middle, the signal divides equally to

both channels, producing an image centered between the two speakers. Other settings produce a corresponding sound-image location anywhere desired between the speaker pair. Note that the listener must be the same distance from each speaker for this to work as described. In some mixers, a 2- or 3-position switch is used instead of a pan pot.

The signal flow in a typical 2-channel mixing console is shown in Figure 4. For clarity, only one microphone input channel is shown. Every console is a little different, but most include the features described here.

First, the microphone signal goes to a pad or input attenuator, which is used (if necessary) to reduce the intensity of high-level microphone signals that can overload the microphone preamp. For example, a typical dynamic microphone picking up a bass drum may generate 0.4 volt. This

voltage can drive the microphone preamp into clipping, causing distortion. The pad solves this problem by attenuating the microphone signal before it reaches the preamp. Some consoles also have a gain-trim pot to prevent distortion. A meter or an LED following each preamp warns of preamp clipping caused by a too-strong microphone signal.

After the microphone signal is properly attenuated and amplified, it goes to an equalizer. This is a sophisticated tone control, something like the bass and treble controls on a hi-fi set. Equalization (EQ) affects tone quality by boosting or cutting selected frequency bands. That is, it alters the frequency response. We'll explain EQ in more detail later. The equalized signal goes to a fader for level adjustment, then to a pan pot for placement on the stereo stage.

The signal leaving the fader is also sent to an effects device such as an artificial reverberation unit. The reverberation signal returns to the console where it blends with the original signal, adding a sense of "room acoustics" or "spaciousness." An echo-send control adjusts the level of the signal feeding the reverb device, and an echo-receive control adjusts the level coming from the device. The echo-send controls affect the amount of reverberation added to each instrument. In some consoles, the echo send is called "aux send" or "effects send," and can be used with any external signal processor, such as an echo or delay unit.

A multi-channel console (Figure 5) is similar to the previous one, with the

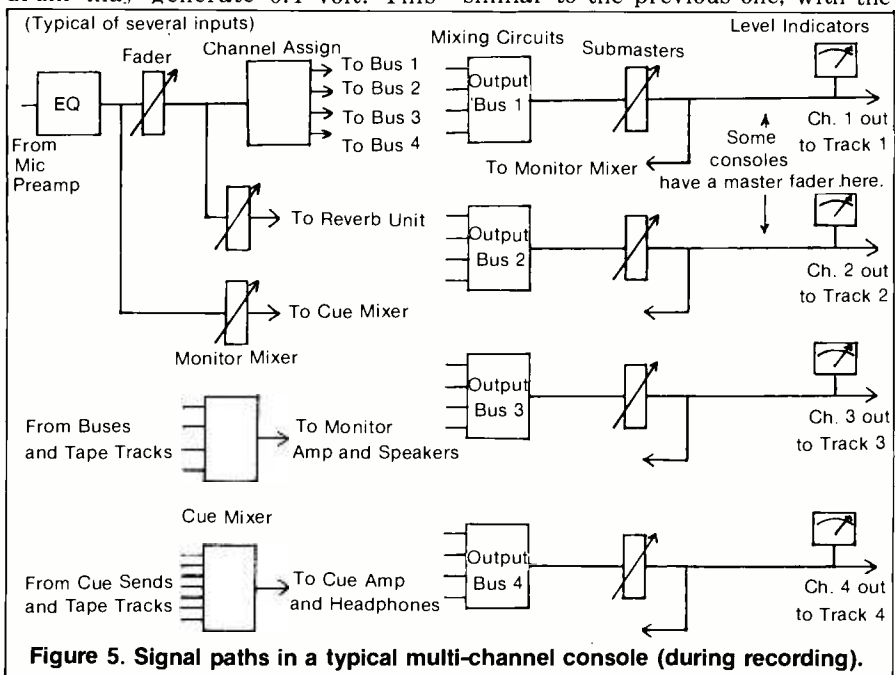


Figure 5. Signal paths in a typical multi-channel console (during recording).



“It’s a glamorous business, isn’t it?”

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If you like all night sessions. Recording and re-recording dozens of times. Trying to please yourself and everybody else in the studio.

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So after you’ve put in all those hours in the studio, the tape you end up with will sound as close to perfect as you can make it.

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Signal
Processing

addition of a *channel-assignment* switch (*track-assignment* switch) to feed each microphone's signal to the desired track of a multi-track tape recorder. For example, you can assign (route or send) the drum microphones to Track 2, bass to Track 1, vocal to Track 3, guitar to Track 4 and so on. You can assign a single microphone to two tracks and pan it between those tracks. Or you can assign several

record them. The mixer lets you balance the channels (control their relative levels) for a good-sounding mix without affecting the signals going on tape. In other words, during recording, the monitor mixer is used to set up a well-balanced blend of the instruments to simulate the sound of the final tape. It's not being *recorded* that way; you're just *listening* that way.

Now it's time to take electronic control of the sound—to manipulate the music at your fingertips.

microphones (say, for a drum set) to a single track. That is, all those microphones are mixed to that track.

Note that a mixing board with four output channels can be used with an 8-track tape recorder. For example, you can record the rhythm instruments on Tracks 1 through 4, then overdub (record later) the vocals, strings and horns on the remaining tracks.

All the controls mentioned so far are mounted in a single *input module*, a vertical panel in the console. Several identical modules—one for each input—are arranged in a row. If you know one, you know them all.

The overall level of each output channel (bus) is controlled by a *submaster fader* (*group master fader*). You use it along with the input faders to set the proper level going to the tape recorder (as indicated by meters or lights). If several microphones are assigned to one channel, the submaster controls the level of all those microphones at once. For example, several drum microphones assigned to Channel 3 can be controlled in level simultaneously by the Channel-3 submaster. This function of pre-setting small mixes within a total mix is called *submixing* or *subgrouping*.

VU meters or lights connected to each bus indicate the signal level (voltage) being sent to the tape recorder. If the level is set too high (say, above +3 VU), tape distortion may result; if the level is too low (say, consistently below -10 VU), tape hiss becomes a problem.

The signal in each output bus also goes to a *monitor mixer* built into the console. Using the monitor mixer, amplifier and speakers, you monitor (listen to) the instruments as you

The volume controls for the monitor mixer are either grouped all together in a single section of the console, or are distributed among the input modules. Sometimes each input to the monitor mixer has a pan pot or echo-send control so you can experiment with these effects without affecting the signals going on tape. *Monitor-select* buttons let you choose what channels you want to hear. A *tape/bus switch* allows monitoring of either the tape or the console, and a *mono/stereo switch* lets you monitor in mono or stereo.

The signal from each microphone also goes to a *cue mixer* (*foldback mixer*) built into the console. The cue controls are used to set up a mix in the musicians' headphones so they can hear each other and hear recorded tracks to play along with. *Cue controls* on each input module adjust microphone signals going to the cue bus; *tape-cue controls* adjust tape signals going to the cue bus. Some consoles have multiple cue buses (or aux buses) for setting up several independent mixes for different musicians. For example, the drummer may need to hear the bass guitar especially loud so they can play together tightly. The pianist, on the other hand, may want to hear the vocal most prominently so he can respond to the vocalist's phrasing.

Other console features may include the following:

- A *solo* button on each input lets you hear that input's microphone all by itself.
- *Effects panning* places the images of the effects signals between the speakers wherever desired.
- An *access* patch point is used to connect external equipment, usually a limiter or compressor, between

the microphone preamp and fader.

- The *talkback* function lets the people in the control room talk to the musicians in the studio.
- The *slate* function routes the control-room microphone signal to all the buses for announcing on tape the name of the tune and the take number. In some consoles, a low-frequency tone is put on tape during slating so that the beginning of the take can be quickly located by listening for tape tones during fast-forward or rewind.
- An *oscillator* is used to put alignment tones on tape, and to reference the tape recorder's meters to those on the console.
- A *mute* button in each input module turns off that module.
- A *direct out* jack routes an amplified microphone signal directly to a tape track, thus bypassing potentially noisy electronics.
- An *echo pre/post switch* sends a signal to the reverb unit either "pre-fader" (before the fader) or "post-fader" (after the fader). With a post-fader setting, the reverb level follows the action of the fader; with a pre-fader setting, the reverb level stays constant, even when the fader is turned down.

Recording, Overdubbing, Mixdown

So far we've looked at the signal path through the console during the *recording* stage. The signal is attenuated, amplified, equalized, assigned, sub-mixed, metered and monitored. During *overdubbing*, the signal path is the same, except that the [previously] recorded tape tracks are fed into the monitor mixer and cue mixer along with the microphone signal of the instrument you're overdubbing. That way the musician can hear the tape tracks to play along with.

The signal flow for the *mixdown* stage is shown in *Figure 4*. During a mixdown, you process the already-recorded tape tracks, rather than the microphone signals. The tape tracks enter the console line inputs via the *mic/line* selector in each input module. While monitoring Channels 1 and 2, you add EQ, reverb and effects to the tracks; mix them and pan them between Channels 1 and 2. These channels feed a 2-track tape recorder. The tape made on that machine is the final product.

Equalization

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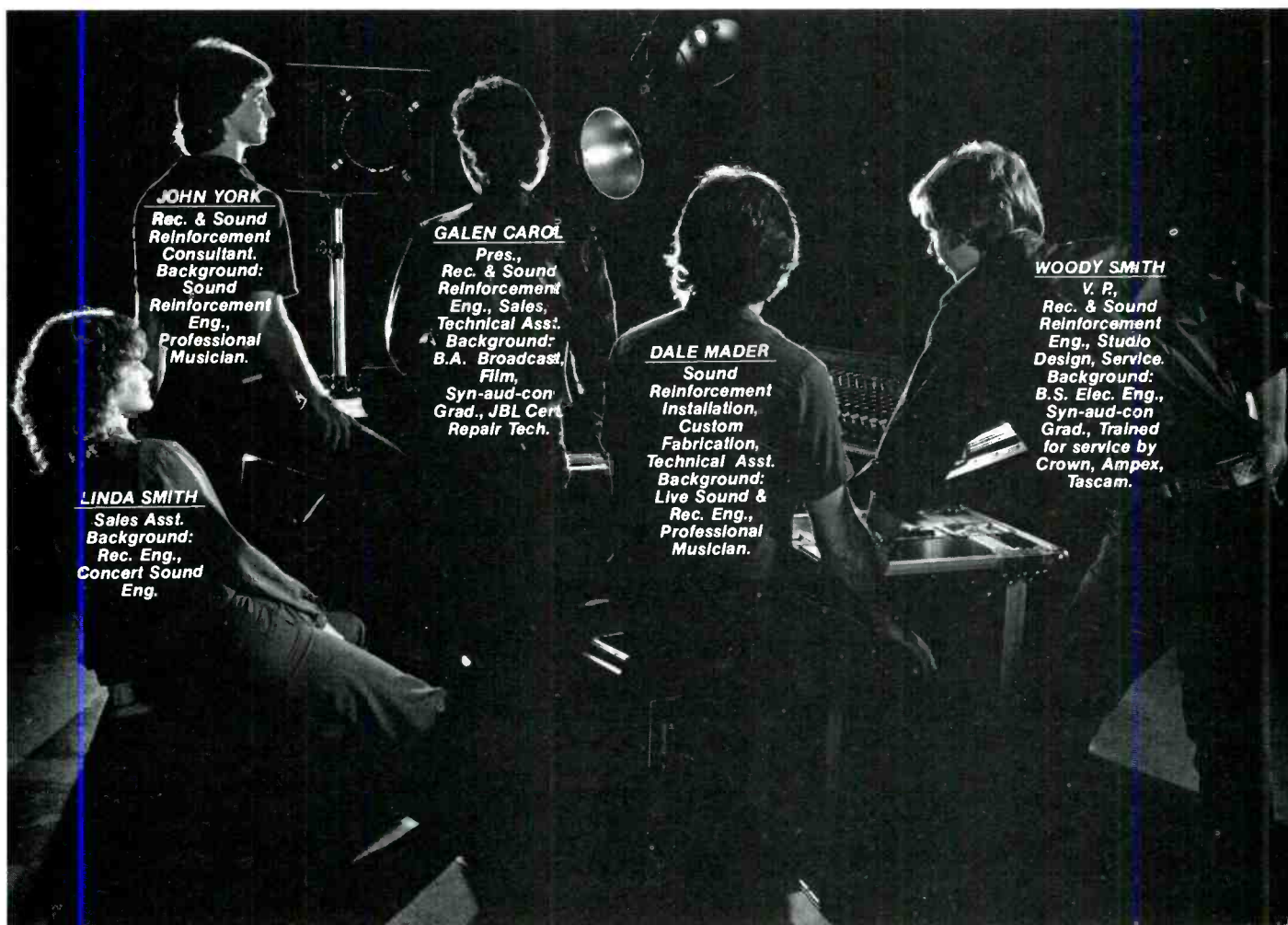
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paths through the console, let's return to the equalization section to take a closer look at this important function.

How does an equalizer work? To understand this, first we need to know what a *spectrum* is. A musical instrument produces a wide range of frequencies, even when a single note is sounded. These frequencies, including the fundamental and harmonics, are the *spectrum* of the instrument. The perception of the spectrum is called "tone quality" or "timbre."

If we electronically alter the strength of any portion of the spectrum, we affect the reproduced tone quality. An equalizer controls the level of a particular range of frequencies or frequency band, and so controls the tone quality. For example, a boost (a level increase) at 10 kHz makes most instruments sound bright and crisp. A cut at the same frequency dulls the sound.

Equalizers range from simple to complex. The most basic is a bass and treble control. Typically, such a device provides up to 15 dB of boost or cut at 100 Hz (for the low-frequency EQ knob) and at 10 kHz (for the high-frequency EQ knob). Fancier equalizers allow boost or cut at several

preset frequencies. Most complex is a *parametric equalizer*, which allows continuous adjustment of frequency, boost or cut and *bandwidth*—the range of frequencies affected within the selected band. A *graphic equalizer* has a row of slide pots, dividing the audible spectrum into 5 to 31 bands. It's usually used for monitor-speaker equalization.

A *filter* is a form of equalizer that sharply rejects (attenuates) frequencies above or below a certain frequency. For example, a 10 kHz low-pass filter (high-cut filter) removes frequencies above 10 kHz. This reduces hiss-type noise without affecting tone quality as much as a gradual treble rolloff would. A 100 Hz high-pass filter (low-cut filter) attenuates frequencies below 100 Hz, reducing rumble from air conditioning and trucks.

Uses of EQ

The following is a list of some ways equalization is used:

- *Improving tone quality:* EQ can make instruments sound better tonally. For example, you might use a high-frequency rolloff on a sibilant singer to make him sound less harsh,

or on a direct-recorded electric guitar to take the "edge" off the sound. As another example, boosting 100 Hz on a floor tom gives a fuller sound, or cutting around 250 Hz on a bass guitar aids clarity. The frequency response and placement of microphones affect tone quality too.

- *Special production effects:* Extreme equalization reduces fidelity, but it also can make interesting sound effects. Sharply rolling off the lows and highs on a voice, for instance, gives it a "telephone" sound. An extreme boost at 5 kHz can accent the impact of a snare drum.
- *Helping a track stand out:* A recorded track of an instrument heard by itself may sound very clear, but when it's mixed with other tracks, the clarity may disappear. Certain frequencies of the instrument can be covered up or masked by frequencies produced by other instruments. A boost in the "presence" range, say 1.5 kHz to 6 kHz, can help restore presence and clarity. Vocals typically are boosted in this range to help them stand out against an instrumental backup.
- *Compensating for response deficiencies:* The microphones, tape

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recorder, monitor speakers and the mixing board itself may not have a flat frequency response. Equalization can partly compensate for these deficiencies. If a microphone has a gradual high-frequency rolloff, for example, a high-frequency boost on the console may help restore a flat response. On the other hand, if a microphone "dies" above a certain frequency, no amount of boost can help it. A bass rolloff can compensate for microphone proximity effect—the bass boost occurring with most cardioid microphones when they are placed close to a sound source.

- **Compensating for microphone placement:** Often you must place a microphone very close to an instrument to reject background sounds and leakage. Unfortunately, a close-placed microphone tends to emphasize the part of the instrument the microphone is near: the tone quality picked up may not be the same as the instrument as a whole. Equalization can partly compensate for this effect. For example, a guitar miked next to the sound hole sounds bassy because the sound hole radiates strong low frequencies, but a low-

frequency rolloff on the console can restore a natural tonal balance.

- **Reducing noise and leakage:** By filtering out frequencies above and below the spectral range of an instrument, you can reject noise and leakage at those frequencies. For instance, you can filter out highs above 5 kHz on a kick drum to reduce cymbal leakage. If this filtering is done during mixdown, it will also reduce tape hiss. Filtering out frequencies below 100 Hz on most instruments rejects room rumble and muddy bass.
- **Compensating for the Fletcher-Munson effect:** As discovered by Fletcher and Munson, the ear is less sensitive to bass and treble at low volumes than at high volumes. So, when you record a very loud instrument and play it back at a lower level, it might lack bass and treble. To restore fullness and presence, you may need to boost the lows (around 100 Hz) and the highs (around 5 kHz to 10 kHz) when recording loud rock groups. The louder the group, the more boost is needed [at low levels]. As an alternative, use cardioid microphones with proximity effect (for bass boost) and

a presence peak (for treble boost).

- **Making a pleasing blend:** When several instruments are heard together, they sometimes "crowd" each other in the frequency spectrum. That is, it may be difficult to distinguish the instruments by tonal differences. But by equalizing various instruments at different frequencies, you can make their timbres distinct, which results in a more pleasing blend. This procedure also evens out the contribution of each frequency band to the total spectrum, giving a mix that is tonally well balanced.

It's very instructive to spend some time using a graphic equalizer. Play wide-range music—or individual instruments—through it to become familiar with the tonal effects of each frequency band. Then you'll know what frequency to boost or cut to correct a tonal coloration, and you'll have a better idea what knob to turn to get a "woody" sound or a "brassy" sound.

With some knowledge of console functions, you're ready to set knobs, flip switches and push buttons to control the sound of music. We'll cover console operation in the next issue.

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RECORDING WITH...



By Karen Schlosberg

Squeeze has been on the verge of "making it big" ever since its first album, U.K. Squeeze, was issued in 1978. Though the British quintet has achieved erratic bouts of chart success in the U.K., most notably with 1978's Top Ten hit "Take Me I'm Yours;" 1979's "Cool For Cats" and "Up The Junction;" both of which reached #2; and "Labelled With Love," which got to #4 in 1981, they have never really broken commercially in the States with a Top Ten album or single ("Tempted" hit the Top 40 last year).

*That hasn't stopped the critical accolades from rolling in, however. The nine-year-old band, especially songwriters Chris Difford and Glenn Tilbrook, has gotten so much praise that its record company [A&M] proudly boasts of Squeeze as the "best-reviewed" band in the business (though it [the label] does tend to go a bit overboard in advertising that fact: there's the removable flap full of praise—"When it comes to Squeeze, they can't be called critics"—on the bands' fifth, and latest, LP, Sweets From A Stranger; there was the full-page ad in the music trades proclaiming a sold-out Madison Square Garden show weeks before it was sold-out; and, of course, the full-page ad in the music trades last year, soon after the release of East Side Story, which announced, in consecutively larger and bolder letters: "Gilbert and Sullivan *** Leiber and Stoller *** Lennon and McCartney *** Difford and Tilbrook *** SQUEEZE").*

If Squeeze wasn't so good it'd never survive the hype. The group's work has steadily matured, through five albums, from a kind of adolescent leer that characterized much of its early songs ("Sex Master," "Touching Me, Touching You") towards more affectionate, compassionate and often wryly humorous examinations of everyday life, encompassed in near-perfect pop vignettes ("Vicky Verky," "Someone Else's Heart," "His House Her Home").

Squeeze was mistakenly lumped in with the British punk movement when it first came to tour the States, but it soon became apparent that the only thing this melodic, musically proficient band had in common with punk was that it supplied a burst of fresh energy to a stale music scene. The only politics Squeeze deals with are social politics, interpersonal politics. The only image Squeeze conveys, if it does that at all, is of five youthful, friendly chaps singing songs of a slightly cynical yet romantic bent.

Squeeze is Chris Difford writing lyrics, playing guitar and singing; Glenn Tilbrook writing the melodies, playing lead guitar and singing; Gilson Lavis on drums; John Bentley on bass and backing vocals; and Don Snow on keyboards and backing vocals. This lineup will hopefully remain constant for some time, as the band has been plagued over the last year or so with a run of misadventures that would have tested the stamina of even the most determinedly optimistic band: it lost two managers and two keyboard players within two years; it split with Miles Copeland (Police), and he was replaced, briefly, by Jake Riviera (Elvis Costello, Nick Lowe); Julian "Jools" Holland, boogie-woogie piano player extraordinaire, left to form his own band; Paul Carrack, who replaced Holland and who sang last year's "Tempted," then left in the wake of its success to pursue a solo career.

Squeeze recently finished a six-week long tour of the States in support of Sweets From A Stranger, which included a sold-out show (nearly 20,000 seats) at New York's Madison Square Garden. Between late April, when the band did a three-week long college tour, and the time of the Garden date, Modern Recording & Music spent some time with the members of Squeeze, discussing songs, producers, instruments, taste in clothes, shoes, ships, sealing wax and cabbages & kings. They're good talkers, but they don't always stay on the subject.

Modern Recording & Music: Do you feel you're at the peak of something now?

Chris Difford: Mt. Everest...No, it'd be awful to say you're at the peak of success, wouldn't it? It'd be like saying you're through. I think we're still climbing the north face, we're not quite on the peak. The peak's obscured by clouds.

MR&M: Do you think it's taken you too long a time to get where you are now? Do you think people were ignoring you at the beginning?

Glenn Tilbrook: There are advantages and disadvantages with the

amount of time it's taken. I think it's an advantage in the sense that we're well-prepared to play somewhere like Madison Square Garden and not allow it to shake us up particularly 'cause we've done lots of gigs. As long as you're happy with the progress of the band, and you can see something that you're achieving, then I think it's fine.

CD: I think the progression from the last album to this one has been very strong considering the mayhem and the shit we went through over the last year, with managers and keyboard players and things, and surprisingly it's turned out very well. But I think it's a loyal band, we'll always stick



together. If you've got a good team, then you're going to win in the end. My mother always said it comes to those who wait. And we've been waiting long enough so I should think it'll be coming soon.

Indeed, the rest of the band seems to share Difford's good opinion of both being in Squeeze and Sweets From A Stranger. Tilbrook says that Sweets "is different in terms of production. We've gone for a tougher sound, generally, particularly with John and Gil. The rhythm section is a lot more representative of the way we are 'live,' which is something, I think, that's been missing from the records before." He mentions that, though there are a couple of different styles of songs, the "obvious example" being "When The Hangover Strikes" (a clever morning-after tale done in a soft, jazzy mood, complete with double bass, brushes and Frank Sinatra-like croon), still, the "mood of the album hangs together a lot more" for him than it did for East Side Story.

The rhythm section agrees. Bassist Bentley says that he thinks Sweets "has a better mix than the last album. From my point of view, definitely, the bass

and the drums are a lot louder. It's easier for me to listen to it. I don't have to strain my ears, or turn the bass up on the amp."

It's taken five albums, but drummer Lavis is finally pleased with how his drums sound. "I think a conscious attempt was made to make 'em sound beefier. I've always griped and moaned after an album's been finished that I haven't been satisfied with the drum sound. Though East Side Story's sound was very good, it was very clean and clinical, very precise. I think the sound on Sweets is more the 'live' sound I get."

He gives a lot of credit to co-producer Phil McDonald (who's worked with, among others, the Beatles) for the improved sound, and deflects most attempts at praising his powerhouse drumming for its part in creating a distinctive Squeeze sound.

"I've been a pro drummer for 15 years, playing for everybody from Mickey Mouse to rock and roll dinosaurs, and I've seen some amazing drummers. I could never hope to play technically the way they do. That's why I find it very hard to take compliments. I like it when people say I'm a melodic

drummer, because I think there's not too many melodic drummers about, who actually play music rather than...[he makes a series of crashing sounds] "That gets on me nerves, when you turn the radio on and all you hear is thumpety-thump, the sound of Woody Woodpecker."

"The only compliment I think I can accept straight in the face is that I fit Squeeze well. I think that's true. I think I am sympathetic to Chris and Glenn's songwriting. I don't think I'm a particularly astounding drummer. I'm very lucky to be able to work with the quality material we have. I mean, you could be a berk [loosely translated as dope] and sound fairly good with Squeeze."

Bentley, too, says that "one of the things I like most about Squeeze is the fact that it's just the songs, they're just good songs, and that's why people come to see us."

Tilbrook is a trifle bit uneasy being singled out, with Difford, as the only reason for Squeeze's success. "Something that distresses me, when reading articles about us lately," he says, "is that the focus is on Chris and myself as songwriters. Though we do write the



"Last summer my band, *Gathering Forces*, performed at the Summerpier Festival in New York City. To my initial despair, the sound system they supplied looked like four eccentrically designed hi-fi speakers on poles. This was supposed to handle a highly electrified fusion band with horns and vocals for an outdoor crowd of 2,500!

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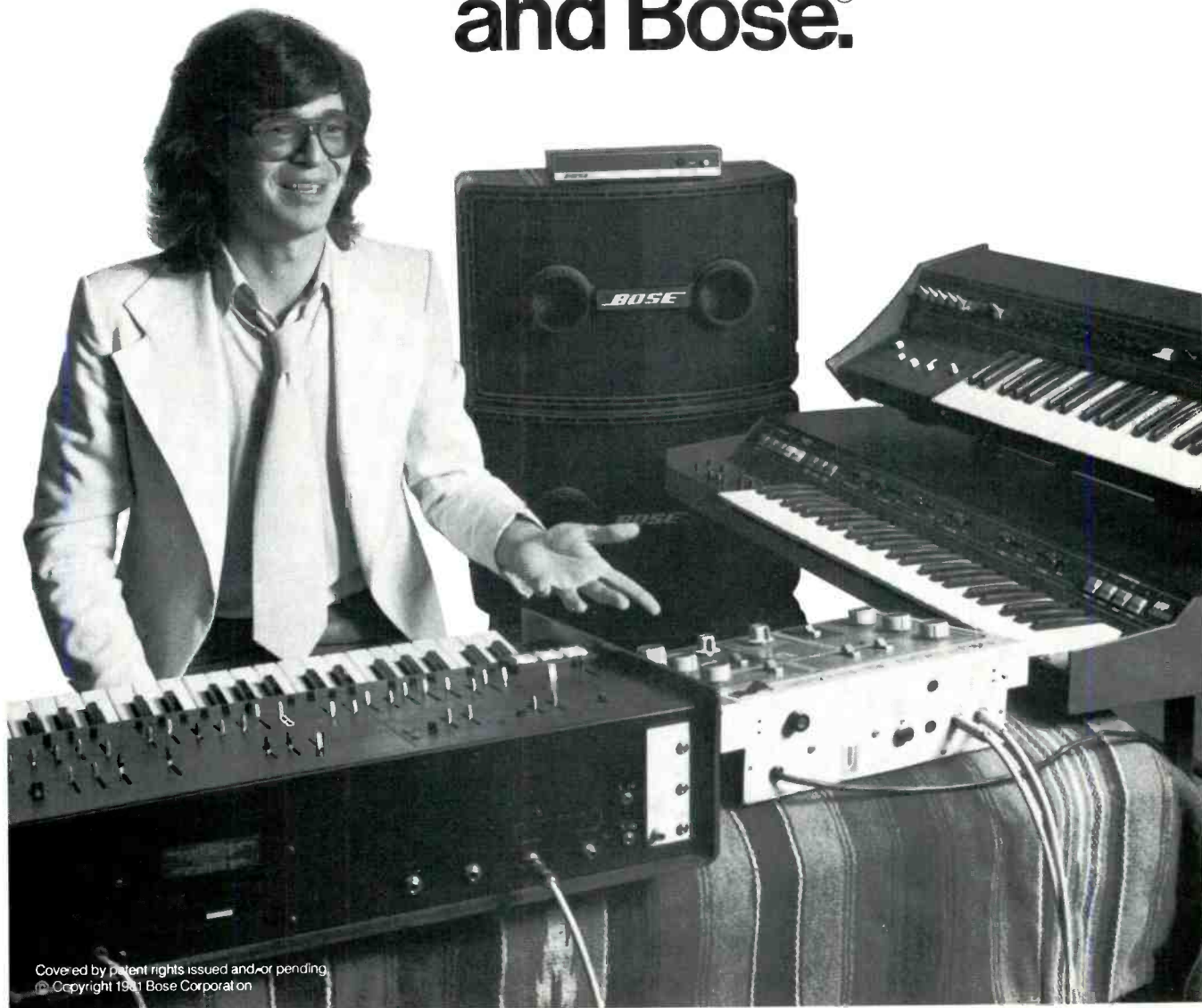
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songs for the band, I think the band as an entity stands up in its own right, and I feel part of the band, not anything separate from it."

Mentioning Lavis and Bentley's remarks just makes Tilbrook uncomfortable.

"Yeah...but it is a band, nevertheless. The personality of the band is stamped on the songs, I think, which is what makes our songs unique."

And try as he might, Tilbrook can't escape from the fact that, aside from the musical chemistry that exists within the band, he and Difford share a wonderful sort of creative chemistry. While Difford paints pictures with lyrics, Tilbrook paints feelings with melodies. The combination can't miss.

GT: I think writing music is basically trying to express emotion without words, because I don't think I'm a particularly articulate person with words. Music, to me, does it a lot better, especially with Chris' words to put music to. I'm very satisfied.

CD: I think I'm a bit of a sponge, really. I'm a bit of a social archaeologist. I like to sort of eavesdrop on other people's stories and just build on whatever I hear other people talking about. I don't think many people would want to hear songs about my life, my relationships, my house, my home...It's not boring, but it's mine. I don't particularly want to talk about it that much. Other people are far more fascinating than my own self. I always think, "Someone Else's Heart" [from *East Side Story*] is a personal song. There's very few of 'em. My wife'd kill me if I wrote about what we get up to, anyway...Mind you, she'd never know.

MR&M: One thing Squeeze has always been known for is its humor. Do you think *Sweets* is a humorous album?

CD: I don't know; I'm too close to it to say if there's any humor in it, or anything. People have said in the past, about the *Argybargy* or *Cool For Cats* albums, that they were humorous, and I didn't really know what they were talking about because that's just the way I write. It's totally natural for me to be, uh, witty—from time to time, not all the time. It's just me. I think "His House Her Home" is a witty song. It's quite funny, as well as being sad.

MR&M: Are you fond of the people in your songs?

CD: I'm fond of the situations that they're in, yeah. I know some of them; some of them I don't know. "His House," for instance, I think I know the people in the song very well. I definitely know the little boy in the middle verse. It's quite a difficult song for me

to sing, but I like singing it 'cause I think you get to know the characters better the more times you sing it. Some songs I haven't quite got familiar with yet, like "The Very First Dance." I'm not quite close enough yet to the characters in the song. I haven't listened to it enough. It was written quite quickly, and when Glenn had done the music to it, I decided that the lyric was inferior to the melody, so I rewrote it, and the following day it was on the album, so I haven't really got to know what it was about yet.

Gilson Lavis: Chris has a sort of dream-like quality to his lyrics. He can make one second last three minutes in a song, like "If I Didn't Love You," that's a specific emotion; it's like one second, and it lasts for three-and-a-half minutes. Yet, on the other hand, he can take a song like "Labelled With Love," which is two people's life stories, and make that last three minutes. Now on this new album, he's jumbled it all up, so one line can mean two years, and another line can mean two seconds. This sort of perspective is all over the place. It's an album that does stretch the imagination.

CD: I think that's just a progression in songwriting. I don't consciously think about it, to tell the truth, I just keep on writing. You can never plan

what's gonna be on an album. Out of the 40 songs we had compiled for *Sweets* could have been any number of three combinations of 12, do you know what I mean? There's not any way of analyzing, except in retrospect, or except in particular songs...Although, most of the songs on this album turned out to be about drink, which is quite odd, and getting up, you know, lazy-type lyric. It's quite strange. Some of the songs that were left off the album, if they'd've gone on it, would've put it in a completely different perspective.

MR&M: What about a song like "Tongue Like A Knife"?

CD: It's part of another song, "What The Butler Saw" [available as B-side to "Pulling Mussels"]. It's set in the same house, same grounds—the only thing that's changed is the characters involved in it now. "What The Butler Saw" has been my proudest moment lyrically, and I wanted to match that proudness, so I set out with that mood of scones and jam and Darjeeling tea, and an atmosphere of must, and it just came about. It's beginning to turn out like a Harold Pinter play. It might be quite interesting to work on it a little bit more.

MR&M: Perhaps put an album together of songs like that; a different sort of concept album.

CD: Yeah, that's right. That's what



we wanted to do with "The Elephant Ride." That's from a piece called "The Elephant Girl," but we haven't finished that yet. If we get the time I'd like to write a musical around it. There's four or five songs from it already. ["The Elephant Girl" is available as the B-side to the U.K. release of "When The Hangover Strikes."] but we haven't got a lot of time at the moment.

MR&M: "Stranger Than The Stranger On The Shore" is a personal song in a way. Though it's specifically open to interpretation, it's generally thought to be about the music business: John thought it was about "growing up and all the different experiences within music," and Gilson said. "It's about us, as a band, all going slowly mad."

CD: Interesting. It's a sort of a view from aside, from the wings. I think, of what we do. It's quite critical, and it's the first time I've ever made any statement about what we actually do. It's split up into three verses: the first verse is about groups that I don't particularly like...like fashions, come and go so quickly...in one ear and out the other. The second verse is about journalists that I've either grown to love or hate in the past, for one reason or another. I sort of question the reasons for the once-a-year photo session, the once-a-year interview with the *NME* [*New Musical Express*, one of England's four music weeklies, and the most opinionated], that kind of thing. It's a very strange song. I actually don't like the lyrics to it at all. I've got a much better lyric for it, which I prefer. It's a different story altogether.

GT: "Stranger," to me, has got quite an ugly melody. It's tuneful, but in a very, what I call, aggressive way. Not aggressive in the sense that we're playing power chords or anything like that, but aggressive in the sense that it's a slightly irritating melody, which I think fits the song perfectly, because I think it's one of the angriest songs that we've written... Maybe angry's not the right word.

MR&M: It's pointed, but it has a sense of humor.

GT: Yeah, I think so. I hate bitter songs. I don't think it's bitter. Pointed is a better word—substitute "pointed" for "angry."

MR&M: One thing I've noticed about your songs is the lack of the traditional "verse-chorus" structure, as in "Up The Junction," "Vicky Verky," "Piccadilly," and, on the new album, "Points Of View" and "Onto The Dance Floor."

CD: I used to write "Verse," then write the verse, and then write "Chorus," then write the chorus. I don't do that now. I just write the verses out, and then I write the chorus out, without explaining which is which, and let Glenn figure it out.

GT: Playing around with the form of songwriting is something that I find very interesting. I think there need not be an obvious structure for a song. I mean, sometimes, verse-chorus-verse-chorus-middle-eight-verse-chorus can work very well. Other times I think it's nice to play around with that structure, and have no choruses, or just lots of verses. On the other that's breaking it down too much, because really, what I do is 90% dictated by the lyric I've been given by Chris. If he writes a song that has a flow to it, then I don't feel that it's a good idea, especially if it's a very coherent storyline, to break it up with a chorus. A chorus, to me, can point the way to summing up what the song's about, and it can do it just as well once as it can four times.

MR&M: When you get a set of lyrics, what do you do?

GT: Well I always read them first...

MR&M: Yes...

GT: No, I never used to. I just used to sit down and start playing to them, to the first lines. But that was quite a few years ago. Now I try and get some sort of feeling from the song. Sometimes I don't get anything at all, then I leave it and read it when I'm in another mood, which is when something will appeal to me more. It's a very emotional thing to do, really.

MR&M: Glenn, you demo the songs at home, and it's not just piano or guitar and a voice, is it?

GT: No, I actually enjoy making quite reasonable demos at home. I do them on a four-track Teac, a 3440A, I think it is. I've got a mini-Moog, an OBXA keyboard, a piano, various different sorts of guitars and anything I can find to bang on to make the rhythm sound more interesting than just a straight drum machine.

MR&M: But you do have one?

GT: I've got two—one of them's a Roland 68, and I've got a [Roland] Dr. Rhythm as well.

MR&M: Then what?

GT: Then I transfer the songs onto a cassette recorder and play them to the band, and we rehearse for two or three weeks and get most of the songs worked out. About a third of the songs we don't rehearse at all, we just learn in the studio, do straight off. Some songs are better to do that way.

MR&M: How much discussing of arrangements do you do?

GT: The arrangements actually just evolve through everybody throwing ideas around. Gilson might suggest a drum pattern or something, which in turn sort of sparks John off into doing something a bit different. The whole concept of the song from demo to finished recording can completely change, or sometimes it stays basically the same. It depends on the song, really.

CD: Can you think of a song in particular that did change drastically?

CD: "The Very First Dance" was a good example. It was a real good demo, very well-made and everybody was wondering how they were going to get it to sound like that, but it changed 'round quite a bit, didn't it? We tried it so many different ways. Trying to make it sound like a group was a mistake.

GT: We tried it as a fairly straightforward song—guitars, keyboards, drums, bass—and somehow it just didn't cut it, and I've got to admit there wasn't a lot of enthusiasm for the song. But I really liked it, so I suggested we try a vocal idea that I had, which took about an hour to do in the studio. It was just Gilson playing drums, the backing vocals and then I sung the lead vocal over the top, and everyone really liked the idea. It sounds sort of like grubby, panting men in the background, except they're singing in tune. It gives the song a lot more of a mood. We built up the track from that, which in turn changed the lyrics, for the better, I think.

I think we're always open to that sort of thing happening in the studio. On the last album, "F-Hole" happened fairly much the same way. I think for the occasional track it's a good idea to build up things as you go along rather than come in with a set idea. Half the fun of recording is experimentation.



We're in the conference room of A&M's midtown office, two days before the Madison Square Garden date. Squeeze was brought into the States on the Concorde the day before, to be met by an excited crowd of fans and the media. The day after they're to play an "unannounced" gig at New York's Peppermint Lounge nightclub. Today was a full day of interviews, and Difford and Tilbrook warn me that they're "all talked out." Noting how short the previous interview was,

Difford says dryly, "We et him alive."

MR&M: Squeeze has had co-producing credit on three out of five albums: *Cool For Cats* and *Argybargy*, produced with John Wood; and now *Sweets*, with McDonald. John Cale produced *U.K. Squeeze*; and Roger Bechirian and Elvis Costello produced *East Side Story*. What's the relationship you've had with your producers? Have any influences rubbed off? Have you noticed any specific differences?

CD: Tightness in buying drinks. [Difford and Tilbrook burst into laughter] John Wood, I think, was the tightest. Tighter than Phil McDonald. Phil was more open with the old Italian meals. He scores a few points on food.

GT: Whereas Elvis was very free with the salads in the studio. We were eating salads all the time we were making *East Side Story*.

CD: Yeah, it was a vegetation album.

GT: The last one we were into heavy Italian, fish & chips and pints of beer... Hah! What was the question?

MR&M: Besides tightness in buying drinks... and food, what other influences have rubbed off on you from your producers?

CD: Definitely not dress sense... [They laugh again] Nothing's rubbed off on us—a sense of humor, I think.

MR&M: You had that to begin with.

CD: Yeah, it's true.

MR&M: Do you think that's been a valuable asset?

CD: Yeah. I think on the humor level Phil was a little bit more funny than John Wood.

GT: John Wood was a slightly drier character. [Chris cracks up] Phil would go for the guffaw, or the raspberry.



CD: The odd slap on the wrist with the ruler was John Wood's thing as well, he was very good at that.

GT: Don't touch!

MR&M: But do you think, when people talk about a "Squeeze sound," they're referring to your work with John Wood? For example, I've heard people say that while "Points Of View," on *Sweets*, sounds like a Squeeze song. "I Can't Hold On" doesn't. I think songs that sound like Squeeze songs are the ones where the band's playing and one of you two are singing.

GT: Yeah. I think there seems to be three schools of thought about that. Some people think of the sound we had on *Cool For Cats* and *Argybargy* as being the Squeeze sound from which we've strayed as of late, and other people think that the sound we got on *East Side Story* and *Sweets From A Stranger* is the Squeeze sound that hadn't fully developed on the other albums. Some people just like 'em all. That's the third school.

CD: There was no fourth school. We couldn't afford it.

MR&M: How involved are you in the mixing of albums?

GT: Very involved, actually. Mostly, the band produces as far as the arrangements and the recording of the songs, and I think it's fair to say, especially on the last album, that it was Chris and myself, with Phil, who were responsible for the mixing. Mainly because if you've got five people chipping in opinions then you can't actually get any finished concept across of what a song should be.

MR&M: An outside producer would help with that, too, wouldn't he?

GT: If you've got an outside producer then you leave it to someone else. That's where either the happiness or the unhappiness comes in with producers. Either you like their idea of the band or you don't.

MR&M: So you seem to have found a happy medium in co-producing.

GT: Yeah, but I think there will always be, within Squeeze, a change between having producers and co-producers 'cause I think it's an interesting and varied way to work—to never establish an actual sound for the band besides the sound that we have when we play together anyway.

MR&M: Squeeze's experimentation with different styles seems to have started with *East Side Story*, songs like "Labelled With Love" or "Vanity Fair." Was that an Elvis Costello influence?

CD: No, I think if you were to look at

our songs before we had a record contract you'd find that we were as diverse then as we are now, to some degree.

GT: I think the thing that did change, though, was the courage of our convictions to *do* the different sorts of songs that we've always been writing. We used to do lots and lots of different songs about six or seven years ago, but because there was no reference point from which we could branch out, no one knew exactly what to make of us at all, playing five or six different types of songs in a set. People would just be very confused. So we narrowed it down and sort of started again, then branched out, so people could see a recognizable pattern of development.

CD: How many people really take it that seriously? I'm not sure that there *are* that many. I think it's only the newspapers and the record companies that want to analyze the group's work or the group's sound, which is fair enough 'cause that's the business that they're in. But I think you find that the general public doesn't give a toss about it, really. Most of the people that go to work in offices, the young people, say, who know of Squeeze, know of us through listening to the radio and perhaps buying our record and perhaps liking this track or that track. But I think if they like what they hear, they buy it, whatever sound it is.



MR&M: Another factor contributing to the various changes in sound might be the various changes in keyboard players. Starting with Jools Holland. Why did he leave?

CD: Why did the chicken cross the road? 'Cause he wanted to form his own band, you know, simple. There was a big change coming in the band—the Wind Of Change, as it's so often quoted—the tides were about to turn, we were about to leave management and all sorts of things were going on. I think Julian saw that as an apt time to go off and strut his own stuff, to quote Shakespeare. So he did, and I think it's a jolly good show, too, 'cause I think he's enjoying it more. We were obviously shocked and angered by him leaving, at first, and then I think we immediately said right, let's club together and get another keyboard player.

MR&M: And that was Paul Carrack,

who didn't last too long.

CD: I think I'm sure why he left. Again, there was another wind of change, change of management and things, and there was a lot of decision-making to be made within the band. I don't think Paul really felt that he'd been in the band long enough to make any of those decisions with the band, and he never really felt accepted into our home, as it were. So it was quite right of him to leave, and I'm quite pleased that he left then, of all times, although I do miss his voice a lot, and his personality was pretty strong, which was nice. I'll tell you what I really think—perhaps it is gonna rain tomorrow.

GT: That's what he *really* thinks! [Laughs]

MR&M: And everything is working out well with Don Snow, then?

GT: [Sighs] Aside from his being a bit too tall. You can't have everything.

Snow's old band, the Sinceros, was on the road to its eventual dissolution when Holland left, and by the time Carrack departed he was free to audition, and got the job, height and all.

MR&M: Do you have a hard time staying away from the old arrangements?

Don Snow: If something's been written, and works, and I can't necessarily think of something that's better—and also, people expect that—I play that. Unless you think of something really stunning, something that's completely different, and you desperately want to assert your own style, I don't think it's necessary to change.

MR&M: Don, how do you see the difference in your sound and that of your predecessors?

DS: Well, I think Jools Holland was basically a piano player; Paul Carrack was basically a piano and organ player; and although I was schooled on piano, I'm basically a synth player. I think that's what my forte is, getting different sounds and using a synthesizer "live." The organ's probably the most difficult thing for me to get used to, because I used to sell them, horrendous home organs, had to play "Spanish Eyes" and all that crap. That really put a slant on organs which has taken me a long time to get out of. I used to *hate* the thought of playing one. I also think that Jools and Paul are definitely more rock and roll keyboard players than I am. I don't know about Paul, but I don't think Jools was classically trained. I had four years of

classical tuition which *definitely* comes out in the playing.

The gear that I'm using is different as well. The piano's the same; they've always used a sort of Yamaha Electric Grand Piano [CP 80], apart from when they first started. I've only just got a Korg organ [CX3]. I think Paul used a real Hammond; Jools probably did as well. And the synths—I've got an [Oberheim] OBXA, which is sort of one of the new breed, and has got a very fat sound. Paul used the [Sequential Circuits] Prophet, which has a lot thinner sound.

CD: I have a guitar with a violin-shaped head, made by Danny Ferring-ton in Los Angeles, that I play on stage. In the studio I use varying different guitars, but on the last album I used a hand-built Charvell, also out of Los Angeles [San Dimas, Ca.]. And that belongs to Glenn.

GT: [Laughs] I was told they make guitars for Van Halen. If I would have known that before I wouldn't have ordered it. I use Fender Strats on stage, and in studio I use mostly a Strat. I've got a '54 Telecaster, which was a gift from Elvis Costello—I've always wanted to say something like that in a music magazine—which is a really great guitar. I use that sometimes, and a Gibson semi-acoustic, ES 125, which is good for bluesy stuff, like "When The Hangover Strikes."

MR&M: What about amps?

CD: [Laughs] Boogie. I hate saying it, though. I've got a Boogie amplifier and a Boogie extension speaker cabinet. I use them at all times, except when I'm in the studio, when I get the biggest...

GT: Marshall stack you've ever seen.

CD: No, no, I like to try out different combinations on different songs. On "Out Of Touch," for instance, was a Fender Twin for most of the song, but some of the drop-ins [overdubs] I did were on the Boogie amplifier. [Laughs] So it's a bit like throwing paint at the wall and seeing if it'll stick. Of course no one can ever tell because your amp's always in a booth, you see, so you sneak 'em out the back and put other ones in.

MR&M: So changing amps is your idea?

GT: Yeah, he's always fiddling about with things.

CD: I like fiddling with knobs all the time.

MR&M: Frustrated engineer?

CD: No, not at all. Frustrated airline pilot, I should think... [Makes whooshing airplane sound]

MR&M: Glenn?

GT: I use a Boogie amplifier as well, put through an old Marshall cabinet, on stage and in the studio, although in the studio sometimes I use just the [self-contained] Boogie amp.

MR&M: Do you use any effects on-stage?

CD: After shave.

MR&M: Not exactly a technically-oriented band, are you?

CD: No, we're not exactly Pink Floyd when it comes to playing on stage.

MR&M: You didn't bring your inflatable pig...

GT: No, we left that at home for this tour. Put it out in the garden.

CD: We brought the inflatable Jools Holland...

MR&M: Is there more touring for you in the near future?

CD: Europe in September. But what we're going to try and do, as soon as this tour's ended, is go home, have a day or two off, then have a day in the rehearsal room, a day in the studio and get a single ready for September, if we can. Heaven help us.

MR&M: Who are you going into the studio with?

CD: Well, a few names have been bandied about—Ronald Reagan, the Pope, Margaret Thatcher—but we've turned them all down.



ADDITIONAL STAGE & STUDIO EQUIPMENT

Effects: Yamaha E1010 analog delay
Roland 201 Space echo

Drums: Ludwig "Optiplus" kit
3 rack toms—8, 10, 12 inch
1 floor tom—18 inch
1 bass drum—22 inch
1 snare drum—14 inch
1 Chinese cymbal—22 inch
1 splash cymbal—8 inch
1 bell cymbal—8 inch
Rogers hi-hat stand w/14"
Zildjian cymbals
Various crash, ride cymbals
Ludwig "Speed King" pedal
Simmons 5 drum synthesizer

Bass: Fender "Showman" amp
Fender 2 x 15 bass cabinet
Kramer bass guitar
Rickenbacker bass guitar
Fender "Jazz" bass

PROFILE: BRIAN ENO



By Gene Kalbacher

In a way, we're all slaves to time and space.

The quality of our lives is determined as much by when and where we live our lives as by how we do it. We are products of our environment and our age. And for the artist, these limitations are especially acute.

To create enduring art, the artist, in the here and now, must transcend temporal and spatial restraints. If Brian Eno has not already done so—and his music leads one to believe he has—then he is on the way.

Born in 1948, Brian Eno has come a long way—and, one might say, a long time—since his formative years in East Anglia, England. In 1971, following fine-arts studies at the Ipswich and Winchester Art Schools, he teamed up with Brian Ferry in the group Roxy Music. A group which many feel helped to usher in the “art-rock” movement.

A rift with Ferry during the recording of Roxy's second LP, For Your Pleasure, in 1973 hastened Eno's departure, whereupon he collaborated with Robert Fripp for No Pussyfootin', the first of several projects he

would undertake with the King Crimson guitarist. Eno's own first solo LP, Here Come the Warm Jets, released in 1974, set the stage for a series of solo albums demonstrating that if the then-long-haired Eno wasn't ahead of his time, then surely record-buyers were behind theirs.

The next year, just as record-buyers and radio stations were getting hip to his heavily synthesized, high-tech music, he shifted gears, scrapping song structures almost entirely in favor of what he called “discreet” and then “ambient” music. In the process, he formed Obscure Records in 1975 and, three years later, Ambient Records.

While continuing his experiments with environmental music (his Music for Airports was heard in airports from New York to Minneapolis), he found the common denominator between the progressive and the regressive, between Western post-industrialism and African pan-tribalism: His production on No New York, a collection of raw tunes from the likes of the Contortions and Teenage Jesus & the Jerks, earned

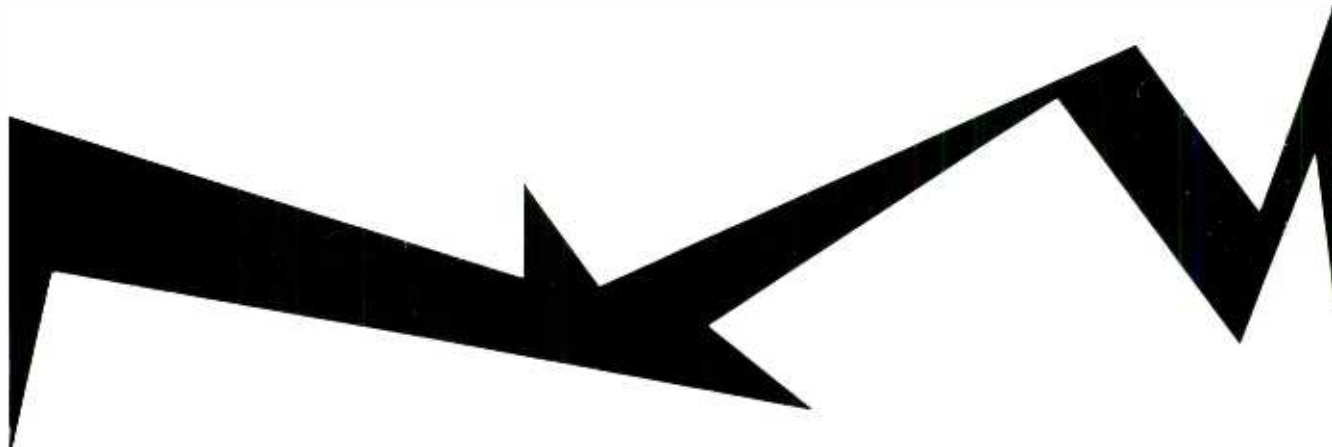
plaudits from the punks; his latter-period work with the Talking Heads (*Remain in Light* and, with David Byrne, *My Life in the Bush of Ghosts*) stretched the boundaries of both time and space, juxtaposing the primeval rhythmic essence of the so-called Dark Continent with the modernistic techno-pop of the West.

Through it all, including collaborations with David Bowie, Devo, Ultravox and others, time and space have been Eno's constant variables. For the following interview, conducted in the semi-Victorian conference room of EG Records in Manhattan, the songwriter-musician-producer wore a blue-gray button-down workshirt over plain gray trousers.

Although he is certainly a fusionist of the first order, a musician who somehow marries seemingly incompatible partners, a painter whose visual acuity matches his

musical sensibility, Eno emerges as a paradox: For an artist who often works alone, and does so by choice, he achieved perhaps his greatest success as a "member" of the Talking Heads collective; in 1975, when his solo albums were beginning to gain acceptance in the marketplace, he turned to highly experimental, and commercially risky, environmental music; this past year, while producing his fourth and latest ambient project, *Ambient #4 on Land*, he turned to early rock and roll artists for inspiration.

On the surface, it doesn't make sense. In conversation, however, Brian Eno unscrambles these enigmas as he discusses the uses and abuses of music. The interview begins, appropriately, with Eno explaining why his ambient pieces take such a long time to materialize.



Brian Eno: These pieces take a long, long time for digestion. They're not fast pieces to do, because they don't have a format like an ordinary song or like anything else I've heard.

Modern Recording & Music: You mention in the essay accompanying *Ambient #4 on Land* that the form and direction of the pieces took shape after you'd been working on them for some time.

BE: That's right. In fact, they really do require time more than anything else. The way most of these things have worked is that they get a few hours of intense work, sometimes a couple of days; then they sit around for three or four months, and I listen to them again and again; then they get another spurt of work, then lots of listening again. Sometimes they'll be mixed differently. More listening. It seems to take a long, long time before I even know what they're about.

MR&M: Does this hold true for most of your recordings, or just particularly for the ambient works?

BE: For the ambient music. Particularly for this record, actually. It doesn't even hold true so much for the other ambient things. But with each of these [ambient records], they all begin from something rather mysterious anyway. They don't begin from, "Oh,

this is a nice tune" or "I like this rhythm" or "I've got this lyric," which other pieces might begin from. But they begin from a fascination with a detail of something.

MR&M: Can you give me an example of such a detail?

BE: Yes. In the piece called "The Lost Day" on the new record, far in the distance there's this little bell sound. It's not really a bell; it's actually the sound from a Fender Rhodes piano played very, very quietly so that you only get the partials and harmonics as the tine of whatever it is hits the string. It doesn't hit hard enough to make the note itself. It's like the upper harmonics of a note. And I was fascinated by this sound. Every time I heard it, it had a pull on me that I couldn't explain.

I went into this piece and I kept trying to put things with it that amplified that feeling or seemed to develop that feeling. Of course, most of the things cancelled it in some way. Gradually, after a lot of work, I built on some things I thought worked with that quality, and it seemed to identify a particular time and place to me. I didn't know why and I didn't know whether any of those sounds were figurative in the sense of being actual copies or references to real sounds.

I went home at Christmas to visit my

parents. I went for a walk on Christmas day, a windy day. They live on a river [Deben]. And as I was walking I heard this sound—it was actually the sound of the metal guy wires banging against the masts of the yachts. They have metal masts on yachts, and this sound was so identical. I suddenly realized where I got this sound [on the Fender Rhodes] from.

MR&M: You'd heard this sound as a youngster?

BE: Oh, yes.

MR&M: And this was the time and place that came back to you.

BE: That's right. That's why I called it "The Lost Day." I seem to remember from this piece a day, a particular time and a particular place in my childhood, and in fact, it was that river, but it was on the other side of that river. It's a fairly small river, but at the point of the town I lived in, it's very broad indeed. It sort of opens into a large harbor.

Throughout my childhood it was an evocative place for me. It was always empty, so whenever you went there, you were lonely. I got to like that feeling rather a lot.

A friend of mine was explaining something to me last night, which I thought was interesting. Did you ever

see *Close Encounters of the Third Kind*?

MR&M: Yes.

BE: Remember where Richard Dreyfuss got fascinated by that shape, the shape of a mountain? He kept seeing it and making it everywhere. That's how it is sometimes [for me].

MR&M: With a sound or a visual correlate?

BE: With a sound and the visual. With the idea of a psychic condition, of a mental place where I want to be. Particularly with a sound, I sometimes will get fascinated by the idea of sound, and I'll hear hints of it in lots and lots of things. Recently I've been hearing it most in street noise, funny enough.

I live quite high on a building, and I've been making lots of recordings of the street downstairs. And then I'll take the recordings into my room and listen to them. There's something about that quality that I find really interesting.

When I was in Canada last week, I started recording. We set up a system where we'd have a microphone stuck in the end of a long resonant tube [*draws in his notebook*]. You know those plastic tubes people spin 'round to make musical notes with? Have you ever seen those? Well, I used them to make this record. Now I've started doing something else with them.

I'd stick this out of the back door of the studio so that it was recording street sounds. Of course, since it's a tube, it resonates at a particular frequency. It picks out or amplifies [a particular note]. In this case, it was G sharp and anything that is related to G sharp. It gives that seashell effect to everything, but with a very strong frequency.

I was working with two or three of these, actually, tuned to a chord. Then I was putting them on three tracks of the 24-track. So I was recording street noises but they were being made musical through this. There was some gravel near the door, and occasionally cars crossed this gravel. You'd hear this crackle, but the crackle *pings* at these frequencies.

MR&M: How was that recording similar to your recording in the African desert, picking up the sounds of insects and frogs, for *Ambient #4*?

BE: It's a similar feeling, but it's something people consistently fail to understand. There's a difference between sitting and listening to something, just like we're listening now, and actually putting that thing in a frame of some kind: like putting on

headphones, pointing the mic in a particular direction...and actually listening to it as though this is a musical event, as though things relate to one another or have the potential of relating in an interesting way....

If you take a photograph of something, you don't take a photograph of everything you can see. You make a selection and you put a frame on it. When you frame something, you do something very distinct to it—you separate it from the rest of the world and you say, "This deserves special attention" or "I'm giving this special attention."

Since I did that [in Africa], I've been doing that a lot. [*Laughs*] I often put my headphones on and sit on the roof and record, and then take it in.

MR&M: Is this a recent development? As a youngster in England, did you ever just sit down and listen to the street or the river as a "musical event?"

BE: Well, I didn't very much....

MR&M: Or maybe you did, and simply didn't realize it, as with the sound of the metal masts.

BE: That's right. I must've been quite aware of what was going on. That mast thing isn't the only incident of connecting with a distant, childhood sound. But it was never something I consciously did. I wish I could honestly say that I had. In fact, most of the time I lived in the country, I was completely oblivious to it. I lived in one of the loveliest parts of England, and it really meant nothing to me. I enjoyed it but I didn't particularly think, "Wow! I'm in the country. What a great place! Aren't I lucky to be here."

In fact, a lot of the time I felt, "I wish I lived in London, where all these things are going on." It wasn't until I had lived away from the country for quite a long time that I realized my soul was definitely there. I always will have a feeling for enjoying a kind of loneliness, a kind of melancholy which belongs to that part of the country in particular. I'm finding myself happiest—and most productive as well—with a very slow pace of things.

* * *

MR&M: How does that feeling relate, if at all, Brian, to your choice of recording studios?

BE: Very strongly, indeed. For some time I've been working, almost exclusively, in this studio in Canada called Grant Avenue. There are two strong reasons for working there: One is that I never feel I'm in a hurry there. I don't feel lazy, either. You never feel lazy in

a studio because you can't ignore the fact that you have booked that time, and that's a specific frame in which to do something. It's not like sitting home and thinking, "Maybe I will and maybe I won't." It's a fact of discipline, which I enjoy. And the studio never gives the impression of being in a hurry or of you being just another client.

The other thing is that I always work with the same engineer there, Dan Lanois, who is an extremely nice and very unneurotic and interested type of person.

MR&M: Does he also project an unhurried attitude?

BE: It's genuine. He really is interested in making the situation so that he can enjoy it. That's what I like. He's not a passive engineer at all.

If I'm sitting out there working on something, he'll be working in there [control room], with all the various devices of the studio, and coming up with sounds. So we really generate things together. It's not that I tell him what to do. It really works both ways; he often tells me what to do.

We'll always be working on a sound together. I was working a lot with the piano, for instance, in the last few days, and trying to get particular harmonics to come out. I was doing that by damping the strings at particular points and then using the tube microphone. Of course, the tube will resonate at a particular frequency. I would find that harmonic, that corresponding harmonic on the string, and as I was doing this, he was in the control room working with resonant filters and various digital time-distortion devices, which would amplify the effect I was getting out there.

At a certain point, we hit a sound together. So I enjoy working with him because, on the one hand, he's discreet enough to desist if he sees I'm on to something. He's not always trying to say, "Why don't you try this?" One doesn't always want to be presented with infinite options at every time. But on the other hand, he's just interested enough in the project, from his point of view, to be constantly experimenting and showing other options at the time that you want to see some. Not when you don't want to see them.

MR&M: It must take a lot of empathy on his part to know when to present the options, and when not to.

BE: Yes. We've had a good working relationship. The first thing we worked on was the Harold Budd record, the second ambient album [*The Plateaux*

of *Mirror*]. And he really enjoyed that record a lot. He [Lanois] is a musician himself, and his own tastes have been tending more and more in that direction.

MR&M: What was the impetus behind your decision on *Ambient #4* that anything you recorded must appear on the record in some form?

BE: I've been listening to a lot of old 50s songs recently—recordings of old Bo Diddley, Arthur Crudup, early James Brown—and wondering why those records are so exciting. I suddenly realized that one of the reasons is because the musicians knew they were in a position where they couldn't retract what they did. Contemporary musicians don't have that constraint anymore. Like I said in this thing [the essay], you can erase anything.

MR&M: A fairly recent example is Fleetwood Mac spending a million dollars to record *Tusk*.

BE: That's right. You can fix anything... This is a freedom and it can be used well, but it's also a way of fooling yourself. If you listen to those James Brown records, they have a kind of messiness which would be intolerable to most musicians today. But concomitant with that, they have a real *charge* of hearing people doing something for real. They knew this was it; this was what they were going to be stuck with for years. I find it very exciting now to be in a position where, before I do a take, I say to myself, "This is the take; this isn't a rehearsal for it."

MR&M: Would you rehearse in advance before this take?

BE: Well, I do now. I never used to before, you see. Now I think about it quite hard. It's given me quite a different attitude toward working.

I used to work like most musicians do in the studio—continuously. I'd sling things on to the tracks continuously, as if it were wasting time to sit down and think about things for a while. Just put it on, put it on, put it on, and at the end of the day seeing what you've got.

MR&M: Was it the feeling that because you had, say, 24 tracks at your disposal, you had to fill them all up?

BE: That's right. Of course, the result is that you get a lot of rather halfhearted things on the tracks. You can go in, polish them up, and make them sound like they're convincing. But there really is something different about it....

I've been in studios where a musician, for instance, would play a rhythm guitar part. He'd say, "I've got an idea for a part," and at that moment he was excited about it. He would play it, and it would have all sorts of imperfections; he

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would suddenly think of a variation on it halfway through that was a little bit better. So having heard that back, he'd say, "Yeah, that variation is good. I'll do that all the way through." So he'd go out and do it again.

As far as you could tell, his playing was identical. But something was lost there, and it's not something one just suspects. I'm sure it's true. Something has been lost. There's a kind of tension, even down to microscopic things like the tentativeness or certainty with which he hits a string. I'm sure that makes an acoustic difference to what happens. So I'm more and more preferring to move into a position of fooling myself, in a way, that what I'm doing is not a retractable statement. It's because of my influence from paintings more than anything else. I look at paintings a lot.

MR&M: I suspected as much. That's why I brought along Miles Davis's 1958 album *Kind of Blue*. On the liner notes, the late pianist Bill Evans writes: "There is a Japanese visual art in which the artist is forced to be spontaneous. He must paint on a thin stretched parchment with a special brush and black water paint in such a way that an unnatural or interrupted stroke will destroy the line or break through the parchment. Erasures or changes are impossible."

BE: That's very similar to what I mean. I'll tell you another thing. There's a book called, I think, *The Theory of Japanese Painting*. And it says, "As the brush moves, so the spirit moves." I like that idea very much because the two things trigger each other. It's not just spirit moves the brush; it's brush moves spirit as well. I like that idea.

MR&M: Brian, is there not an art term called *Pentimento*? I believe the term involves the process wherein a painter will start an image, have second thoughts, and then paint over the first impression. And when one looks at the finished work, the original impression is visible underneath.

BE: That's right. I like that very much. In any piece, I love to see its history written in there as well. I like to see some of the earlier decisions. Instead of seeing a thing at one moment in time, like a snapshot, you're seeing like a tunnel in time; you're seeing it having progressed through a period. One of the reasons I love the painter Michael Chandler's work so much is because he works in such a way to deliberately build those "facts" into a piece. His works take *years* to do. They're very small things, mostly...and he'll work on them for years. And the final picture or

image—they're sort of semi-three-dimensional—has within it all these nuances of other ways of approaching that position. So you get the thing itself and then all the theories he had about it in the meantime.

MR&M: I've long been impressed, Brian, by your album cover art. Are these covers, and the work you've been showing me in your notebook this morning, traceable to your fine art studies at the Ipswich and Winchester Art Schools?

BE: I think in diagrams a lot, that's for sure. For me, a diagram is worth a thousand words. What's interesting about a diagram is that you make a little picture that is an attempt to structure some idea you have. And then you find that the picture actually tells you more than you knew beforehand. It leads you to another idea. This book is full of diagrams, and I use them all the time as a way of advancing.

One of the reasons I feel attracted to painters is because they also work alone. I work in a rather similar way. A painter is alone with his work, and mostly I am too, on my own records anyway...I work in a completely empirical way, an almost completely empirical way. I put something down and then I try something else with it, then I shift the first thing around a little bit. I really see it as if I'm doing it with my hands. I move this, and then I find that for this to be strong, it has to have a certain color behind it.

I think a lot in terms of color of sound. I've always been moved by the moment when a piece suddenly has a geography to it. I suddenly feel that this piece is located somewhere. This is funny, Michael, the painter, says he suddenly feels moved when the piece has a *sound* to it [*Laughs*], so he's working the other way around. Peter Schmidt, the painter, who never knew Michael or anything, used to say exactly the same thing. He said there's a certain moment in a piece when it has a *sound*, and then you know you're on the right track. Before that, you're sort of enthusiastically experimenting. You're moving things around, but there's a certain way they'll click. I've got the place, they've got the sound.

* * *

MR&M: Turning back to ambient music, Brian, what distinction do you make between ambient music and discreet music?

BE: "Discreet/Music" was really the title of that particular piece.

MR&M: So it isn't a generic form.

BE: No, it wasn't. I'd had an accident,

where I got this scar across the top of my head—I was hit by a taxi. And I was laying in bed—I couldn't move—and a friend of mine came to visit me. (And when a friend left, I used to ask, "Would you put a record on for me?") She brought me a record of virtuoso harp music. Not something I would naturally have bought myself. She put it on the record player and then left.

It turned out that my stereo was really flaky at the time. [*Laughs*] One channel didn't work. It was a very quiet record. I could scarcely hear it, and it was raining outside. So just the very loudest parts of this music I could hear. At first I was annoyed, I wished I could turn it up, and then I started to drift off into this sound. I thought, "This fits so beautifully with the rain." It's like you've slightly tuned some of the raindrops, or something like that. Just these little plucks of the harp at its loudest. I thought, "This is a kind of music that ought to exist."

MR&M: So you weren't hearing all of the music. Just certain passages.

BE: Not at all. I thought of it afterwards. In fact, I wrote a piece when I was in art school called "Icebergs," which was very much the same idea. Just occasional pieces would surface from your threshold of audibility. Like icebergs—nine-tenths of an iceberg is under the water.

I liked the idea very much of making a piece of music where quite a lot was deliberately hidden, or was allowed to be obscured. The phrase I used to describe this type of music was "discreet music."

MR&M: When you first started your ambient projects, did the lingering stigma against Muzak give you pause? Serious listeners and critics often dismiss a piece of music as Muzak. Did that sensibility make you think twice before embarking on the project?

BE: Sure, I had two stigmas to work against, actually. One was that criticism, which I also felt myself. It's not as if it was just a bunch of critics saying this, and I was saying, "No, I stand on my principles!" I was in doubt about it, too. Any criticism that worries you is one that you also feel could possibly be true....

The other difficulty was that my own background was from doing pop records of a particular kind, which just at that time people were beginning to like. [*Laughs*] On a large scale, people were beginning to see where they [these solo pop albums] fit into things. When they came out they were a bit left-field; I believe that's the phrase. They were odd.

But by the time I started doing

discreet music and then the ambient series, they [the pop records] were seen to sit nicely in the development of a kind of music that was on the radio stations at the time. At the point I was getting some real encouragement for doing it, I was abandoning it. And the same people who were encouraging me were saying, "But why can't you write some songs? This other stuff is all right, but why can't you do some songs?" That was just about the time I was losing confidence with songs.

MR&M: What time frame are you speaking of?

BE: Actually from 1975 onwards. After *Another Green World*. Even on that record, there's a very strong drift—more than half of the pieces are instrumentals.

MR&M: Traces of your eventual landscape concept can be discerned on that album.

BE: That's right. And it's obviously getting very strong there. In that sense, *Before and After Science* was a kind of regressive record. I don't dislike it by any means, but it was me thinking, "Christ, maybe I should write some songs." In a way, it was artificial for that reason. It was made for some rather peculiar reasons—wondering whether I still had it in me.

One of the things going on there was the development of age, where you start to let go of that adolescent excitement and manic panic [Laughs] type of thing, and you naturally tend to be interested in things that are slower, that move a different part of you. I don't say more profound, but they move you in a different part of your being. This is a frightening process because you think, "God, am I getting old? What's happened? I used to be such a wild kid, and now look what's happened. I have to think about everything I'm doing." All this self-questioning. So one is very afraid of letting go of that baggage of youth. But you have to do it. Once you've seen another direction, you can't half-embrace it. You either go with it or you don't. And I knew I was at least going to half go with it, so I had to go with it all the way.

* * *

MR&M: How much does the composing/recording/producing process for ambient music differ, if at all, from "active" music? In other words, how much does the potential function of the music—be it dancing, serious listening or the completion of some task—enter into your thinking?

BE: Well, take a particular usage: My old records had a voice in them, my

voice. And these new ones don't. Or if it is in there, it's so disguised; some of the animal noises on this new record are actually me, but it's not clearly a human voice.

As soon as you have a voice in a record, particularly if it's a single voice, you have a personality and you have a human being. It's very difficult to put that human being anywhere other than in the center of the thing. You can't treat him as incidental because you know that immediately the listener will attach to that person. So even if you stick him far away, the listeners will still be struggling to pull him forward; their perception fastens on that.

So I got into a difficulty there. I was trying to do these landscape things where things were spread and where there was a continuous gradation between the most distant and the closest.

MR&M: No background and no foreground.

BE: That's right. No strict separation. You didn't just have these things at the front [makes diagram in book] and then all that stuff at the back. You had some things that were closer than others, but there was a continuous shift out to the edges. Also, I wanted the sense that things could move within this, so they weren't in fixed positions. As soon as you have a voice, you put this thing in the middle of the piece. You can't help it. It becomes foreground. I haven't found a way of solving that problem.

Now, I think certain great singers can do this. I think Van Morrison is a great singer; he has a way of using his voice, sometimes, where you lose the sense of a personality in the voice. I didn't want a *person* in these things, really, I wanted the person in them to be the person who was listening. I didn't want them listening to me, I wanted them [listeners] to be in there listening to it.

MR&M: You wanted the listener to project himself into the music.

BE: That's right. A lot of these things have to do with the feeling of loneliness. But not as a negative type of feeling. The feeling of *aloneness*, I should say. That doesn't have quite the same pejorative sound of loneliness.

I couldn't see how you could do that if you had this other person in there. I also think about the use of certain instruments. If you have a set of instruments that are rhythmically meshed together, like in a rock song, they're naturally going to stay tight to one another; they're going to stay as a

group. Whatever else you do there, however dominant the so-called "background" is, it won't destroy the cohesiveness of that group. So, again, you'll get not in this case a person, but a group of people or a group of interactions that will occupy the foreground. I try sometimes breaking this down in various ways, like on the Talking Heads record.

MR&M: I was about to interject that this is achieved to good advantage with the Heads on *Remain in Light*.

BE: I had a particular image on that record. I imagined that you were sitting down, watching a group of people dancing around you. They were dancing in nice ways with one another, but you kept seeing through their legs out into the distance, [Laughs] so every time there was a hole in what the instruments were doing, you listened through to a distance somewhere. On that record I worked a lot with particular types of echo and so on to try to create a sense of this thing being located in a very large space.

MR&M: I can't explain why, but I get an impression of the iceberg you mentioned before.

BE: I suppose so, yes. That's right, that's right. The background is coming through as an iceberg. I never thought of it like that. But I still found it difficult; I couldn't do it like I wanted to somehow. I think this is a problem that might sort itself out in time. It's like a production problem, and like any serious production problem, it's a conceptual problem as well.

MR&M: A more mundane question. Following the release of *Remain in Light* and *My Life in the Bush of Ghosts*, the individual members of Talking Heads issued solo albums. There has been talk, speculation, that you were a divisive factor in the group. Do you have any projects in the works with the Heads?

BE: I haven't got any projects in the works with them. I don't think I'll work with them again, actually. I don't particularly want to... it's very hard to talk about things like this because they're always extremely complicated situations. It's like if somebody said, "Why did your marriage break up?" You can say, "Well, Christ, she did this." But in fact, the real reasons for something like that are extremely complicated.

MR&M: They may be symptoms rather than actual reasons...

BE: That's right. Exactly. And the difficulty with ever discussing something like this is that, first of all, your

own judgment of a situation tends to change in time, and as soon as something is printed, that's a fixed judgment. Situations where a group of people are working together are always very, very complicated, and it's extremely rare that they persist for a long time because all the members are developing. Of course, people tend not to notice in each other that they're changing; they tend to have a fixed idea of how things were when the relationship started.

Now, with all the people in that group, myself included, throughout the course of doing these projects, our actual roles were gradually changing. But they were changing within a kind of strait jacket of a given role from the early days, and this created a real tightness to the whole thing, a tense...

MR&M: However, it must be said that for a person who, admittedly, often works alone and does so by choice, you achieved a rare communality with the Heads insofar as composing, recording and, I presume, dispensing royalties.

BE: Well, the dispensing of royalties was one of the best [*Laughs*] things that I did there, I think. One of the problems in the band had been that there had been a developing difficulty of how to share royalties.

The way the band had started was rather different from the way it developed. For instance, on the last record, we all worked together in the studio. There were very few predetermined starting points, so there were very few identifiable composers. What would happen is that we would start playing in the studio, and one idea someone had would trigger a direction. I'd say, or someone else would say, "You hold onto that. We'll shift what we're doing around it." Then we'd shift and then something else would lock in. "Hold onto that for a while." Things would lock like that.

Quite often, what happened was that these early parts, though they'd been important anchors for the development of the piece, would eventually become extinct. The piece had developed to a stage later on where, in fact, these things even fought against the new shape of the piece. So we'd drop them. This created all kinds of...

MR&M: Yet these ideas provided momentum, incentive to carry on, and thus were valuable.

BE: That's right, they were evolutionary steps without which the thing could never have got to where it is. So there was a real difficulty there. Any

conventional way of dividing up royalties—saying, "You played this and here's what you did"—simply wouldn't work because many of the steps in the piece had not appeared on the final record yet were acknowledged by everyone as being important.

So my girlfriend and I came up with a system for dividing royalties, which I should tell you, because I think it's quite ingenious. Take a particular song. I would say what I thought the relative contributions of the four other members was, in terms of 100 percent. So this person 25, this person 35, this person so much, adding up to 100 percent. So I'd make a judgment on the writing of that piece as if I had nothing to do with it. I'd just work out their portions. Each person would do the same. When we totalled them up, you see, what we got was everyone's opinion of what you've done, except his or her own.

This seemed to me extremely fair. In fact, the way the royalties finally divided up, everyone was very pleased with what happened. There were minor things, like "I could've gotten a bit more for this" or "I think I got a bit too much for that," but by and large, it was, I thought, a very fair way of dividing it.

I was consequently a bit distressed [*Laughs*] when—I never saw this, I never read the press very much—someone told me that one of the Talking Heads had been saying in the press that I forced royalties out of them by threatening legal action. Anyway, I don't feel that. It seems to me like an understandable situation that will alter in time, so I don't make too many comments about it.

MR&M: Your music creates its own reality, its own view of the world, whereas most pop music is a dull reflection of the world, if that. Your music creates its own world instead of conforming to it.

BE: A friend of mine—he was a painter as well—was once asked, "Why do you paint?" He said, "One of the reasons I paint is to create a more desirable reality." This, of course, is considering: "*Oh, escapism—you're not dealing with the harsh realities of life!*" But, in fact, I thought about that quite a lot, because I thought that was a valid criticism. I think that when you make something, you offer people the choice of another way of feeling about the world...and as soon as people start practicing another way of feeling about the world, they actually *create* that world. As soon as you acknowl-

edge the possibility of a certain type of being or a certain type of environment, you create that environment, because you tend to select and nourish those facets of that environment.

MR&M: Then it becomes a matter of personal discipline. One assumes the actual behavior he wishes to achieve.

BE: Exactly. With human beings, what patterns our world is our perception of it. I had a very clear instance of this. I've always had a problem with New York because it's such a menagerie of craziness. My answer to that has been a tendency to retreat into high places—most of my apartments have been at the top of buildings.

MR&M: The pyramid theory again.

BE: [*Laughs*] Yes, that's right. I was out for a walk in Chinatown on the first sunny Saturday this year, and there was someone burning [*cooking*] [*shish*] kebabs on the corner. There was the smell of burnt meat in the air. They were sort of dwarfs; one or two of the grotesque-looking people you get in New York. I don't mean grotesque in a nasty way. There were people selling things on the street, and I suddenly thought, "*This is the Dark Ages.*" I suddenly had the feeling of being in a great medieval city, a thriving, dangerous, mixed-up and strange medieval city. Now, from the moment I had that thought, it hasn't left me. And I've enjoyed New York tremendously since then.

I like this idea of being in the Dark Ages. I walk around and look for...

MR&M: ...crumpled figures carrying bales of hay on their backs.

BE: Well, you almost do. If you look at New York though those spectacles, you suddenly see that it really is in that condition. It's a rabbit warren. There are so many things going on here.

MR&M: Music, as we've discussed, can create its own reality for the composer, musician and listener. Brian, what do you suppose your reality would be had you not become a musician?

BE: I guess I would be a painter if I weren't a musician. I think I would be making something spiritually similar—obviously not formally similar—something that was spiritually intended to put me in the same place. I sometimes think that everyone goes through life searching for a particular mental place, and this place isn't fixed—it changes throughout their life. I think artists are people who are so desperate to find this that they decide they're going to commit themselves to it and do nothing else.

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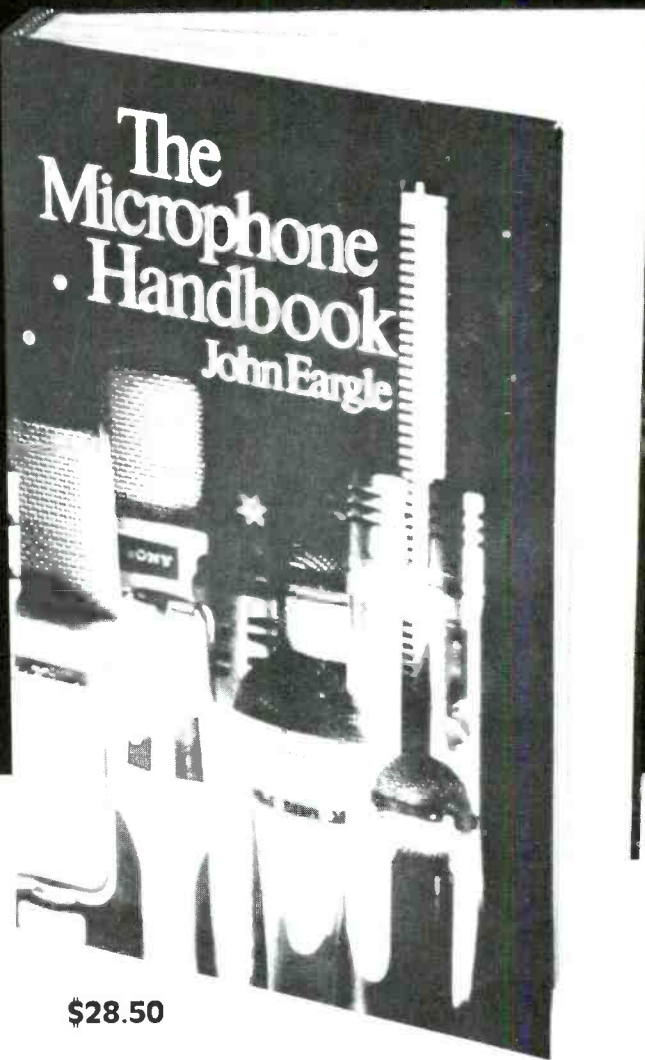
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Ambient Sound

By Len Feldman

The Audio Recording Rights Coalition

A few months ago [July 1982 issue] I discussed in this column the status of the so-called "Betamax" case. That's the one in which Universal City Studios and Walt Disney productions had sued Sony Corporation in an attempt to stop the sale of video recorders which could record movies or other copyrighted material "off the air." While Sony had won the case in a lower Federal court, which ruled that individual video recording at home for non commercial use was *not* a copyright infringement, the plaintiff in the case appealed and in a surprising move, the Ninth Circuit Court of Appeals reversed the lower court decision. That court suggested that the lower court decide how to compensate the plaintiff. Most observers and those involved in the case feel that while, theoretically at least, the sale of VCRs could be outlawed, the real purpose of the plaintiffs is to establish some kind of royalty arrangement (adding a royalty "tax" to the price of blank tape and/or the video recorders themselves) to further enrich the copyright holders, movie studios and, presumably, artists, writers, actors and everyone else involved in the original production of the copyrighted material.

Following this development, several bills were introduced in both houses of Congress, some of them designed to make it legal, once and for all, to record video programs in the privacy of one's home, providing the resultant recordings were not used for commercial gain. Lobbyists for the motion picture industry, meanwhile, succeeded in inducing various legislators to tack on amendments to these pieces of proposed legislation which would make it mandatory that royalties be paid on tape and hardware used for such recording purposes. Meanwhile, Sony continued to press its case via judicial channels and, just recently, on June 14, the U.S. Supreme Court announced that it will review the Ninth Circuit Court of Appeals decision. The Supreme Court is expected to take at least a year to come up with a final decision and, in the meantime, action via legislative means in Congress seems to be stalled.

Everybody Wants to Get in on The Act

Audio tape recorders have been marketed for approximately 30 years. For most of that time consumers have been using tape recorders in their homes for occasional taping of records and of radio broadcasts. During all of those years, the recording industry has been fully aware of this practice but has never complained. In fact, they publicly stated in a Congressional hearing in 1971 that they did not object to consumer taping, considering it to be what is called "fair use" in the Copyright laws.

Now, all of a sudden, the record industry is claiming that private taping of records is doing great injury to the recording industry because it allegedly reduces sales of prerecorded discs and tapes. RIAA (the Record Industry Association of America) now suddenly urges that this "problem" should be remedied by passage of legislation that authorizes the imposition of a royalty "tax" on the sale of *audio* recording equipment and blank tape. In other words, because business is bad, consumers should be made to pay a tax, payable to the record companies, on *all* blank tapes and audio recorders.

Facts and Fiction

I realize full well that readers of this publication fall into two categories: serious home recordists and musicians who will immediately see their "right to record" threatened by this sudden effort of the RIAA, and those who are involved in the professional, money making side of recording who may, perhaps, think that the RIAA has a good argument. Before you reach any final conclusions, though, let me state a few hard facts about the issue and at the same time dispel some of the myths that have arisen concerning this hot topic.

The record industry proposals raise several basic questions. What has really caused the decline in record sales? If it is not consumer taping, why should consumers subsidize the recording industry? Would the proposed "remedy" work? If the "cure" turns out to be worse than the "disease," why have it?

Why Are Record Sales Declining?

Between 1970 and 1978, hi-fi equipment sales rose an average of 15 to 20 percent per year. In 1979, audio recorder and record sales declined, but prerecorded tape sales increased. The greatest contributing factors to the slowdown of audio sales were the beginning of a recession and the increasing availability and popularity of competing home entertainment products such as video recorders, videodiscs, video games, personal computers and the like. As one spokesman for the newly formed Audio Recording Rights Coalition put it, "It's not consumer taping that's eating up record sales, it's Pac-Man!"

In many ways, the record industry also has hurt itself. Record companies now accept only a limited number of returns of unsold merchandise—causing retailers to buy more conservatively. Record companies have cut back severely on concert tours of their artists. They have, as most everyone knows, reduced vinyl content in records, making them flimsier and more subject to warpage.

Instead of keeping up with the times and offering high quality commercially recorded tapes as interest in tape players for the home increased, record companies released commercially recorded tapes on cheap grades of tape, rather than on the premium tapes which are the best selling blank tapes. No wonder that the public prefers to make its own tapes to insure better quality reproduction!

Finally, to make matters still worse, record companies continue to compete with each other for a few "name" stars and end up entering multi-million dollar contracts with these stars. To insure profits they must then raise the prices of records, in effect changing what used to be a "pocket money" impulse purchase into a "credit card" purchase.

Contrast these archaic business practices with the way the hi-fi component industry has faced up to the challenges of a shrinking market. When hi-fi component and compact sales dropped off 16 percent in 1979 (record sales, by the way, only fell 8 percent that year), the consumer electronics industry invested heavily in R&D and came up with exciting new products such as personal portables (Walkman, etc., etc.), portable stereos and, more recently, a wide selection of minis and mid-sized equipment. *The recording industry has yet to respond to shifts in consumer demand and taste from records to cassettes.* It still does not release all titles on commercially recorded tapes, and it still releases inferior quality cassettes.

Is Home Taping A Substitute for Buying Records?

In advancing its arguments in favor of a royalty "tax" on audio tape and audio equipment, the record industry commissioned a study by Warner Communications. In this survey people were asked such questions as how much blank tape they bought each year, how many tapes they used, how much time they spent recording, the content of the tapes they recorded and the source of the material they recorded. The facts indicate that the respondents in the Warner Survey may have exaggerated. For example, the Warner estimates of purchases of blank 8-track cartridge tapes was actually 460% greater than actual sales!

But even if we accept some of the basic findings of the Warner Study, some of the facts revealed by that study as well as facts derived from other statistical studies show that taping of records does not have anywhere near the detrimental effect on sales of records as the RIAA would have us believe. Consider the following:

The very same Warner Study found that twenty-five percent of those interviewed say they tape to *preserve their records*. More durable records would eliminate the need to tape for longevity. Furthermore, many consumers tape one song from a record, another song from another record and so forth, to put together a custom-made tape of their favorite selections. Consumers could not purchase such a "record" in any store anyway. *Indeed, the Warner Study data reveal that the average tapper spends seventy percent more on recorded music than the non-taper who buys recorded music.* A CBS survey found that at least one-fourth of records sold were purchased only *because* they could be taped. Finally, taping by those who purchase albums to make tapes for car or portable stereo use actually *boosts* record sales.

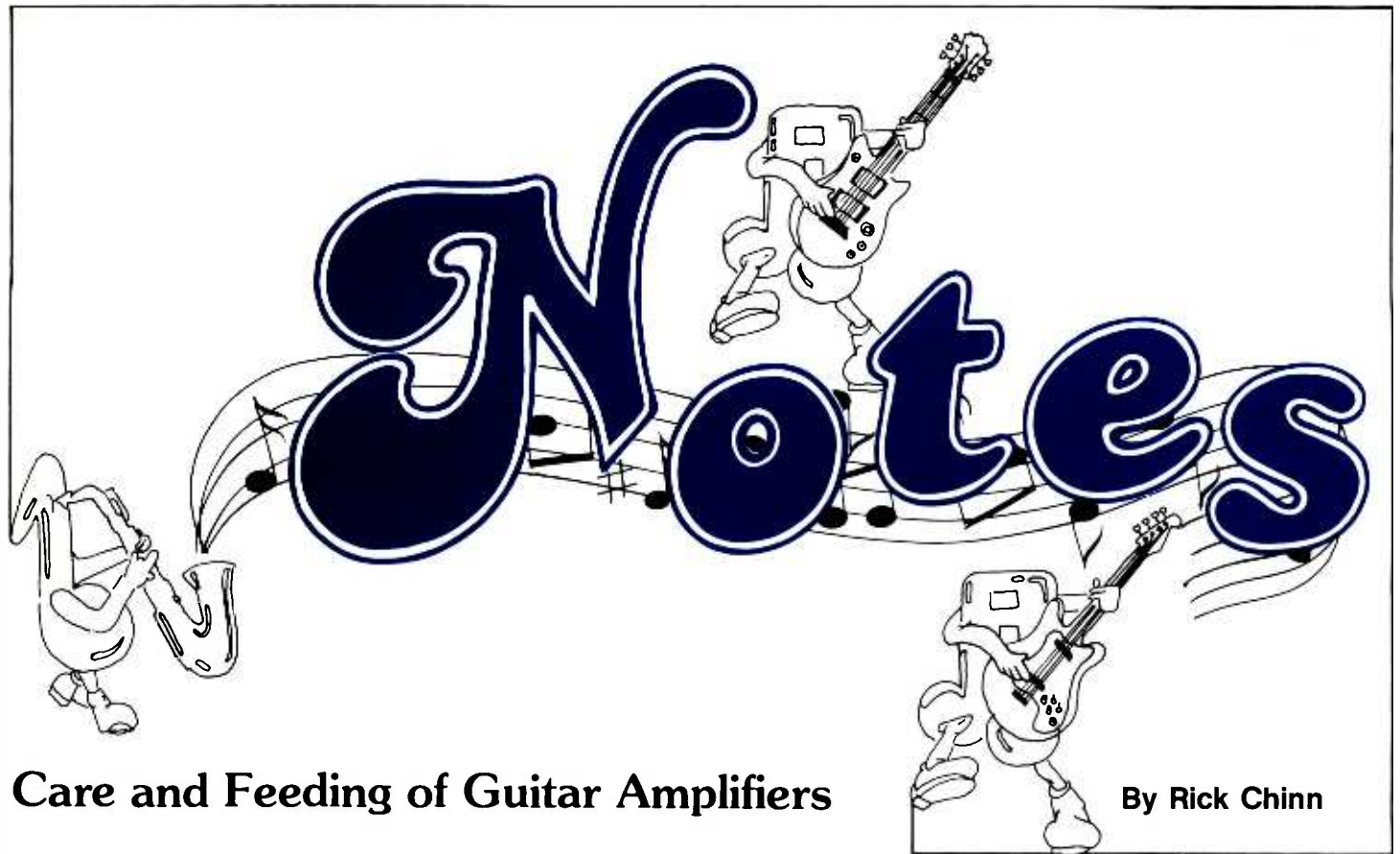
Would The Proposed "Remedy" Work?

A Copyright Royalty Tribunal study of people who own tape recorders found that 57% of respondents "do not tape music at all." Yet every one of them would have to pay the proposed tax! The same machine and the same cassette used to tape copyrighted music are regularly used for such other purposes as transcribing dictation; recording lectures; by reporters to interview their news sources; by home computer owners to store data; by almost all of us to record baby's first words; childrens' weddings and other non-music related activities. Yet, everyone would have to pay a tax on every blank tape and every tape recorder, even if they never use either of them to tape a record.

The proposed royalty tax would be virtually impossible to design and enforce and would create incentives to try to evade the tax. How, for example, would it be imposed when the recorder is just part of a total system? How could it be imposed on commercially recorded tapes which can be erased and used again?

It was all of these considerations which prompted a diverse group of manufacturers and retailers of audio recording products to form a coalition aimed at defeating proposals by the record industry to impose royalty taxes on tape recorders and blank tapes. Clearly, the record industry is trying to ride piggy-back on the video taping issue which has attracted so much attention in the press. Else why would they wait thirty years to raise this issue?

What can you do? You can, as always, make your voice heard by writing to your own Congressmen and Senators, asking them to strongly *oppose* Bill H.R. 5707 (in the House of Representatives) and Senate Amendment 1133. Tell your legislators, in your own words, that you feel that these proposals are not only inefficient, but totally unfair to the millions of Americans who tape for personal and/or business use. For more information about the Audio Recording Rights Coalition and how you can help, write to them at 2001 Eye Street, N.W., Washington, DC 20002, or phone them at (202) 457-4992.



Care and Feeding of Guitar Amplifiers

By Rick Chinn

In previous articles, we covered the various Fender amplifiers in detail [see *Notes*, the June and August 1981 issues]. In this month's column we delve into some of the *other* types in more detail. Most of this is for the technicians in the group, although there is something for everyone here. In addition, we'll discuss some of the more popular tube types found in today's and yesterday's instrument amplifiers, and some of the finer points about their care and feeding.

In the August 1981 column we talked about the ground switch found on most guitar amplifiers. Here are a couple more tips that I have found handy (perhaps even useful) through the years.

The Buck-Twenty Nine Special

Words can't over-emphasize the potential danger of the ground switch circuitry used in most amps. As previously pointed out, this danger is compounded if the third pin on the power cord is non-existent or has been cut off. My pet trick, aside from a calibrated finger (most guitar players are willing to let someone else be the guinea pig), is a \$1.29 neon bulb voltage tester.

The theory is simple: if there is enough voltage for you (a human type) to feel, then the bulb will light. All you do is touch one lead to the guitar (I use the metal

shell on the output jack) and the other to the windscreen of the microphone. If the neon lamp lights, work the ground switch, or turn the AC plug one half turn in the socket. Of course, it takes two to tangle, and the P.A. system could be at fault, especially if it has no path to good old mother earth (ground).

When the neon tester isn't checking for hot guitars, it can be used to check suspicious AC outlets to make sure they really are live before you blame your amp for being dead.

Personality Traits of Various Vacuum Tubes

Each of these tubes is as different as the strings that a guitar player might put on his instrument. Each has a particular characteristic(s) that makes it better suited for a given job than perhaps a different one. Many have similar basings (this means that the bottom pin connections are the same) and we will note this where practical.

OUTPUT TUBES: The output tubes do all the work. They convert the rather puny signal from the preamp into a powerful one that can operate a loudspeaker. Since they handle considerable amounts of power, they are also one of the more short-lived parts in any

amplifier. Heat caused by poor ventilation is another one of their enemies.

Since most of these tubes are used in pairs, a recommended practice is to carry two of whichever type is used in your amplifier. I have found it somewhat difficult to find pairs of them at the neighborhood electronic 7-11. Whatever you do, try to get the same brand, preferably at the same point in time. When and if you replace an output tube, replace in pairs (or quads) whenever possible. If the remaining tube of a pair is one or two months old, you can probably get away with only replacing one. The reason for replacing in pairs is to keep the two halves in the output stage balanced, so the signal gets equal amplification for both halves (positive and negative).

You should figure on replacing the output tubes at least once a year. This is based on a rough estimate of playing two or three nights a week and practice sessions. If you play very hard (loud) or more frequently, replacement every six months is probably in order.

When an output tube fails, it can cause any of several symptoms: instant or delayed fuse blowing, severe distortion, lack of or low output, low- or mid-frequency ringing (usually triggered by a few particular notes). If you look in the back of the amplifier and see sparks inside of the tube (try tapping on the glass envelope), or a reddish glow involving any portion of the metal inside structure (except for the central element which normally lights up) you have a potentially serious problem. Try installing the spare set of tubes. If the problem persists, you need to call the amp doctor. [See the June 1981 issue of MR&M for some additional information on tube replacement and troubleshooting.] Following is a short collection of some of the more popular types.

6L6GC: Perhaps the most popular tube used today. It is rugged and very available. Works well in most any position (remember that the Fender amps run them upside down). Similar types are the 5881 (lower power military version) and the 6L6 (metal envelope type). The 6L6GB is an earlier version.

In an emergency, you can use the 6L6GB or the 5881 for the GC version. The metal types won't take the punishment and have a lower power rating than the glass ones. They tend to get microphonic with age, especially if they run upside down (more so in single cabinet amps like the Fender Twin Reverb).

6CA7/EL34: Another very popular type. They are used in the 50 watt and 100 watt Marshall and Hi-Watt amplifiers, the Music Man amps, the 40 watt Sunn amps, and the old Vox amplifiers (recent Marshall amps use the 6550). In my experience, they do not weather abuse (dropping, heavy vibration, etc.) well. Typically, they extract their revenge by developing internal shorts (sparks inside the glass envelope).

On the positive side, they are pretty efficient, with a pair of them typically good for about 40 or 50 watts. Amplifiers that get 50 watts out of a pair run them pretty hard, and I would expect to replace them more often. The EL34 is a European number and is directly interchangeable with the 6CA7.

If your amp uses this type, I would carry enough spares to completely replace the ones used in your amplifier.

6V6GT: This is a smaller tube, used in 10 to 15 watt

'practice' amps. The Fender Princeton uses a pair of these for a 14 watt output rating. The old Leslie speakers used 4 of these. A single 6V6 will get you around 2 to 5 watts. These smaller amplifiers don't stress their components as hard so you should get fairly good life from them.

In a pinch, a 6V6 (metal envelope) will interchange directly. The 6L6GC and 5881 have the same pin basing and would probably work, although it might eat up the output or power transformer (they're expensive!) in the process. On the other hand, if the club owner is threatening you with bodily harm, this might be of no consequence.

6550/KT88: These large bottles are found in the big macho 200 watt amps like the big Marshalls, 1000 and 2000 series Sunns, and every roadies favorite back breaker—the Ampeg SVT. (Earlier SVTs used the 6146, a transmitter tube, but that is another story.) They are also used in the later (last 20 years) versions of the Leslie speaker. The McIntosh 275 and 75 used these guys also. They are big, powerful and rugged, not to mention rather expensive. You *definitely* will not find these at the electronic 7-11 on Sunday!

I consider the 6550 to be the equal of the KT88 for musical applications, although there is controversy in the hi-fi camp over this issue.

PREAMP TUBES: Most of these types have the same pin connections. This means that you can usually plug them into each other's sockets. This doesn't mean that things will necessarily work better, or worse, but it just might mean the difference between playing or sitting. I don't recommend arbitrarily substituting tubes with different numbers, but when you are in a bind, this information could be useful. 'Nuff said!

All of the following types have glass miniature 9-pin envelopes. The pins are not nearly as rugged as those on a 6L6. Sometimes, a tube will develop noise that is traceable to an ancient socket. Naturally, replacing the socket is the best cure. You can try using spray cleaner (please pick a cleaner that leaves no residue) on the pins. Sometimes you can buy some time by inserting the tube partially (tips of pins inside contacts, but before pressure or resistance is felt) into the socket and *gently* twisting slightly. If you are not gentle, the tube will probably break on you. This gives the pins a slight bend and increases the retention force inside the socket. Modifying the socket connections slightly with a small screwdriver is another good trick.

As previously mentioned, these smaller tubes are much less likely to fail. They will, however, get microphonic with advancing age. A good recommendation would be to carry one spare of each type used in your amp.

If your amplifier uses an octal (same general appearance as the bottom of one of the output tubes) based tube like the 6SL7 or 6SC7 in the preamp stages, you had better find some spares and stash them. These types are quite old and they are going to get harder and harder to find as time marches on.

12AX7/12AX7A/7025/ECC83: This is the all time standard input tube. Any of the above numbers will work for each other. My preference is European made ECC83s, but they'll all work fine. This is a high gain type and is usually used for preamp, reverb and tremolo/vibrato circuits.

12AU7/12AU7A/ECC82: This is sometimes the

last tube before the output tubes. It is also quite rare in guitar amps. Again, all the numbers are equivalent. This is a low gain type and is used where its higher power capability is needed, like driving the output tubes. In a pinch, you can put a 12AT7 into a 12AU7 socket. (*Note:* The term power here is used to describe electrical power, or watts. A good many folks have the term *power* confused with *gain*, or *amplification*. Power is electrical energy, or the ability to do work. Amplification or gain is the ability to make a small signal larger [more volts], but not necessarily more powerful [more watts].)

12AT7/12AT7A/ECC81: This is used in Fender amplifiers to drive the output tubes and to drive the reverb tank. It is a medium gain type and could be thought of as being midway between the 12AX7 and 12AU7 types. You can use a 12AU7 in an emergency.

12DW7/7247: All the preceding tubes are dual section types. This means that there are actually two amplifying elements inside a common glass bottle. Both elements are identical.

The 7247 is an oddball. One half of the tube thinks that it is a 12AX7, the other thinks it is a 12AU7. The only amplifiers that use this type (to my knowledge) are the Ampeg units. The pin basing is the same as the 12AX7, but because of the non-identical sections, I would not substitute it, except in an emergency.

12AY7/6072: This tube was used in the early Fender amplifiers for the input (preamp) tube. It is extremely quiet and optimized for low microphonics. It is expensive and somewhat hard to find now. You can use a 12AX7 in its place.

RECTIFIER TUBES: The rectifier tubes change the AC power from the wall socket and power transformer to DC (circuit current) to operate the amplifier's circuitry. All amplifiers have *rectifiers*, not all amplifiers use *rectifier tubes*.

All of the electrical power used by the amplifier passes through the rectifier circuit. If it quits, the amplifier is dead. A failure in the rectifier circuit usually means instant fuse blowing. A tinfoil 200 amp no-blow fuse (you know the ones that you are tempted to make in an emergency) installed in an amp with a rectifier problem will guarantee a blown power transformer. This means that you pay the amp doctor big bucks to resurrect your favorite amp. Carry a spare rectifier tube (if used)—it's lots cheaper than replacing power transformers.

5Y3/5Y3GT: This is an older type found in lower power amps. It is pretty reliable, even when abused. They do not like to be mounted sideways. The 5AR4 or the 5U4 can substitute for it.

5U4GB: This is also an older type. It has a higher power rating than the 5Y3 and can substitute for it in a pinch. Like the 5Y3, it is reliable but does not like to be mounted sideways. In a pinch, the 5AR4 can substitute for it and vice-versa.

5AR4/GZ34: This is a newer type. The GZ34 is an identical European type. Unfortunately, neither type is as rugged as the 5Y3 or 5U4. I don't recommend substituting either the 5Y3 or 5U4 for the 5AR4, except in an emergency. Definitely carry a spare(s).

One possible cure is replacement with a solid-state substitute. It's not quite that cut-and-dried and the filter capacitors will need to be replaced with higher voltage units. Again, this is a job for the amp doctor.

Some Specific Amplifiers

I will attempt to describe some other amplifiers that have been popular over the years. If you have a favorite that I have missed, drop me a line care of *MR&M*. If there is enough interest, we'll cover it in a future column.

Sunn: Sunn started out using a Dynaco amplifier coupled to their own preamp. These units were piggy-back types and have two chassis boxes inside. The one with two tubes is the preamp box. Both tubes are 12AX7 types. The power amplifier uses two 6550s or KT88s (output), a 6AN8 (driver), and a 5AR4 (rectifier). The power amplifier is actually a Dynaco Mark III.

Later units (100S, 200S, and other 60 watt units) have a single chassis. The tube lineup is the same, with the non-reverb units having only one 12AX7. The units with reverb have an additional 12AU7 to drive the reverb unit.

The 40 watt units use an almost identical circuit with 6CA7/EL34 output tubes and a 7199 driver. As previously mentioned, the output and rectifier tubes are the weak point of this amplifier. Carry spares!

The 120 watt units use a similar circuit to the 60 watt units. The largest differences are four 6550s and two 5AR4s.

The units with reverb and/or tremolo also use transistors for portions of the circuitry. The instrument signal, however, passes only through the tubes for amplification.

Marshall: The British-made Marshall amplifiers have circuitry that is very similar to an early Fender amplifier, the Fender single cabinet Bassman (amp and four 12-inch speakers in same box, circuit #5F6). The big differences are in the output stage.

The 50 watt units use 6CA7s. The standard caution concerning these tubes applies here. The 100W models use four 6CA7s. Later Marshall models use 6550s.

The 200 watt units use four 6550s. If you are working inside of the chassis, *beware*. There are higher than normal voltages inside (about 600V). If you get on the wrong side of this amplifier, it could be your last time! Personally, I try to keep one hand in my pocket. This helps keep your heart out of the circuit when you do get zapped.

A common output stage problem was the output tube sockets arcing over during use. This results in a conductive carbonized path across the surface of the socket. No amount of cleaning will fix it. Replace the socket with one using ceramic or steatite for the body material.

The preamp stages all use 12AX7 types.

Music Man: Leo Fender is the founder of this company. The Music Man amps have solid state, integrated circuit preamps and tube output stages. There are no user replaceable parts inside the chassis. The output tubes are the only user replaceable parts (except the fuse). 6CA7s are used for output tubes. Technicians note: The output circuit in the Music Man amps is unusual, to say the least. The output tubes operate in grounded grid configuration and the cathodes are driven by transistors. Beware.

Some models may use a 12AX7 and 6CA7s in a conventional push-pull circuit.

Ampeg: Like Fender, Ampeg has made *many* different amplifiers. One outstanding thing about Ampeg as a company is their policy of pasting a schematic to the chassis of the amplifier. This makes the schematic almost perpetually available and is a real boon if you need the amplifier repaired while you are playing in East Overshoe.

Of all the various units that come to mind, three units bear mention here. The single 15" speaker bass amp (model B15) that is popular with recording studios and jazz players, a mid-sized amplifier (VT-40) popular with guitar players and the SVT, a 300 watt brute popular with volume freaks.

The B15 is a small bass amp that originally used all octal (8 pin with a positioning keyway) tubes and 5881's for output tubes. Later ones use 9-pin miniatures for the preamp and 6L6s for the output stage.

The VT-40 guitar amplifiers used 7027 tubes for their output stages. This is similar to the familiar 6L6, but is different. The basings are different, so substitution is not possible. The output tubes are not the only unusual tubes in this amplifier. There are three other types used: 6CG7, 6K11, and 12DW7. Keep spares for the 6K11, 12DW7 and the 7027s.

The SVT is a large 300 watt piggy-back amplifier. The only clue to its portability are the handles placed on each side. Don't let the handles fool you, this thing is *heavy*. The SVT has 6 output tubes. Early ones used 6146 transmitter tubes. They can be identified by the metal caps on the top of the tube. Stay away from the caps when the amplifier is "live." There's about 700 volts on them. Later models used 6550s in the output stage. In either case, treat this amplifier with respect

(and one hand in the pocket). There is an abundant supply of high voltage inside and if you do get across it, it will wake you up, maybe even permanently.

Parting Shots


Once again, I want to emphasize the need for safety when working inside of a tube-type amplifier. Even when the unit has been turned off, there is still a shock hazard, unless *you* have personally discharged the filter capacitors. If not, there is a good chance that they can still deliver a nasty jolt.

If you work on amps with the power on—be even more careful. My comments about the 200 watt Marshall amps come from personal experience. I was lucky enough to live to write about it here. (I don't operate on Marshall amplifiers before noon anymore!)

You might want to make a chart of which tubes are used (and where) in your various pieces of equipment and keep it in a safe place (like your wallet). It's a good idea to also write down the possible substitutions for each type on the card.

The tips given on Fender amps in the two previously mentioned columns are applicable in most of the amplifiers discussed in this month's column.

One last thing. You will notice a decided scarcity of solid state amplifiers in this discussion. For a lot of reasons, there isn't much you can do when one of these guys croaks. One thing you can try is to replace the fuse with one of identical value and apply power. If the fuse quits immediately or within say 5 minutes, your amp needs a doctor.

Remember, keep those cards and letters coming! 

ALL YOU NEED IS EARS

The memoirs of modern recording genius George Martin.

George Martin is the most famous producer in the music business. Working with such diverse stars as Judy Garland, the Bee Gees, Ella Fitzgerald, Cheap Trick, and The Beatles, he has constantly set new standards for the recording industry and redefined the relationship between artist and producer.

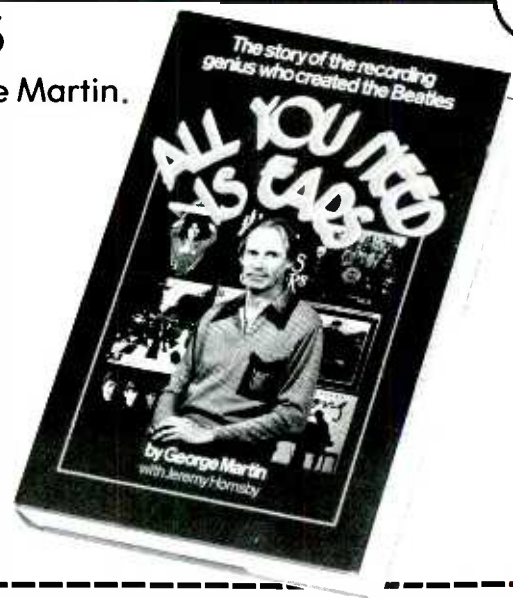
Now, in **ALL YOU NEED IS EARS**, Martin details his amazing career in the vanguard of modern recording... from the early days when wax was the medium, 78 was the speed, and an echo chamber was a small tiled room... to the advent of revolutionary digital reproduction. His vast experience makes him an expert commentator on fascinating backroom details like acoustics, arrangement, orchestration, microphone techniques, and more.

In addition, Martin offers an entertaining view of how he put together hit records, what it was like to be tapping The Beatles endless repertoire of songs, the hardship and excitement of forming his successful independent studio, AIR.

Lucid and absorbing, **ALL YOU NEED IS EARS** is nothing less than a personalized tour of the world of recorded sound.

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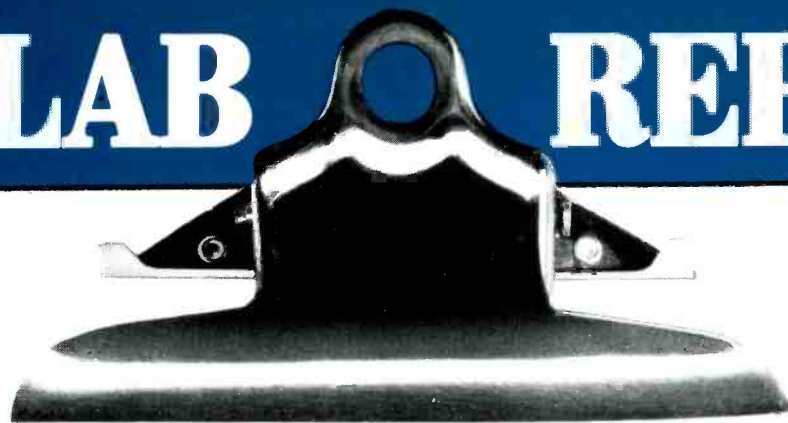
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NORMAN EISENBERG AND LEN FELDMAN

Adcom GFA-1AP Power Amplifier



General Description: Adcom's model GFA-1A power amplifier is rated for 200 watts RMS per channel into 8-ohm loads, and 340 watts RMS per channel into 4-ohm loads. Surprisingly compact for this power level capability, the amplifier contains several protection circuits in addition to a cooling fan. The fan comes on automatically at a relatively low speed when power is turned on; additionally a front-panel switch may be used to raise fan speed should it be required during commercial applications or for listening at extremely loud levels.

The front panel contains the power and fan switches plus a "normal on" indicator and two more indicators that show pre-clipping peak levels on each channel.

Inputs at the rear are 1/4-inch phone jacks. Speaker outputs are color-coded 5-way binding posts. Because of the amplifier's "balanced bridge" design, the negative terminals here are not true ground but rather represent the negative half of the signal waveform. As a result, the "minus" terminals must never be connected together. Since most speaker systems do not

require their negative terminals to be "commoned," this should pose no problem except in rare instances, in which event the user is advised to contact the manufacturer for advice. Also at the rear are the amplifier's AC power cord and line fuse.

Besides the forced-air cooling, the Adcom amplifier contains a relay protection circuit to safeguard speakers and its own circuitry from possible damage. In the event of DC subsonic frequencies appearing at the output, the amp will disconnect itself from the load and remain so until the problem has been corrected. Sudden low-frequency transients (such as those caused by a thumping muting circuit in a tuner, or by dropping a stylus onto a record, etc.) will momentarily disconnect the amplifier. Also used in the GFA-1A is a thermal cutout, as well as a low-impedance electronic sensing circuit that will limit current output into loads below 2 ohms, but without limiting current into loads of 4 ohms or higher, including reactive loads such as those presented by electrostatic speakers. At turn-on there is a delay of 3 to 5 seconds, designed to prevent turn-on transients or thumping.

The circuitry of the GFA-1A uses what Adcom calls its "balanced bridge" concept which basically consists of two high-accuracy power amps per channel, one such amp for driving the positive output terminal and the other for driving the negative output terminal. The speaker, for each channel, is actually connected across the bridge between these two power amps. Both positive and negative terminals have controlled feedback and drive networks. According to Adcom, this design approach ensures that both positive and negative waveforms, no matter how complex or unique, are fully and carefully driven under all conditions.

Test Results: Power and distortion specs for the Adcom GFA-1A were met or exceeded in our lab tests, and the unit generally produced some of the best amplifier "numbers" we have seen for a product as compact and modestly priced as this one. In listening tests, it performed as splendidly as its measurements would suggest. We paid especial attention to the fan and found that at its slow speed under normal operating conditions it was virtually inaudible. At its higher speed, of course, the fan can be heard from fairly close up, but the output signal levels that would logically be associated with the need to operate the fan at its higher speed would easily mask that noise. In sound-reinforcement or other commercial applications, simply locating the amp remotely from the audience would certainly prevent any fan noise from intruding into the sound.

Worth mentioning is Adcom's fail-safe protection system which continuously monitors temperature, current and voltage, and which will shut down the amplifier if any abnormal conditions are detected. We also found the peak indicator lights (which alert the user to near-overload conditions) to be extremely accurate and therefore quite useful.

General Info: Dimensions are 9 inches wide, 6½ inches high, 10½ inches deep. Weight is 26 pounds. Price: \$360.

Individual Comment by L.F.: Don't let the small size of the Adcom GFA-1A fool you. This little power amp delivers its full rated power and then some. At its price it is about the least expensive straight-

forward amplifier design on the market at that power level. (Don't send me letters about the so-called Magnetic Field Amplifier by Carver; I don't consider that one to be straightforward.)

Did I say "straightforward"? Well, not quite! The Adcom unit employs a rather novel arrangement circuit that amounts to two power amplifiers per channel, one of which drives the positive output while the other drives the negative. The balanced bridge arrangement (somewhat similar to what is done on most stereo amplifiers that have provision for mono bridging) is said by Adcom to eliminate many of the inherent problems of conventional amplifier designs. In the latter, says Adcom, careful attention must be paid to the positive output terminal with feedback control and compensation. The negative terminal is assumed to be a perfect ground which is not always the case. In the Adcom amp, both positive and negative outputs have controlled feedback and drive.

I really haven't had the amp long enough to confirm or contradict the advantages claimed for this design, but I did connect the amplifier to a variety of different speaker loads, and I am able to state with reasonable assurance that it will be able to drive virtually any load that is likely to be presented to it by any modern speaker system I can think of.

Our lab measurements turned out to be pretty much what you would expect from a well-designed amplifier that would be just as much "at home" in a home audio system as it would be doing heavy duty as a P.A. or sound-reinforcement amplifier. Transient response, when reproducing music, I found to be especially good. While the amplifier did not exhibit quite as much headroom as Adcom claimed (I suspect that their definition of "headroom" must differ from the "dynamic headroom" we measured in accordance with the latest EIA Amplifier Measurement Standard RS-490), there was certainly no shortage of power capability. If you want to apply crass commercial considerations in judging the worth of this fine little amplifier, consider this: Operating into 4-ohm loads with both channels driven, the Adcom GFA-1A delivers power at only about 66 cents per watt! I know of no other amplifier that does that well from a cost point of view and still sounds as good as the Adcom GFA-1A.

Individual Comment by N.E.: A surprising amount of amplifier savvy has been packed into this unit, judging from our lab test results (*see accompanying "Vital Statistics"*) and confirmed in hours of

listening to a variety of program material and with different speaker loads connected to the GFA-1A. Apparently a prime design aim with this product was to offer exceptional value in terms of performance vis-a-vis cost, and this surely has been achieved. The amp delivers its program material with consummate clarity, excellent transient response and a feeling of effortless coping with the most demanding of musical complexities. As is true of the finest of audio devices, one gets the feeling of "listening through" it back to the

source itself.

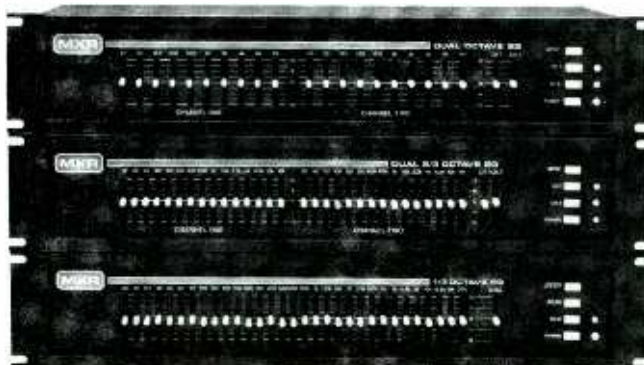
As for practical considerations in using the Adcom GFA-1A in commercial applications, on the plus side of course is its relatively small size and low weight. However, it is densely packed internally with circuit parts, and maybe for some of our readers who have to lug amps around, it would help to be able to fit the thing with handles or projecting "ears" of some kind. If that is important to you, perhaps contacting Adcom will produce a helpful hint on this.

ADCOM GFA-1A POWER AMPLIFIER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Continuous power for rated THD		
8 ohms, 1 kHz	200 watts	210 watts
4 ohms, 1 kHz	340 watts	350 watts
FTC rated power (20 Hz to 20 kHz)	200 watts	200 watts
THD at rated output		
1 kHz, 8 ohms	0.025%	0.020%
1 kHz, 4 ohms	0.025%	0.020%
20 Hz, 8 ohms	0.05%	0.03%
20 kHz, 8 ohms	0.05%	0.05%
IM distortion, rated output		
SMPTE	0.1%	0.06%
CCIF	NA	0.004%
IHF	NA	0.044%
Frequency response at 1 watt for -3 dB	1 Hz to 100 kHz	1 Hz to 80 kHz
S/N ratio re 1 watt, "A" wtd, IHF	90 dB	90 dB
S/N ratio re rated output, "A" wtd	106 dB (unwtd)	113 dB
Dynamic headroom, IHF	2.2 dB	1.02 dB
Damping factor at 50 Hz	60	50
IHF input sensitivity	NA	0.70 volt
Input sensitivity re rated output	1.5 volts	1.0 volt
Slew rate (volts/microseconds)	40	40
Power consumption, idling; maximum	100; 800 watts	83; 985 watts

CIRCLE 58 ON READER SERVICE CARD

MXR 171 Graphic Equalizer



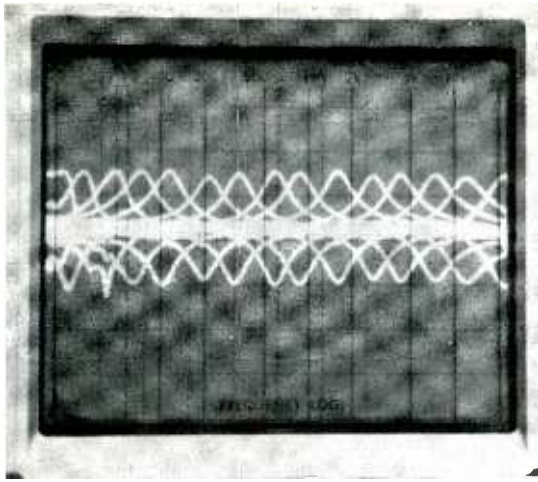


Fig. 1: MXR 171: Spectrum analyzer composite display of boost and cut range of all fifteen bands (per channel).

without matching transformers. At the same time, its 40 K ohm input impedance permits its use in unbalanced systems (e.g., small P.A. or stereo systems). The power cord is fitted with a three-prong (grounding) plug.

Test Results: Our lab tests confirmed or bettered published specs for the MXR 171. The measurements, summarized in the "Vital Statistics" table, speak for themselves. Both harmonic and IM distortion reached vanishingly low levels; noise is way down; boost and cut ranges were all as claimed. In *Fig. 1* we have plotted the complete boost and cut range for each of the fifteen controls (per channel) of the unit, over the frequency span from 20 Hz to 20k Hz. As usual, sensitivity of the display on our spectrum analyzer was 10 dB per vertical division, and the sweep is

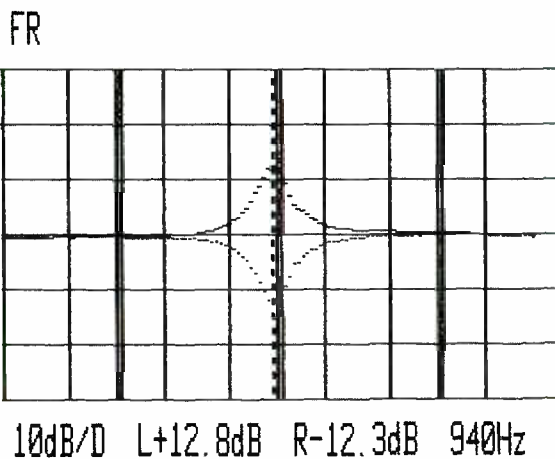


Fig. 2: MXR 171: Precision plot of boost and cut range of an individual band filter of the unit.

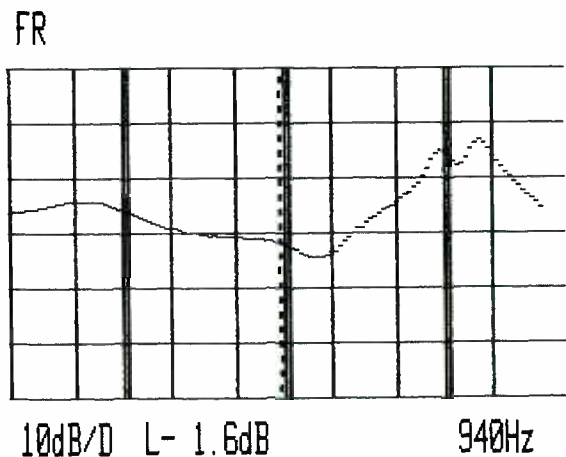


Fig. 3: MXR 171: Complex response curve created using the equalizer.

General Description: A dual 2/3-octave equalizer, the MXR model 171 offers fifteen bands of boost or cut on each of two channels. Frequency centers are 25, 40, 63, 100, 160, 250, 400, 630, 1 K, 1.6 K, 2.5 K, 4 K, 6.3 K, 10 K and 16 kHz. The range of each slider is ± 12 dB. The 0 = dB points have detents. In addition to the frequency band sliders, there are two overall gain sliders, one per channel, for use in adjusting for unity gain. Operating on both channels simultaneously is a 40-Hz switch that serves to activate an 18 dB/octave high-pass filter. Separate switches are provided for bypassing each EQ channel independently. LED's adjacent to the channel 1 and 2 switches and the power switch come on accordingly. Side pieces projecting from the panel permit standard 19-inch rack-mounting.

Phone jacks ($\frac{1}{4}$ -inch) at the rear handle either balanced or unbalanced input operation. The outputs are unbalanced, although when the equalizer is bypassed, a balanced line is maintained at the outputs. The MXR 171 is designed to work in 600-ohm systems

logarithmic in frequency (rather than linear) from left to right of the display.

The exact range of a single band control in greater detail is shown in *Fig. 2*, plotted with the aid of our Sound Technology 1500A Audio Test Instrument. Boost and cut for the particular frequency shown here were 12.8 and 12.3 dB, respectively. Note that the "Q" of each filter band, while not adjustable as it would be in a parametric equalizer, has been kept fairly sharp (i.e., bandwidth per filter is fairly narrow) which is, in our opinion, just right for an equalizer having this number of controls.

Fig. 3 shows the response we obtained by setting up an arbitrary response curve, similar to one that might be required in an actual sound-reinforcement application where a high degree of speech intelligibility would be required and where the bass was somewhat deficient. The extreme flexibility of a 15-band equalizer such as this one is clearly evident from this curve.

General Info: Dimensions are 19 inches wide; 6 $\frac{3}{8}$ inches deep; 3 $\frac{1}{2}$ inches high. Weight is 11 pounds. Price: \$375.

Individual Comment by N.E.: Apparently we have here another "cost-conscious" product in which a good deal of useful features plus fine performance are combined to make things easier or better in use. The no-fuss option for balanced or unbalanced inputs is one. The ability to interface the unit with either prototype 600-ohm lines or with the unbalanced lines found in home stereo systems is another. Probably more innovative is the ability to introduce equalization on one channel without necessarily applying it on the other channel. Yes, this can be done on any dual-channel equalizer by returning all of the band controls to their center positions for the channel in which no equalization is wanted. But then, what if you want to restore equalization to that channel and you haven't noted every control setting? In any event, what could be easier than simply touching a switch to defeat EQ on either channel independently? My only gripe here is that the LEDs for the two buttons failed to come on—probably something got loose during shipment.

You might prefer a wider excursion for the band sliders than the 1 $\frac{1}{2}$ inches of total distance provided here. If so, I think you had better be prepared to spend more for an equalizer, or settle for less versatility than offered by the MXR 171.

Individual Comment by L.F.: There are few comments one can make concerning a graphic equalizer other than the fact that it performs its job perfectly and that, with its controls set at their mid-positions, it does not introduce unwanted tonal coloration or distortion. MXR, of course, is no newcomer to this product area, having been producing

devices for both consumer and professional use for years, and have fine-tuned (sorry!) the circuitry used in its equalizers to the point where they really give no trouble at all and do the job efficiently and reliably.

The chief difference between MXR's consumer-type equalizers and those intended for professional use (other than the standard rack-mount dimensions of the pro models) is the type of input and output terminations provided. In the model 171, $\frac{1}{4}$ -inch phone jacks are used for both purposes. If a mono phone plug having only two contacts (hot and ground) is used, the input and output connections will be unbalanced, whereas if a stereo (ring-tip-sleeve) plug is used, balanced input and output connections can be achieved.

The 2/3-octave graphic equalizer turns out to be a nice compromise between an octave-by-octave unit (which, in some pro applications, may not have enough fine gradations of control), and the 1/3-octave type which could be too expensive for certain applications, or physically unwieldy when attempts are made to incorporate two channels of EQ into a single unit. In fact, MXR offers a 1/3-octave equalizer in this series of products (its model 172) but it wisely elected to build that unit as a single-channel device to keep its dimensions within bounds and to avoid front-panel crowding.

Overall, I feel that the MXR 171 is a well executed graphic equalizer that is easy to set up and easy to use effectively. The extra 40-Hz low-frequency filter is a nice addition that should be helpful in eliminating such unwanted effects as stage rumble during a performance. The relatively narrow bands of this equalizer are also narrow enough to reduce P.A. feedback (by notching out specific troublesome frequencies) without seriously affecting overall tonal balance, if that's the type of problem you are trying to solve with this equipment. Pricing of the model 171 seems more than fair.

MXR 171 GRAPHIC EQUALIZER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Maximum input level	+ 20 dBm	+ 22 dBm
Maximum output level	+ 20 dBm	+ 22 dBm
Output impedance	approx. 100 ohms	confirmed
Frequency response for - 1 dB	20 Hz to 20 kHz	confirmed
Boost and cut range per control	approx. \pm 12 dB	typ., + 12.8; - 12.3 dB
Number of bands per channel	15	confirmed
Harmonic distortion	< 0.02%	0.012% at 1 kHz
IM distortion	< 0.01%	0.004%
Equivalent input noise	- 95 dBm	- 97 dBm

CIRCLE 59 ON READER SERVICE CARD

Sennheiser UPM-550-1 Universal Level Meter



General Description: The name of Sennheiser probably is associated by most of us with microphones and headphones, although this company also makes several specialized electronic devices for commercial applications. Its new UPM 550-1 is a professional-grade precision meter whose basic function is to measure AC voltages in the frequency range from 10 Hz to 1 MHz, but this "definition" hardly describes the instrument's enormous versatility.

Actually there are two versions—the UPM 550, and the UPM 50 550-1. The latter, which offers a few additional features, is the one chosen for this report. The basic UPM 550 can be used for making measurements of:

- standard frequency response and attenuation with true RMS or peak rectification;
- signal-to-noise ratios, weighted in accordance with DIN 45405 (for studio equipment);
- signal-to-noise ratios weighted in accordance with DIN 45500 (for hi-fi equipment);
- unweighted S/N ratios in accordance with either of the above standards;
- harmonic distortion of tape recorders (the 3rd-order component above 333 Hz);
- Cross-talk and erase ratios for tape equipment (using a built-in 1 kHz filter) in accordance with DIN 45511;
- various parameters using external filters as required;
- selective voltages of very small magnitude, from about 2 microvolts and up, using the built-in 1 kHz filter;

- sound-levels in accordance with DIN 45633 using

an external calibrated microphone.

The UPM 550-1, in addition to the above, also can make direct measurements of harmonic distortion of a 1-kHz signal using its built-in 1-kHz notch filter. This version of the meter also contains an added input; input selector switching; level adjustment and associated defeat switch; and the 1-kHz filter control selector in the row of filter switches on the panel.

A large portion of the front panel is given over to the metering, a multi-purpose display with several scales calibrated in mV, dBV and dBm. The range selector switch and associated reference level indicators occupy the space to the right of the meter. There are LEDs for all range positions. To the right of this area (on the UPM 550-1) is the combination switch and level adjustment for the direct harmonic distortion measurement. Just below and to the right is the related input selector, and below it are the input connectors.

The instrument's power off/on switch is at the lower left; next to it are two outputs—one being rated for 60 ohms, 1 volt; the other for 600 ohms, 1 volt. The mode and filter switches form a row across the bottom of the panel. Included here are switches for both reserve and external filters which may be added as required.

The rear of the unit contains an external filter input and an associated calibration adjustment. A graph of the instrument's filter characteristics is printed here. The unit's power cord is detachable and plugs into a three-prong receptacle on the rear panel. The front may be fitted with handles.

- 1 Filter OFF
- 2 DIN Weighting filter (Unweighted noise)
- 3 DIN Noise weighting filter (dBA)
- 4 CCIR Noise weighting filter
- 5 1000-Hz Filter
- 6 1000 Hz-STOP Filter (in series only for UPM 550-1)

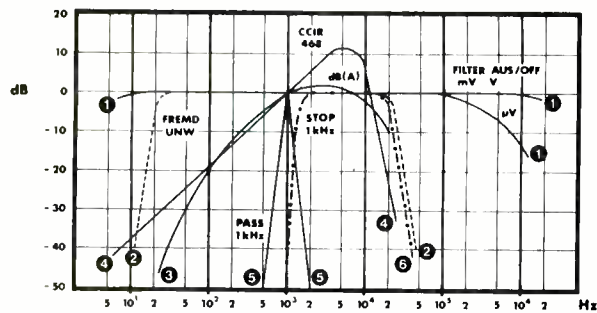


Fig. 1: Sennheiser UPM-550-1: Filter characteristics of the UPM-550-1 and 550 UPM as published by Sennheiser.

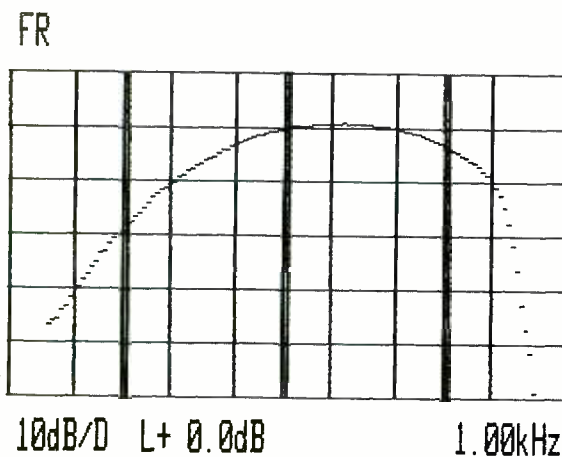


Fig. 2: Sennheiser UPM-550-1: A-weighting response curve as measured in the lab for the UPM-550-1. Compare this curve with the #3 curve in Fig. 1.

Test Results: Because of the nature of the UPM 550-1 we had to depart somewhat from our usual "Vital Statistics" presentation. We felt that it would make no sense to try to measure the accuracy of a meter with another meter of approximately the same degree of accuracy. So instead we are simply reprinting Sennheiser's specifications for both versions of the meter, and those who are interested in the wealth of data provided in these specs are invited to read them carefully.

About all we could do to check out the system was to use it for a while, and to plot some of the weighting filter curves and compare them with the published curves reproduced in Fig. 1 from Sennheiser's owner's manual.

Thus, Fig. 2 shows the familiar response curve obtained when we switched in the "A" weighting noise

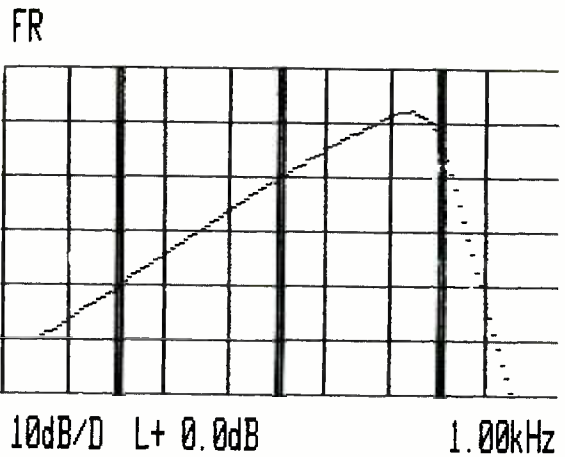


Fig. 3: Sennheiser UPM-550-1: Measured CCIR-468 curve for the unit. Compare this curve with the #4 curve of Fig. 1.

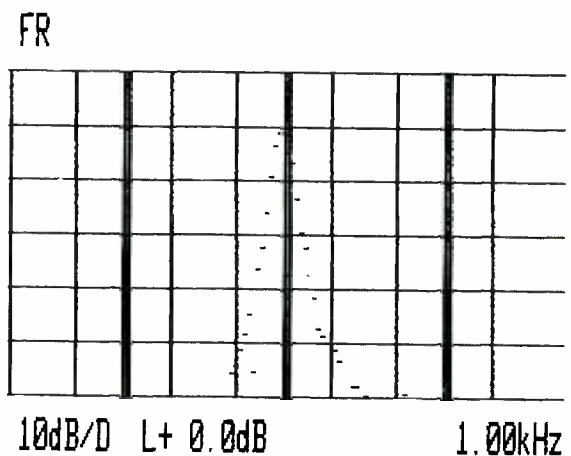


Fig. 4: Sennheiser UPM-550-1: Measured 1 kHz band-pass filter response for the unit. Compare this curve with the #5 curve of Fig. 1.

filter. It compares quite neatly with the curve identified as "3" in Fig. 1.

Next we selected CCIR-468 weighting (this is the original CCIR-ARM version espoused by Dolby Labs). We show this in our Fig. 3, and it compares very closely with the Sennheiser curve labeled "4" in Fig. 1.

Finally we checked out the 1-kHz band-pass filter. The response when using that filter is plotted in our Fig. 4, and it is the same as the curve "5" shown in Fig. 1.

General Info: Dimensions are approximately 11.6 inches wide; 7.7 inches high; 6.14 inches deep. Weight is approximately 13 lbs, 4 oz. Price: UPM 550, \$1380; UPM 550-1, \$1680.

Joint Comment by N.E. and L.F.: Any recording studio, or lab involved in audio design or testing, often must make precise measurements of signal levels. However, not all meters read voltages in the same way. There are average-reading meters, peak-reading meters, quasi-peak reading meters, true RMS meters and meters with varying rise and decay time constants. The truly well equipped studio or lab that wanted to keep up with the many ballistic characteristics of meters and the various methods of meter construction would have to own at least six different AC voltmeters, and possibly more. Add in the various and sundry "weighting curves" that often are associated with such signal-level readings, and the inventory of required gear increases even further.

With the Sennheiser instrument, it all comes together in one unit which, as far as we could determine, is both accurate (our own filter curves are in excellent agreement with Sennheiser's), and "idiot proof"—thanks to the front panel indicators that tell

you what range or scale on the meter is being used, what filters you have selected for a particular reading and whether peak or RMS readings are being made. The owner's manual is written in three languages (German, French and English). While some of the translation to English is a bit awkward in style, it is perfectly understandable and usable. The presentation is hardly on what could be described as an "elementary" level since it does presume previous knowledge and experience in making audio measurements. The device, in other words, is not intended for the casual or even enthusiastic "audiophile." However, for the professional user who is tired of having to plug in an assortment of different meters to check out equipment or to conduct proof-of-performance tests, the Sennheiser device may well be the one unit to replace several outdated or outmoded meters. Anyone who is planning to buy a group of new meters for a studio or lab would do well to consider this single device which may well be the only meter you require.

SENNHEISER UPM 550 and 550-1 UNIVERSAL LEVEL METER: Vital Statistics

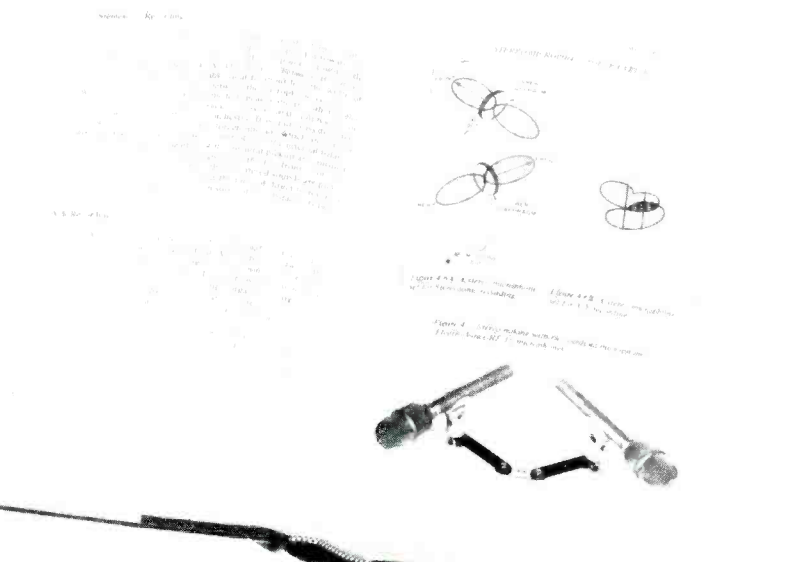
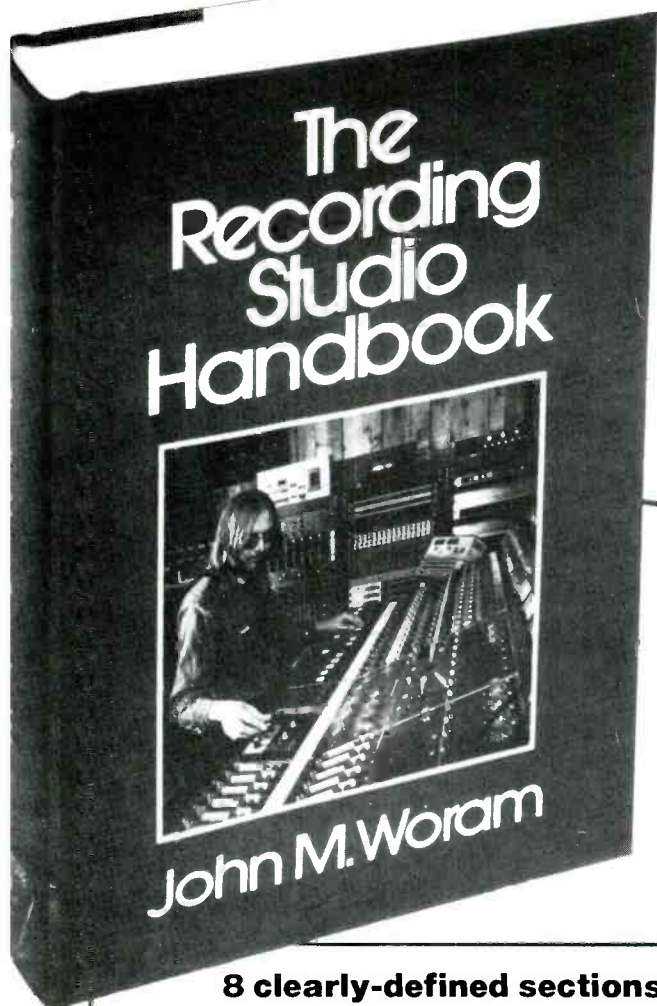
PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	
	UPM 550	UPM 550-1
Voltage ranges	0 30/100/300 μ V 1/3/10/30/100/300 mV 1/3/10/30/100/300 V - 100 ... + 52 dBV (selective - 115 ... + 50 dBV dBm) - 98 ... + 52.5 dBm (selective - 113 ... + 52.5 dBm)	0 30/100/300 μ V 1/3/10/30/100/300 mV 1/3/10/30/100/300 V - 92 ... - 52.6 dBm (selective - 113 ... + 52.6 dBm)
Frequency range for peak rectification		
Ranges 1 mV to 100V	10 Hz ... 1 MHz	10 Hz ... 1 MHz
Ranges 30 μ V to 300V	10 Hz ... 100 kHz	10 Hz ... 100 kHz
For RMS-rectification in all ranges	10 Hz ... 100 kHz	10 Hz ... 100 kHz
Tolerance for sinusoidal voltages and measurements without filters:		
Amplifier (mV and V-ranges)	20 Hz ... 200 kHz \pm 3% 10 Hz ... 20 Hz and 200 kHz ... MHz \pm 5%	20 Hz ... 200 kHz \pm 3% 10 Hz ... 20 Hz and 200 kHz ... 1 MHz \pm 5%
Amplifier (μV-ranges)	20 Hz ... 50 kHz \pm 3% 10 Hz ... 20 Hz and 50 kHz ... 100 kHz \pm 5%	20 Hz ... 50 kHz \pm 3% 10 Hz ... 20 Hz and 50 kHz ... 100 kHz \pm 5%
Input divider	\pm 0.5%	\pm 0.5%
Scale Linearity of rectifiers at RMS-rectification	\pm 0.5%	\pm 0.5%
Indicating instrument	tolerance class 1.0	tolerance class 1.0
Scale Linearity of rectifiers at RMS-rectification	\pm 0.5%	\pm 0.5%
at peak-rectification	\pm 3%	\pm 3%
Dynamic properties		
for peak-rectification	according to DIN 45 405	according to DIN 45 405
for RMS-rectification	according to DIN 45 633 and 45 500	according to DIN 45 633 and 45 500

Frequency of built-in calibration generator	1000 Hz \pm 1%	1000 Hz \pm 1%
Voltage constancy	0.2 %/K, 0° bis +50° C	0.2 %/K, 0° bis +50° C
Input impedance	1 M Ω /50 pf	1 M Ω /50 pF
Max tolerable D.C.-voltage at the input	400 V	400 V
Max tolerable A.C.-voltage at the input:		
in the mV and V-ranges	500 V peak	500 V peak
in the μ V-ranges	10 VRMS	10 VRMS
Noise voltage referred to input:		
unterminated, screened input		
without filters	\cong 15 μ V eff	\cong 15 μ V eff
unterminated, screened input with		
1000 Hz filter	\cong 2 μ V eff	\cong 2 μ V eff
terminated with 10 k Ω without filters	\cong 10 μ V eff	\cong 10 μ V eff
with 1000 Hz filter	\cong 1 μ V eff	\cong 1 μ V eff
Outputs		
Monitor output	e.m.f. = 100 mV at t.s.d. R ₁ = 60 Ω \pm 3% (short circuit proof)	e.m.f. = 100 mV at t.s.d. R ₁ = 600 Ω \pm 3% (short circuit proof)
Headphone output	e.m.f. = 1 V at t.s.d. R ₁ = 60 Ω \pm 3% (short circuit proof)	e.m.f. = 1 V at t.s.d. R ₁ = 600 Ω \pm 3% (short circuit proof)
Filter output	e.m.f. = appx. 20 mV at t.s.d. R ₁ = 600 Ω \pm 3% (short circuit proof)	e.m.f. = appx. 20 mV at t.s.d. R ₁ = 600 Ω \pm 3% (short circuit proof)
Input impedance of the external filter input	600 Ω \pm 20%	600 Ω \pm 20%
Sensitivity of the external filter input	2.5 ... 12.5 mV adjustable on rear panel	2.5 ... 12.5 mV adjustable on rear panel
Max. e.m.f. of outputs		
Filter output	28 Vpp (10 VRMS for sinusoidal voltages)	28 Vpp (10 VRMS for sinusoidal voltages)
Monitor output	2.8 Vpp (1.0 VRMS for sinusoidal voltages)	2.8 Vpp (1.0 VRMS for sinusoidal voltages)
Headphone output	28 Vpp (10 VRMS for sinusoidal voltages)	28 Vpp (10 VRMS for sinusoidal voltages)
Standard integrated filters		
1000 Hz filter	Attenuation at 1000 Hz 0 db \pm 0.2 dB Characteristic: see curve 5	Attenuation at 1000 Hz: 0 dB \pm 0.2 dB Characteristic: see curve 5
Weighting filter to CCIR 468	Attenuation at 1000 Hz 0 dB \pm 0.5 dB Characteristic: see curve 4	Attenuation at 1000 Hz: 0 dB \pm 0.2 dB Characteristic: see curve 4
Weighting filter to DIN 45 405 and DIN 45 500	Attenuation at 1000 Hz: 0 db \pm 0.2 dB Characteristic: see curve 2	Attenuation at 1000 Hz. 0 dB \pm 0.2 dB Characteristic: see curve 2
dB (A)-Weighting filter to DIN 45 500	Attenuation at 1000 Hz 0 dB \pm 0.2 dB Characteristic: see curve 3	Attenuation at 1000 Hz 0 dB \pm 0.2 dB Characteristic: see curve 3
1000 Hz Stop filter		Attenuation at 1000 Hz > 66 dB Characteristic: see curve 6
Setting range of level potentiometer		0 dB to -10 dB
Optional plug-in filters	1 or 2 on plug-in board	One on plug-in board
Operating temperature	-10° C to +50° C	-10° C to +50° C
Power requirements	45 ... 60 Hz 180 ... 265 V for 220 V-operation 90 ... 130 V for 110 V-operation appx 15 VA	45 ... 60 Hz 180 ... 265 V for 220 V-operation 90 ... 130 V for 110 V-operation appx 15 VA

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GROOVE VIEWS

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JOE KLEE
NORMAN WEINSTEIN

POPULAR

CROSBY, STILLS & NASH: *Daylight Again*. [David Crosby, Stephen Stills, Graham Nash, Stanley Johnston, and Steve Gursky, producers; Steve Gursky and Stanley Johnston, engineers; recorded at Rudy Records, Devonshire Sound, and Sea West, Los Angeles, Ca.] Atlantic SD 19360.

Performance: **Brighter later**
Recording: **Super smooth**

No problems here: same old harmonies blending atop tasty melodies. Or maybe that *is* a problem.

What Crosby, Stills & Nash lack with this new album is the kind of socio-political scenario that really set off their most memorable music in the early '70s. Back then they represented a sudden turnabout from a rock world that had grown harder and harder, and their image of mellow brotherly love contrasted sharply against the drab conflict in Vietnam.

Without that backdrop, and the musical edge that went with it, *Daylight Again* is none too shabby, but slightly pale by comparison. The classic CSN sound remains intact and is beautifully captured here on such cuts as "Too Much Love To Hide" and "Song For Susan." There are personal, individualized insights—Stills' "Southern Cross," Nash's "Wasted On The Way," Crosby's drifting "Delta"—but nothing that could be considered compelling on a grander scale.



CROSBY, STILLS & NASH: Continuing to relate on a quietly human level.

It's reasonably obvious that these three don't retain quite the organic chemistry that was once so profound, though they still sound great together in almost every other respect. Despite much publicized lifestyles reportedly steeped in indulgences, the voices are still strong and the blend is liquid. It's the songwriting that, however professional (even enjoyable), just seems to lack the countercultural focus of yesteryear, though we should hardly expect things to be otherwise. But even Graham Nash's very public anti-nuke concerns are downplayed entirely here—the only hint of a message comes on Stills' finishing collage of the peace lament "Daylight Again/Find The Cost Of Freedom"—and it's a fairly generic lament at that.

While the album may not hit with the wallops of *Deja Vu*, it has to be said that *Daylight Again* does indeed have a

brightness to it that seems quite refreshing at this point in time. It would be easier to say that these guys sound nice but don't really compute in the Eighties. On the other hand, they *do* continue to relate on a quietly humane level.

It's been five years since the last studio get together, (1977's *CSN*), an album that had higher high points, perhaps, but not the consistent ambience of this one. *Daylight Again* grows warmer, brighter with repeated listenings, and despite the absence of a really momentous tune, this collection rates a "buy" for its overall excellence and super smooth sound. Let's hope that a little newfound success and camaraderie will keep these guys headed in the same direction...and light a fire under the creative juices of what could again become a magical rock triumvirate. R.H.

STEEL PULSE: *True Democracy*. [Karl Pitterson, producer; Dennis Thompson, engineer; recorded at Feedback Studios, Aarhus, Denmark.] Elektra E1-60113.

Performance: **Rambunctious and rollicking reggae**

Recording: **Scintillatingly sharp**

Anyone who believes that most reggae music suffers from rhythmic and lyrical monotony should listen critically to this refreshing new release by one of the most emotionally as well as musically appealing reggae bands to emerge in the last decade. Steel Pulse is a six-man band based in England that gained a great deal of public notice in the late seventies while playing on the same bill with several notorious punk bands. This was an odd marriage of sensibilities. Steel Pulse's music is *anything* but primitive and reductionistic. And their songs overflow with a virtual abundance of hummable hooks—a quality one wouldn't identify with, say, the Sex Pistols.

Steel Pulse first came to my attention because of a "live" version of a song about the Ku Klux Klan included on a slapdash anthology of progressive rock released by A&M records last year. The lyrics were shocking, bold, fiery. A keen intelligence was evident in the anti-racist song—an intellect evident in the song's catchy arrangement. I've since heard bits and pieces from the band's previous three releases for Island/Mango. But nothing prepared me for the furious energy of *True Democracy*.

True Democracy demonstrates what goes into the making of a monumental reggae release. First, all of reggae depends on a brilliantly driving beat. Rastafarian Jamaican bassist Robbie Shakespeare and drummer Sly Dunbar have set a nearly impossible-to-beat standard for an exacting bottom for many years. Steel Pulse's drummer Steve Nesbitt and bassist Ronald McQueen are the first reggae musicians I've ever heard to equal the Shakespeare/Dunbar team in sheer musicality. Second, any reggae band worth its salt (or marijuana, the sacramental herb used by many Rastafarian reggae bands) needs a forceful lead singer. David Hines fulfills that role with savvy and class. He also is the most visually bizarre looking of the band members, possessing a Medusa-like tangle of dreadlocks arranged to look like a tophat. His singing style (as well as hair style) suggest the late Bob Marley as a source of inspiration.

Third, reggae music is religious music. The lyrics eschew our own pop preferences for broken hearts in favor of religious hymns about returning to the spiritual homeland of Africa. Steel Pulse extends this traditional lyrical focus and writes songs about racial prejudice, world violence, the need for sober living (can you remember the last time you heard a song about the dangers of drunken behavior?) *True Democracy* is dedicated to the children of Atlanta, Georgia. Such political consciousness is so lacking in American popular music that it took an English band to call attention to our own racial ambiguities. Strange times we live in.

True Democracy opens with a spectacularly rousing and up-beat song based upon—surprise of surprises!—the Old Testament psalms of David! Three songs of political concern form the core of side one. My favorite is "A Who Responsible?," an anthem that posits the solution to violence as individual political resistance. Hines fervently sings: "Some say the earth/ Will keep on turning/ Dread times are near/ And I'm not joking I a warning." "Worth His Weight in Gold" is a hymn praising Marcus Garvey, the Black philosopher who saw the necessity for all of the world's black populations to return to Africa. Side two stuns with a feverishly propulsive song about a raid by English police upon a Rastafarian dance, "Blues Dance Raid." Basil Gabbidon's lead guitar playing is sparse and stinging. Percussionist Phonso Martin and keyboard player Selwyn Brown add gorgeous vocal choruses backing Hines' touching vocal. "Man No Sober" should be required listening for those wretched souls often arrested for driving while intoxicated. The album closes with an instrumental reprise of "Worth His Weight in Gold". *True Democracy* proves that this is one band worth *more* than its weight in gold.

The recorded sound is quite a delight after hearing numerous reggae recordings produced in Jamaica. Some of those island releases sound like they were recorded in telephone booths on wire recorders. The sound on *True Democracy* is sharply recorded. Drums and percussion are smashingly present. Vocals are captured with warmth. The guitars and keyboards are a trifle low in the mix—but still finely present in the total sound.

"How can we sing in a strange land?" sings David Hines echoing old biblical laments. The miracle is that they sing so well in this strange land. May their musical efforts lead us toward that

utopian vision of *True Democracy* this album majestically celebrates. N.W.

GINO SOCCIO: *Face To Face*. [Gino Soccio, producer; Paul Page, engineer; recorded at Studio St. Charles and Studio Tempo, Montreal.] RFC/ Atlantic SD 19358.

Performance: **Good, but shooting low**

Recording: **Better than average electri/dance**

The disco boom had its impact after all, leaving us with not only a rebirth of contemporary R&B, but also several distinctive additives to modern recorded sound. Among these, increasingly sophisticated keyboards and synthesized poly-rhythms that have expanded pop music lexicon.



GINO SOCCIO: Brilliance next time?

Gino Soccio emerged amid the late '70s disco monotony with a synthesizer-oriented instrumental approach that made several progressive overtures within an otherwise dull idiom. But like Herbie Hancock and other potentially serious instrumentalists before him, this keyboard whiz can occasionally lose sight of what is basic to (and exciting about) his music, and seize on that which is superficially successful. The current emphasis on vocal hooks may be keeping Soccio out of his natural (?) electronic groove and into an area that is already saturated in today's new R&B arena. In that

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respect, *Face To Face* seems like the simplest representation yet of danceable Soccio sounds.

Not that Erma Shaw or other female vocalists on *Face To Face* lack in any way—they help set off catchy numbers like “It’s Alright” and “Who Dunit?” And speaking of vocals, Soccio’s own rendering of “Remember” turns into the most progressive of the new cuts, containing a hint of the Berlin via London electronic attitude... a promising direction.

But compared to what Soccio has shown he *could* do, *Face To Face* is a fairly conservative studio effort. It stresses styles currently plentiful in the pop-soul mainstream, and does a very good job on them for the most part. But while there isn’t a bad track in the bunch, there isn’t a brilliant one either.

It’s pretty obvious that Gino feels the beat, and that he can crank out hits while virtually resting on his synthesized laurels. But now that he’s sitting pretty, maybe it’s time to lean a little harder on the musical boundaries and see what might happen next. R.H.

ROBERT FORCE & ALBERT D’OSSCHÉ: *Crossover*. [Bill Tootell, producer; David Mathew, engineer recorded at Kaye-Smith Studios, Seattle, Wa.] Kicking Mule Records KM 308.

Performance: **Sprightly**

Recording: **Rich**

Pity the poor dulcimer. For so long it has been relegated as a folk instrument of minor importance. Or it has been considered as a vaguely appropriate backup sound for a single voice singing Scotch or Irish ballads. Its dry metallic sound brings to mind the banjo and the Japanese koto—two other instruments whose fate seems linked with “ethnic” or “folk” music.

Robert Force and Albert D’Ossché are out to change the dulcimer’s reputation as an instrument fit only for folksy music. Several years ago they published the definitive dulcimer instruction book, *In Search of the Wild Dulcimer*. Now they have recorded *Crossover*, an album of virtuoso dulcimer music in settings from Brazil, Iceland, and realms beyond. With this release Force and d’Ossché have done for dulcimer what David Grisman has accomplished for mandolin: a radical redefinition of the instrument’s role.

Crossover opens with a raucous

South American samba. Talk about “the wild dulcimer!” Force and d’Ossché vigorously strum their dulcimers while percussionist Tim Celeski puts down a snappy Latin rhythm track on congas. The initial response is astonishing. Dulcimers can’t function as Latin instruments! But these two players make it happen. Part of their secret comes from their use of six string dulcimers which are strummed like guitars. The traditional dulcimer has only three or four strings and is held in the player’s lap. Hence the traditional dulcimer’s charming and modest image. A lap dulcimer is not a loud instrument capable of projecting a samba. But the dulcimers plucked by Force and d’Ossché are resonating concert instruments.

This record, however, does have its share of quiet and meditative moments. “Workaday Daddy” is a thoughtful ballad in a contemporary folk vein about the proletarian life. Which brings to mind my only two bitches about this recording. Neither Force nor d’Ossché are particularly profound songwriters. Their lyrics smack of sixties *angst*, those good-old-I-must-hit-the-road-and-find-my-true self blues. I don’t want to be too cynical about this stuff. After all, our current president would have us all hum along to “We’re in the Money” or “The Battle Hymn of the Republic.” There is a refreshing naivete to these lyrics.

My other complaint has to do with the pair’s vocal abilities. One word will suffice: adequate. I would have preferred an entire album of instrumentals. “Krummi” (The Raven) is a traditional Icelandic ballad scored for two dulcimers and Indian drums. The complex interplay between Force and d’Ossché on this cut is the height of musical ecstasy. I would buy this album simply for that cut alone.

The recorded sound is full and rich. The mixing is quite sensitive so that when other voices support Force and d’Ossché, they never overwhelm. This recording is a shining example of giving every voice and instrument just enough space.

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The Ceaseless Sounds of Surprise: Jon Hendricks and The Duke

By Nat Hentoff

One of the most joyful jazz phenomena of the late 50's and early 60's was Lambert, Hendricks & Ross. With high-risk zeal and wit, Dave Lambert, Jon Hendricks and Annie Ross put sizzling words to renowned instrumental jazz solos. They also scatted with careening brilliance, and sometimes sounded like a whole, strutting band. Then Annie left, Dave died, and the string of astonishments was over.

Now, however, Jon Hendricks—who was the chief lyricist of the original trio—has resurrected the tradition in a group composed of his wife (Judith Hendricks), his daughter (Michele Hendricks), and Bob Gurland. In *Jon Hendricks & Company*/"Love" (Muse Records), these four plus Leslie Dorsey and such instrumental swingers as Harry "Sweets" Edison and Jerome Richardson bring new colors and rhythmic dimensions to a range of jazz delights—from "Royal Garden Blues" to Duke Ellington's "Harlem Airshaft."

As exhilarating as the original Lambert, Hendricks & Ross were, this continuation is even more satisfying because it creates a broader and deeper range of mood. Along with the high spirits of the original, for instance, there is also more tenderness here, a willingness to sometimes be more innocent than hip.

The recorded sound is just right. All the intricacies, sometimes high-speed, of the interplay between voice and instrument come through with crisp precision.

As a lyricist, Jon Hendricks is a kind of diarist—transforming into jazz those sights, sounds and speculations that stir his imagination on any given day in the world at large. The master of this kind of creation-from-real-life was, of course, Duke

Ellington: and Columbia, as part of its admirable series of jazz reissues, has combined *The Girls' Suite* and *The Perfume Suite* in *Duke* (Contemporary Masters series).

Recorded in 1961, *The Girls' Suite* was never heard in its entirety in either club or concert appearances. It should have been, because this variegated tribute to such distinctive women as Lena Horne and Mahalia Jackson—as well as such legends of romance as "Peg O' My Heart" and "Diane"—abounds with grace, humor, and desire.

The band was especially relaxed during this session, and the feeling, for the most part, is more that of a small combo than an orchestra. Many of the giants of Ellingtonia were still in the band—Johnny Hodges, Harney Carney, and Lawrence Brown, among them. The solos, therefore, are nonpareil—as fresh and compelling now as then. Brown, in particular, is extraordinarily limber, sensuous, and inventive—with the loveliest sound in jazz trombone history. *The Perfume Suite* (recorded in 1957) is more uneven, but it has one special, lasting delight—"Dancers in Love."

The recorded sound on both sessions is up to the Columbia standard during those years, which was very high indeed. No tricks, just the real sound.

JON HENDRICKS: & COMPANY. [Jon Hendricks, producer; Robert Grogan, Richard Greene, Buddy Pollack, engineers.] Muse MR 5258.

DUKE ELLINGTON: *The Girls' Suite And The Perfume Suite.* [Irving Townsend, Teo Macero, producers; Frank Abbey, re-recording engineer]. Columbia FC 38028.

THE ROYAL BALLET ORCHESTRA:
The Royal Ballet Production of Elite Syncopations: The Music of Scott Joplin and Others. [No producer listed; Bob Auger, engineer; recorded in Great Britain, 1967.] Vanguard SRV 373.

Performance: **Ballet? Si!**
Ragtime? No!
 Recording: **Comfortable stereo**

I wonder what Scott Joplin would have thought in 1902, the year in which he wrote "Elite Syncopations," had he known that some seven decades plus later his music would serve as a basis for a ballet score arranged by Phillip Gammon for the Royal Ballet to perform expressly for transmission by satellite to U.S. television viewers. I think that Joplin, whose pretensions about the music went so far as the composition of at least one ragtime opera, would have relished the idea. The orchestrations for string quartet, two trumpets, trombone, clarinet, flute (doubling piccolo), piano, string bass, tuba and two percussionists make the music considerably heavier than the usual ragtime accompaniment of piano, guitar, mandolin or banjo and various other rhythm instruments. This, plus the rather concert hall approach of Gammon's piano conception make this music ragtime in name only. It misses the zest and spirit of the best ragtime composers and of the era. On the other hand, when one is writing for, or arranging other people's music for, a ballet company one must bear in mind that the discipline of the choreographed dance requires a restriction of freedom which the general run of social dancing not merely allows but which social dancing and music for social dancing during the ragtime era was largely dependent upon to give it the bubbles and fizz it required to make it work.

The selections are mostly from the pen of Scott Joplin (rags such as "Elite Syncopations" and waltzes such as "Bethune") but there are representations of works by other composers: Paul Pratt, Joseph F. Lamb, Max Morath, Donald Ashwander and Robert Hampton. There is also an addenda to the ballet score which is listed as "three extra rags by Scott Joplin."

The Stereo recording, like so many of those on Vanguard which originates from the British CRD label, is clean without the spectacular quality that puts you right in the middle of the sound. This may not be the thing with which to show off your stereo equipment but I find this sort of comfortable sound more to my liking than having the high and low extremes of the audio spectrum accentuated to the point where the middle is totally submerged by triangle and kettledrum.

The major question for the buyer of this recording is, just how valuable is a recording of a ballet score without the visual aspect? If you saw the "live" satellite telecast and were so enthralled with it that you can recall the choreography, the scenery, the costumes... then this is for you. If, on the other hand, you are a lover of ragtime whose major interest is the music itself, you would do much better to seek out this music in a good piano recording by such artists as Max Morath, David Jasen or Dick Hyman or in an instrumental performance that does not need to sacrifice the aura of the era to the discipline of the choreographer.

J.K.

ELLA FITZGERALD AND COUNT BASIE: A Classy Pair. [Norman Granz, producer; Val Valentin, engineer; recorded at Group IV Recording Studios, Hollywood, Ca., Feb. 15, 1979.] Pablo Today 2312-132.

Performance: **Classy performances**
 Recording: **Classy recording**

In the liner notes Ella is quoted as talking about her first encounter with Basie's band at the Savoy Ballroom and her later appearance with the band in a Paramount Theatre stage

production with Nat King Cole. She even makes mention of their first recording together, "April In Paris," in June of 1956. Some things never change. Basie's band still swings. Ella still sings both scatting and worded more magnificently than her peers. Count is still the best accompanying pianist for Ella at least when she's working with Basie's band. So how come it took three years for this record to come out? Part of the reason I'm sure was the digital recording made by Ella and Basie's band at the Montreux Festival of 1979 and released as *A Perfect Match* on Pablo Today (see my review in the September 1980 issue of *Modern Recording & Music*). Although *Perfect Match* was recorded five months later than *Classy Pair*, it was the first released. Perhaps this was because Norman Granz felt that a digital recording would have a better sales potential than a plain old analog stereo would. He may even have been right about that. But what is unfortunate is that *Classy Pair* is an even better record than *Perfect Match*. Now I know it's splitting hairs to talk about which Ella and Basie record is better than which other Ella and Basie record, but if you remember from my review of *Perfect Match* the digital recording from Montreux was an Ella and Basie for one track only (two at the most, since I'm still not convinced that was Paul Smith at the piano on "St. Louis Blues"). Here it's Count Basie at the Keyboard all the way—and what a difference a Count makes! Listen to "Honeysuckle Rose." It's on both *Classy Pair* and *Perfect Match*. It's the same tune, the same chart by Benny Carter, basically the same band, although Ella's bass player Keter Betts did replace John Clayton in Basie's band. Also, according to the liner notes, Mickey Roker took over the drums from Butch Miles, but frankly I'm not so sure about that—it still

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sounds like big bad Butch to me. The difference is Basie. On *Perfect Match* the track starts with a brass figure that doesn't come in until halfway through the chart on *Classy Pair*. What *Perfect Match* is missing is a marvelous chorus or so of Basie's piano and then an opening statement of the tune by Ella accompanied by the real All-American Rhythm Section: Basie/Green/Clayton/Miles, or at least the 1979 version of the All-American Rhythm Section. That's one of the reasons why—digital or not—I prefer *Classy Pair* to *Perfect Match*. Another reason is "Organ Grinder's Swing," a trendy reminiscence from my youth when Ella recorded the tune for Decca, and yet another is "Sweet Lorraine" in which Ella, thank heavens, does not try to change the gender of the lyric to suit the fact that it's being sung by a female vocalist rather than a male.

There have been a good many Ella and Basie recordings and performances through the years. I hope there will be a good many more of them. Then on the other hand, the Count's not been enjoying the best of health lately and someday time will break up a good team. Until then we have them with us and we should be grateful for that and await their next collaboration—*A Classy Match, A Perfect Pair* or whatever. When I reviewed *Perfect Match*, I advised my readers to definitely buy a copy, buy two, in fact, and turn on a friend. I feel the same way about *Classy Pair* in fact, even more so since it's the First Lady of Song and the Kid from Red Bank there together all the way from start to finish.

GARDNER JENCKS: *Selected Works for Piano, 1942-1980.* Marcia Mikulak, piano. [Charles Amirkhanian, producer; Robert Schumaker, engineer; recorded at 1750 Arch St. Concert Hall,

Berkeley, Ca., July 1980.] 1750 Arch S-1781.

TOM BUCKNER, GERALD OSHITA AND ROSCOE MITCHELL: *New Music for Woodwinds and Voice.* [No producer listed; Robert Schumaker, engineer; recorded at 1750 Arch Studios and the Pacific School of Religion, Berkeley, Ca., Jan. 1981.] 1750 Arch S-1785.

Performance: **The sounds of things to come**
 Recordings: **Dolby stereo excellence**

In these two recordings they have come up with a little known piano composer named Gardner Jencks and a trio composed of singer Tom Buckner, reed virtuoso Gerald Oshita and jazz saxophonist Roscoe Mitchell. The liner notes identify Gardner Jencks as a pianist/composer whose career was interrupted by World War II. Either this is clearly audible in Jencks' music or I'm reading (or listening) between the lines again. What strikes me most about the music of Gardner Jencks is that here in the mid-to-late twentieth century is a composer who still writes for the piano, pianistically. This is not to say his music is not new and forward sounding. It certainly doesn't sound like Chopin or Schumann and yet it shares a certain quality of predestination, or at least preordination, for the instrument on which it is to be performed that is shared by few, if any, modern classical composers. Like many modern composers he is blessed with an interpreter who has devoted a great deal of time and effort to the furtherance and performance of his music. She is Marcia Mikulak and while I find it difficult to assess a performer who deals in unfamiliar music, without first hearing what they do with music which I know, she deals

well with the problems with which this music confronts her. I use the word *confront* deliberately because so much of this music, like so much of all contemporary art and contemporary life, is a confrontation. I doubt that anyone will feel comfortable with Gardner Jencks' music at first hearing. The deeper one digs, the more familiar one gets with its complexities, the easier it should become to hear and understand and appreciate this music.

I have an easier time with the album by Roscoe Mitchell, Tom Buckner and Gerald Oshita because it is rooted in that fusion between jazz and concert music which Gunther Schuller called *The Third Stream*. I have heard Roscoe Mitchell in various jazz settings and like his fellow avant-garde Chicagoan, Anthony Braxton, I find Mitchell's music more accessible to me as chamber music than as jazz. I think I can say the same of Gerald Oshita whose compositions make up side one of this album but I have not encountered Oshita in a jazz circumstance per se so I do not feel as sure about his work as I do about Mitchell's (on side two) which I have encountered under both circumstances. While I rather agreed with the violent opinion expressed by an audience who had come to hear traditional Chicago jazz at a recent George Wein produced festival concert in New York when they were presented with a set of difficult modern music by Roscoe Mitchell, I find his music not only accessible but rewarding in this setting.

I do get the feeling listening to both Oshita's compositions and Mitchell's work, as I also do with Braxton's music, of an overall pervading influence of both Paul Hindemith and Igor Stravinsky. Yet, like Hindemith, there is much pleasure to be derived especially from the combinations of voice and uncommon instruments (such as the Sarousaphone which I've not heard on records since Sidney Bechet used one on Clarence Williams' Blue Five recording on "Mandy Make Up Your Mind" [1924]).

The recording by Robert Schumaker is excellent in both cases. I doubt that either digital or direct to disc techniques could add more to the presence on these two excellent recordings.

Yet nowhere on either of these discs do I get the feeling, as I did listening to the three volumes that 1750 Arch has released of the music of Conlon Nan-carrow, that I was listening to something which was undeniably destined to become a classic. J.K.

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VICTOR HERBERT: *The Music of Victor Herbert from the Gay Nineties to the First World War.* [Dr. Allen G. Debus and Bill Bennett, producers; Warren K. Plath, reissue engineer; original recordings made between 1898 and 1923.] Smithsonian R 017.

Performance: **Historical milestones**
Recording: **Originally primitive brought up to date as much as possible**

VICTOR HERBERT: *Naughty Marietta.* [Thomas Frost and Bill Bennett, producers; Bert Whyte and Frank Dickinson, engineers; recorded at the University College Auditorium, College Park, Maryland, Nov. 24th through the 26th, 1980.] Smithsonian N 026.

Performance: **A good repertory company ready**
Recording: **Digital—what else!**

Along with newer names like Irving Berlin, George Gershwin and Cole Porter, the history of musical Americana would not be complete with the names of John Philip Sousa, Rudolf Friml, Sigmund Romberg and Victor Herbert. If anyone was more successful than Herbert in molding the melodies of the infancy of the American musical theatre I can't think of the name. If you weren't familiar with the shows *Babes In Toyland*, *The Red Mill* or *Naughty Marietta* you at least knew the hit tunes "Kiss Me Again," "Italian Street Song" and "Ah, Sweet Mystery of Life." It was a familiarity fostered by the newfound success of first the gramophone and then the Victrola. Record companies from such pioneers as Berliner and Edison through such early major companies as Victor and Columbia filled our homes with Victor Herbert's successes.

Chronologically the earliest recordings here are the Berliners (1898) from *The Fortune Teller*. The fidelity, true, was dreadful but the voice of Alice Nielsen was there singing "Always Do As People Say You Should" just as she sang it when *The Fortune Teller* opened in 1898 at Wallack's Theatre on Broadway. The last of the items included here, chronologically, is Amelita Galli-Curci's 1923 Victor remake of "Kiss Me Again" which Fritzi Scheff sang, but did not record,

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in 1905 when she appeared in Victor Herbert's *Mlle. Modiste*.

The comprehensive notes with this three LP set, by Dr. Allen G. Debus, point out that very few recordings exist of the original casts of Herbert's operettas and in fact many of the recordings of Herbert's music were made many years after their original successes. Yet we do have here, at various points such fine artists as John McCormack, Frances Alda, Alma Gluck and Galli-Curci singing the tunes that America loved from Victor Herbert shows. Yet the best renditions seem to me not to be those by the great artists of the Met but by those whose familiarity with early recording techniques gave them the ability to come through the primitive technical means of recording with voices that still shone with freshness, vibrancy and realism. It seems to me that the only opera singer who recorded as well as these studio singers in those early days was Caruso. One of these singers, Billy Murray, injects a good deal of life into his 1906 Columbia version of "In Old New York" from *The Red Mill*. Another pleasant surprise is the 1906 recording of Eugene Cowles, a member of the original Broadway cast of *The Fortune Teller*, singing the hit of the show, "Gypsy Love Song." The strides made between Cowles' 1906 Victor recording from the show...he also recorded the song for Berliner in 1898 but it isn't included in this album...and the various 1898 Berliners which are included give ample proof of the strides that the recording industry made in those eight years...and this may also be the reason that the 1898 Berliner was not included and the 1906 Victor was. Frankly I wish I could have heard both versions but I guess that's looking a gift horse in the mouth, isn't it? There are some lesser known Victor Herbert items here, a cello solo, some orchestral recordings and a hideous band recording for Zonophone from circa 1900 which may or may not actually be Victor Herbert's band...see the liner notes for details. It doesn't really matter anyway because "The Battle of Manilla" is one of the poorest excuses I've heard for a musical performance since my days in the school orchestra back home.

So having appealed to those purists who want to hear the music the way it was back in the tens and twenties, Smithsonian turns around and gives us a modern up to date digital recording of basically all the music from "Naughty Marietta." The cast, com-

posed mostly of unknown performers, boasts at least one singer who sounds like she has a future either in opera or operetta or both, whichever way she wants to go. That (of course you do put your best voice in the lead role, don't you?) is Judith Blazer whose Marietta is quite good indeed. The rest of the cast is workmanlike if not distinguished. They do the job and they don't get in the way. Frederick Roffman who assisted in preparing the music and text of *Naughty Marietta* for Smithsonian (he had done the same a few years earlier for the New York City Opera) also wrote the exhaustive liner notes.

Frankly, faced with *Naughty Marietta*, those of us who grew up in the days of the MGM musical movie have an additional problem. It's no easy thing for any present day production, either the New York City Opera production or the Smithsonian production, to compete with nostalgia and our memories of Nelson Eddy and Jeanette MacDonald. Even though, as pointed out in Frederick Roffman's notes, MGM pretty much corrupted both the score and the plot of Victor Herbert's original production it's a hard image to forget for those of us who were children of the '30s.

Naughty Marietta is not only an excellent choice to begin Smithsonian's project of recording early American Theatre Music in authentic form with modern digital recording technique, it is the *only* choice which could have been made with intelligence. No other work of the early American musical theatre could boast of such universal success. No other early American music could boast such an embarrassment of hit melodies ("Tramp, Tramp, Tramp," "Neath The Southern Moon," "Italian Street Song," "I'm Falling In Love With Someone" and "Ah Sweet Mystery of Life"). It is the quintessential pre-thirties Broadway musical. The restoration by Frederick Roffman under the direction of James R. Morris gives us a digital recording of an historic document.

Smithsonian Records are available at the gift shop of The Smithsonian Institution or can be purchased by mail from Smithsonian Recordings, P.O. Box 10230, Des Moines, Iowa 50336. The list price of the digital *Naughty Marietta* is \$29.98 (\$26.98 for Smithsonian Associates) plus \$1.10 postage and handling costs. The album, *The Music Of Victor Herbert*, costs \$19.98 (\$17.97 for associates) plus \$1.50 mailing and handling. J.K.

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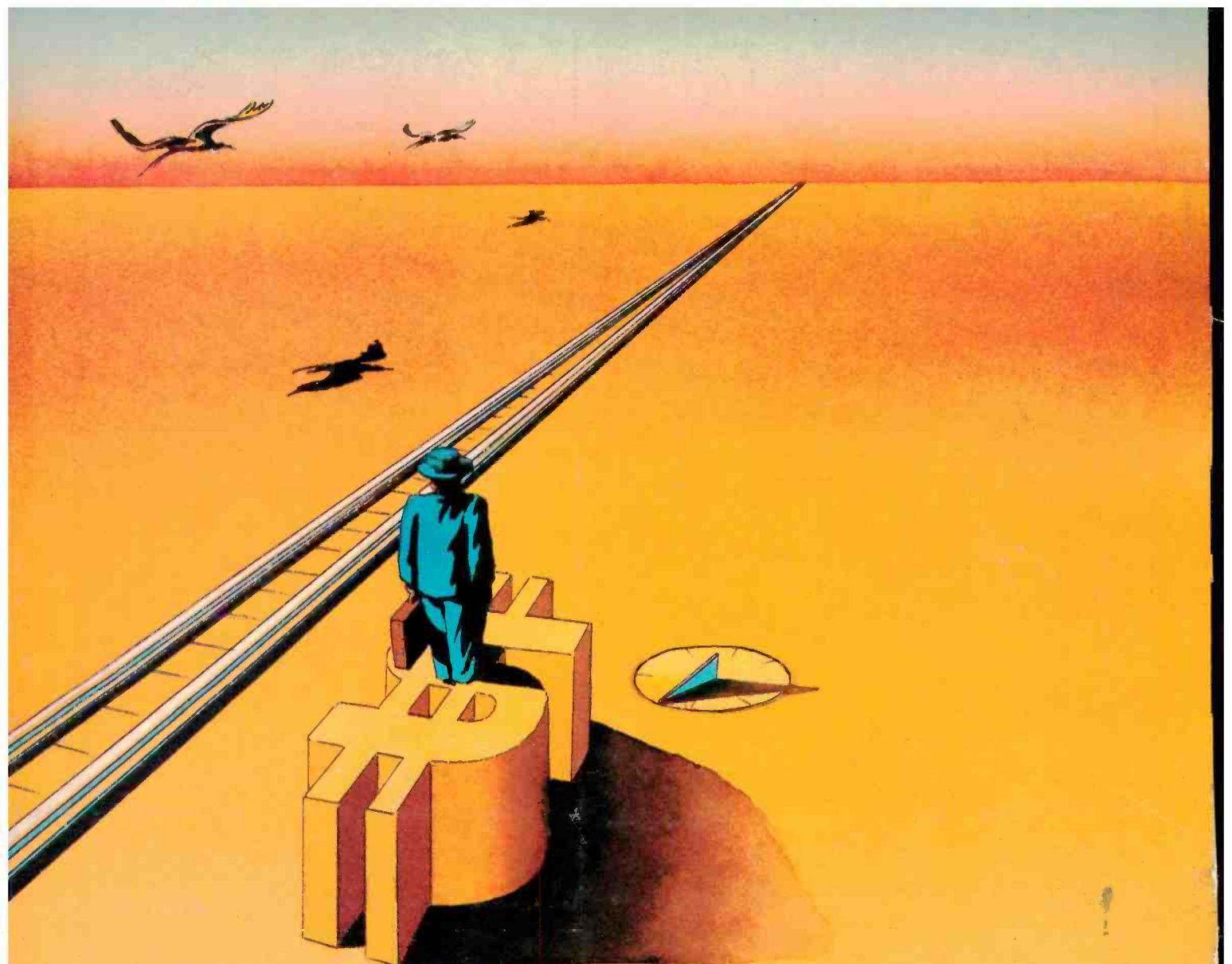
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