

Profile:
Producer
JACK DOUGLAS

ICD 08560
\$1.95

MODERN RECORDING & MUSIC

Vol. 7 No. 1
October 1981

a
session
with
Ron Wood

**STUDIO
NOTEBOOK #3**

LAB REPORTS:

**Onkyo M-5060 Stereo
Power Amplifier**

Orban 674A Equalizer

**Uher 4400 Open-Reel
Tape Recorder**

HANDS-ON REPORT:

**OmniSound's
"Great British Spring"
Spring Reverb**

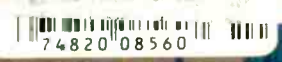
NOTES:

**The Legendary
Leslie Speaker**



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**PRODUCTS
REVIEWS**



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Your live system is sounding more dead than alive and you know you need a supertweeter. But consider this before you rush out to buy one of the "old standards" — Yamaha's JA-4281B compression tweeter is better. It packs the kind of ultra-high frequency response, high sensitivity and dispersion necessary to keep up with a powerful bass and midrange.

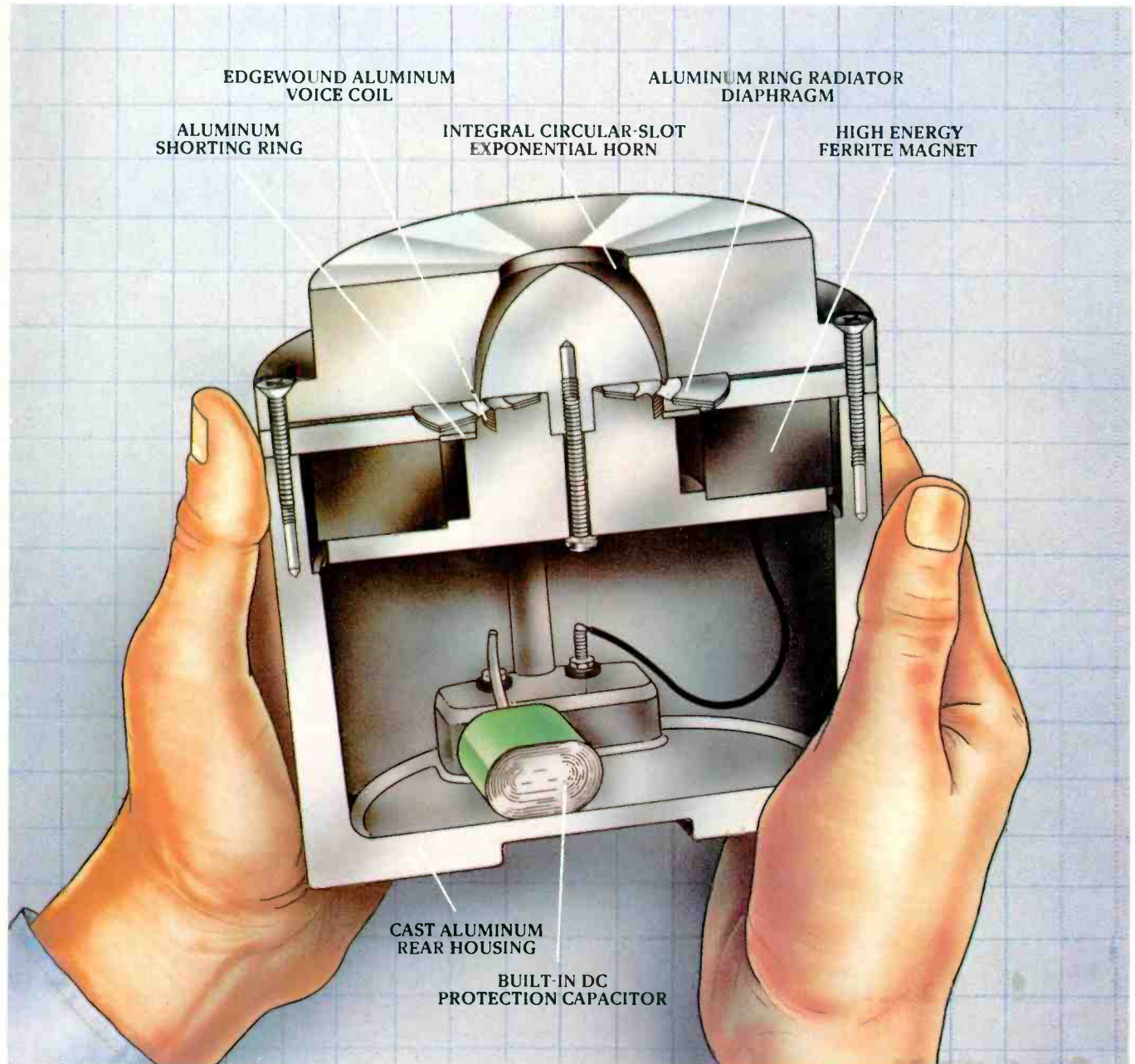
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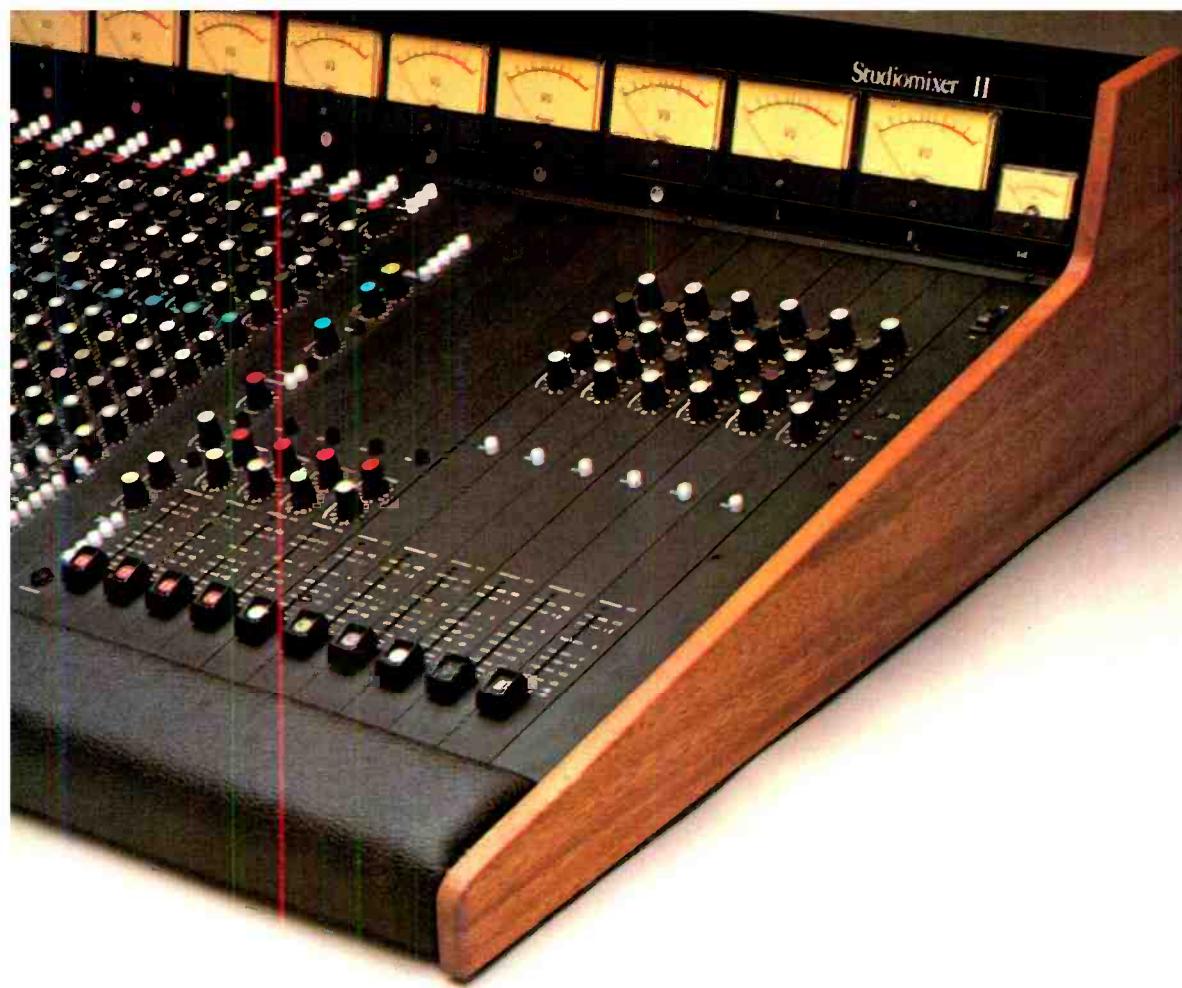
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Now You Can Get What You Want

The next time you walk into your local audio store and listen to the salesman try to tell you what you want, turn the tables on him. You tell *him* what *you* want, instead.

Explain to the salesman that you have a studio and you need a mixing console with the finest components and specifications available to give trouble free performance and produce high quality tapes. Mention that your band also works gigs, and that your new mixer must have equalized, balanced sends for stage amps, too.

Next, convince him that you need some basic features like individual input channel patching, phantom power, input attenuation and padding, two effects sends, and overload indicator lights. Remind him that you would like at least a four-way, independent mix for headphones in the studio or for monitors on stage. Tell him that you would like the mixer's submasters to be an independent mix from that of the masters, so that a tape can be made of a live gig without disturbing the P.A. mix.

Don't forget to tell the salesman that you must have a full parts and labor warranty for at least two years . . . one which enables you to deal

directly with the factory if you like when your band is not near a local dealer.

Then demand more features. Tell him that you would like the board to have a built-in pink noise generator, a lineup oscillator, VU meters for all output functions, and cueing buttons for just about everything you can think of. And, of course, tell him that you expect all this for an unbelievably low price!

But, most importantly, put the final icing on the cake by saying that you need a 10X2 mixer today, but that your needs may dictate as large as a 35X8X4X2 console for your expanded facility, tomorrow.

By this time, if your local audio dealer is prepared for someone with needs as complex and sophisticated as yours, he will be directing you to the Studiomixer display in his store. If he's not prepared, then maybe you had better find a dealer who is.

If you need help finding a dealer, or just plain want some more information, please write to us, Amerimex Co., Inc., 10700 Katella Ave., Anaheim, California, 92804.

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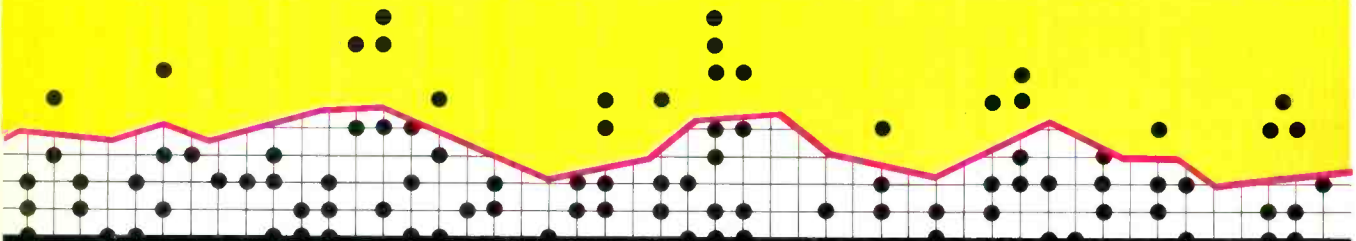


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The Roland TR-808 will undoubtedly become the standard for rhythm machines of the future because it does what no rhythm machine of the past has ever done. Not only does the TR-808 allow programming of individual rhythm patterns, it can also program the entire percussion track of a song from beginning to end, complete with breaks, rolls, literally anything you can think of.

Writing

Because the TR-808 is completely programmable, the rhythm selection is not limited to factory presets. Any rhythm pattern can be easily written into the TR-808 digital memory, even odd time signatures like 5/4 and 7/8.

The programming is done in real time using the step method we pioneered with our BOSS Dr. Rhythm. However, the number of steps is variable so that rhythms can be programmed with as small a division as 32nd notes.

Playing

A total of 32 different rhythm patterns can be written into the TR-808. Rhythms are played by selecting one of the 16 switches along the bottom of the front panel. These can be switched while a rhythm is playing to change from a straight beat to a fill, or another rhythm.

LEDs indicate which rhythm is playing, and a Prescale feature makes sure all rhythms are in time with each other, even while switching between odd and even time signatures.

Composing

A feature that sets the TR-808 apart from any other rhythm device is its ability to record an entire composition's percussion score, which we call Composing the Rhythm Track. This is accomplished in exactly the same way as the unit is played, by switching from one rhythm to another, only this is done while in a Compose Mode. When the song is over and you switch from Compose to Play, every change has been recorded, every fill, straight beat and break, up to 768 measures in length.

The Voices

The eleven instrument voices of the TR-808 include bass and snare drums, three toms, three cymbal voices, hand claps and more. Roland's exclusive programmable accents give additional life to any programmed rhythm.

Each voice has its own level control for total mix, and many of the voices have timbre, tuning and decay controls. If that's not enough control, each voice has its own output jack so it can be processed however you like.

Roland Corp US
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We Want You to Understand the Future

MODERN RECORDING & MUSIC

OCTOBER 1981

VOL. 7 NO. 1

THE FEATURES

STUDIO NOTEBOOK, #3

By James F. Rupert

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Have you indeed been worrying about those strange little numbers introduced in #2? Well, Rupe will either set your mind to rest or send you screaming into the hills with his explanation of what they mean to you. Read on!

A SESSION WITH RON WOOD

By Steve Caraway

40

Putting the finishing touches on his fourth solo album, *1,2,3,4*, at the Los Angeles Record Plant, Wood (whose credits include the Jeff Beck Group, the Faces and the Rolling Stones), took time out with *MR&M* to describe, among other things, recording in a cold garage!

PROFILE: PRODUCER JACK DOUGLAS

By Bob Anthony

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Douglas, whose career spans sessions with the Knack, Patti Smith, Aerosmith, Yoko Ono and John Lennon, credits his success to patience, a willingness to try anything, and a unique ability to keep "circuses" in hand. Chances are, the 22-hour days he puts in while recording didn't hurt either!

COMING NEXT ISSUE!

A Session With Hall & Oates

Profile: Producer Tom Dowd

Construction Project: Build a Noise Gate

Cover Photo: Kathy Cotter
Ron Wood Photos: Kathy Cotter
Jack Douglas Photos: Kathy Cotter

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Nothing else sounds quite like it: the Leslie speaker. Advice for keeping its sound sound.

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Two years after its initial introduction, Dr. Dolby's headroom extension system has been "adopted" by Bang & Olufsen. A look at B & O's Dolby HX Professional.

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The Great British Spring Stereo Reverberation System

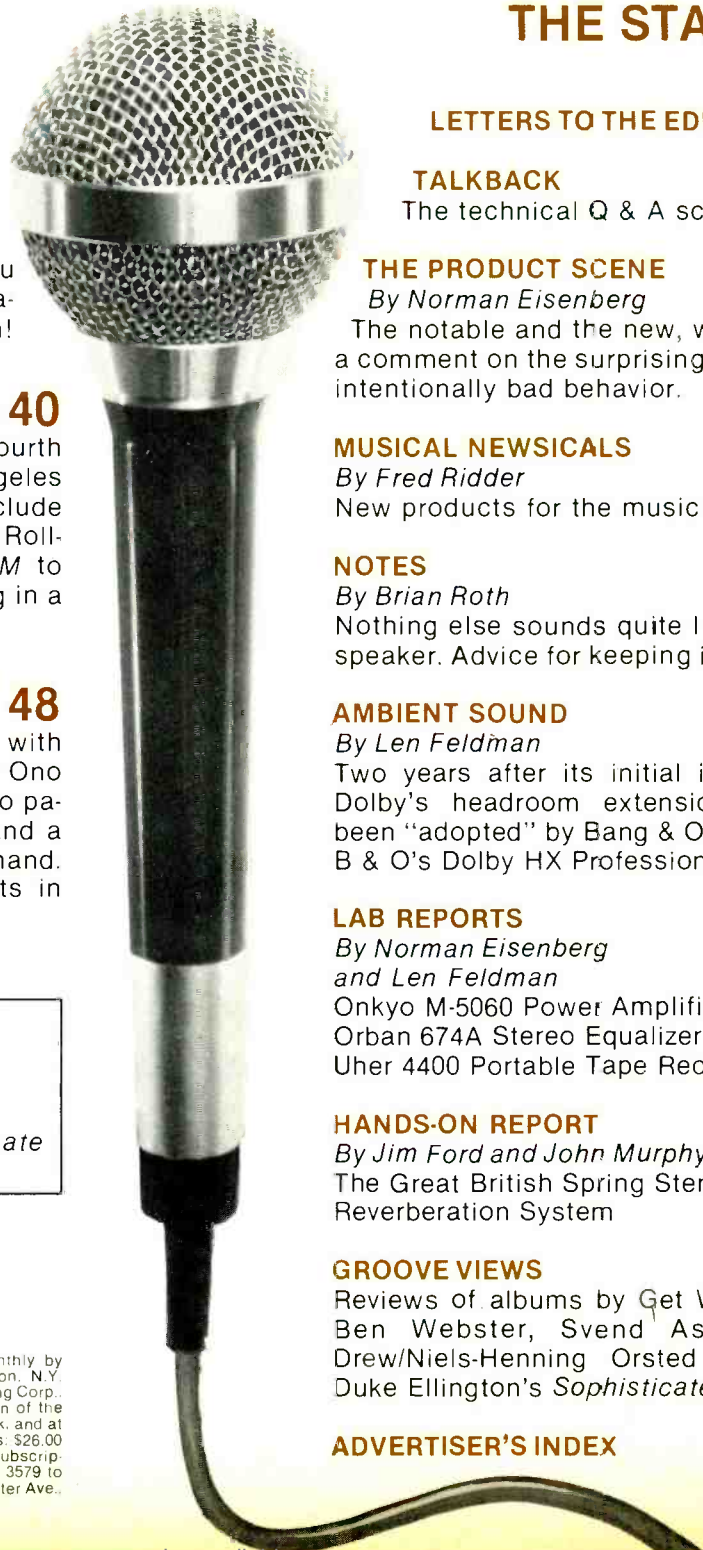
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Reviews of albums by Get Wet, Joe Walsh, Ben Webster, Svend Asmussen/Kenny Drew/Niels-Henning Orsted Pedersen and Duke Ellington's *Sophisticated Ladies*.

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LETTERS TO THE EDITOR

More Limiter

Sometime back my father purchased a 6790 dual limiter kit for me, James Tasto. I assembled the kit, and it functioned perfectly. However, when limit threshold was reached an audible "clicking" sound was heard. It was a terrible sound, and I was very disappointed with Craig Anderton's design.

After some careful study of the circuit, I have found the true cause of this distortion. Transistor Q1 is normally "off" when signal is below threshold. When signal rises about threshold IC3A and/or IC3B turn the base of Q1 negative with respect to emitter. This turns the transistor Q1 to its full "on" state. I believe the limited slew rate of Q1, or the transient Q1 feeds back to pin 1 of IC1A. In either case, it can be proven that Q1 is the cause of this distortion by simply disconnecting either the V+ line to Q1 emitter, or disconnecting the control voltage from pin 1 of IC1A.

In the June 1981 issue of *Modern Recording & Music*, there appears a *Letter to the Editor* called *Back to the Limiter*. The writer of this letter claims that the "clicking" sound is caused by the input impedance of the (IC3A + B) comparator circuit causing current pulses that feed back to the input of the compressor IC, IC1. It can be proven that in fact this is not the cause of the clicking by disconnecting pin 1 of IC1A from the circuit.

Disconnecting pin 1 from the circuit does not stop the function of the comparator circuit IC3A and B, but it does stop the "clicking" sound. This proves that the cause of the distortion is not the comparator circuit, but is, in fact, the transistor Q1.

Also in the June 1981 issue appears a reply from a Craig Anderton to a letter called *Is Phase Inversion Serious?* Craig gives a suggestion on how to reduce distortion of the limiter. He suggests changing C11/C12 to 100 UF, and R1/R2 to 33 ohms. This lengthens the release time of the control voltage so that Q1 does not change state as often, thus reducing the amount of "click" (distortion) for a given amount of time. Craig's suggestion does not solve my problem because the release time of the limiter is lengthened to a point where it (the release time) is too long for most applications.

The information for the above paragraphs was formulated out of my experimentation with the limiter circuit. If the above information is found to be incorrect in any way, please be sure to disregard that portion of it, and accept my apologies for taking your valuable time.

Note: A possible cure for the distortion would be to limit the slew of Q1 to a point somewhat. Another choice may be to stop the transient spikes of Q1 from reaching pin 1 of IC1A, or rearranging the circuit so that Q1 would not have to switch from its full "off" state to its "on" state, i.e. (forward bias of Q1's base).

If anyone investigates the above thoroughly and can respond with the results of your investigation, I am anxiously waiting to hear from you. An answer would be very much appreciated.

—James Tasto
St. Cloud, MN

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If anyone out there investigates, or has information on hand to give to Mr. Tasto, his address is: James W. Tasto, 148 28th Avenue North, St. Cloud, Minnesota 56301.

Something Electronic in the State of Denmark

I was shopping in New York City recently and came across some new products made by T.C. Electronics of Denmark. These products are small effects boxes similar to the ones made by MXR and Boss that are battery powered. I was wondering if *Modern Recording & Music* ever did a review on these and if you could provide the address of T.C. Electronics so that I might contact them for information. Thank you.

—Charles Redman
Stroudsburg, Pa.

We spoke to someone at the Danish Consulate General in Manhattan, but they could not find any company by the name you give. They suggested that you find out what the T and C stand for and try to contact them for

further information. Or perhaps they are a subsidiary of someone else? You could follow up on this by writing to: The Danish Consulate General, 280 Park Avenue, New York, New York 10017. Their phone number is: 212-697-5107. They seem to be extremely helpful. If anyone in our readership has any information on T.C. Electronics, please let us know!

What's the Difference?

I am a bit confused about two terms: remanence and retentivity. I am not quite clear, either, on the difference between the two terms. Would you be able to clarify this for me?

—Joseph D'Angelo
New York, NY

We quote from The Cameo Dictionary of Creative Audio Terms, by Gary Davis and Associates, Topanga, California.

Remanence is: "The magnetic field (in lines of flux per unit width of tape) that remains when the magnetizing field is reduced from maximum (the level producing saturation) to zero."

Remanence is used as a reference number for comparing the relative output, distortion and response of the recording tape at low frequencies.

Here's what Cameo has to say about "retentivity." "Equivalent to 'remanence' except expressed in terms of flux per unit of cross sectional area (flux density). Retentivity is used to compare the uniformity of oxide dispersion independently of the thickness of the coating. It serves as an indication of the sensitivity of the tape at high frequencies."

Cara

I'm interested in getting the address of Cara Pacific Sales Company. I'd heard that about a year ago they came out with some stereo condenser microphones which I would be interested in getting information on. A phone number, if you have it, would also be highly appreciated. Thank you.

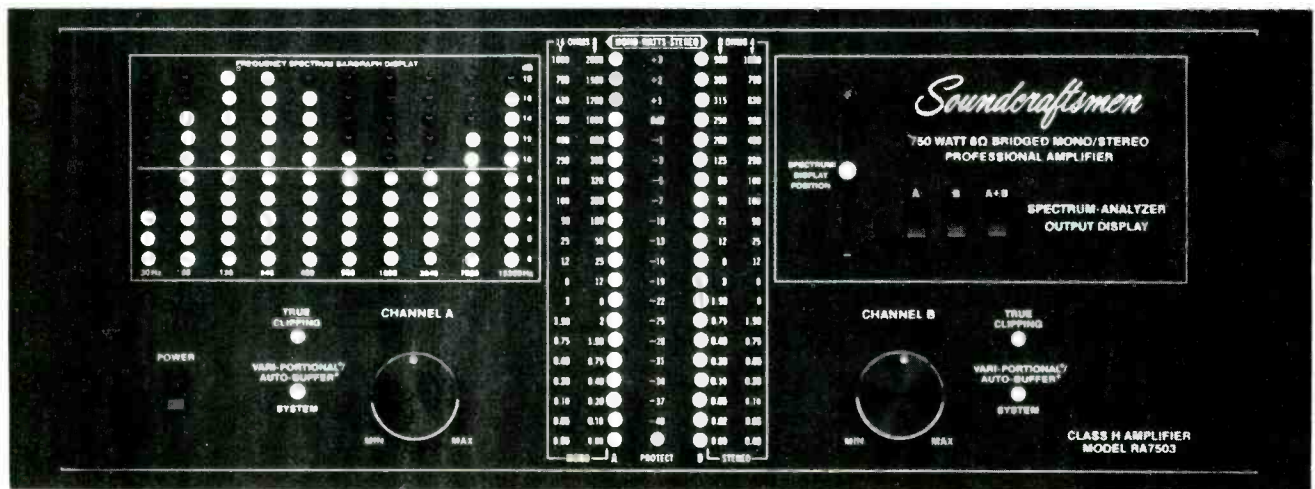
—Stephen Connors
New York, NY

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www.americanradiohistory.com

tional Ltd., P.O. Box 9339, Marina del Rey, California, 90291. Their phone number is: (213) 821-7898.

Just Sit Back and Relax

Thanks for a great magazine and keeping it so readable. I read the other trade mags that are more technical in nature, but it's nice to be able to relax and keep up with what's happening. I also really liked the addition of MUSIC to your name and the articles that come with it.

—Stewart V. Lowry
Chief Engineer
Audiotracks of
Roanoke, Va.

Thank you for that vote of confidence. We're glad that the change we made about a year ago, in adding "music" to our name, has had such a fine reception.

The Hass Effect

Are the Hass effect and the "precedence effect" the same thing? I'd always thought they referred to two different phenomena, but now I'm beginning to have my doubts after some things I've been reading.

—Michael Irvin
Coral Gables, FL

Yes, they are the same thing. The both terms refer to the psychoacoustic phenomenon of our being able to perceive where a sound is coming from, based on the relative level and arrival time of the sound in each ear.

This phenomenon was first described by Helmut Hass, hence, the name.

A Word from a Home Recordist

I have a Teac Model 2A mixer and I do like it, though I find it noisy. There are many of these neat little boards out here. How about some modifications to improve performance specs? Perhaps some relevant schematics or (dare I hope?) a complete article. Remember, we "home" recordists who can't afford \$1500 for a mixer are very clever with our soldering irons.

I couldn't write without giving a round of applause to Craig Anderton. I have built just about all his projects, and they have raised my audio consciousness. I anxiously await the revised edition of EPFM. Hats off to Craig.

I have built the limiter and the hot springs project...several of each, actually...I do get some feedback in my reverb signal, but not serious. Help on this would be nice. Otherwise they are excellent. I find limiting preferable to noise reduction of a companding nature. Much more natural sounding. The reverb sounds great with a bit of EQ. Keep those projects coming.

Some tips...I have added an effects and cue monitor to my 2A using the cue mixer from *Home Recording for*

Musicians. I used TL071 BiFet Op-Amps, and included a unity gain inverter after each of the mixing circuits. This prevents the problem of phase inversion when using the cue mixer as a reverb mixer (or effects). The 100 K isolation resistors on the mixer circuit prevent interaction with the signal flow on the 2A. I have built three...two for effects, which return to an input strip, and one for cue which goes to the aux input on the amp I use for monitoring.

"The Milab LC-25 beats any mic you can buy that we've ever heard!"

That's what Larry Brown, engineer for Sheffield Lab's Direct Discs Volumes I & II, had to say about the newest addition to Milab's complete line of professional mics. Larry added, "It's incredible on vocals when compared with the U-87 ... superb on acoustic guitar, better than the KM-88 and it wipes out the 414."

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JAPAN: Continental Far East, Tel: 03-583-8451, or

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AUSTRALIA: W. C. Wedderspoon, Tel: 22-642-3458

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NORWAY: Pru Technic, Tel: 02-460554

SINGAPORE: Auvl Private, Tel: 293-7155

FINLAND: Studio Tic, Tel: 358-0-52064

We'll see you at AES in November

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Phoenix Systems sell an excellent parametric EQ. For those versed in tinkering, one can just buy the boards, collect parts for various sources, and use one power supply to push several units. I have six channels of two band EQ or three channels (strapped) of four band EQ. All for less than \$175...not bad.

Thanks for your time and any help. I am a novice and my nomenclature might be rough, but my interest is strong.

—Bob Waxer
Cambridge, MA

Learning By Doing or By Reading

I am wondering, as no doubt are many soundmen working for working bands, if there are any books or manuals published that deal with the problems of sound reinforcement, such as unity gain, correct patching in correct sequence, how to choose the right system for your sound, how to troubleshoot the system for a problem, as well as a million other questions and problems that come up. Or is it necessary to go

to electrical engineering school and then spend ten years on the road and in the studio to learn some of the basic techniques of working with sound reinforcement? Thank you.

—Gregg Reed
Big Rapids, MI

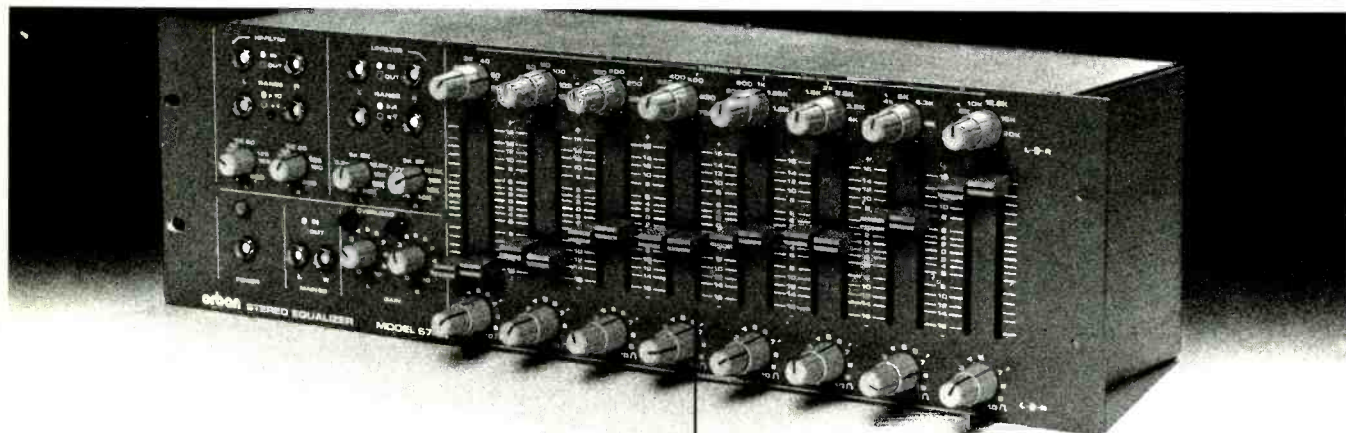
Try *How to Design, Build, and Test Complete Speaker Systems* by David B. Weems. It's a TAB book, No. 1064 in the series. You can write for a complete catalog of TAB books by sending a request to TAB Books, Blue Ridge Summit, Pa., 17214. I don't really believe it will be necessary for you to first spend ten years on the road and in the studio before you learn the basic techniques.

Trademark Info

Could you straighten me out on trademarks—what exactly the term means, how they can be obtained, how to register them? I'm afraid that I have a few misconceptions about them that need to be cleared up. Thanks.

—Stu Roth
Chicago, IL

A trademark can be a word or a logo that identifies an item or goods from a particular source. An example of a trademark is a brand name, such as "Sony," which identifies the goods—in this case—tape recorders. Service marks identify services, such as the name of a rock group to identify the recording and entertainment services of that rock band. The owner of a trademark can sue when someone else attempts to use the same name on the same type of goods or services. The owner's rights apply to different terms that are similar enough to cause confusion, and to different goods and services if they are closely related enough to create confusion of origin or sponsorship. The owner of the trademark is able to license someone else to use the same trademark on any goods or services. The owner though, in this case, has a responsibility to control the quality of the goods and services provided by the licensee. The effect of this is that purchasers are protected from being misled about the source of the goods or services, and the owner can still benefit from the "reputation" of his trademark.



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The low-frequency loudspeaker

Electro-Voice EVM™ Series II loudspeakers represent the ultimate in maximum efficiency, low-frequency speaker design. Years of experience, testing and refinement have resulted in a series of loudspeakers that are ideally suited for professional high-level, high-quality musical instrument and sound reinforcement systems.

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EVM's are the ideal speaker for vented and horn-type enclosures. They are also featured in Electro-Voice's TL line of optimally-vented low-frequency systems. TL enclosure builder's plans are also available for custom construction, and each EVM Data sheet contains the Thiele/Small parameters which allow you to predict the large and small signal performance in vented boxes.

For these and other reasons, not the least of which is an unmatched record of reliability, EVM's have been universally accepted by sound consultants, contractors and touring sound companies. When specifying a low-frequency loudspeaker, there really is no other choice. EVM — by Electro-Voice.



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In Canada:
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245 Herbert St., Cananocue, Ontario K7G 2V1.

CIRCLE 130 ON READER SERVICE CARD

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In the United States, unlike in most other countries, trademark rights can be acquired by using the mark on the goods or on the displays for them, or by displaying the mark in the sale or the advertising of the services.

The first person who uses the trademark generally has exclusive rights to that trademark in whatever area he has used it on a commercial scale. A trademark search report is often done before a new trademark is adopted. This prevents an infringement of someone else's rights. Only an attorney from a professional search service can order the search, and a trademark attorney can interpret the report and advise whether or not any particular problems will come up.

As to registration of a trademark, it is not actually necessary, and unregistered rights will still be protected in the trademark user's trading area. The trademark owner, should, though, register the trademark with the U.S. Patent and Trademark Office if the trademark has been used in interstate commerce. The current fee for this is \$35. Organizing a corporation or the filing of a certificate of doing

business under an assumed name is not a substitute for obtaining a federal registration. A federal registration is notice of the registrant's exclusive ownership rights nationwide to anyone who later starts using that trademark. It also allows federal courts jurisdiction to hear infringement claims. The trademark rights can continue indefinitely as long as the mark is used properly though federal registrations must be renewed every twenty years. A declaration of use must be filed during the sixth year after registration.

Magic

We just opened a 4-track recording studio (Wiggins Family Sound) about the time your May issue of *Modern Recording and Music* arrived in our mailbox. Much to our surprise, in this issue, was the life saving article *Multi-Track Magic: Creative Multi-Track Recording* by Craig Anderton. Thanks to this article we were able to lay down 21 tracks for a very large group the very next weekend using your published techniques. I could not have made it without these ideas, as I just didn't

think about doing things by bouncing without using sync. The group really was surprised and pleased at the results and have us pegged as a top professional recording studio, again thanks to *Modern Recording and Music*.

—Ron Wiggins
Wiggins Family Sound Studio
Florence, SC

Cardioid Distinctions

Could you explain the differences between a basic cardioid microphone, a hypercardioid microphone, and a supercardioid microphone?

—Doug McNeill
Bloomington, IN

A cardioid microphone has a heart-shaped pickup pattern. It is sensitive to sound coming from the forward direction and will not pick up sound coming from directly behind the mike. At the sides of the microphone, it is only half as sensitive as it is at the front.

The hypercardioid pattern has a greater front to back ratio than does the cardioid. At the sides of the mike,

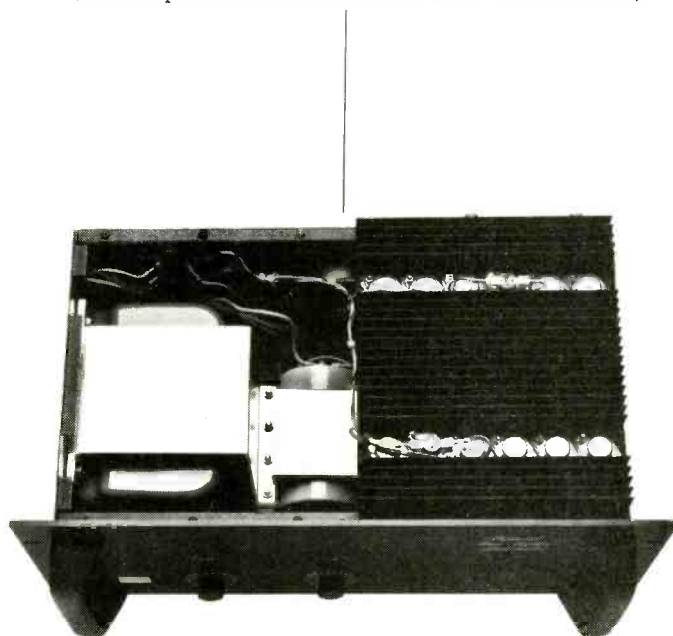
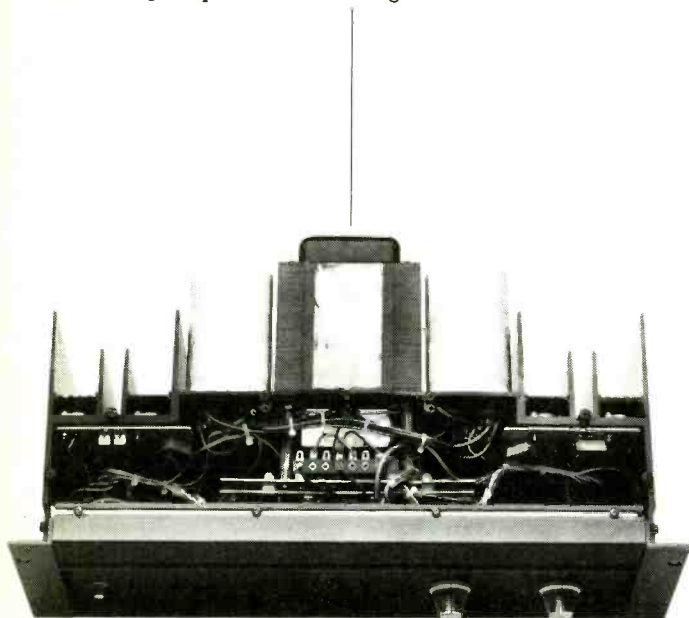
THE WEAK LINKS.

A power amplifier is only as good as its mechanical integrity.

Here, the transformer is mounted outside the chassis. Exposed to knocks and damage. Its rear mounting may cause rack weight imbalance.

The transformer and support bracket here is mounted to the outside cabinet. The transformer is located poorly for direct impact on the cabinet bottom.

Also, it takes 20% more rack space than ours. (Left output module removed to show transformer.)



PHASE LINEAR TAKES THE

You can see the advantages of the new Phase Linear A60 and A30 pro amps. Now listen to them. For the name of your nearest

the cardioid is four times less sensitive than at the front. At the rear of the microphone it is half as sensitive as at the front.

The supercardioid is another variation of the cardioid microphone, similar to the hypercardioid, but having a slightly lower front to back ratio. Its sensitivity at the rear is less than that of a hypercardioid while its sensitivity at the sides is greater.

Your Own Business

I am presently considering joining a business venture that involves a recording studio. In the June 1981 issue of *Modern Recording and Music*, in the *Studio Notebook #1*, you mentioned an article, *Small Studios—The Lighter Side of Business* which was very helpful. Could you suggest any other reference? Thank you for your attention and cooperation in this matter.

—Dana Dal Bello
Marketing Concepts
Dania, FL

I would recommend looking at the Contemporary Music Almanac by Ronald

Zalkind published by Schirmer Books, a division of Macmillan Publishing in New York. There is a chapter on organizing your own business that you might find helpful.

Controlling Flutter

I'm in the process of building my own recording studio and am trying to glean information from as many possible sources as I can before going on with any definitive steps. One thing I am especially worried about, and would like your advice on, is how can I control flutter?

—Martin Thomas
Houston, TX

Try covering just one of your walls with an absorptive material. Or you could use patches of material, for example, acoustic tile, or cork on both of the walls. Patching causes the waves to diffract in random directions when they strike the patch boundaries. Absorption removes some of the energy from the reflected wave. The solution of one layer of patching material on one wall creates a situation of one wall having a

very different acoustical character from the other. Patching allows a consistency between the character of the two walls.

You could also slope one of the walls by about ten degrees or more. This prevents the direct reflection of waves back and forth. This method is often found to be used in echo chambers in which absorptive materials cannot be used.

There is another method which leaves reflectivity intact... You could put in large "diffusers" which will make the sound waves that approach reflect in random directions. These can be geometrical wooden constructions that protrude from the walls. They can be of a variety of shapes and sizes. This solution also does not involve building a new wall.

We hope these solutions are workable for you. Good Luck.

The Question of Schools

Leo de Gar Kulka raises a good question with his suggestion that one simple listing of recording schools is inadequate or even misleading. Education in

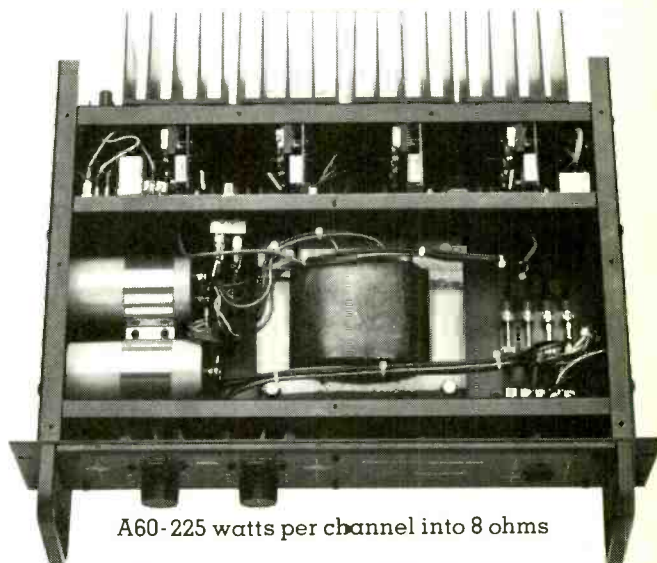
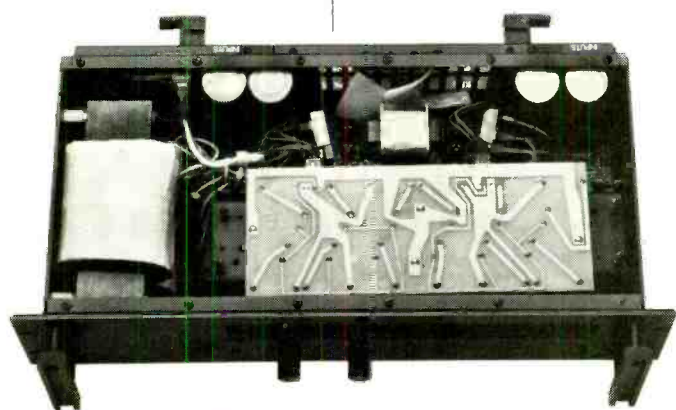
Here, the power transformer is bolted directly to the chassis. Every time the chassis takes a knock, so does the transformer.

Also, there are no detachable cords, no flexibility.

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this field can vary from a \$100 seminar taught by inexperienced engineers in a small studio to a year long, intensive program costing many thousands of dollars. He is being unfair, however, when he implies that only state accredited schools are to be taken seriously, as this places undue emphasis on formality. Certainly, everyone who opens up a recording studio is not automatically qualified to teach audio, but there *are* several fine courses being offered at various independent studios. Also, since many interested people are unable to invest the large amount of money that would be required for a year long program, a less expensive course is often the only possible way to gain exposure to modern recording technology.

Perhaps in future listings of recording schools, *MR&M* could include information on the length and scope of the classes offered as well as class size and of course, the cost. When considering a particular recording program, the prospective student should always call the school and if possible, speak with the instructor directly. Inquire as to what topics will be covered in the

course and what you should expect to know when you complete it. Also, how much of the class time is devoted to individual hands-on experience, and how wide a variety of microphones and outboard equipment will be available. If you do not receive clear, coherent answers to these questions, you should probably continue looking.

Finally, I believe that the success of any course is greatly dependent upon who is teaching it and likewise, the student must possess sufficient aptitude and dedication if a career in audio is to become reality.

—Ethan Winer
Chief Engineer and Instructor
The Recording Center, Inc.
Norwalk, Ct.

In reference to the second paragraph of your letter, we haven't been and do not intend to be printing any more listings of schools. In listing schools it seemed that we were passing judgement on the relative merits of one school over another. Omissions on our part were taken to be decisions that a particular school did not measure up to those which we did list, and this was not the

case. Because it is impossible for us to determine which schools "deserve" to be listed, and which don't, we recommend now that people interested in attending school do their own careful research through catalogs, visits, phone calls, and any advice they can get from people who have either attended a particular school or who have accurate information about it.

The advice you give in your letter should be taken by any prospective students out there. Thank you for it.

How to Reach the Castle

In the August 1981 issue of Modern Recording and Music, in our Letters to the Editor column, we printed a letter written by Ben Cahill, owner of Castle Instruments (Word From the Castle, p. 5). We neglected to print the address and phone number of Castle Instruments, so here we go: Castle Instruments, 2 Carteret Court, Madison, New Jersey 07940. The phone number is: (201) 377-8185. Sorry for the inconvenience to those of you out there who wanted to write to or call Castle and didn't have the information on hand.



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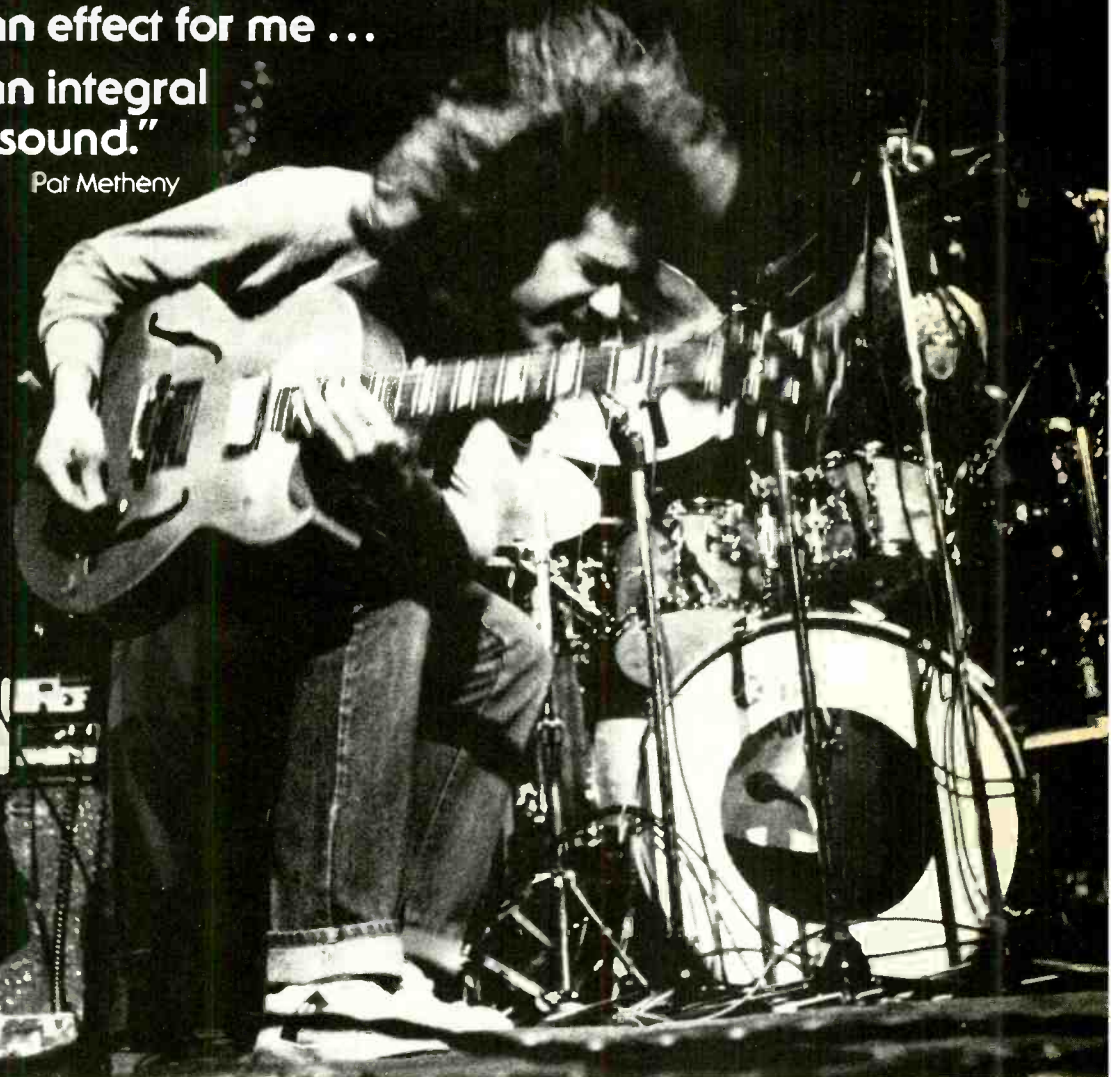
Quotations are from contributors to recent issues of PZMemo, a newsletter of PZM ideas published by Crown.

CIRCLE 104 ON READER SERVICE CARD

MODERN RECORDING & MUSIC

**"Lexicon Prime Times
aren't just an effect for me ...
... they're an integral
part of my sound."**

Pat Metheny



Pat Metheny records for ECM Records.

"I felt I needed a bigger guitar sound, and the sound engineer at Talent Studios in Oslo where I was recording told me to wait while he plugged in a box. What came over the monitor was the greatest guitar sound I'd ever heard, something I'd been seeking for many years. The box was a Lexicon digital delay."

"I'm amazed at the guitar sound I get from Prime Time. No other delay has its warmth. Prime Time creates a space around the sound which in a lot of ways is as important as the sound itself. Knowledgeable listeners say our concerts sound like our records. Much of that can be attributed to the Lexicon Prime Time."

"Today, I use five Lexicon systems on a typical concert, of which I do about 300 a year. On stage at my right hand is a Prime Time; another Prime Time is at the board that mixes the drums and piano. A third Prime Time is used on the PA line. We also use a Model 92 and the new 224 digital reverb."

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CIRCLE 122 ON READER SERVICE CARD

TALK BACK

"Talkback" questions are answered by professional engineers, many of whose names you have probably seen listed on the credits of major pop albums. Their techniques are their own and might very well differ from another's. Thus, an answer in "Talkback" is certainly not necessarily the last word.

We welcome all questions on the subject of recording, although the large volume of questions received precludes our being able to answer them all. If you feel that we are skirting any issues, fire a letter off to the editor right away. "Talkback" is the Modern Recording & Music reader's technical forum.

Some "Light"-hearted Advice

You've been a great help to all us semi-pro recordists and musicians in terms of audio, but I've come upon a problem in another, although related, area. In my effort to provide an entertaining show for the people hiring our musical group, I have put together some lighting trees consisting of three 150 watt spots and colored gels. Is there anyone that can provide me with plans for building a sequencing circuit or chaser electronic circuit? It doesn't seem enough that the lights just stay on. I need some variety. If there is anything you can do, I would really appreciate it. Your articles have been very helpful to me in the sound department but I seem to be in the dark about lighting.

—Doug Cooper
Milford, Ohio

[Ed. Note: Oh, Doug, how could you? We'll help you—despite that awful pun!]

One word of advice on "home-bulding" lighting control equipment: *DON'T!*

The problems with much "home-built" equipment are the spurious R.F.

(Radio Frequency) emissions and electronic (sometimes even mechanical) noise generated by improperly filtered components. There are a number of commercially made sequencing/chase units available that will meet or exceed your needs. However, try them before you buy them to make sure they will not interfere with the quiet operation of your P.A. system.

Second word of advice: Any repetitive lighting sequence—such as "chasing"—quickly becomes boring as it is predictable and repetitive. Special effects, of any kind, are best used in moderation, to highlight the effect, not run it into the ground with overuse.

Perhaps the best way to get the variety you ask for is to use dimmers to change the lighting picture or look. Dimmers allow you to:

1. Fade from one color (or look) to another color (or look) to punctuate or underscore the music.
2. Direct attention to specific areas of the stage, by what you light *and* what you don't light.
3. Mix colors to change moods (the look).

Dimmers are just another tool to enhance the total performance, but are not as limiting as special effects. They are the base that special effects are added to, to become "special."

Third word of advice: Your best lighting equipment vendor is a company that regularly and frequently handles both lighting and sound equipment for *musicians*; usually, these companies are quite capable of providing correct and compatible lighting and sound equipment. Also, their sales people probably have a good deal of experience in helping non-lighting people find and operate the appropriate equipment.

Fourth word of advice: To "find" the variety available in lighting, go see a wide range of performances; music, theatre and dance in particular. You

will see a wide range of approaches to variety and, by using your imagination, can adapt the "looks" you like. Use your eyes, imagination and memory to create the lighting you want.

—John C. Gates
President
New England Production
Services, Inc.
Needham, Mass.

An End to Teac Test Tape Torment

I hope you (or anyone) can help me find some answers to questions I have about servicing a Teac A3440 ¼", 4-track tape deck which is used daily in the production studio where I am employed. We have both the owner's and service manuals for the machine, but unfortunately the manual calls for a specific test tape (YTT-1004) manufactured by Teac. We have been unable to find this tape even through Teac's regional distributor. In addition to not being able to find this test tape (anywhere!), the manual lists several pieces of gear to be used in servicing the deck without specifying the type of gear, i.e., "Oscilloscope-General Purpose; Attenuator-General Purpose." As we both know there are many types of 'scopes and attenuators (I haven't found "General Purpose" listed under test equipment yet in the Yellow Pages.)

The procedure the manual gives for level set-ups, bias adjustment, head alignment and other normal routine adjustments requires the use of a VTVM, oscilloscope, oscillator, attenuator and other specific gear. What I don't understand, and have the biggest question about is, why did Teac make it so difficult to service and align this deck when so many broadcast and low-budget music studios use this deck on a regular day-to-day basis like us? I

can't align the heads (playback or record) because the test tape is not available and the meters on this machine do not even read the output of the deck itself, but the level coming from the output preamps! That feature (if you could call it that) *alone* keeps me from being able to set bias, record EQ or even align the playback or record heads in the normal manner.

Our studio runs on a continuous schedule and I perform all the normal (or abnormal) maintenance and alignment procedures on all of our machines (except one) on a weekly basis. When I want to perform these procedures on our Teac A3440, I have to set aside hours of time to perform that which would normally take me only 15 to 20 minutes.

If you could give me any helpful hints towards an easier way to perform these routine services or obtain the test tape mentioned above, it would be greatly appreciated.

—No Name Given
AudioTraks of Roanoke, Inc.
Roanoke, Va.

Aah, we remember it well. July, 1980, wasn't it? Yes, it all comes back now! "Calibration, California Style" (page 20), the epic tale spanning an entire continent: the search for a Teac test tape! Well, maybe that's overstating it a bit, but if you do check out that issue, you'll find you're not alone in your confusion over the whereabouts and availability of these tapes, although we do have an update on the story. Drew Daniels of Teac Corp. of America in Montebello, California has informed us that the YTT 1000 and YTT 2000 series tape tests have been discontinued. Teac suggests instead that you get the proper test tape (185 nanoweber/meter, EQ = 3180-50 usec NAB) from either Magnetic Reference Labs, Inc. (MRL), 229 Polaris Ave., Suite 4, Mountain View, California 94043 (or call 415-965-8187) or Standard Tape Labs, Inc., 26120 Eden Landing Rd., No. 5, Hayward, California 94545 (415-786-3546)

Addressing himself to your consternation over the equipment suggested for completing the necessary maintenance, Drew reiterates "nothing fancy." The basic oscilloscope or attenuator that you would normally have handy for repairs, etc., is all that is required.

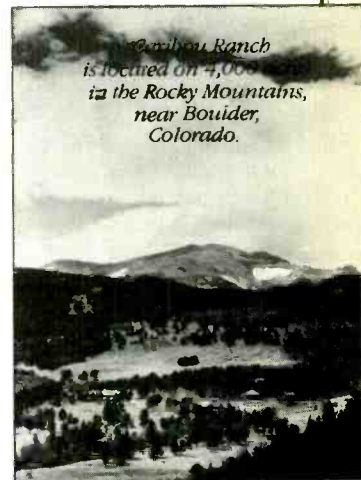
If you find you have additional prob-

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learned your stuff
from experts
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The \$2000 fee for the Workshop includes: deluxe accommodations on the Ranch, all meals, airport transportation, use of Ranch facilities, text and tape.



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CIRCLE 184 ON READER SERVICE CARD

lems in servicing this machine, we suggest that you speak to the customer service people at Teac directly, and perhaps they can "de-escalate" the distress you seem to be experiencing. Contact them at 213-726-0303.

track or two and the result, while satisfactory, loses that "hot" sound the first generation has. Would this adaptation help counter this loss a bit?

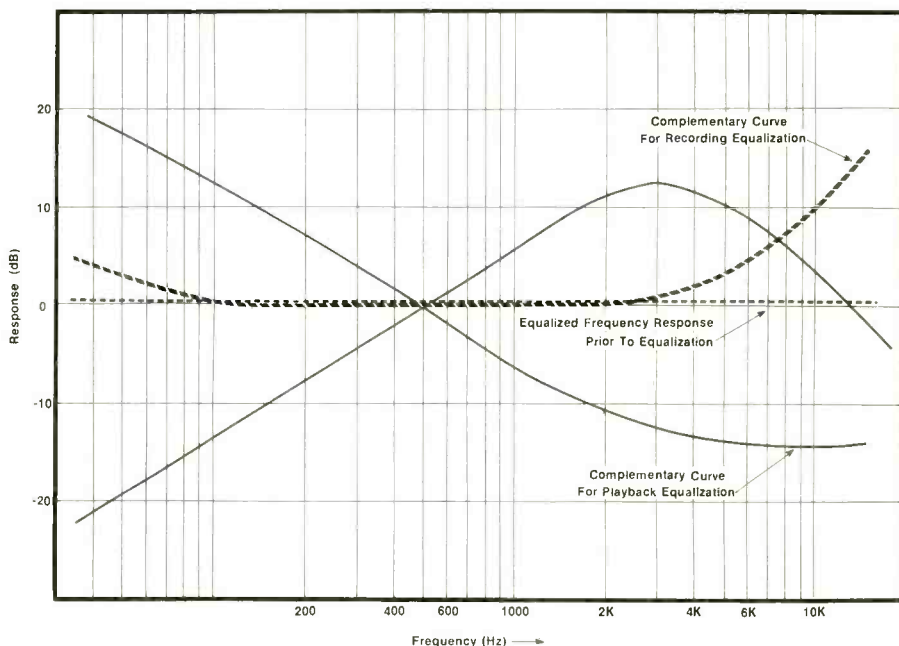
—Aaron Davis
Wenatchee, Wash.

You have posed an interesting question—the answer to which is well worth noting.

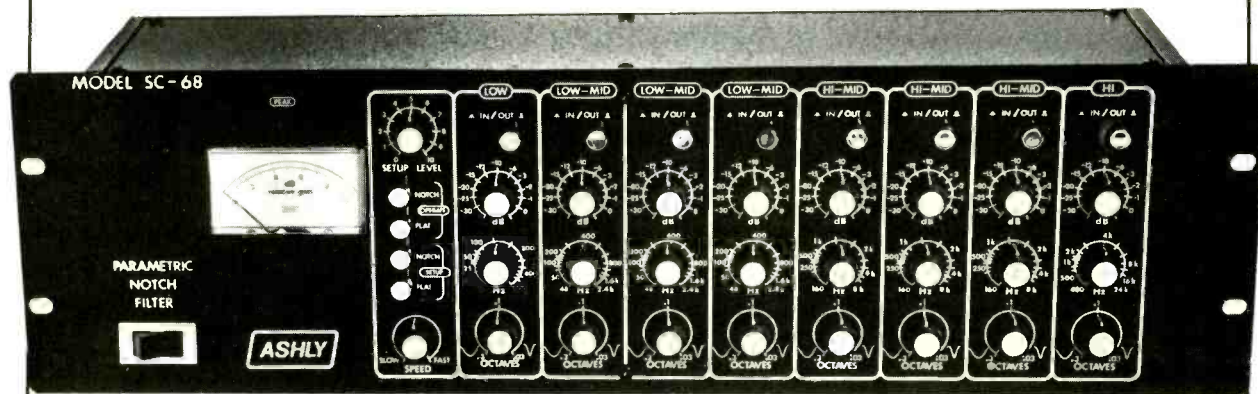
The theory you have regarding the tape speed will no doubt work, and if your machinist can hold a tolerance of

A Tailor-Made Alteration for Teac?

I own a Teac A2340 machine which I understand is basically the same as a 3340 but with slower speeds. I've been fooling around with my Teac and I've devised a plan to make mine capable of 15 ips by having a machine shop make a capstan with a setscrew to fit over the one on the 2340. I also scraped up a smaller pinch roller to make up for the larger capstan and I will attach a guide bar to keep the tape tracking properly. Everything seems workable in theory, but I'd like to *know* before I start using the machine if this alteration will in any way damage it. The object of all this would be to get a better frequency response and better S/N. Would this change accomplish these goals or is the effort futile? I've made a few multi-track recordings where I've bumped a



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If only they made cars this well.



IT'S WORTH IT.

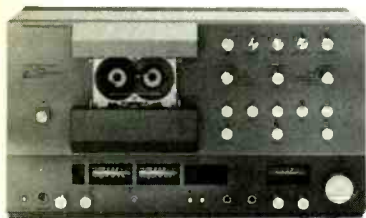
In the highly unlikely event one of our audio cassettes should perform unsatisfactorily, return it to Maxell, 60 Oxford Drive, Moonachie, N.J. 07074.

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*Recommendation presented to A.E.S. 1978 dealing with Special Equalization in Reel-to-Reel Recording

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AMERICA INC.

CIRCLE 185 ON READER SERVICE CARD

0.00005 inch, you might not even hear the "wow" (providing your sleeve fits as close as this tolerance). I tend to suspect, having machine experience myself, that the pressure of the set screw will be enough to deform your capstan to the point where an audible effect would occur. The logical alternative would be to obtain an A-3300SX-2T capstan assembly (probably cheaper than your machined sleeve) and simply replace the one in your machine. The pinch roller solenoid should have enough play in its mounting slots to accommodate the larger capstan without changing pucks.

Now to the tough part. The recording process—getting signals onto tape—is far from simple. A tape head, by its nature (a coil with a metal core) is an inductor. An inductor placed in an A.C. electrical circuit will resonate the way the springs on your car do. Have you ever noticed the bouncing you experience when you drive at just the right speed out on the concrete freeway? This is because the concrete is poured in sections, which cure faster at the edges, causing the centers to form a slight dish. Even though the dish is very slight, when you drive over at a speed that coincides with the *resonant frequency* of your car's springs (so many edges per second) you can bounce as though your shocks had been removed. Well, the inductance in the heads on your tape machine create a need for "shocks" of an electrical variety, called filters. The frequency response of an unaided tape head follows that of a low-pass filter (inductors themselves are filters) with a 6 dB per octave rolloff of high frequencies above a point determined by the length and number of turns of the wire in the head along with the volume and magnetic permeance of the metal core the wire is wound onto. The resonant/filtering effects of the tape head(s) are adjusted electrically by adding electrical filtering circuits to the amplifiers that drive the record head, and boost the weak output of the playback head. These filters can be thought of as "tone controls" whose frequency response is an inverted or mirror image response of the heads themselves. The filters "equalize" the response of the heads, and thus the terms "*record/play EQ.*" All of the various parameters of tape head design affect the final frequency response of

the deck. Things like the head gap width, surface contour (round or hyperbolic), and inductance, as well as tape speed also plays a role in the overall frequency response.

There is a deliberate alteration of "flat" frequency response designed into tape recorder electronics to help impart and retrieve signals with as little electrical "work" as possible. These alterations are called "curves" and are well defined by national or international agreement, and given names like: AES, NAB, IEC, CCIR, DIN, BTS, JIS, and RIAA. There are probably others since some manufacturers create their own, like Nakamichi.

The curves used by a given manufacturer will be matched to a head or heads that require as little EQ as possible, but the gap size of the head, and the physical curvature of the head's surface will cause a certain amount of high frequency self-erasure. As it turns out, this self-erasure is interdependent with tape speed because of the change of wavelength (wavelength = reciprocal of frequency times tape speed). You will not only need to reduce the amount of play EQ and increase the amount of record EQ, but also raise the EQ *frequency*.

This is usually an exercise that requires the skills of an advanced audio technician or an engineer with test equipment to measure the head parameters and calculate the appropriate values for the filter components that need to be changed. Flux loop measurement, using a frequency counter, a precision test tape, and an RLC bridge, might be required in addition to the standard compliment of audio test gear.

The advantage of higher speed is, of course, twice the *volume* of tape passing heads in the same period of time, and thus twice the *power* in electrical terms, stored on the tape (a 500 Hz tone recorded at 7½ ips, would play back as a 1 kHz tone at 15 ips, but in half the time, and ideally 3 dB higher).

Given the complexity of what you want to do, I would say that unless you are an engineer yourself, it might be simpler to find someone who can use your A2340 as is, and get into a 15 ips machine like the 22-4 or A3440.

—Drew Daniels
Applications Engineer
Teac/Tascam Professional
Products Group
Montebello, Ca.

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Take a look behind the scenes at today's hottest concerts and you'll find some legendary names in sound equipment. From compact, combo twins to massive sound reinforcement arrays. And if you could look inside these systems you'd probably find another name—JBL. Because for over 30 years professional musicians have been depending on JBL loudspeakers to deliver the performance and sound quality they demand.

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And the improvements aren't limited to just power capacity and efficiency. The E Series also features our unique Symmetrical Field Geometry (SFG) magnetic structure.

This new magnet design provides extremely high accuracy with minimum speaker distortion.

Of course, the one thing we would never change is the unmistakable sound quality of our speakers. So the E Series maintains the distinctive tone character that has made JBL loudspeakers an industry standard.

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Specifications	E110 (10 in)	E120 (12 in)	E130 (15 in)	E140 (15 in)	E145 (15 in)	E155 (18 in)
Primary Application	Lead or rhythm guitar, piano, vocals, line array	Lead or rhythm guitar, electric piano, organ, vocals	Lead or rhythm guitar, electric piano, organ, vocals	Electric bass, low frequency reinforcement	Organ, synthesizer, low frequency reinforcement	Electric bass, subwoofer, low frequency reinforcement
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

Necessity the Mother of Invention?

I live in the St. John's, Newfoundland area and because of my work (I'm a guitar player with a rock and roll band), I find it necessary to do some speaker repairs from time to time. More and more people are coming to me to do their speaker repairs as well, and I do my best to oblige them, otherwise they would have to send their

speakers to Halifax, Nova Scotia or Toronto, Ontario. I have a problem, however, that I hope you may be able to help me with.

I find it impossible to get speaker kits or parts of kits. Only the Electro-Voice people make their parts available at reasonable prices. I am hoping that you can put me in touch with some other sources of supply for speaker kits and parts so that I can continue to

do repairs for the musicians here. You would be helping many a local musician by helping me with my endeavor.

—Nick Cutts
St. John's, Newfoundland

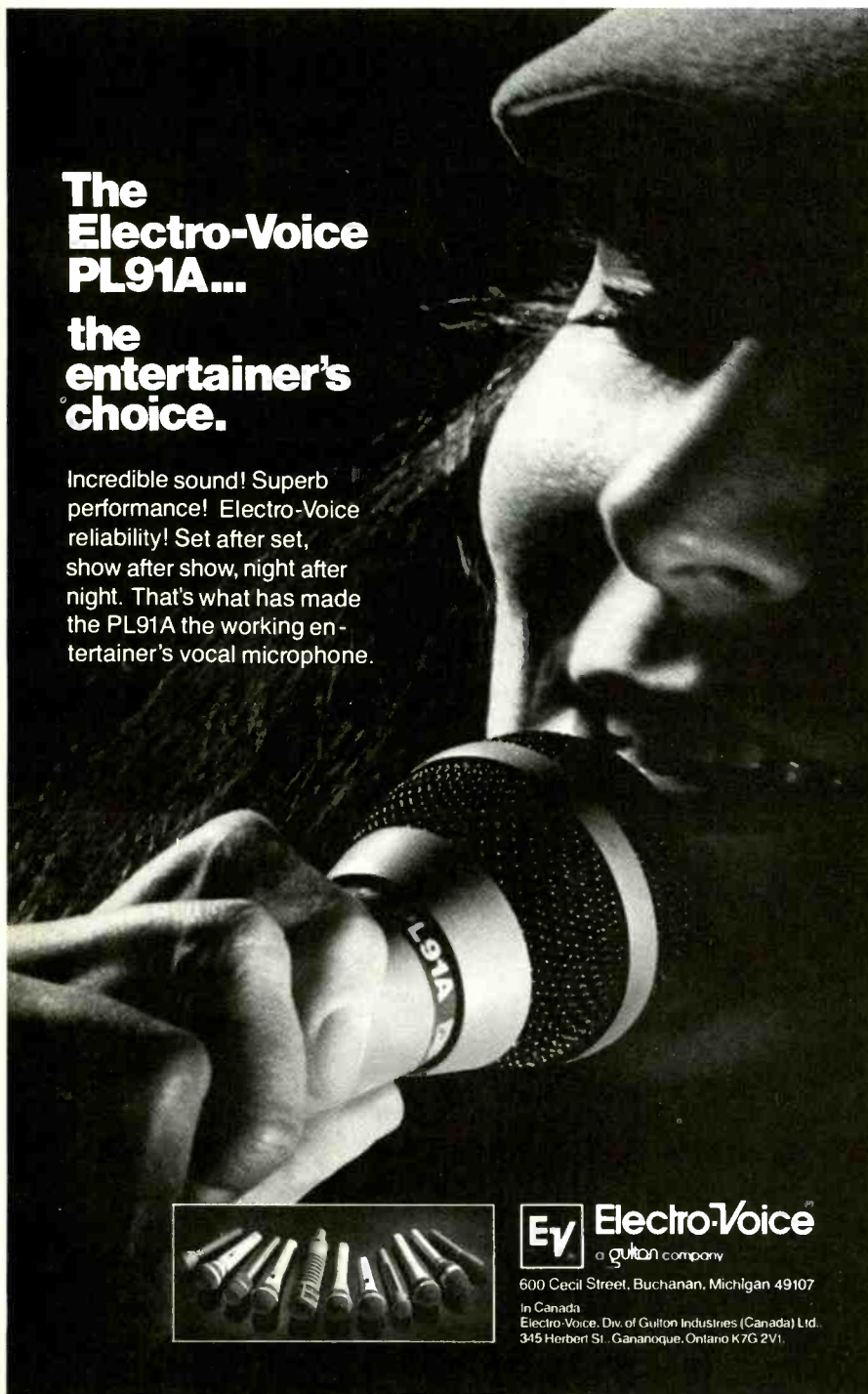
While we do certainly sympathize with your dilemma, we can only offer the most obvious and simplest of replies which we realize is ironically the most difficult to implement: contact the manufacturers of the speakers. Some of the delay and/or seeming refusal to deal with you might stem from the fact that their Canadian distribution might not be that solid, but the pro audio dealers (if there are any) in your area should be able to supply you with some contacts to make communication easier. If you had asked advice on speaker repair techniques, our answer might have been more detailed. Meanwhile, if you don't already have it, get a copy of Billboard's International Recording Equipment and Studio Directory (write Billboard, 1515 Broadway, New York, New York 10036, or call 212-764-7300). This annual publication will supply you with the addresses of the manufacturers with facilities in your area. You might also voice your problem to some of the Canadian sound publications, who might be aware of some avenues of distribution that we are not. (If any of our other Canadian readers have suggestions for Nick, please drop us a line and we will gladly get you in touch with him directly.)

Oscar-Winning Oscillator

I need a square/sine wave oscillator for the ring modulator I'm building. Do you think you could come up with one using a Radio Shack RS566 (276-1724) voltage controlled oscillator? The way I see it, a pot on the line voltage would control the oscillator, and the output could be switched from square to sine by DPDT. What I fundamentally need are schematics for the timing resistor and the capacitor. Once I have oscillation, I can tie it into the ring modulator.


—Ed Baumgarten
Stewardson, Ill.

The part you want to use is actually made by National Semiconductor (their part number LM566) or Signetics (NE566), and you should request application notes and data from them. National Semiconductor can be reach-



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CIRCLE 82 ON READER SERVICE CARD

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THE TASCAM 122 STUDIO CASSETTE RECORDER.

Tascam. Now we've designed a cassette recorder for the studio. One that has everything you need to reproduce your studio sound faithfully.

Performance plus a combination of features makes the 122 a tool of the trade, not a plaything.

Dolby Headroom Extension.

Gives you up to 10dB more headroom over 10 kHz. Cassette dubs end up hotter, fuller, cleaner when played back on any standard Dolby* B deck.



Three-head System.

Separate record and reproduce heads are mounted in a single housing, eliminating azimuth error.

Front Panel Trimmers.

The kind of fine-tuning you're used to having on studio machines. Notice the parallel line inputs in place of hi fi microphone inputs.

Plus Options. Like full transport remote control and dbx.* Check out the 122's qualifications at your Tascam dealer. When you want the best you can get, it pays to use a professional.

Two-speed Transport.

You get 1 7/8 ips plus 3 3/4 ips, a two-position pinch roller for cueing in the pause mode and a capstan motor that doesn't idle needlessly in the stop mode, for long-term reliability.

TASCAM STUDIO SERIES
TEAC Production Products

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CIRCLE 125 ON READER SERVICE CARD

www.americanradiohistory.com

ed at 2900 Semiconductor Drive, Santa Clara, California 95051. You can write Signetics Corporation at 811 East Arques Ave., P.O. Box 409, Sunnyvale, California 94086.

This part is only voltage controllable over a 10 to 1 frequency range if you use a single timing capacitor. To make it work over the whole audio range, you would need to switch three capacitors (as shown). Also, the "sine wave" you want is really a triangle wave output. This has more harmonics than a sine wave, and will produce a noticeably "thicker" sound in a ring modulator system. A single diode "sine converter" (which will produce fairly acceptable sinewaves) is also shown.

You can get much more appropriate VCO circuits and chips designed by

Solid State Microsystems (2076 B Walsh Ave., Santa Clara, California 95050) and Curtis Electromusic Specialties (2900 Mauricia Ave., Santa Clara, California 95051). These are more complex, but will greatly outperform your present circuit idea, and give you many new ideas to try as well.

—Michael Beigel
Beigel Sound Lab
Warwick, N.Y.

A Three-Mic Night For Clapton?

I am a student of electronics here in Huntsville, Alabama, and I am designing a mixer and would like to learn more about Nakamichi's three-mic system which comes with all their

cassette recorders. Could you explain the input and output systems that they use? I was listening to Eric Clapton's *Just One Night* (RSO) album and wondered if perhaps the engineers on that album might have utilized this system.

—Jeff Sandy
Huntsville, Alabama

The unique three-mic system utilized by Nakamichi was described in detail by Harron K. Appleman, then Technical Director of Nakamichi, back in our September 1979 issue. Check out "The Magical Number Three," pages 24-26. As to whether this system was used to record Clapton's *Just One Night* album remains a mystery. We checked with RSO Records in Los Angeles, and were told that the album had been recorded "live" at Budokan in Japan by producer/engineer John Astley. Unfortunately, all attempts at contacting Mr. Astley have proved unsuccessful. However, if we do learn more, we'll be sure to fill you in.

A Relatively Normal Patch Bay

What is meant by the term "normalled?" I have often seen this word

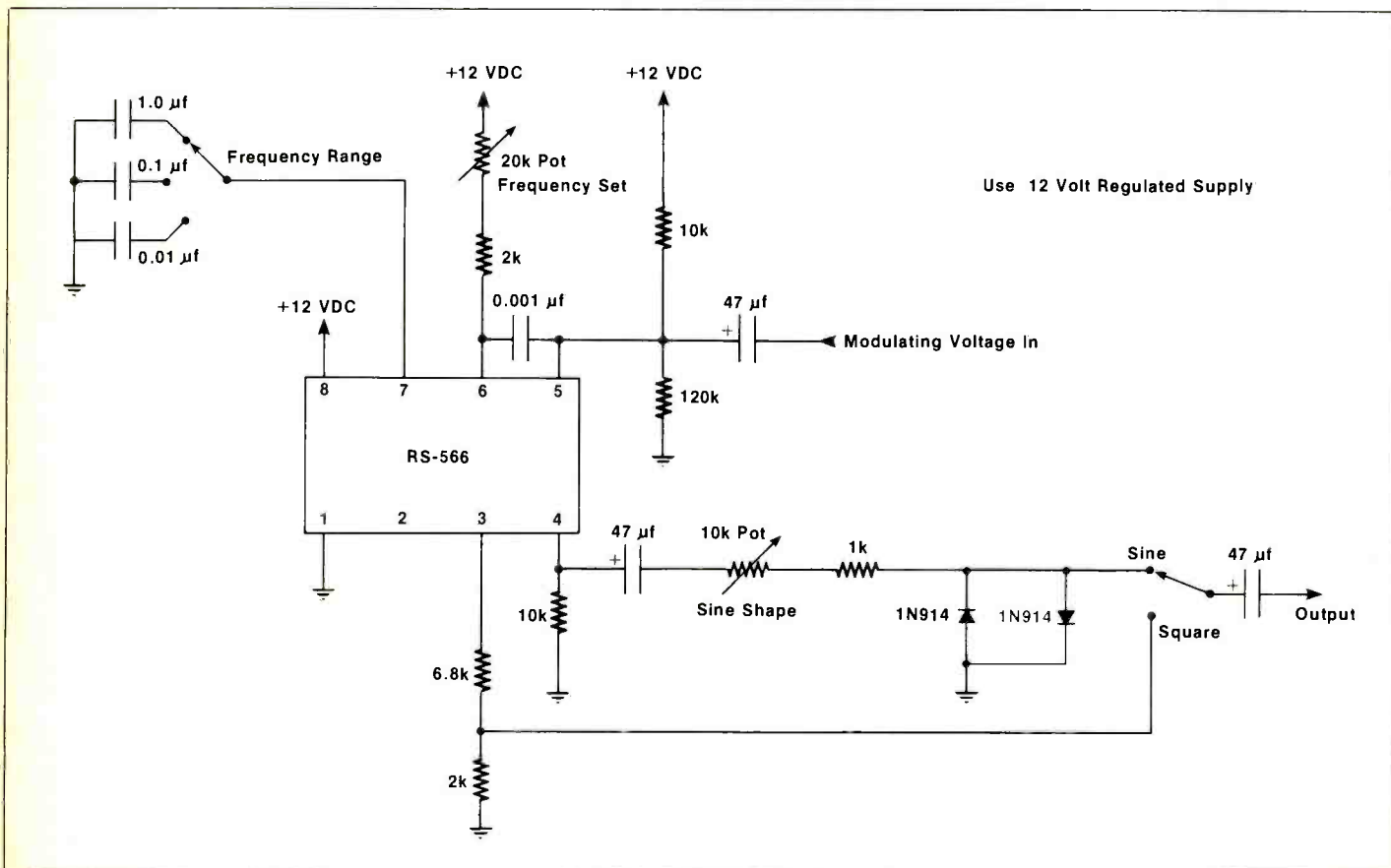
Voltage Controlled Oscillator using RS566:

- Sine-square switch selects square or sine output.

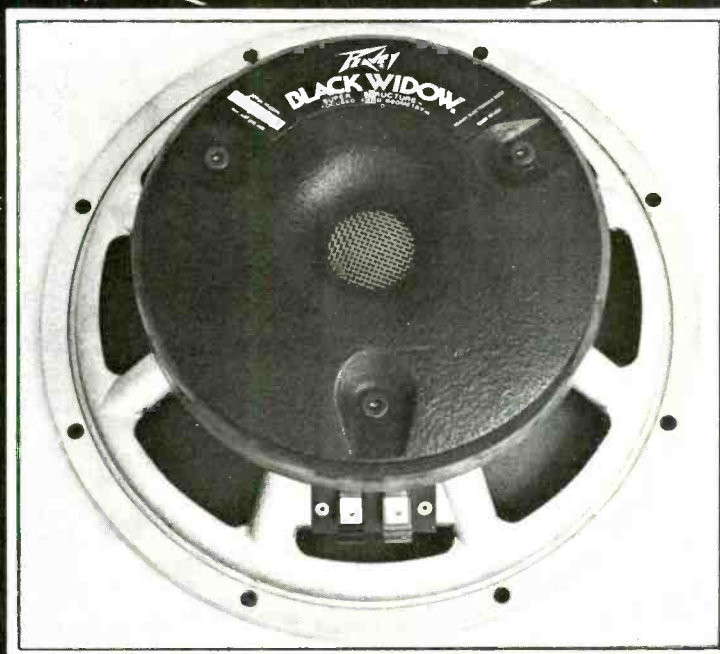
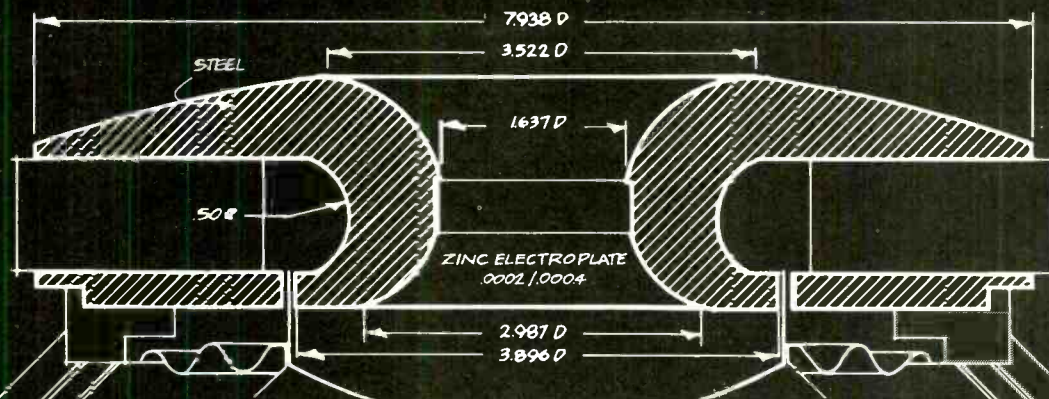
Features:

- Frequency Set pot allows 10 to 1 frequency adjust.
- Frequency Range switch (3 position) allows selectable ranges of 20-200 Hz, 200-2,000 Hz, 2,000 to 20 KHz.
- Modulating Voltage Input: modulates frequency ratio up to a factor of 3.0.
- Sine-shape pot varies from nearly triangular to nearly sine-shaped output.

NOTE: Use +12 volt regulated supply (7812 regulator).



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Our Black Widow® loudspeaker program was initially conceived because we felt there was substantial room for improvement in the design and construction of premium grade loudspeakers. Since the loudspeaker is the last and typically the weakest link in the audio chain, any improvement, no matter how small, will significantly upgrade the overall performance of any system.

We developed many new design innovations (i.e., one-piece coil form/dome assembly and field replaceable basket assembly) that have helped to make the Black Widow® the choice of engineers and performers the world over.

Our ongoing research has recently developed a more sophisticated product featuring what we consider to be superlative performance! The Black Widow® now features our unique Super

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related to patch bays, and wondered what it meant.

—Doug Horner
Sheperdstown, W. Va.

The term "normalled," as applied to patch bays, indicates a connection (say, between the output of a mixing channel and the input of a tape deck track) that exists without having to be patched separately, even though the output and input appear as patch points. This sort of "normal" connection appears most often within mixing console signal paths and in signal paths between mixing consoles and certain "normal" pieces of external equipment such as tape machines, monitor amps, etc.

On inspecting a typical signal path in a mixing console microphone input channel, we might find the following points of access to the path available as patch points on the patch bay: preamp in, preamp out, EQ in, EQ out, fader in, fader out, booster in, booster out. During a recording process, it may not become necessary to insert any additional devices into the signal path, and therefore it is preferable that the

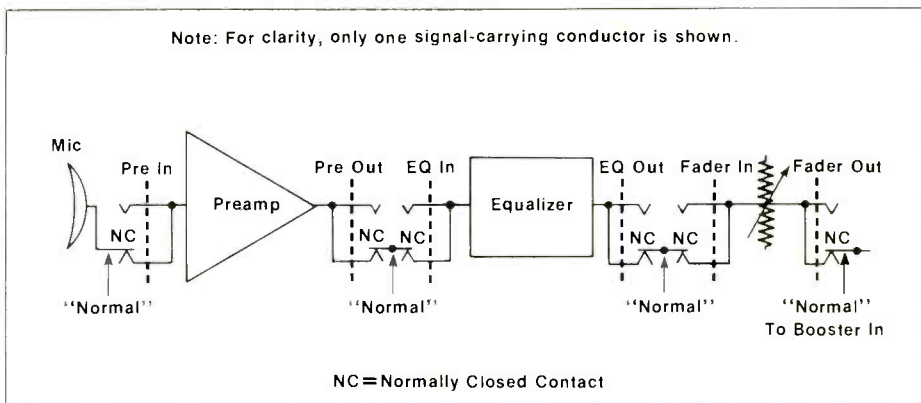


Figure 1

signal path exist as described without the need for any patching at all. However, when the need arises to insert a signal-processing device (a compressor, for example) into the chain, it is helpful to have available the patch points mentioned above.

Normalled connections and the means of breaking and re-making them are generally accomplished through the use of "switching" type jacks. Switching jacks perform two functions. First, a connection is made between the patch plug inserted into the

jack and whatever point in the signal path is internally wired to the jack contacts. Second, the physical action of the patch plug inserted into the jack causes sets of switch contacts to operate; normally closed contacts will open, normally open contacts will close. An arrangement of switching jacks in a typical signal path, as well as "normalled" connections, are shown in Fig. 1.

—Peter Weiss
Contributing Editor
Modern Recording & Music

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to meet all your needs. Some, but not all.

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But convenience and versatility are just two of the advantages of the new ATM models. All-new electronics provide plenty of headroom inside the microphone with no more than 1% THD even when used in acoustic fields of 141 dB SPL. Which sets new standards for clean sound even close-up to big brass or inside a powerful drum kit.

And the sound you hear is wide-range and musical. Presence without peaks. High to 20,000 Hz but without a raspy "edge." Yet despite their responsiveness, these new ATM microphones have the "Road Tough" reliability proved so often on stage and in the studio.

Before you add another microphone, compare our sound, our convenience, our reliability, and our cost. Write for literature and list of nearby ATM microphone specialists. Get great sound...right from the start! AUDIO-TECHNICA U.S., INC., 122 Commerce Drive, Stow, Ohio 44224. (216) 686-2600.

CIRCLE 102 ON READER SERVICE CARD

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THE **PRODUCT** SCENE

By Norman Eisenberg

NEW POWER AMP



The model A60 power amplifier from Phase Linear is said to have been designed for professional applications requiring audiophile-quality performance from a compact, road-worthy unit. Features include LED fault, signal present and thermal indicators; automatic balanced/unbalanced inputs; automatic mono input. The power transformer and supply components are housed in a separate internal chassis. The A60 is rated for 225 watts RMS minimum per channel into 8 ohms; 350 watts into 4 ohms; 650 watts minimum mono into 8 ohms. THD is less than 0.05 percent from 20 Hz to 20 kHz. Output protection includes limiters, DC and subsonic sensing and power supply fuse. Weighing 42 pounds, the A60 is of standard rack width and is 5¼ inches high.

CIRCLE 1 ON READER SERVICE CARD

NEW VOCAL MIC

Described as an extremely rugged professional-quality condenser microphone capable of handling the most demanding broadcast, recording and on-stage requirements is the hand-held Shure SM85 Pro Tech. Features include a three-stage "pop" filter; unidirectional (cardioid) pattern; low-F rolloff filter; class A amplifier; power supply regulator; RFI filter; and more. Without cable, price is \$231. With cable, as model SM85-CN, price is \$252.

CIRCLE 2 ON READER SERVICE CARD

"TRIPLE-DOUBLE" CASSETTE DECK

The TA-W80 cassette deck from Onkyo is a "double" unit in three ways. To begin with, it is a dual cassette model in which two separate cassettes may be driven side-by-side at the same time so that one may be copied from the other. In addition, the deck can operate at double speed (3¾ ips) when used for dubbing. Finally, the deck can play two cassettes in sequence. Metal-capable, and incorporating Dolby-B, the TA-W80 costs "under \$400."

CIRCLE 3 ON READER SERVICE CARD

PANNING UNIT AND TRI-BAND PROCESSOR

From Audio & Design (Recording) Ltd. of England comes word of a new 19-inch effects box called Panscan. Developed from the Scamp S23 pan effects module, Panscan features an "image freeze" button that can hold the stereo image in any position. The device also has a "beat control" circuit so that panning may be triggered after a preselected beat count. LED bar-graphs indicate image position and beat count. In Britain, the device sells for 450 pounds.

Another new device from this source is the "Transdynamic" tri-band processor, said to have been designed specifically for broadcasters but with uses in the recording studio. This unit splits the audio master into high, middle and low frequency bands and presents them for separate processing. The bands then are recombined and passed through a broadband peak limiter/clipper section and conditioning output filters. According to tests reported by the manufacturer, 3 to 4 dB of limiting per band plus the same degree of overall broadband produce tight dynamic signals with little or no modulation effects.

CIRCLE 4 ON READER SERVICE CARD

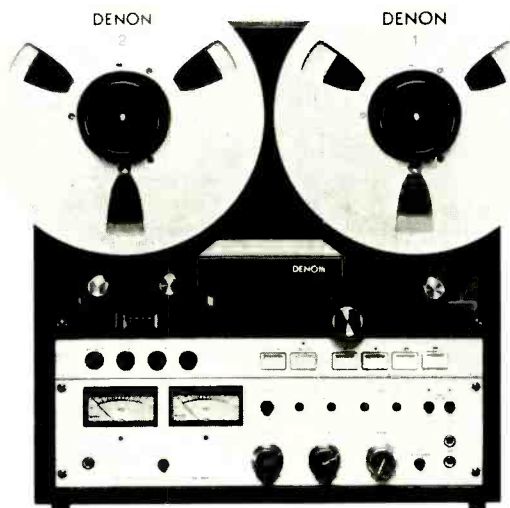
SANSUI ENTERS VCR FIELD

Up to six hours of running time is offered by the model SV-R5000 which marks Sansui's entry into video. The new recorder uses the VHS format, is a top loader, has feather-touch front controls, a 14-day timer and a two-speed frame search function. Along with the deck, Sansui is introducing its own brand of videotape.

CIRCLE 5 ON READER SERVICE CARD

DENON SHOWS OPEN REEL DECK

Denon's model DN-94R open-reel recorder/reproducer has 10½-inch reel capacity and two speeds of 15 and 7½ ips. The capstan uses direct drive from the motor shaft which itself is servo-controlled by a speed-detection device using a magnetic coating on the surface of the capstan flywheel. As a result, wow-and-flutter are claimed to be less than 0.04 percent and 0.06 percent at 15 ips and at 7½ ips, respectively. Track configuration is two-track, two-channel. Three heads are used; the separate R and P heads are made of hard permalloy with narrow gaps for better treble. Head surfaces are polished to reduce low-frequency "bumps" caused by contour effect. Other features include continuously adjustable bias and EQ; metering that can be switched for peak or VU levels; unattended operation with an external timer.



CIRCLE 6 ON READER SERVICE CARD

NEW BOOKS

Four books, of possible interest to sound and music pros, have been announced.

The *Pro-Audio Yearbook* contains information and photos on professional audio equipment and services. Over 7,000 entries are included. For each product, the manufacturer, as well as distributors in the U.S. and in Britain, are shown; indexes also list distributors in principal countries. Dealer sections also are included. Containing 624 pages, the Yearbook is priced at \$49.50. It may be obtained from specialist bookshops, pro audio dealers or by mail order (add \$5) from its publisher, Special Projects Dept., Link House Magazines (Croyden) Ltd., Link House, Dingwall Avenue, Croyden CR9 2TA, United Kingdom.

CIRCLE 7 ON READER SERVICE CARD

Audio in Media by Stanley R. Alten is described as a comprehensive introduction to audio production told in nontechnical language but covering such topics as sound and hearing; sound studios; consoles; microphones and miking techniques; monitor speakers; tape recorders; signal processing; production and editing; mixing; and others. The book contains 420 pages and is published by Wadsworth Publishing Co. of Belmont, California 94002. Price is \$18.95.

CIRCLE 8 ON READER SERVICE CARD

An Introduction to Music Publishing is a collection of articles by various writers including some familiar to the recording field (such as Teresa Sterne) and some composers (such as Aaron Copland). Included are an overview of the music publishing business; the relation of contemporary music to publishing; and a brief look at one music publisher; C.F. Peters, who published the 22-page volume and is offering it for \$3.50.

CIRCLE 9 ON READER SERVICE CARD

Jukebox The Golden Age is a new book featuring color photographs and historical text of that most romantic music maker—the jukebox. The selection of jukeboxes are chosen from the years when "the design was the richest, the sales figures highest and the influence on music most pronounced." The 112-page hardbound book (68 color photos) will be published September 18, 1981 and retail for \$12.95.

CIRCLE 10 ON READER SERVICE CARD

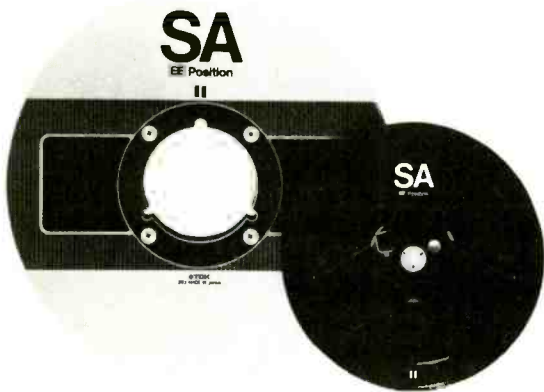
NEW OPEN REEL TAPE AND DECKS

Heralded as "the first major improvement in open-reel recording tape in almost a decade" is the new formulation developed jointly by Maxell and by TDK, for which new decks have been announced by Akai and Teac.

Maxell calls its version XL-II and describes it as a high-bias formulation using a ferric-oxide particle core in gamma hematite cobalt. It comes in both 90- and 180-minute reels. Says Maxell, the new tape yields specs at 3¾ ips that one would expect from normal ferric-oxide tape at 7½ ips. Bias and EQ differ from settings required by conventional tapes.

CIRCLE 11 ON READER SERVICE CARD

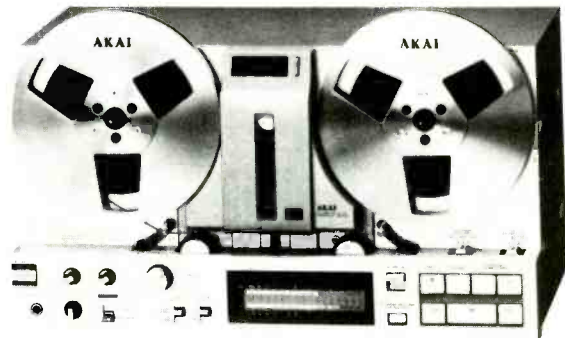
TDK describes its version of the open-reel tape as having high density, and says that it uses the same Super Avilyn particle found on TDK's SA high-bias audio cassettes and video tapes. The tape's high



coercivity is said to be virtually double that of any standard ferric-oxide tape currently available. Like Maxell, TDK claims the same improvement at 3¾ ips when used on open-reel decks capable of handling it. The new tape switch position is called "EE" for "extra efficiency." Both 7 and 10½-inch reels are made.

CIRCLE 12 ON READER SERVICE CARD

Akai has announced two decks for handling the new tape. One is the GX-747 which features bi-directional record and play, has six heads, 10½-inch reel capacity and other advanced features. Price is



\$1250. The other is the GX-77, also with bidirectional R and P, six heads and 7-inch reel capacity. Price is \$775.

CIRCLE 13 ON READER SERVICE CARD

Teac's decks for the new tape had not yet been announced at the time of this printing, but will appear in these pages in the very near future.

SONY SHOWS DIGITAL RECORDER

Visitors to the May 1981 Audio Engineering Society Convention in Los Angeles were treated to a demo of Sony's PCM-3324, a 24-channel stationary-head digital audio recorder, described as the cornerstone of Sony's pro digital audio recording equipment. The system provides 24-channel recording with 16-bit full linear quantization. Among listed specs are dynamic range of greater than 90 dB; flat response from 20 Hz to 20 kHz; less than 0.05 percent harmonic distortion; immeasurable wow and flutter. The system also is said to offer superb editing capabilities, including overdubbing, ping-ponging, punch-ins and punch-outs. These facilities, says Sony, are much smoother than in analog taping because edit points can be digitally cross-faded. Moreover, punch-ins and punch-outs can be automatically repeated with precisely the same edit timing. The system's "rehearsal capability" permits final checking of the signal by simple cross-fading without actually recording. Two additional analog tracks allow razor-blade editing. Splicing points can be easily cross-faded for smooth sound-level transitions. A separate SMPTE time code track allows synchronized recording of up to 72 tracks, and it also permits compatibility with video recorders.

CIRCLE 14 ON READER SERVICE CARD

DOD INTRODUCES STEREO FLANGER DOUBLER

The model 870 stereo flanger doubler from DOD Electronics of Salt Lake City, Utah is listed as a full-featured, short-to-medium delay device that provides—for studio or “live” performance—flanging,



doubling, ADT (automatic double tracking) and stereo chorus. Features include in/out invert and delay-time switching; input level control with clip indicator; stereo outputs with dual mix controls; and LED status indicators on all switches. Housed in standard rack-mount case 1¾ inches high, the model 870 is priced at \$299.95.

CIRCLE 15 ON READER SERVICE CARD

TIME COMPRESSOR

Designed to play back audio or video tape and film faster and slower without changing the original pitch is the Model 1200 Audio Time Compressor/Expander from Lexicon. Says the manufacturer, the model 1200 “makes it pushbutton easy to expand or shrink recorded material to meet allotted time requirements” while eliminating “time-consuming editing and expensive retakes.” A multi-function digital read-out provides visual display of operating parameters. The display function is pushbutton selectable.



Suggested applications include both music and voice for recording; television; radio; film production. The device works by changing audio frequencies through digital processing, and combines audio pitch and tape speed control in one unit.

CIRCLE 16 ON READER SERVICE CARD

BIG SPACE IN SMALL AREA

Deliberately, and “with malice aforethought,” I recently dubbed some discs and tapes onto cassettes doing “wrong” things—such as using too low or too high recording levels, or setting bias and/or EQ incorrectly with respect to the kind of tape, or not cleaning record surfaces.

The reason for this lapse from normally good practice was to provide some “worst case” program material for a new stereo system installed in my car. The system in question is the Bose which includes the cassette player combined with a stereo receiver, a separate power booster/equalizer and four speakers—the rear two being fitted with “direct/reflecting” grilles. When this setup was first installed it came as no surprise to me, and to everyone else who listened, that its performance was just great. The sound had wide-range response; big dynamics; no audible distortion; and a marvelous spatial effect. But of course we were using first-rate program material—the best prerecorded cassettes we could get our hands on plus our own homemade-with-tender-loving-care cassettes.

So, to determine how the equipment would sound with faulty program material, I dubbed some cassettes with noise, incorrect bias and EQ, and so on. Allowing that even a Bose system cannot make a silk purse out of a sow's ear, I must say it came remarkably close to doing just that. The tone controls (there are two bass adjustments, one for mid and one for low-bass) helped, as did the system's clean power reserves (25 watts for each speaker). What seems to have helped as much, or maybe more, was that spacious sound pattern which seems to expand the dimensions of a mid-size car that you might not think could contain the sonic blockbusters of a Mahler symphony or some of the old big bands like Woody Herman et al. Apparently then, “spatiality” can be as much a contributing factor to lifelike sound in a car as in a proper listening room. Or maybe even more so.

Speaking of which, I must add another item to the collection of “Digital Hokum” that ran here in our July 1981 issue. This one appeared in the British magazine *The Gramophone* where an otherwise usually sober and learned critic chastised some recent albums for their lack of ambience, blaming this on the fact that they had been digitally mastered. Doesn't he know that ambience is a producer's decision rather than a by-product of the recording system?



MUSICAL

NEWSICALS

MUSICAL INSTRUMENTS

News came from Hamer USA recently that the Hamer Vector guitar, which has been available only as a custom ordered model, will now be part of the regular line of handbuilt Hamer guitars. The V-shaped Vector is built of the finest Honduras mahogany, and is available with a curly maple top or as a full mahogany model. On the hardware side, the Vector features Schaller tuning machines, a solid brass bridge/sustain block unit weighing in at a whopping eight ounces, two humbucking pickups and Hamer electronics. The Hamer Vector is available in natural, sunburst, cherry, opaque red, transparent yellow, blue, green and Hamer's black-and-white graphic.

CIRCLE 22 ON READER SERVICE CARD

Peavey Electronics has introduced a new, high quality, budget-priced electric guitar, the T-15. This new model features Peavey's patented bilaminated neck construction with full adjustment capabilities and a contoured hardwood body. Hardware includes an adjustable bridge, two high performance pickups and a pickup selector switch. The Peavey T-15 includes a molded hardshell case despite its low price tag.

CIRCLE 23 ON READER SERVICE CARD

MUSICAL INSTRUMENT AMPLIFIERS

New from RolandCorp is an addition to its Cube Series of amplifiers, the new Cube 100. Roland's Cube Series has become very popular because it is probably the only complete line of compact amps to offer big amp performance. The Cube 100 uses an FET preamp stage for enhanced tone, with enhanced warmth in the normal mode and fat sustain and

distortion in the overdrive mode. An unusual feature of the Cube Series is the use of four volume controls—three overdrive and one normal—with immediate switching among the settings. Other controls on the Cube 100 include Bass, Middle and Treble EQ and a Reverb control. Jacks are furnished on the back panel of the amp for external speaker, headphone, footswitch jacks and preamp out and main amp input jacks.

CIRCLE 24 ON READER SERVICE CARD

The first new product for the Intersound line since Intersound was acquired by Electro-Voice last year was recently announced. The Intersound IKP-6 is a 6-input mixer/amplifier specifically designed for keyboard artists who need to conveniently mix the outputs of their various synthesizers, pianos, organs and so on. Each input channel of the IKP-6 has a low gain input for high-level sources such as synthesizers and organs, and a high-gain input for acoustic pickups and other low-level sources. Each channel features an Auto-Pad volume control and bass and treble tone controls. The treble control has been specifically designed for keyboard applications: the treble control was designed to af-

fect the midrange more than conventional treble controls for better definition of the percussive character of keyboard instruments. On the output side, the IKP-6 has a master volume control, two high-level outputs and two adjustable level outputs.

CIRCLE 25 ON READER SERVICE CARD

Among the new offerings from Peavey is the Solo Series of music instrument amplifiers. Three models have been announced: the Bandit, the Special and the Renown, rated, respectively, for 50, 120 and 160 watts output. All feature Peavey's Saturation™ circuit said to be capable of producing "the warm, tube-like tonalities and overload textures that are so much in demand by today's guitarists."

CIRCLE 26 ON READER SERVICE CARD

New from St. Louis Music is the latest addition to its popular Crate amplifier line, the Crate 60B bass guitar amp. This new model is a 60-watt, piggy-back design housed in solid ponderosa pine cabinets which feature more streamlined styling than previous Crate amps. The 60B uses a special 15-inch Magnum projector speaker in a bass reflex enclosure for



maximum efficiency. The amp head, which delivers 60 watts RMS into a 4-ohm load and nearly 100 watts into a 2-ohm load if another speaker cabinet is connected, incorporates a variable limiter circuit to decrease distortion while improving sustain. In addition to the limiter, the amp head has preamp gain, master volume controls, active bass and treble equalization plus a bright switch.

CIRCLE 27 ON READER SERVICE CARD

MUSICAL INSTRUMENT ACCESSORIES

Two new additions to the Boss line of electronic sound modifiers have been announced by Roland Corp US. Both products are part of Roland's Pocket Series of super-compact devices equipped with belt clips to allow the musician to clip the unit to his belt or pocket. The MA-1 Mascot Amplifier is a contender for the world's smallest guitar amplifier, measuring only



2.6" x 4.7", small enough to fit into the string compartment of most guitar cases. The MA-1 has guitar and line inputs with separate volume controls to allow the user to play along with records, tapes or the radio. The 1/2-watt amplifier in the MA-1 drives a built-in 2-inch speaker, or the user can plug in a pair of headphones to disconnect the speaker for silent practice. The other new Boss box is the FA-1, a pocket-sized preamp to solve the problem of loading and high-frequency loss due to long cables and low amplifier input impedance. The input impedance of the FA-1 is very high to preserve the sound of the instrument, while the output impedance is low to drive any line, effects device or amp. The FA-1 has bass and treble equalization controls in addition to a volume control, and also features a low cut filter which can be

very useful in preventing low frequency howl-back when an acoustic guitar with pickup is being amplified.

CIRCLE 28 ON READER SERVICE CARD

Two divisions of Silver Eagle Designs have announced new products of interest to guitarists and bassists. The Doctor Song Music Company now has available a line of simulated snakeskin guitar straps. The straps are available in 2-inch and 3-inch widths with a length which is adjustable from 39 inches to 56 inches via a sliding buckle which is covered to prevent scratching and gouging. All straps feature heavy-duty leather attachments at each end, a handy "pick pocket" on front and back and are stitched with nylon thread for extra strength and durability. Doctor Song snakeskin straps are available in five colors or patterns. Tres Amigos Wood Care Products, which is also a division of Silver Eagle Designs, has announced what may be the ultimate method of protecting the finish of guitars and other fine instruments. The Tres Amigos Bodyguard system uses sheets of tough, transparent polycarbonate plastic which are cut to shape and attached to the back, sides and/or face of a guitar by means of adhesive tabs. The Bodyguard kit comes complete with two 12" x 16" sheets of the polycarbonate material, adhesive tabs and comprehensive instructions. All the user needs to furnish is a pen, a pair of scissors and some patience.

CIRCLE 29 ON READER SERVICE CARD

The Metone 23-F is a compact, solid-state metronome which will reliably, accurately and stably produce any tempo from 40 to 220 beats per minute. Tempos are monitored via a built-in speaker and a front panel LED. The Metone 23F is housed in a break-resistant case with a scratch-resistant, reverse-screened Lexan faceplate. The unit is powered by a single, 9-volt battery which will provide up to a year of stable operation.

CIRCLE 30 ON READER SERVICE CARD

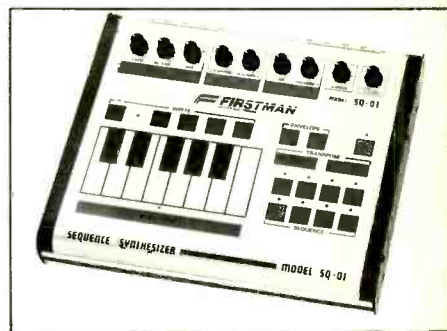
SYNTHESIZER EQUIPMENT

MicroTune Corporation recently announced its latest product, the MicroTune IV, a portable, micro-processor-controlled electronic musical instrument which will play tunes in ar-

bitrary tonalities and temperaments. Three fixed scale temperaments are available to the user, or he may program an original set of notes by specifying frequencies at will. Notes may be selected from a group of eighty per octave over a three octave range. The unit also has sequencer functions allowing the user to program chords of up to four notes and tunes of up to sixteen chords with programmable chord durations ranging from 50 milliseconds to one second. Sixteen such tunes may be stored in the unit's non-volatile memory where they are retained until redefined, along with all user-defined notes and chords. All frequencies and timings in the MicroTune IV are derived from a master quartz crystal for accuracy and repeatability. The MicroTune IV lacks the usual timbre and envelope controls of conventional synthesizers, but offers microtonal possibilities difficult or impossible with keyboard-controlled synthesizers.

CIRCLE 31 ON READER SERVICE CARD

Multivox has announced the introduction of the SQ-01 Mini Music Lab, a monophonic mini-synthesizer with built-in sequencer. The sequencer records up to 1024 notes in sixteen channels, with tempos ranging from 30 to 300 quarter-note beats per minute and sixteenth-note subdivisions, and triple as well as double meter. The synthesizer section of the SQ-01 has a seven-octave range from its single octave, 13-note touch-pad keyboard. The



unit has high quality 24 dB/octave low-pass filters and a variable envelope selection system with touch-activated switches. Jacks are provided on the rear panel for control voltage in/out, gate in/out, clock in/out, synchro out and a footswitch as well as power in (12 volts DC for battery or AC adapter use) and audio out.

CIRCLE 32 ON READER SERVICE CARD

Studio Notebook #3

By James F. Rupert

Last time as I recall we left you hanging as to the identity and purpose of a series of numbers adjacent to the second column of spaces on our initial capital requirements chart. (See "Studio Notebook #2," August 1981 issue.) We had figured our one-time-only starting costs and basic monthly estimated expenses as accurately as possible to determine real dollar amounts necessary to open our mythical studio. Remember that monthly expenses have to be computed based on projected business that will be done, i.e., how much money you bring in during an average month will determine how much you spend during that same period. Any figure you arrive at is going to be a guesstimate, but it should be an educated guesstimate. Before you hang out your recording shingle you better have done sufficient research to be able to honestly say whether or not there is a demand for your new business. If there is an established demand, the next step is further homework to find out how much of that demand you can take care of in your new operation and what that is going to mean in projected dollar amounts during the next year and subsequently in an average month. This could involve hitting the pavement and talking to prospective customers for rough ideas on how much trade they might realistically be able to shoot in your direction.

All this street roaming and brain gymnastics add up to an incredible amount of work, but it is a lot more than just important, it is essential. (I mean, how can you fill out this sheet without it!) Everybody laughs at the joke about the moron who took the job selling encyclopedias to cannibals because it was an untapped territory. But every year thousands of new businesses bite the dust because they failed to explore the need for their product or service in their locality. You may think your business is the most useful and fascinating thing technology ever produced, but the public (remember them? The ones with the money?) may not share your fascination.

Dollar amounts for monthly sales also depend on how much you are charging for your product. If Megabuck Studios on the other side of town is charging an arm and a leg and twelve toenails for its 24-track studio time, it might not be the wisest thing to hop hip high into hock to help you hack head-to-head with those hondos. (Say that five times fast!)

Appealing to the musician, retailer or organization who previously felt they simply couldn't afford a

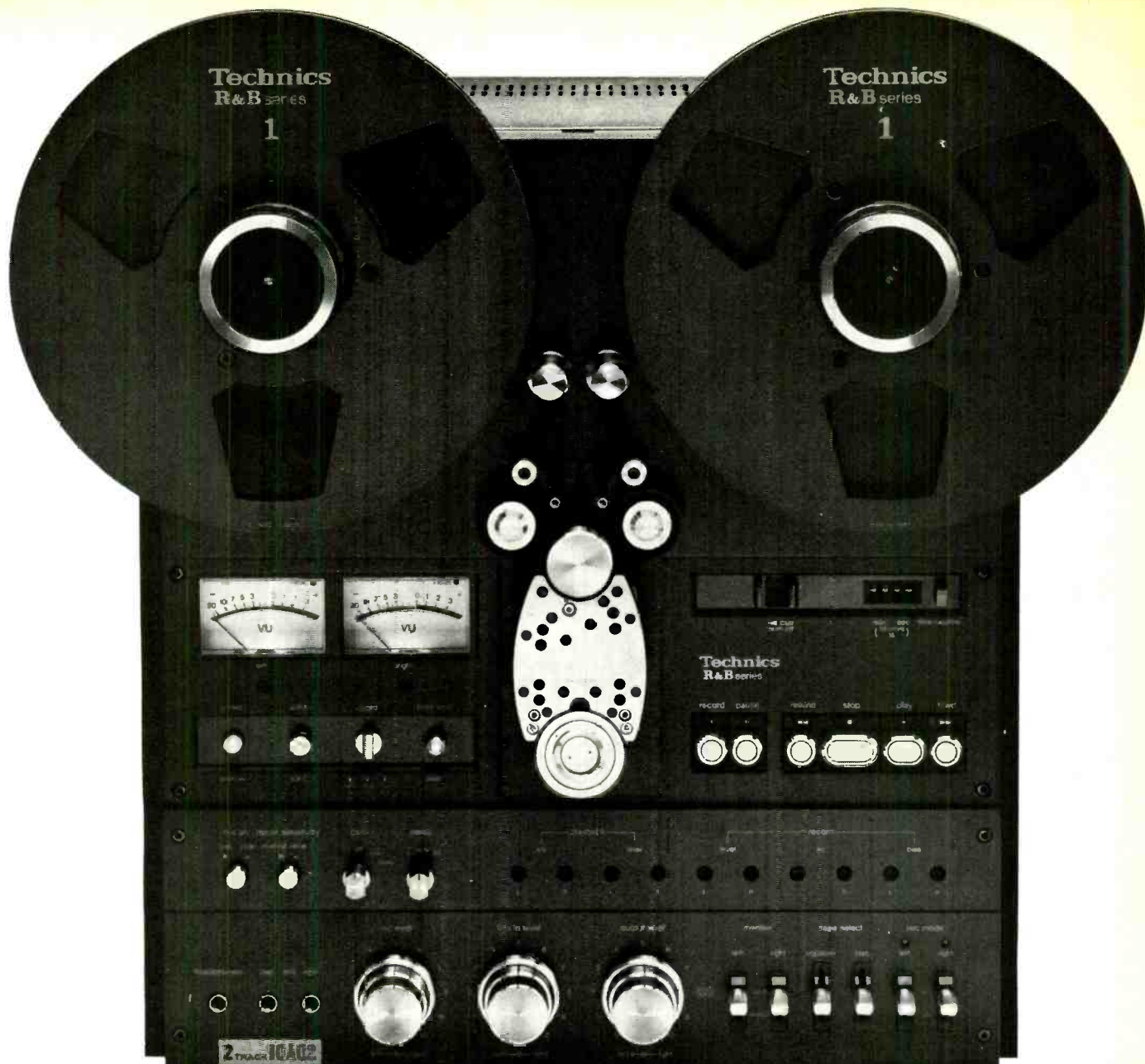
good quality recording service might open up large markets of potential customers. Keep this in mind when establishing your prices, but also keep in mind that cheaper rates mean more studio hours must be booked to meet expenses. Megabucks might rake in \$75 per hour to your \$25 per hour. Your minimum sales might be 1000 dollars a month to break even while theirs might be twice that much. You need to book 40 hours of time in that month to meet your financial obligations, where the Megabuck boys only have to book 26.6 hours. This isn't what's known as "cost effective" pricing. You might be able to dirt ball out your studio time and steal a great deal of business from your competition, but at the dirt ball price will there be enough hours in the day to complete enough work for you to earn a sufficient amount of money to survive? There arise the horns of the dilemma upon which so many of us sit. Are our prices low enough to be competitive and at the same time high enough to be cost effective? There aren't any tricks I can offer here. Everybody likes to cut prices during the grand opening to bring in new customers, but when they float back up to normal, at what point do you let them level off?

So much depends on your position in the marketplace. Is yours the best quality in town bar-none? Or can you deliver finished products faster and cheaper than the competition? Do you specialize in one aspect of recording such as audio/visual work while the competition is heavy into music? Do you have high speed duplicator gear while the others do not? You may discover that your strongest point is one for which there is no competition in your area. And that's the best kind.

We will be talking more in the issues to come about positioning in the marketplace and establishing a business identity. (Who was that masked man?) For now suffice it to say that the image you choose to project is just as critical to your success as how you project it. So there.

But lest we forget the original question, we were filling in the estimated monthly expenses on the initial capital requirements chart.

In the last installment we ran out of time before the meaning of the numbers to the side of the second column of spaces came into the open. I remember saying something to the effect that the days of planet Earth were numbered without these numbers that were the end-all and be-all of the universe.



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Well, I lied.

At least a little anyhow. The notations such as 3X and 4X stand for how many times by which to multiply the monthly dollar total for that category to get the necessary back-up funds necessary to maintain your new business. Clear as mud, huh?

Let's take the rent category for example. You're probably going to have to pay rent while you're renovating your room into a studio (if your location is not in your home). The landlord doesn't care if you're not bringing in any money or not. He still wants and is entitled to his bread come the first of the month. Also, consider those credit customers. If the majority of your accounts operate on a 30 day or longer billing, you won't see a dime for the first month or more you are open. This is why it is very advisable to have that fund socked away to fall back on. The same applies to all of your continuing costs. In the case of the rent, let's say you pay \$100 per month. To play it safe you should have at least \$300 in your rent fund to start in case of a cash crunch. Landlords do not take kindly to any tenant who cannot pay after only one month of being open. You want more than your landlord's trust, you want his faith in you and what you are trying to build. That trust can't happen if you stumble right out of the starting gate.

The same holds true for all your monthly expenses. Please note that the category marked "Insurance" has only an asterisk following it. This is because although insurance is an ongoing expense, it is generally paid quarterly, semi-annually or annually. Better plan on at least six months coverage fees hidden away in your sock purse for this purpose.

View the category marked "taxes," however with a sober and accurate eye. The United States government (Department of Internal Revenue in particular) has the world's worst sense of humor. Hit the library for the basics on tax laws and remember that Social Security (F.I.C.A.) is not just a deduction from an employee's check. The employer has to match the funds to the government. For example, if the

employee has \$25 to be deducted from his check for F.I.C.A., the employer has to contribute a matching \$25 to the employee's F.I.C.A. fund in his or her name. These monies are in addition to, not deducted from, the employee's wages. Keep this in mind when estimating your taxes fund. (More on taxes will be coming in later articles.)

Mark these multiplied figures down in the second column of spaces to find how much you will need for each individual category. By the way, these multiplier figures were not pulled out of the heavens, but are the figures recommended by the United States Small Business Administration. Although these figures are pretty typical, your own situation will be the final determining factor towards your deciding how many months to allow for in your business. Maybe you won't be paying any rent or initially are planning not to do any advertising. If your supplies orders are big enough, you may not have to pay any freight and delivery charges. If you're handy with a multimeter and soldering pencil you might be able to cut your repair and maintenance costs to nil. Everything depends on you.

Taking all the multiplied monthly totals in column two and the total of fixed one time starting costs and using some simple addition, you can get an idea of what kind of money you realistically will need to start your own recording studio. This final dollar figure should allow for all the extra expenses incurred in getting ready to fling your doors open wide to humanity and the safety funds to keep you going till the money starts rolling in. Charts and lists like this are the type of thing bankers like to see plopped before them when you are planning to seek their aid in the form of a loan. It shows you've thought out what you are about to try, you've explored the marketplace and have tried to think ahead about what you will need to stay solvent.

But before you jump into your cleanest outfit of overalls and wing tips to run down and let your tongue hang on your local banker's desk, stop to take self inventory. There are several questions you should ask yourself if you are planning on assuming the responsibility of being your own boss, even just part time. How you answer those questions could provide you with more than a few subtle clues of how you will handle the good and the bad of self-employment.

What questions are those, you ask? Why the questions in the next installment, that's what! To make it simpler I have assembled the questions in the form of a quiz which you can take in the privacy of your own home. I got a lot of mail over the last quiz I had printed in these very pages ("A Quiz for the Would-Be Recordist," April 1979 MR&M), and I want you to know that I have turned the letters over to the Postmaster General—the local authorities will in the near future be contacting those who wrote them. Nevertheless, we're going to try it again soon.

See you then.

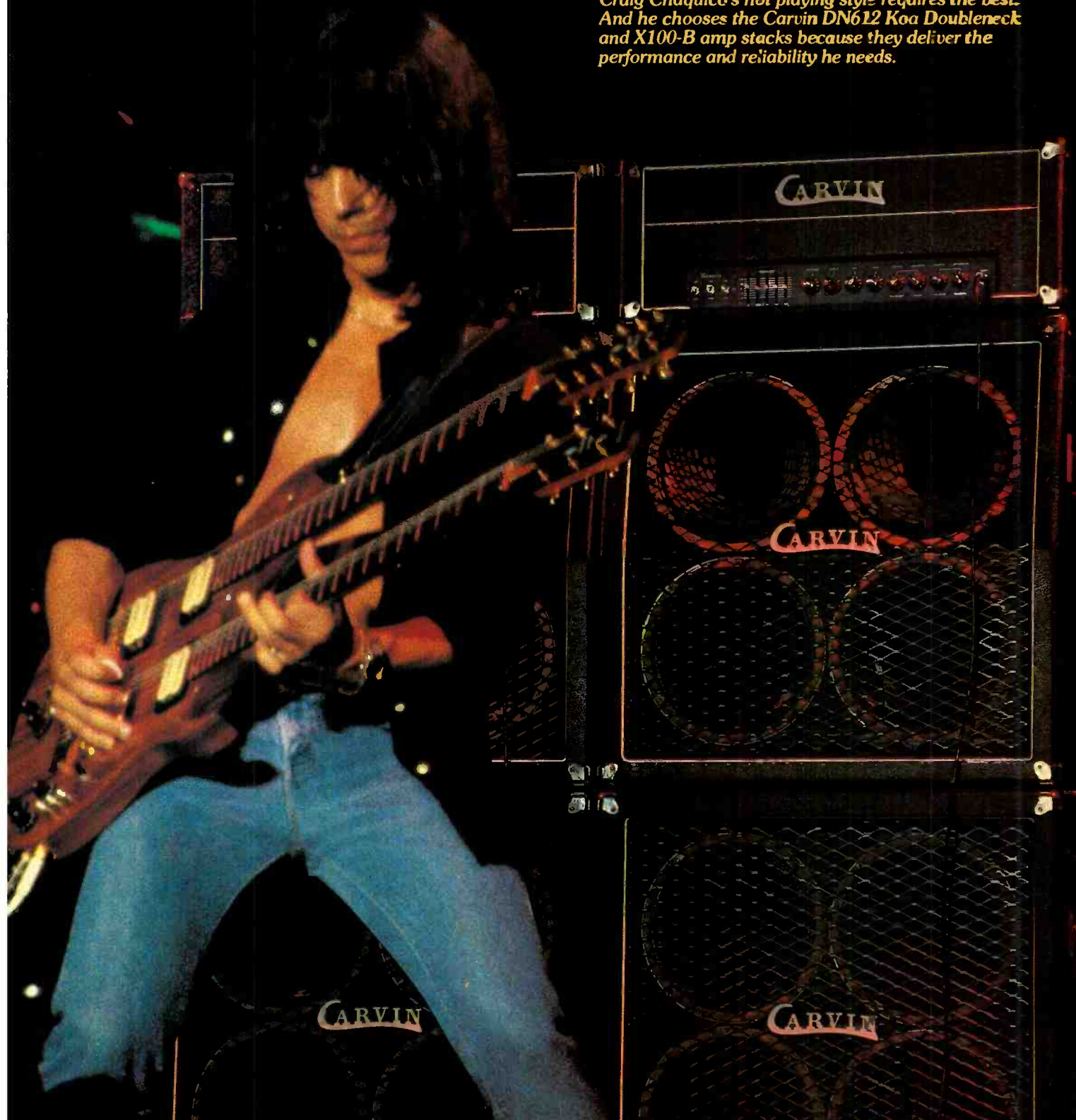
ESTIMATED MONTHLY EXPENSES

Salary of Manager/Owner	_____	_____	2x
All Other Salaries/Wages	_____	_____	3x
Rent	_____	_____	3x
Advertising	_____	_____	3x
Delivery Costs	_____	_____	3x
Supplies	_____	_____	3x
Telephone	_____	_____	3x
Other Utilities	_____	_____	3x
Insurance	_____	_____	*
Maintenance/Repairs	_____	_____	3x
Legal/Professional Fees	_____	_____	3x
Miscellaneous/Other	_____	_____	3x
Taxes/Social Security	_____	_____	4x
Interest	_____	_____	3x

TOTAL ESTIMATED INITIAL CAPITAL REQUIREMENTS _____

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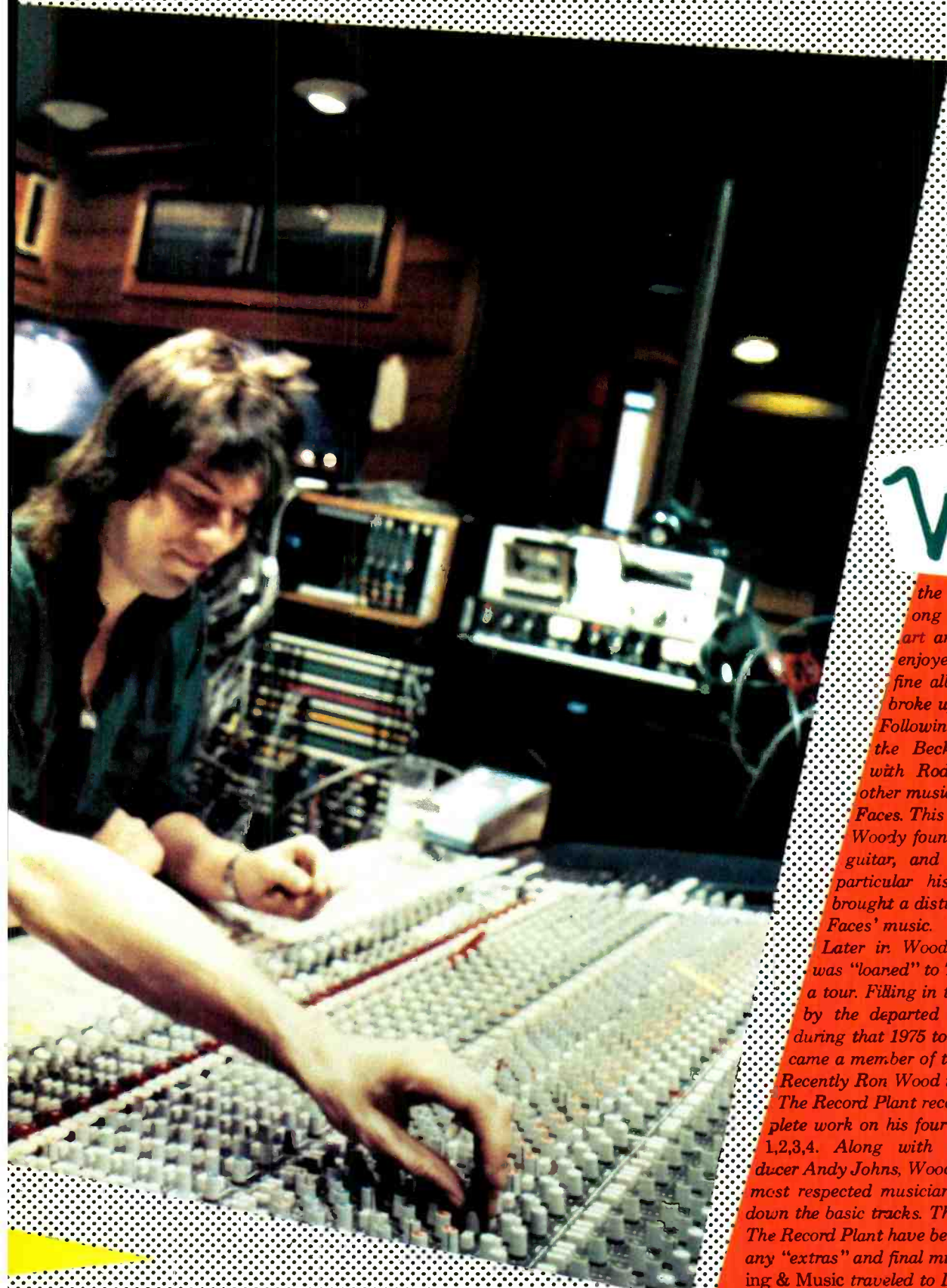
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a session with...

Ron Wood



by Steve Caraway



We all got our first good look at Ron Wood when he was the rock-solid bassist for

the Jeff Beck Group. Along with Beck, Rod Stewart and Mickey Waller, he enjoyed success for several fine albums before the band broke up amidst controversy. Following the disbanding of the Beck group, Ron, along with Rod Stewart, joined another musical venture, The Small Faces. This time around, however, Woody found himself playing lead guitar, and his unique style, in particular his bottleneck playing, brought a distinct new sound to The Faces' music.

Later in Wood's Faces career, Ron was "loaned" to The Rolling Stones for a tour. Filling in the guitar vacancy left by the departed Mick Taylor, it was during that 1975 tour that Ron Wood became a member of the Rolling Stones.

Recently Ron Wood was in Los Angeles at The Record Plant recording studios to complete work on his fourth solo album entitled 1,2,3,4. Along with veteran engineer/producer Andy Johns, Wood recruited some of the most respected musicians in the "biz" to lay down the basic tracks. These recent sessions at The Record Plant have been used for tracking in any "extras" and final mixing. Modern Recording & Music traveled to L.A. to meet with Ron Wood and Andy Johns, and to sit in on these

last session dates. Evening sessions found Rod Stewart jumping in and out of the studio to lend his assistance, he was working in another studio in the Record Plant complex. Stewart simply couldn't help getting involved in his old sidekick's recording project.

Modern Recording & Music: Tell us a little about this project.

Ron Wood: Probably the most interesting thing about the LP is that we

came on the project, which he brought over here. We tried to recreate what he had at "The Wick" except in a 24-track format. We saved a lot of money doing it that way, actually. If we would have been using The Record Plant, for example, we'd be spending \$1500 to \$2000 a night; instead, we spent only \$12,000 a month. Plus it was convenient because we didn't have to arrive at the studio on time. It was more relaxed.

RW: A few people saw the facility while we were working and were

Eyes," but I swapped the title with another song.

AJ: That was an interesting track to record. It was one of those working all night things. I was in another room in the house talking to someone and I walked out at 10 in the morning and everyone was still sitting around. I expect they thought I had gone home, 'cause I always leave early. I walked out and Ronnie grabs me and says, "Oh, you've got to do this track now!" They had taken all the microphones away and there was very little equipment there, and only one monitor speaker was working. We recorded the song using two mics and only one monitor speaker. The basics sound great! Despite the conditions.

MR&M: Can you tell me who appears on the album?

RW: Well, Nicky Hopkins is on percentages and also on piano [*Laughing*], and Ian McLagan is on keyboards as well. He's my old cohort from Faces days and from nowadays. Jimmy Haslip is on some of the bass; Charlie Watts, Alan Myers from Devo, Ian Wallace and Carmine Appice are all on percussion. On backing vocals we have Anita Pointer, Clydie King and Shirley Matthews. On horns were Steve Madeus, Bobby Keys and Jim Horn. We had Jim Keltner and Alvin Taylor on percussion as well. One thing about this album is that my voice has improved a million percent; I've been singing better and better.

MR&M: How much work is left to be done on the LP?

RW: Just a few mixes, three or four days work.

AJ: One thing, talking about vocals, this time around we wanted Ronnie to get into the vocals a little more. The intention was to not have it sound like a guitar player doing vocals on his album, but rather a songwriter who sings his songs and plays guitar as well! It's quite different from anything Ronnie's done before.

RW: I also play keybo rds on the album and most of the bass...and saxophone on a tune called "Fountain of Love." I am particularly proud of that; it's a good track.

MR&M: Can you run down some of the gear you used in terms of guitars and amps?

RW: The amps that I used mainly were a Mesa Boogie and a Roland JC 120. In fact we put the Roland in the bathroom on a sheet of plywood over



Ron's smile reveals that his vocals are "improved a million percent" with this release.

did most of the basic tracks in my garage. The garage is built onto my guest house; we basically cut the tracks there. The most amazing thing is that we actually have a "product" that came out of those sessions. We had a 3M 24-track machine and an Audiotronics console shipped in from the Record Plant in Sausalito, Ca. and installed them in the guest house. We recorded with overcoats on in the evenings and using mattresses as baffles; so we called it "mattress sound." When we recorded we had the garage door open, and everyone froze their balls off! We started the project on January 2, 1981 and it was cold!

Andy Johns: The police came up a couple of nights because of noise complaints, but the police and the neighbors were really very nice. We only had two complaints the whole time. We stopped for a week and sound-proofed the room. You see, Ronnie had a studio in his home in England called "The Wick," a little 8-track set-up. Ronnie had made some demos before I

suitably impressed—in particular Rod Stewart and Bob Dylan. They both helped me out in an advisory capacity on this LP. In fact, Rod did the arrangement for "Priceless." He also helped out on the mix.

MR&M: Which cut wasn't done at Ronnie's?

AJ: What happened was that on that one song, "Priceless," Rod was working in the next room here at the Record Plant. We were playing him some songs and he really liked one of them in particular. Ronnie, Rod and I talked over some ideas and Rod said, "I've got some really nice ideas about the arrangement," and Ronnie decided that we'd just do it all over again. Well Rod says, "I'll get my band down here and we can all do it together!" So we got Rod's band in with all the new guys and Rod was there helping out; and it turned out great!

MR&M: How did the title of the album come about?

RW: It came from a track called "1,2,3,4," which used to be called "Red

the bathtub for a real nice tone. The guitars I used were mainly a Fender Stratocaster and some Zemitis instruments. I've got about ten Zemitis guitars in my collection now.

MR&M: So you cut the basics at your home and then brought everything down here to the Record Plant to track and mix?

RW: Yeah, but we did go to one other place; we did the vocals and some other stuff at the Chateau in North Hollywood. It's a nice studio and it's cheap!

MR&M: Did you write all the songs on the album?

RW: Everyone except for the one that I didn't write! I wrote some in cahoots with Jim Ford and I wrote one with Bobby Womack.

MR&M: How do you enjoy the studio versus "live" gigging?

RW: I enjoy going into the studio between "live" gigs! The differences are that when you're in the studio you're your own boss, while on the "live" gigs the audience is your boss.

MR&M: You just returned from New York where you were finishing up a new album with the Stones. How does your role change between solo work and your work with the Stones?

RW: Well...I only do solo albums so Mick can do films and Keith can work with Fats Domino [Laughing]. It is a trade off in a way because the group is bound to have certain months off in the year, either by choice or not. The Stones always come first, but the thing is that it's a good exercise when you're on your own, keeping your act together and keeping your standards up high.

MR&M: Did you do a lot of woodshedding before recording?

RW: Well, a bit but we actually rehearsed the tunes as we recorded them. Andy took a dim view of that!

AJ: Oh, *not true!* [Laughing]

RW: Really, it is impossible to nail a song down when everyone has just been introduced to it. I'd say, "OK, this is how I want it to go." It seemed a bit far fetched to try and nail it in the same evening, but we managed.

AJ: That's kind of an unusual situation. Usually when you have the sort of thing where it's not a band but rather a bunch of guys playing together and working a song out, quite often what happens is that at the end of the evening they say, "That's really good, so tomorrow when we get here first thing we'll knock it off." Well,

that only happened once or twice in these sessions. Ronnie was really good, very much in control of the band. He was organizing things; he was like a musical director!

RW: It surprised me too! I needed that outlet, that responsibility.

AJ: Ronnie would give the guys the song and they'd work it over for about three hours. In the end, everyone still had the energy to do a really good take of it. The only song on the album that wasn't done that way was "She Never Told Me" which we knocked out the next day after working it out the night before.

MR&M: Overall, it sounds like a very relaxed recording situation.

RW: It was, and nobody really expected it to be that way. Especially Andy! [Laughing] It was like, "But you can't work *that* way." And, "This *can't* be allowed!" But it worked in the end.

AJ: It's usually the other way around. They're always yelling at me to get off my ass. But it was fairly relaxed...but someone sort of had to be leaping up and down a little bit!

RW: It was like Andy had to have it together to make sure the controls were all properly set so that we could

get that one great take.

MR&M: In terms of room layout, how were you all set up at your place?

RW: We were set up in the round, really. Drums, organ, piano, guitar and bass all in a circle looking at each other.

AJ: It was funny in terms of the room. If you'd just walk in, it looked a bit suspect for recording. But as long as nobody in the room got too loud, we'd just place a microphone in the vicinity and it would come out nice. The thing that worked surprisingly well was the drum mics. I usually like to use a room mic with the drums. But when you do that, you can't have a bunch of instruments in the room. At Ronnie's place you couldn't have the room mics in those cramped quarters, so we just went ahead with the close miking technique and the drums still sound "open." There was a concrete floor with a rug over it and a wood-shingled roof. I am sure the roof helped a bit in that the bottom end didn't stay in the room as it would have if there had been a solid roof or ceiling.

RW: It is basically what I wanted to



Ron Wood enjoying a bit of laughter with producer/engineer Andy Johns.

achieve—the old Buddy Holly “garage” sound. That rawness had to be there.

AJ: We didn’t spend a lot of time getting sounds, a little bit here and there, but it was mostly, “Oh that’s good; let’s take it from there!”

RW: I like recording in that kind of circumstance. OK, you’re ready or you’re not.

MR&M: How did the two of you get to working on this album together?

AJ: That’s a funny thing. I’ve known Ronnie for a long long time, but I have never worked with him. He’s worked with my brother Glyn and all kinds of other people, but we were never ever in a studio together.

RW: Which is probably what motivated us to work on this project together! I knew Andy had it in him, what I wanted to do, which was just a very basic approach. It was good for Andy too because he’s used to working on a very professional level under very set circumstances...so it was good for him too. It was good for him to loosen up and it was good for me to tighten up in Andy’s own way. I *needed* a kick up the pants!

MR&M: Do you play very much bottleneck guitar on this album?

RW: Surprisingly not, I think on only one tune. I may track in some pedal steel guitar tonight, I play that pretty well. You see, there are only so many things you can slide in there. You know you’re either concentrating on your vocals, or your guitar playing, or keyboard work...

AJ: One interesting thing is that we tried to do a “Blues week” while Charlie Watts was here; it was great fun because Charlie is a *great* player. Well, that week turned into a reggae song and Charlie is playing some of the most unusual beats.

MR&M: How many tunes did you lay down for the album and how many are you going to use?

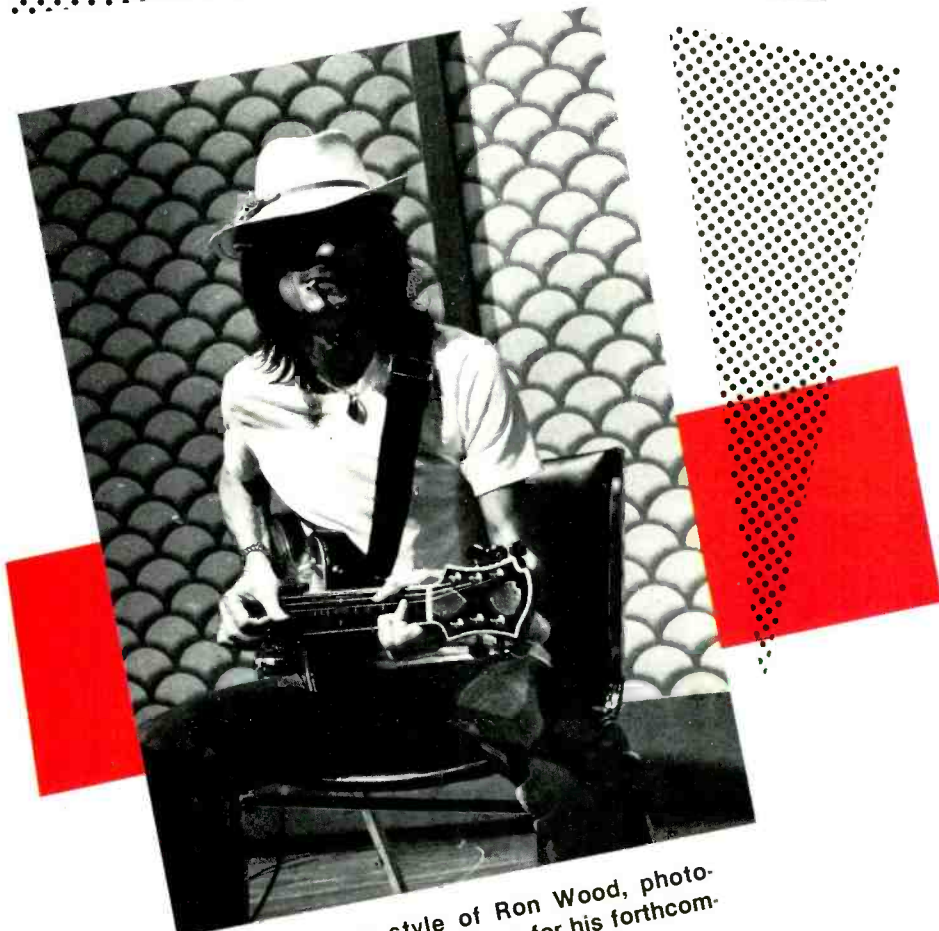
RW: Eight million [*Laughing*]... Really, we did seventeen songs and we’re going to be using nine.

MR&M: You enjoyed the project?

RW: Oh yeah, contrary to some beliefs. I wouldn’t do it if it weren’t fun. Some people think I *have* to do it because I am obligated to CBS Records, but *that* has nothing to do with it at all. I did two solo LPs for Warner Bros. and this will be my second for CBS; I’ve enjoyed working on them all.



A one-man band? Wood contributed keyboards, as well as vocals and guitar work to his solo album.



The unique style of Ron Wood, photographed during sessions for his forthcoming album, 1,2,3,4.

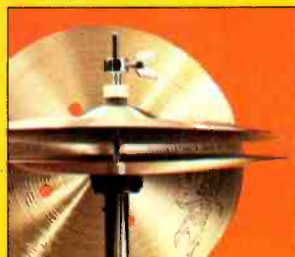
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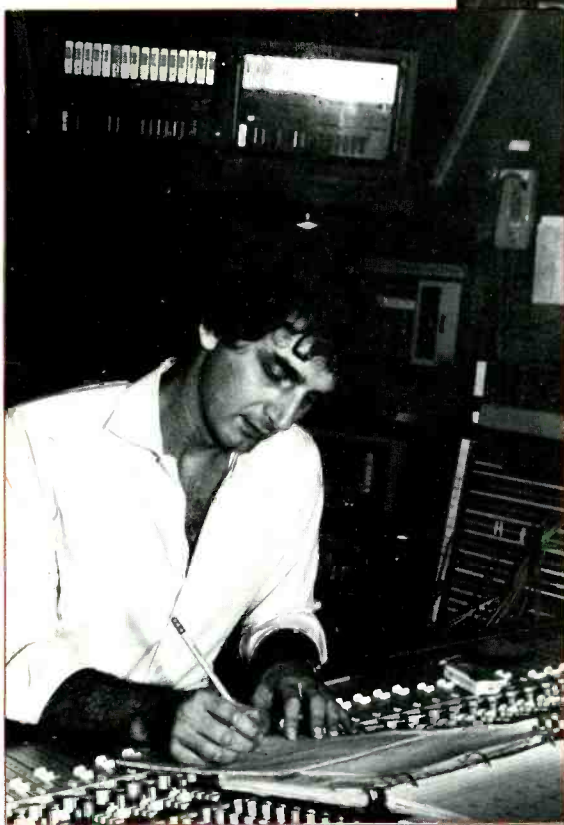
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Profile:



Producer **Jack Douglas**

by Bob Anthony

Within any industry there are always those few whose untiring dedication and genuine love for their craft propel them into the top 10% to become recognized as the true standard bearers of innovation and excellence. Ironically, in a business where publicity is, of necessity, a way of life, there are still some who manage to escape the spotlight regardless of their accomplishments. This anonymity is usually the consequence of busy schedules, and the resultant lack of time to do interviews. So it is with Jack Douglas.

"I'm always in the studio," says Jack, looking like a tanned New York surfer, if there is such a thing. "I don't know what a short day is. I wanted to get into the business so bad-

ly that I started as a janitor in a recording studio. That meant working literally 22 hours a day in order to get where I wanted. I made such a lifestyle out of working like that that it really doesn't bother me now."

The offspring of this labor of love is a list of credits that include John Lennon and Yoko Ono, Aerosmith, the Knack, Patti Smith, Rick Derringer, and many more.

Modern Recording & Music caught up with Douglas between appointments at the Record Plant in Los Angeles where he is currently finishing up the Knack's third album. "Plant" owner Chris Stone graciously volunteered his office, and the interview begins upon Stone leaving the room.

Jack Douglas: It's funny. I used to work for him [Chris Stone] in New York; I would get fired all the time. I used to sneak into the studio on the weekends and do dates that nobody knew about. This is when I was just becoming an assistant engineer. I'd call up my friends and say, "C'mon down and record!" I used to take the

ends of tapes that weren't used and splice them together. I'd wind up with about half a reel—enough to do a date on. Or, if I didn't have anyone to come in and do a "live" date, I'd get some old tape out of the library and mix it. I'd do that constantly. The studio was supposed to be locked. The alarm company would call: "Somebody's in the

studio!" It was more to put a scare in me than anything else. I would keep getting fired, and the chief engineer would listen to the tapes and tell Chris, "Hey, these tapes are pretty good. Maybe he'll make some money for the company." So I started to engineer jobs a lot.

Modern Recording & Music: That

brings up an interesting point. You started out in the recording business as a janitor, and got where you are through long hours in the studio. With all the new technology—digital recording, computer assisted automation, video related hardware—do you feel it's still possible for someone to work his way up like you did?

JD: I think the best kind of school is still here in the studio, without a doubt. For instance: the guy working with us—Bill Freesh—is very competent and handles all the technicalities. He knows how to deal with the computer; we use the Solid State Logic system, which is kind of an off-shoot of the Necam yet not related to the Allison system. After years of assisting on technical dates, he's probably ready to be an engineer. That's really the best way, I think.

I went to what I believe was the first audio school in the United States: the Institute of Audio Research, in New York. It was the first semester of that school, and the classroom was in a hotel room in Manhattan. There must have been about fifty students opening day. The instructor came out and said, "If you guys think you're gonna go into a studio and do mixes, you're wrong. And if you don't know the first thing about basic algebra, I'll refund your money right now, because all we're gonna do is look at textbooks, learn how to operate and fix those machines if they break and understand how a microphone and a speaker work. You guys are not going into a studio for six weeks. The next day there were twenty kids in class. It was hysterical. I stuck it out figuring that I may as well learn that part of it. I got a job in a studio about a week after I started in the school. The studio didn't care one bit whether I was going to engineering school; it didn't mean a thing. Could I sweep the floor was more important...and was I dedicated. I think taking a course that sends you directly into the studio to do mixes is totally wrong, because you have absolutely no idea about what's going on.

MR&M: You've had experience engineering sessions, producing them, co-producing and even doing a couple of jobs on the same date. Which arrangement do you prefer?

JD: I prefer to be just a producer. From the experience of being a staff engineer at the Record Plant in New York I learned that I don't want to

step on the toes of the engineers I'm working with. I regularly work with two engineers—Lee DeCarlo and Jay Messina—and they know what I want to do. If there is a sound that's so specific, and I know exactly what I need to do to get it, then I'll say, "Let me do this." I'll just do it and save time. Luckily, I can talk to the engineer in terms he understands. I've been there. It's better to let the engineer work on his own as long as he's a competent engineer and someone you are used to working with.

I prefer to concentrate on the musical form, whether it be tracks or overdubs. A lot of guitar overdubs or electric keyboard overdubs or bass overdubs I prefer to do in the control room with the musician sitting next to me.

MR&M: Does the engineer ever feel intimidated that you have solid studio knowledge?

JD: No. *Because* I have that knowledge, I don't want to be all over him. The most dangerous producers that I ever worked with when I was engineering were the guys who knew a little bit. Just a little bit and they'd be all over me reaching for the EQ. Mostly what I liked to do was interpret what they were trying to do. I really didn't appreciate guys all over me. I knew what I was doing.

MR&M: How about mic placement, track assignments—do you leave that up to the engineer?

JD: No, and this goes back to what I feel the producer's job is. When we talk about a song—the basic tracks—I pretty much know what kind of mics we'll try. The engineer doesn't really know the concept of the song until it starts to come through the microphones. I, on the other hand, already know, because I've been in pre-production with the group. I'll say, "What we're going to be looking for on this tune"—this will be in a meeting with the engineer before the tune is recorded—"is such and such a sound. It should be warm here," or "Keep it bright," or "This is how much space is going to be necessary." We'll discuss the microphones and how we're going to mic it. We'll draw diagrams and study them. Then by the day the band comes in, we've pretty much got a good idea on how to do the set-ups. Both of us will run back and forth. I'll move a mic around. Or he'll run out while I'll stay in the booth. We're basically working

with two engineers.

Pre-production is real important in order to know what the band is about and what the specific songs are about. I keep all of that on a set of notes—musical notes for the band. Then I have another set of technical notes on what I'm doing with the instruments: will there be bottom heads on the drums or no heads; a front head on the bass drum; which snare am I gonna try if the drummer has a variety of snare drums; which amps; which speakers on their amplifiers are the better ones—the brighter ones, the duller ones? During pre-production my head will be stuck in the bass drum, or next to the snare, or next to the speaker to find out which instruments sound best.

MR&M: Sort of putting your head where the microphone would be?

JD: Yeah. Although I had a bad experience doing that when I was assisting on a remote date in 1970 or '71; Mountain was playing Carnegie Hall. Leslie West was offstage with a really long cord on his guitar. I was standing in front of his Marshall stack listening to see which speaker sounded cleanest as far as tone. Leslie was talking with someone off-stage when he hit a full chord. It nearly blew me into the orchestra pit. Ever since I've learned how to walk up to an amp and listen at the most incredible levels without being hurt by it. I've found places when approaching an amp that are just off-axis, and I equate that off-axis sound to the on-axis sound when the microphone goes up there. If I didn't do that, I'd go deaf in no time. The actual sound is whizzing by me to the point where I'm not going to get hit by it. Working with Aerosmith I had to develop a way of listening as a matter of self-preservation. Those guys had to wear ear-plugs, because they found themselves to be on-axis when they were playing on stage.

MR&M: Musicians get psyched-up for a session; they get to the studio, only to find that they must spend half a day, all day, or more going for just the "right" drum sounds, bass sound, etc. Do you find that spending a lot of time getting specific instruments' sounds drains the musicians of their creative energies?

JD: Definitely, but some bands are looking for very specialized sounds. The Knack is a good example. [Lead singer] Doug [Fieger] came to me when

we talked about doing a record and he said, "I want every song to sound like it was recorded for the sake of the song; I want to have the drums and other things continuously changing." I said, "Well, that involves a lot of work right from the basic tracks. That means radically changing our set-up every day and moving the drums around to different parts of the room." He said, "Yeah. That's the way we want to go."

So on this last album we would spend most of the day changing instrument sounds. One thing that makes it easier is that I can go out and play the instruments myself,

and not ask the drummer to sit there and play the part for hours. What I'll do is play the drums and check to the engineer until the sound is right.

When the drummer comes in, it's pretty much set up. I've tuned his drums knowing what key the tune is in and everything else. That way I don't get any surprises; the tenor tom is not going to ring on an F while the song is in the key of E. I get all that straightened out. Then I'll bang on the bass and play the guitar. Whatever it is so the musicians don't have to do it. In case of some artists, they just want to record. That takes me back to the experiences I had on jingle dates, when I was an engineer.

On a jingle date, the client comes in, the band runs through the song once and the second time around you have to be ready to record or you lose the client. That experience helps me with those artists who prefer that kind of recording. For instance: when I was working with John [Lennon], if he had to wait around to work on something over and over again, he'd throw the song out. He wanted to work fast. It was the jingle date experience that enabled me to run it down once and work like a madman to get it down fast. Not to get sounds that were obviously worked on for hours, but sounds that were clean and solid and gave us a full hi-fidelity so that when we decided to mix, we could change EQ and create the ambience we wanted. We had that freedom since we were working from a full frequency spectrum.

MR&M: For the most part you'd be recording with no EQ?

JD: I may have had to do some EQ-ing during the recording session, but I'd do it in the first run down. I would have all of my outboard gear patched-in before the date started, so I wouldn't have to punch-in during the session. The only outboard equipment I like to have ready is a bunch of tube equipment for the bass and drums. There aren't too many tube mixers left, and that's the sound I like. I run my basic

"You can't expect it to come real fast . . . even to develop into a super producer, you must have patience."

drums through some tube gear—usually Pultecs—just for the function of the tubes, even if I'm not using any EQ.

In New York City they have some old limiters and stuff like that that I'll use on bass. I'll have that all pre-set. During the first run-down I can brighten the snare, get the bass drum right, get the bass right and maybe use a little board EQ. At the very worst, maybe a mic is out, or the bass drum is really wrong and I may need a few hits on it, but then we're ready to go. The method I use depends on how the artist feels.

The neat thing about working in a studio is that you can try anything. Everytime I come out of a project I've really learned something. I always go into a project looking to learn something. You have to do every band or group differently. That way they sound like themselves and not like some formula.

MR&M: You worked with George Martin on the *Sargeant Pepper* movie soundtrack. What is the one most important aspect of recording you feel that you learned while working with him?

JD: Patience! Patience to plan. When the band's not there, when it's not time to work, to take the time to think about what you're going to do. You can't expect it to come real fast; it takes time. It may take time for the band to get hot. Even to develop yourself into a super producer, you must have patience.

MR&M: Speaking of patience, the segue between "Watching the Wheels" and "I'm Your Angel" [from Lennon & Ono's *Double Fantasy* album] was pret-

ty involved, wasn't it?

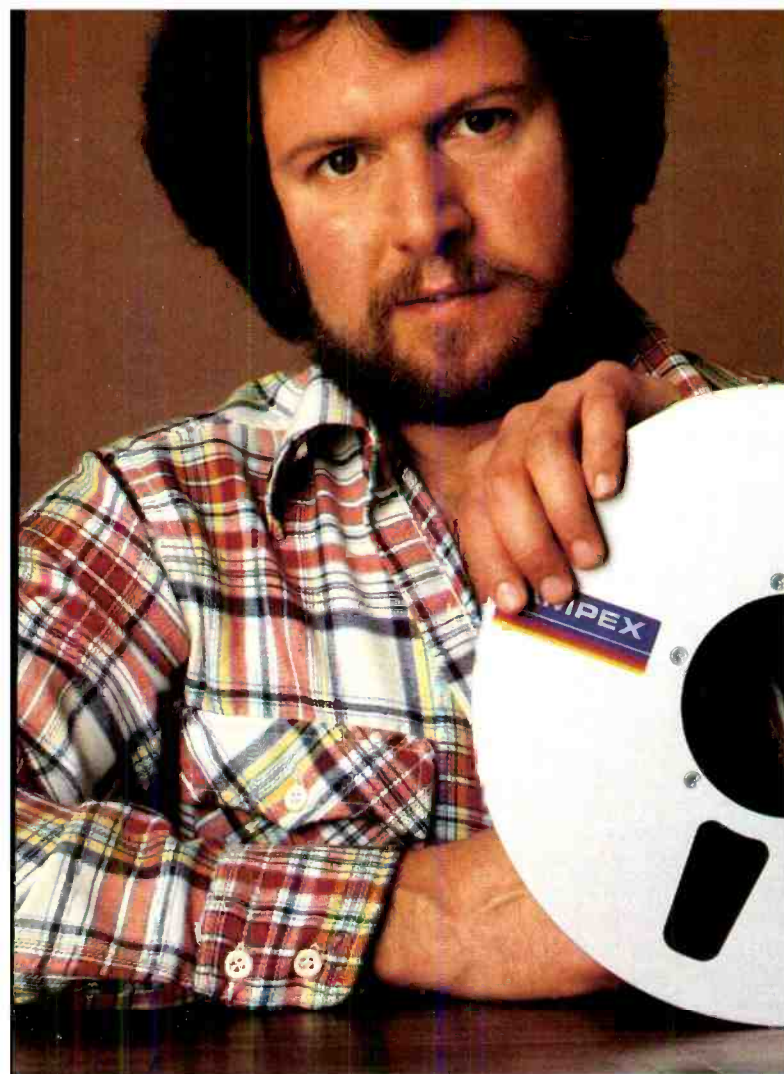
JD: That's a funny bit. It was all recorded on a Nagra recorder outside the studio; it took about 8 hours to do that.

John just said to me, "Can you paint me a picture between these two cuts?" There's a beggar in the beginning of it (the end of "Watching the Wheels"). Some people walking by throw money into his cup and he says, "Thank you, Ma'am. You've got a lucky face. Thank you, thank you, thank you." From there we go up to 8th Avenue past a Greek shop where they're playing Greek music. We come around on Central Park South

to the hotels, get into a horse and carriage and ride to the Plaza Hotel. Once there we go up the stairs and through the revolving doors. As the doors open you can hear the sounds of the Plaza Court way off in the background. We walk to the court and someone asks, "Would you like a table?"

It's all really subjective stuff. After a couple of plays you start to hear it. People have imagined it to be all sorts of things. This is what it really is: We go into the Plaza Court and music comes on; the audience applauds the orchestra. All of this is cross-faded a number of ways to get it. Yoko walks onto the stage; this part didn't really happen at the hotel. You hear the orchestra start up again, but this time it's not the house orchestra; it's the band in the studio. We were able to make it sound the same by using room ambience from the Nagra to its fullest, and making the mix mono at that point of the song. Yoko starts singing and the audience applauds. Very slowly the music comes out from the center and becomes stereo. Suddenly you're no longer at the Plaza Court. I had six 2-track machines going. Lee De Carlo and I were doing the cross-fades to get a good flow; it was complicated.

I have some tapes that are hysterical. The horse goes into the Plaza; the Greek music climbs onto the carriage; the beggar comes back into the Plaza—all these wrong things until we finally got it. Everything had to be faded-in or faded-out and panned properly to create the illusion. Listen for John in the beginning as the beggar.



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The other sound picture is at the end of "Beautiful Boy." It ends up on the beach.

MR&M: Would you talk about that? The waves sounded too fast to be a real seashore. What did you do?

JD: The waves are sped up. If you listen on headphones, you find they're related to the tempo of the song. They come in from the right side. Down at the other end of the beach are some kids playing as a dog runs by. The kids are Sean [Lennon] and his friends at Sean's birthday party. The dog runs right down the beach to the kids. It's fun doing that: I love doing that kind of thing with sound.

MR&M: You engineered the *Imagine* album for John Lennon; was there an aura of excitement the first day you walked in the studio as co-producer?

JD: What do you think? Of course!

MR&M: Why do you think he asked you to produce?

JD: Maybe because I'm old-fashioned about sound and technique... and at the same time a state-of-the-art freak. John could count on the fact that whatever new was on the market, I would know about it. I'm always looking and trying things out and discarding the things that don't work.

Also, the fact that there would never be a circus around anything that I did, because I could take what anybody else would consider had to be a circus and reduce it to a real working situation. Like with Aerosmith or Patti Smith. Possibly I'd close the studio if the musicians were afraid to tell their friends not to come to the session. The friends would come to the door and I'd

"I prefer to be just a producer. I prefer to concentrate on the musical form, whether it be tracks or overdubs."

ask "Are you recording here? We're working in here. This is not a party." John knew that that's the way I worked. I wanted no complications, no press—none of the things that he was really afraid of. I knew a month and a half before we were going into the studio; it was top secret. I got at least fifteen people to swear to secrecy and managed to keep a lid on it until well into the recording. Then John released the news.

The other thing is that Yoko and I got along pretty well. We had done all sorts of strange things together that John produced but never saw the light of day. We sure had a lot of fun doing

them. I'd try anything. She'd bring in strange instruments and I would figure out the best ways to record them. For example, this one guy they brought in had automated instruments—little motors hanging over everything with rubber bands to play a chord on a pre-set guitar. We'd have a few laughs and try to make it work. It was little things that added up, but I still didn't expect to be called in as co-producer.

MR&M: I know *Double Fantasy* was recorded at the Hit Factory in New York, but most of your sessions are at the Record Plant. What are the qual-

ities that make you return there?

JD: I know those monitors. The ones here at the Record Plant in Los Angeles are very similar. They're Hidley's, now known as Westlake. Also, those are two rooms, among others, that put their money back into equipment: they keep up with the state-of-the-art. In N.Y., manufacturers call up all the time and ask to bring in new products to try out. If it's good, it finds a home there. In both studios there are rooms full of outboard gear. There are more older things in New York, because they were recording more there before L.A. became as popular as it is today. They'll buy out old studios in N.Y. and find great old equipment and wonderful old microphones, equalizers...they even have a small transmitter at the studio in N.Y. so you can compress and broadcast your music to see what it'll really sound like on the air.

MR&M: Many times when a vocalist or musician is being recorded the consistency of performance from track to track or from lead vocal to vocal overdub doesn't remain the same. The intensity may not stay there the second time. Is there a way that you guard against that?

JD: There's really not much you can do. The main thing is to relax the artist. You say, "Listen. You've got this great performance on tape; you can do anything you want to beat it." Now the artist should be totally relaxed. Whatever he does, he knows he's already got a great performance on tape because he's been *told* it's great. When he goes back into the studio, he feels that all he has to do is do justice,



Douglas with assistant engineer Bill Fresh during the Knack sessions.

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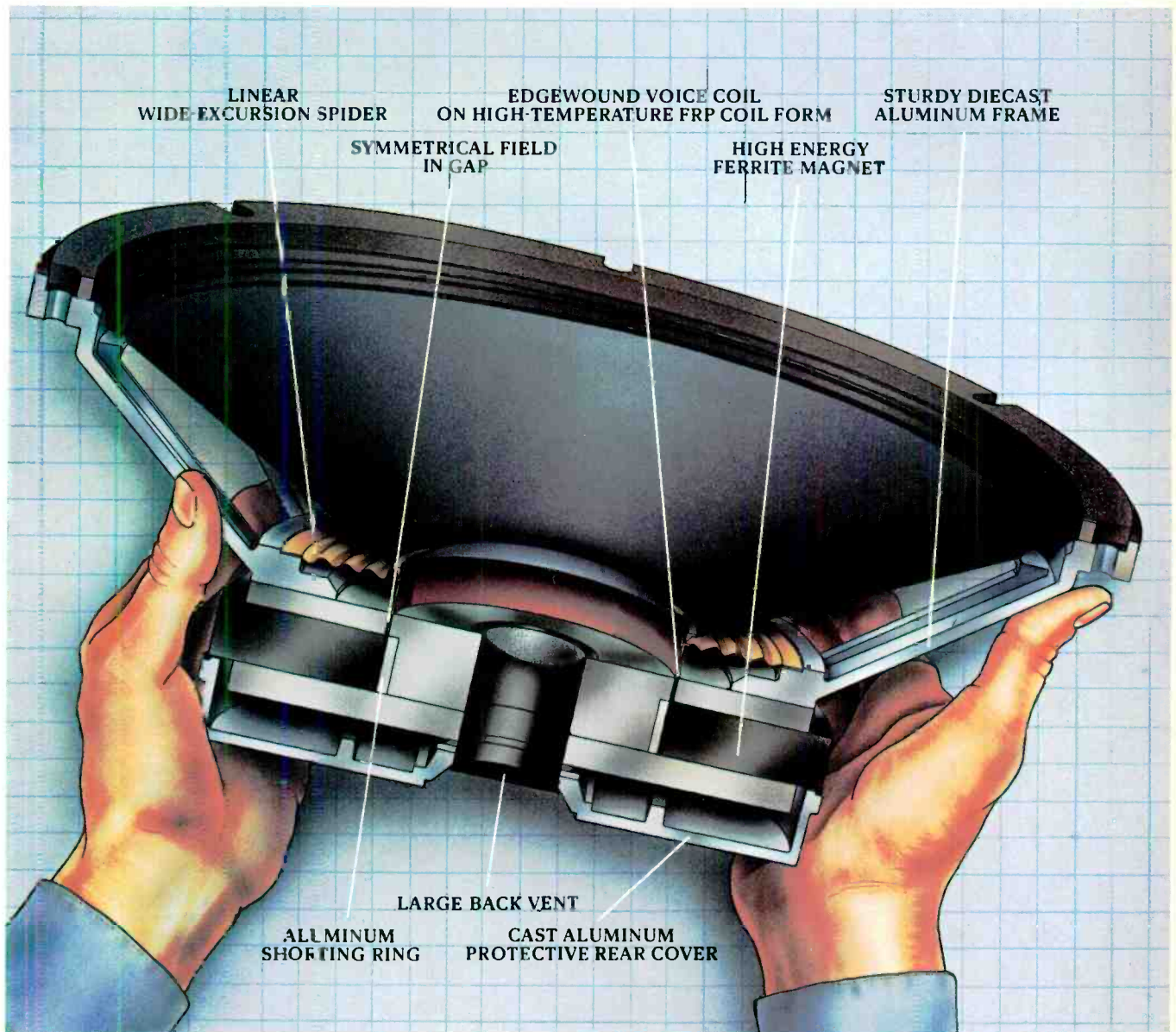
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and he usually gets himself up for it.

On doubling, I'll tell the artist that the double will not be quite even with the lead vocal, that he doesn't have to worry if he makes errors. The thing is to relax the artist so he feels free to work. I did that with John for his doubles. John was a great doubler; he'd beat the original performance that he was doubling. An hour or so later I'd say, "Guess what? We're gonna double the vocal you just did." Once they're relaxed there's no problem.

Sometimes difficulties arise if it's the first time you've worked with that artist or whichever soloist you're dealing with. You've got to find out what works, and that may take a while. You may have to go back and do some of the first vocals or solos over again once you know what it takes to make the artist free and open.

A lot of artists don't like to wear headphones. They're stage performers; they like to hold the mic in their hands and not wear 'phones. In that case I'll put two JBLs on stands in front of him, give him a hand-held mic like a D135 and a little bit of an area to work in. I'll put the speakers out-of-phase so that in the center spot the tape machine and mic won't pick up the monitors. I have a piece of white string that I use so I can locate that center spot for the singer to work in. He feels free; the band is cooking away and he's standing there singing with no problem. If I have to build a house around him so he doesn't see anybody, then I do it.

I once had a vocalist sing on top of a water tower on the roof of a ten story building. It's true! We were doing a cover version of "Higher and Higher," and the vocalist said, "I'd love to be singing *Your love is lifting me higher* and be able to look out at all of New York City!" This was at the Record Plant; Studio C is on the tenth floor. Outside is a water tower with a big flat platform on top. "How'd you like to stand up there?" I asked him. "There's all of Manhattan at your feet!" He said, "Great!" We ran the mic cable out of the control room, up the water

tower and attached a mic with a wind screen to the wire. It was a group from Canada called Crowbar. I don't think you can buy the record anymore. In the middle of the song you can hear jets going over the tower and traffic noise, but I loved it...and the singer really got off on it. I'll go to any length. If the

guy wants to record at his home, I'll get a truck and go there.

MR&M: Suppose you get a player in a group who is adamant about playing a part that he came up with, but you, as the producer, may feel it's a little strange or not quite right for the song. How do you deal with that kind of an attitude?

JD: Most of the time I'll try it his way first. If he really likes that part and he worked on it, I'll say, "Let's put it down." I'll do it until it's properly executed the way he always heard it in his head—not just recording the part to placate him, but really doing a good job. To me, the part may sound real strange, but there must be some reason why he feels so strongly about it. That way he'll be happy. Then I can ask, "Will you do me a favor?" I've already done so much for him; he actually got what he wanted. "Will you try my idea?" At that point, his part is on tape. He feels confident and feels like playing. Just about every time—I've never run into a stone wall—he'll be willing to try.

I've found that when a guy is insistent, especially a guy in a self-contained band, even though it may sound off the wall to me in the beginning, when we get it right, there is almost inevitably something that is really good. Even if it's crazy, it's really good. I may only have to change a few things on it. When it goes back with my changes on it, we've come up with something that everybody's happy with. The important thing is that no matter how bizarre it is, try it! Sometimes the thing that is dissonant is that which is part of the group's sound. Sometimes the musician has to do something that seems crazy in order to express an emotion, and that's what music is all about.

"The important thing is that no matter how bizarre it is, try it!"

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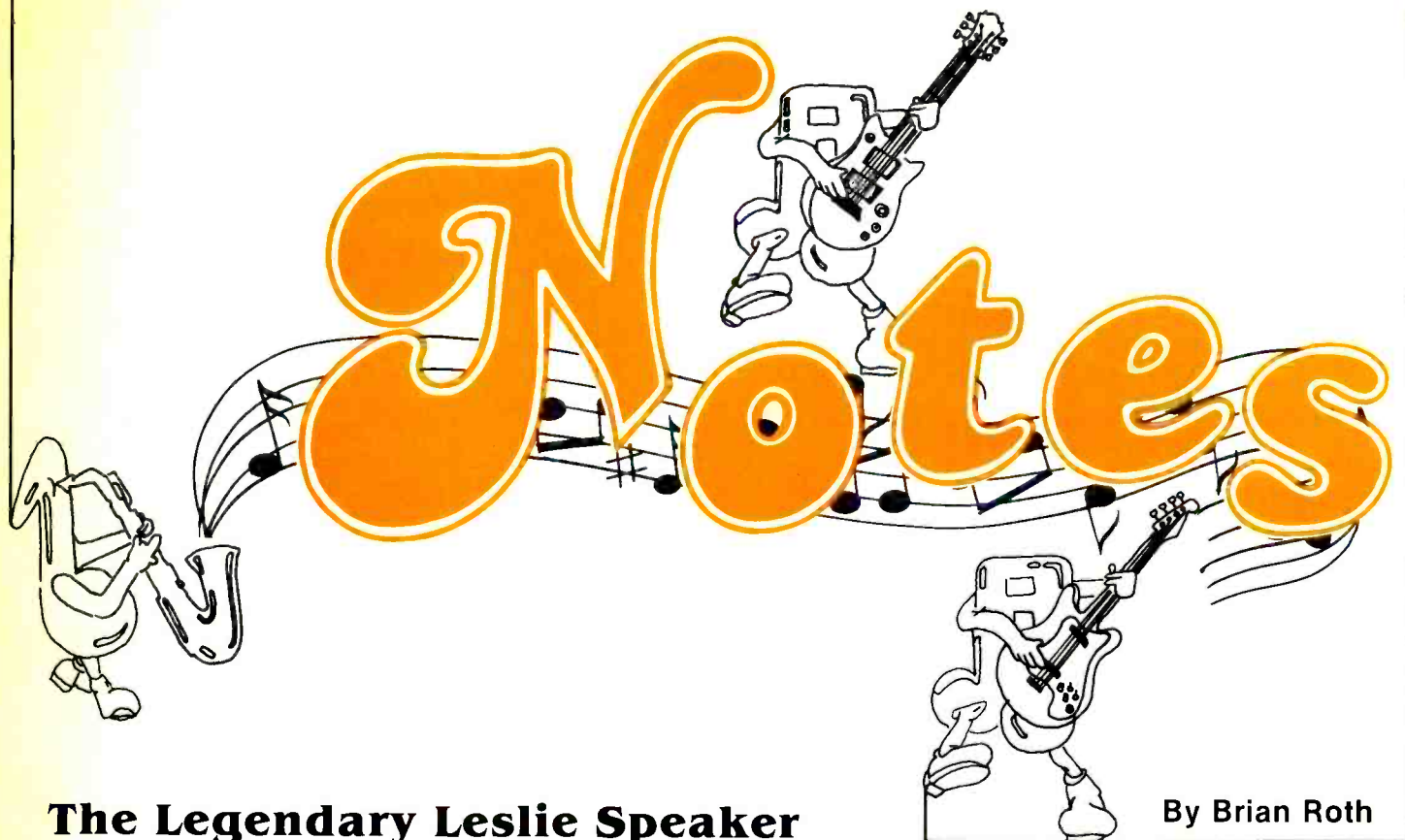
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CIRCLE 142 ON READER SERVICE CARD



The Legendary Leslie Speaker

By Brian Roth

This month, I am continuing the saga of tube-type equipment service by examining a very popular amp/loudspeaker combination: the Leslie speaker. (By the way, Leslie is a trademark of the Electro Music division of the Hammond Organ Company.) The two types to be discussed herein will be the model 122 series and the 147/247 models. [The 147/247 model has been replaced by a solid-state version, the model 770.]

Originally designed to be utilized with an electronic organ, the Leslie cabinet has found many other applications. The novel idea of rotating loudspeaker elements creates a lush, liquid vibrato effect that is practically impossible to duplicate in any other fashion.

The 122 models were specifically designed to interface with Hammond B-3 and C-3 organs. Consequently, 122 Leslies have a rather odd input stage configuration that limits their usage to these particular organs.

On the other hand, the 147 series features a much more conventional input circuit design that allows them to be used with most any organ that has a loudspeaker output. For instruments lacking speaker level output signals, Leslie manufactured a "combo preamp" that boosts the low-level audio of guitars, portable electronic keyboard instruments, etc., up to a level which can drive the Leslie power amplifier. Additionally, the preamp provides 120-volt AC power to energize the amplifier's circuitry.

The amp itself is located on the lower surface of the Leslie cabinet, and is visible from the rear. A six-conductor plug interconnects the power amp to the signal source (organ or preamp).

There are only two controls on a 147 series amp: im-

pedance selector and volume control. The impedance switch is marked with settings for 8 ohms, 16 ohms and "open." This provides the proper termination of an audio amplifier in an electronic organ; merely select the value which matches the impedance of the organ's original loudspeaker.

Normally, however, a Leslie is used with a combo preamp, and consequently the loud-resistor switch must be set to the "open" position. Otherwise, the internal resistors in the Leslie amp will severely load the output of the preamp, resulting in low signal levels and high distortion.

Although of tube-type design, the amplifiers in 122 and 147 series Leslies are very reliable and conservatively designed. There are four tubes in a 147 series: 12AU7A, pre driver; two 6550 power output tubes; and an OC3 regulator. This last tube is somewhat of an oddball. It is normal for the OC3 to generate a soft, purple glow when operating. Also, it is normal for the glow to vary in brightness when the amp is being driven with audio.

Due to the conservative design of the amp, all tubes should last a long time. The 6550 output bottles are the ones most likely to give problems, but can still be expected to run for many months, even if used daily.

The output from the power amp connects to a passive crossover which splits the audio spectrum to the high and low-frequency rotor speakers. Access to these can be made by removing the rear cabinet panels.

The 15-inch, low-frequency speaker will seldom fail, but if it requires replacement, be sure to use a 16-ohm impedance speaker. The high-frequency driver is more likely to fail, particularly if the Leslie is "cranked" wide open so that it generates distortion. The treble driver is secured to the top

rotor by three screws, and if it should fail, I advise replacing it with an exact duplicate. However, if you are really ambitious, you can have a machine shop fashion an adapter plate so that a larger driver can be used in place of the original. (I know of a number of people using JBL or Altec replacements.) Just be sure to use a 16-ohm impedance replacement, or you run the risk of cooking the amplifier.

Because a Leslie uses motors, drive belts and other mechanical contrivances to generate the vibrato effect, these are the items requiring the most service attention. First, let's see how the two speeds are created.

Both the upper and lower rotors are driven by a two-motor assembly. The larger motor provides a direct drive to the pulley which in turn moves the belt and hence the rotor. This large motor is activated for high-speed rotation.

A large wheel is mounted on the opposite end of the large motor's shaft. A rubber "O" ring is snapped into a groove of this wheel. The small motor shaft physically contacts this wheel when the slow speed mode is activated by the footswitch on the combo preamp (or the lever switch mounted on the organ). The small motor shaft and the large diameter wheel serve to reduce the motor speed, and thus drive the rotor at a low speed.

The unusual aspect of the low speed/small motor design is the means used to engage and disengage the small motor shaft from the rubber-edged wheel. When the small motor is energized, the electromagnetic field of the motor's coil pulls the armature into a position that allows its shaft to contact the wheel. When the small motor is switched off, an internal spring pushes the armature into a resting position that does not allow the shaft to touch the wheel.

As the rubber "O" ring on the edge of the wheel wears down, it is common for the slow speed to stop functioning. Consequently, a mechanical adjustment is provided to compensate for wear. A long bolt is attached from the motor assembly frame through the laminations of the small motor. A nut on either side of the laminations locks the small motor into position. By loosening the nuts, an "azimuth" adjustment for the small motor is possible. If the nut on the side of the motor closest to the drive wheel is "run out" on the bolt away from the wheel, the small motor shaft contact will be increased. Setting this nut closer to the wheel will decrease contact. Tightening the other nut locks the small motor in place after adjustment.

Leslie suggests this procedure to determine the proper small motor adjustment. With the small motor (slow speed) activated, hold the appropriate rotor so it no longer turns. Adjust the two nuts to provide enough engagement so that the drive pulley begins to slip on the belt. This should be enough pressure to ensure proper slow speed operation. Activate the fast speed, and make sure that the small motor shaft can still disengage from the rubber-edged wheel.

It may take a little experimentation, but the small motor adjustment can easily be done. Be sure to snug up both adjustment nuts after you've determined the right position.

Periodically, it is necessary to clean and lubricate the two motors in each assembly. It is necessary to remove the motor assemblies from the cabinet. This is accomplished by pulling the drive belt from the pulley, and removing the wing nuts that attach the unit to the cabinet. It's also necessary to unplug the motor power plugs from the amp.

With the assemblies out of the cabinet, remove the four screws that attach the small motor to the large motor.

Then remove the two nuts that hold the mounting plate to the small motor (don't lose the small washers!) as well as the adjustment nut (on the rear of the motor) which provides contact pressure as described earlier. This should give access to the small motor for cleaning and oiling.

Next, remove the pulley and rubber-edged wheel from the large motor's shaft. Mark an alignment point on the "U" bracket and motor so that the bracket can be installed in the same position after disassembly. Loosen the three screws that attach the motor to the bracket; the large motor is now completely accessible.

Use a vacuum cleaner to suck all the gunky dirt from the motors, particularly from around the motor shafts. Use alcohol to remove any remaining dirt or grease, and be sure the small motor's shaft is grease-free. Then, referring to the diagram, put a few drops of light oil (*don't* use automotive oil; sewing machine oil is a good possibility) into the oiling holes of the small motor and onto the felt pads on each end of the large motor.

Reverse the disassembly procedure, and re-install the motor units in the cabinet. Put the drive belts back on the pulleys. Adjust the bass rotor belt tension by pulling the motor assembly until the belt is tight, and then releasing the tension just a small amount while tightening the wing nuts. Belt tension on the upper rotor is provided by the spring loaded idler wheel. If this belt seems loose, bend the spring to increase tension.

With proper mechanical care, the rotors will speed up and slow down properly, and will generate a minimum amount of ratchet in the process. Just be sure to keep dust from building up in the motor assemblies, and lube the motors yearly to keep your Leslie spinning.

Technician's Corner

The biggest problems with a Leslie are the various mechanical devices discussed earlier. However, a few comments are in order concerning the amplifier.

If the amp is not providing any output, and yet the filaments on the tubes are lit, look to see if the OC3

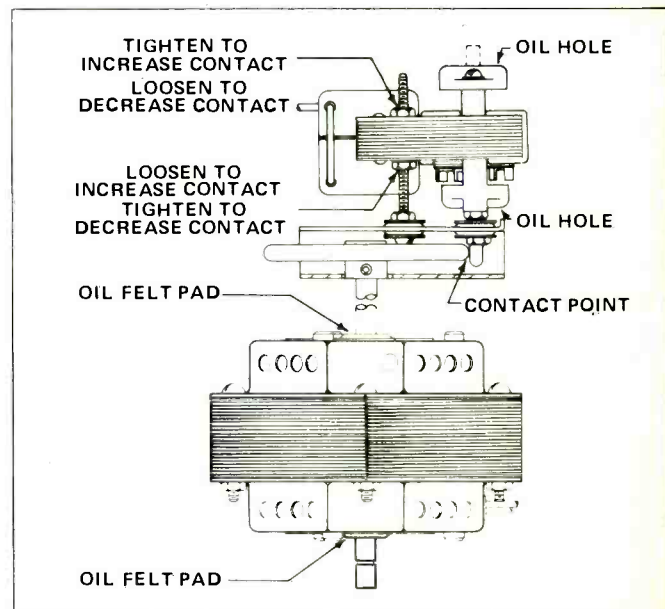


Figure 1: Diagram of small motor adjustment nuts and oiling locations.

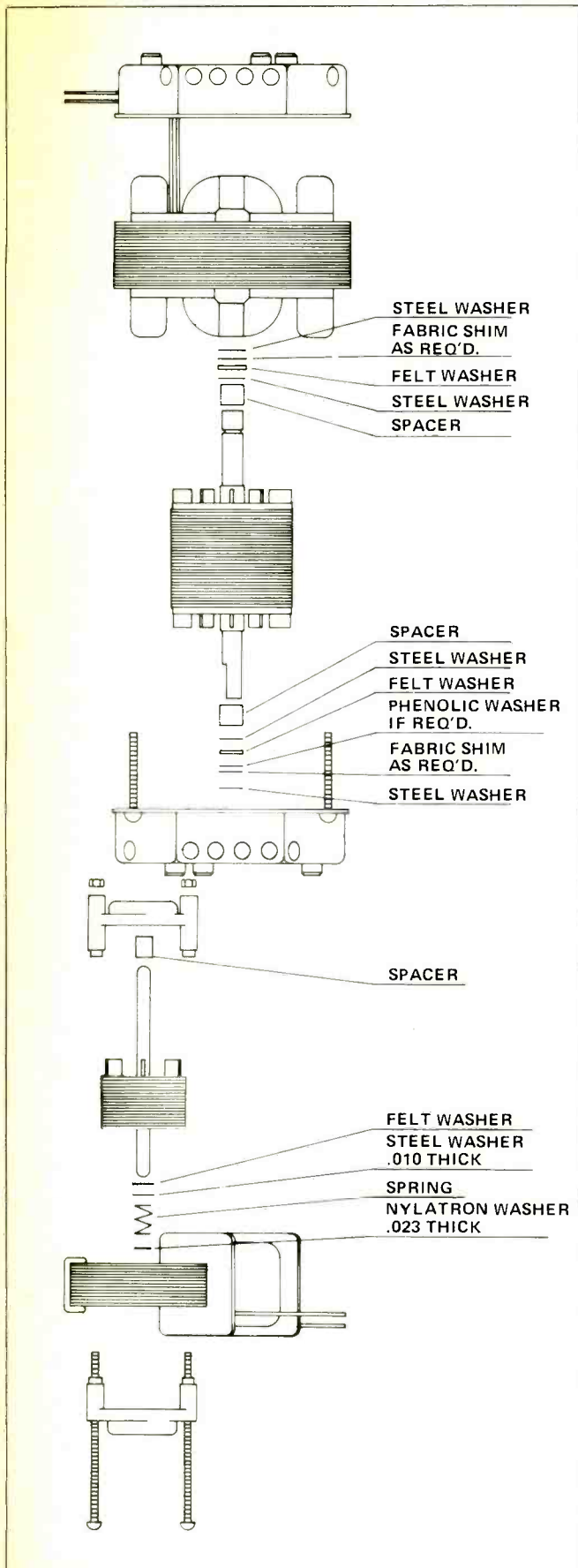


Figure 2: Exploded view of internal components of large and small motors.

regulator is glowing purple. These will rarely fail, but will result in a totally dead amplifier.

After the 6550 output tubes have been in service for a while, you will notice that the normally silver-colored patches on the interior surface of the tube's glass envelope will become burnt or smoky looking. This is a good sign that the 6550's are in need of replacement, as is repeated blowing of the 1½ amp line fuse.

Other causes of fuse blowing include leaky electrolytic capacitors in the power supply, and shorted diodes in the bridge rectifier. These can be checked with a VOM as described in previous installments of this column.

To suppress clicking sounds as well as to keep the contacts of the high/low speed motor relay from becoming burned, a .1 mfd, 600-volt capacitor is connected from each relay contact to the relay's armature. A short circuit in one of these capacitors will cause one of the motors to stay on all the time, which in turn will tear up the rubber "O" ring if the other motor is energized by the combo preamp or switch on the organ. Open capacitors will cause a large "pop" to be heard from the speakers when the speed is changed from fast to slow or vice versa.

Very rarely, the output transformer will fail. If it requires replacement, use an original factory part and be sure to follow the color code on the leads. Sometimes, even if the color codes match up, the amplifier will go into oscillation once it is re-energized. In this case, interchange the two secondary leads (which should be the green and black ones) at the speaker output socket.

As mentioned earlier, the armature assembly of the small motor is moved into contact with the rubber wheel by magnetic attraction. When power is removed from the small motor, an internal spring pushes the armature in the opposite direction, thereby eliminating contact between the shaft and tire. Thus, a lot depends on the proper action of this spring, which, unfortunately, has been known to fail.

For those lucky enough to be near a Leslie service center, replacements are generally available. But what do you do if it's ten o'clock on a Saturday night and the spring gets sprung? According to "reliable sources," a modified ball point pen spring can be substituted. I have not personally tried this, but I am told it works quite nicely.

First, disassemble the small motor per Figure 2. Take out the spring so you can judge the required length. Use a pair of wire cutters to shorten the ball point pen spring, which will reduce the spring to about half its original length. Then, grab each end of the spring with needle-nosed pliers and twist to increase the diameter enough to allow the spring to slip onto the motor's shaft. Reassemble everything, and with luck, it will function normally.

Conclusion

I have always enjoyed the sound of the rotating Leslie loudspeakers as have many others. However, they require more maintenance than the average speaker/amp set-up. I hope the service suggestions outlined are of use to Leslie owners.

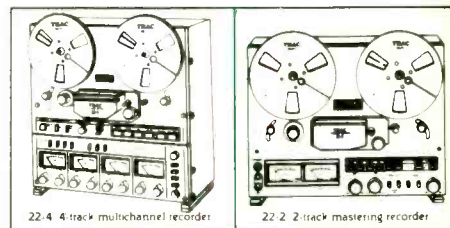
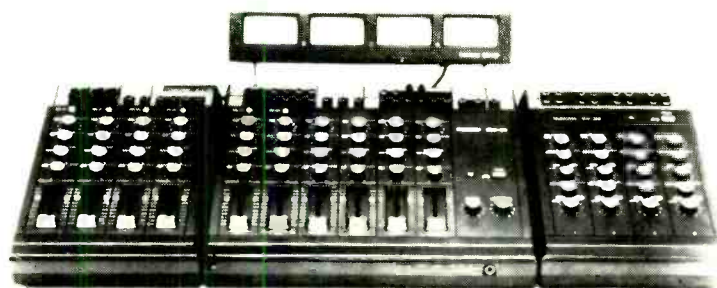
In the meantime, clean up those dirty motor assemblies and make your Leslie happy!

CIRCLE 17 ON READER SERVICE CARD



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Ambient Sound

BY LEN FELDMAN

What Ever Happened to Dolby HX?

It's been about two years now since Dr. Ray Dolby introduced his headroom extension system which he called Dolby HX. To say that the cassette tape deck manufacturing fraternity didn't exactly welcome the new development with open arms would be an understatement. As nearly as I can remember, only two or three "name brand" cassette deck manufacturers ever bothered to incorporate the HX feature into their products, even though Dolby Labs offered the circuit innovation to all of its licensees at no extra royalty charge. Part of the reason for the eclipse of Dolby HX may lie in the fact that the emphasis in cassette technology in recent times has been more on tape hiss reduction than on high frequency headroom extension (which is essentially all that Dolby HX ever claimed to do), as witness such noise reduction systems as dbx, ADRES (by Toshiba), Super-D (by Sanyo) and finally, from the very same Dolby Labs, Dolby C which *has* caught on more rapidly than anyone would have predicted.

Another possible reason for the less than enthusiastic reception accorded Dolby HX is the fact that metal tape, having come down somewhat in price in recent months, offers essentially the same benefit that HX was supposed to offer, without any of the undesirable side effects. And it is those side effects which constitute the main reason for many manufacturers' rejection of the HX principle. As we will explain in a moment, the way in which Dolby proposed to dynamically alter recording bias (and equalization) to increase high frequency headroom on cassettes and at the same time maintain flat frequency response actually introduced distortion in other parts of the spectrum—distortion that *could* be heard, despite Dolby's contention that it would be masked.

Bang & Olufsen Offers An Improved HX

Among those firms which recognized the inherent merits of the Dolby HX idea (as well as its demerits) was Bang & Olufsen, of Denmark. Before examining the differences between B & O's Dolby HX Professional (their name for the new approach) and ordinary Dolby HX as originally proposed by Dolby Labs, it might be a good

idea to briefly review the earlier technique.

Dolby HX works on the assumption that if bias level is made variable, and allowed to change with the input signal, it should be possible to record higher levels of high frequency program material, since high frequencies require less bias level for distortion-free recording than do mid- or low-frequency signals. Since Dolby noise reduction circuits already contain a control signal whose value is dependent upon high-frequency content, the same control signal was used, together with appropriate additional circuitry, to vary the recording bias level—decreasing it when large amounts of high frequencies were present and increasing it for optimum mid-frequency recording when there was little high-frequency energy present in the program content. However, the control signal that is ideally suited for noise reduction circuitry was found to be less than ideal for handling bias level changes, and furthermore, as bias changes, overall frequency response changes as well, because tape sensitivity varies with bias, too. To correct for this mismatch, Dolby used the same control signal to alter recording pre-emphasis at the same time that it changes bias level. In theory, bias and dynamically changing pre-emphasis are supposed to balance each other out to maintain flat response. In practice, it is extremely difficult to have everything track perfectly, and, as we have already pointed out, it is often possible to audibly detect increases in mid-frequency distortion during playback, when bias has been shifted to accommodate high-frequency, high-level program content.

Background for Dolby HX Professional

During the investigations by B & O which led to the development of Dolby HX Professional, several interesting phenomena were noted. The most important of these is the biasing effect on the low frequency part of an audio signal by the high frequency content of that same signal. In other words, any part of a signal that has a frequency greater than five times the low frequency part will increase the effective bias for the lower frequency. The biasing effect of one part of an audio signal that is being recorded on another part of

the same signal has been termed "mutual biasing."

It was also noted that the "flat" frequency response obtained through the use of pre-emphasis applies only for recordings made with single frequencies, under static sine wave conditions. This is the usual way in which frequency response measurements are made, and reported (even in our test reports) for tape or tape decks. When more typically complex audio signals are recorded, however, the signal contains a wide spectrum of frequencies, and static conditions are no longer valid. So, when recording signals on a machine with fixed bias, sensitivity changes continuously as a result of mutual biasing, depending upon the high-frequency content of the signal being recorded. With the change in sensitivity, overall frequency response changes, and the recorder no longer has the "flat" response curves obtained during single-frequency measurements. Such dynamic changes in frequency response are present not only in cassette recorders, but in all tape decks using high-frequency bias to give low distortion recordings, including studio quality open-reel tape recorders.

How Dolby HX Professional Works

The Dolby HX Professional system is based upon ideas that are quite similar to those which led to the original development of Dolby HX. Developed largely through the efforts of J. Selmer Jensen, of B & O, between 1978 and 1980, engineers from Dolby Laboratories helped to optimize the system and, because of this joint effort, it was agreed that the name of the system should include "Dolby."

While in the original HX system the primary aim was to allow higher levels of high frequencies to be recorded on tape, "Professional" has a more fundamental aim of keeping "active" bias constant. By active bias we mean the *effective* bias seen by each frequency in the audio spectrum. In achieving this objective, all parameters that would normally be affected by a change in bias under static conditions will be stabilized under the dynamic conditions that actually exist during recording. Dolby HX Professional is similar to Dolby HX in that both systems change the amplitude of the bias signal from the bias oscillator, but the reason for doing so, as well as the method of doing so, is different. In fact, however, all of the original aims of HX are achieved to virtually the same extent, but without some of the disadvantages. In addition, HX Professional has several advantages over HX. It is a dedicated system fully independent of the Dolby noise reduction module and all other electronic circuits in the Dolby decoder. This makes it as suitable for professional applications (such as in studio recorders) and for high speed duplicators as it is for use in high-quality cassette recorders.

In HX Professional, the signal from the recording head is fed to a processing circuit which consists of an accurately designed passive filter. After filtering, the signal is rectified to form a control voltage, which is an accurate replica of the total biasing effect of the processed audio signal *plus* the bias at the recording head, or the active bias. The control voltage is compared to a

reference voltage, which is adjusted for the static bias required for the actual tape used, and a correction signal is generated. This correction signal adjusts a voltage controlled amplifier which in turn alters bias amplitude so as to maintain a constant *active* bias for the signal that is being recorded. Once correctly designed and installed, no further adjustment or corrections are ever required for any tape or for any signal processing.

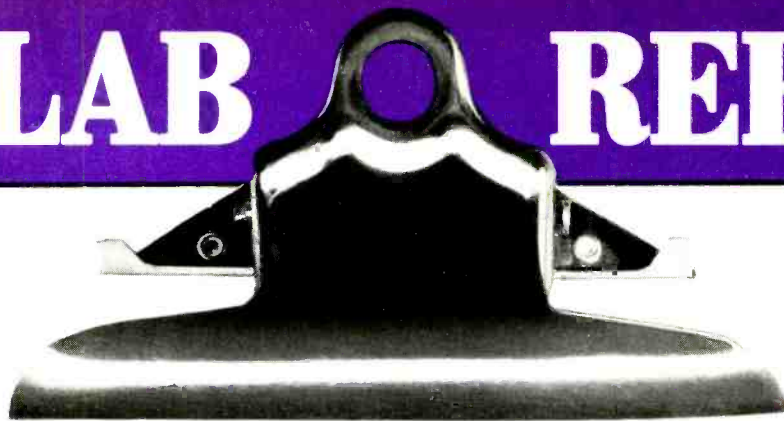
Since effective active bias remains constant, no changes in pre-emphasis are required, unlike standard HX. HX Professional can be used with Dolby B, Dolby C or, for that matter, with no noise reduction circuitry at all. The benefits of optimum recordings at all frequencies is available under all conditions.

As an example of how the system will operate, suppose a signal consisting of low frequencies only is to be recorded. The bias level will remain unchanged, since no changes in bias level are required. If now a signal containing the same low frequencies, but also including large amounts of high frequency signals is to be recorded, the HX Professional system will reduce the bias supplied by the bias oscillator to a lower value. The amount of reduction is arranged so that it is almost exactly equal to the mutual biasing effect of the audio high-frequency signal component described earlier. Thus, low frequencies see a constant bias level (and an optimum one, for them), while bias level has changed for the high frequencies, since they now receive no added "self bias" from the audio signal. As a result, low and high frequencies "see" bias levels which are optimum for their respective frequencies. Finally, if the signal to be recorded contained only high frequencies, bias would be reduced at the bias oscillator to a degree that is very close to the optimum bias for high-frequency signals. In that way, the substantially increased headroom at high frequencies (which was the basic purpose of the original HX system) continues to exist for HX Professional as well.

HX Professional functions independently on the two stereo channels. This means that bias for *each* channel is always adjusted to the optimum for that channel, even though signals applied to the opposite channel may require (and be supplied with) a totally different bias level. Traditionally, machines with fixed bias are adjusted so that the bias setting is a reasonable compromise between low frequency maximum output level (MOL) and the ability to record high frequencies of relatively high amplitude without excessive tape saturation. With an HX Professional equipped deck, bias settings can be adjusted to the optimum value needed for lowest distortion at low and mid frequencies, and the best possible MOL. No consideration need be given to the compromises normally required for acceptable high-frequency recording quality.

Bang & Olufsen will, of course, be incorporating Dolby HX Professional in models of cassette decks to be introduced in late 1981. Whether other tape deck manufacturers will follow suit, embracing an improved version of an idea that didn't click the first time around, remains to be seen.





NORMAN EISENBERG AND LEN FELDMAN

Onkyo M-5060 Power Amplifier



General Description: The Onkyo M-5060 is a stereo power amplifier conservatively rated for 120 watts output per channel at very low distortion. Its circuitry highlight is a DC amplifier aided by servo amplifiers which are designed to “purify” the low-frequency response by cancelling unwanted low-frequency components such as those produced by tone-arm resonance, signal-coupling capacitors or other spurious components produced by temperature or power supply voltage changes. Also built into the amplifier are protection circuits for excessive current or DC at the speaker terminals.

Prominent on the amplifier’s front panel are two meters showing left- and right-channel power output. Calibration includes both power ratings (for 8-ohm loads) and dB markings, with “0 dB” representing 120 watts into 8 ohms. A single range switch for both meters may be used to multiply the meter scales by 0.1, thereby reducing all the numbers to one-tenth of their indicated value and thus increasing meter sensitivity but, of course, limiting the total range readout. Each channel has its own gain control. The power off/on switch is at the lower left of the panel, while over at the right are a headphone jack and two speaker switches. One of these switches may be used to mute the speakers; the other will select either of two pairs of speakers connected at the rear. There is no switching

for selecting both speaker output terminals on the same channel.

Signal inputs at the rear are phono “pin” jacks; outputs are color-coded binding posts. The rear also contains a grounding terminal, the AC line cord and an unswitched AC convenience outlet.

Test Results: Testing the Onkyo M-5060 in the lab was an exercise in confirming manufacturer’s specs, except that at times the exercise got somewhat strenuous. Note that the static rated distortion figures (both harmonic and IM) are unusually low. We decided to try to read distortion at 1 kHz and at 20 kHz, just to see if it could be done with the combination of test equipment we had on hand. The way we ended up doing this was to feed the distortion output of our distortion analyzer to our spectrum analyzer. By first establishing a 100-percent reference level that corresponds to 120 watts of output (per channel), we applied this signal to the spectrum analyzer to produce the tall spike at the left in *Fig. 1* (for 1 kHz) and in *Fig. 2* (for 20 kHz).

We then increased the sensitivity of this distortion output (on the analyzer) by scaling down to a -70 dB level. That made a full scale reading of any distortion components actually 70 dB lower than the reference level. We then swept from 0 Hz to 20 kHz logarithmic-

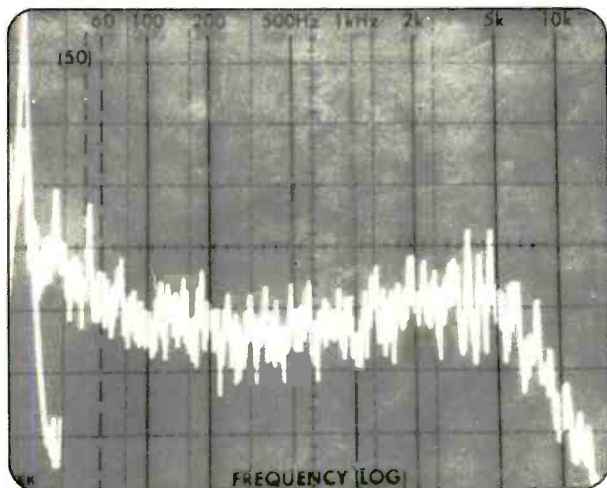


Fig. 1: Onkyo M-5060: Harmonic distortion was so low on the M-5060 that it had to be measured using an indirect method, combining distortion analysis and a spectrum analyzer, 2nd- and 3rd- order components were more than 100 dB below rated output.

ally (in *Fig. 1*) and observed a 2nd harmonic component that was 30 dB lower than 70 dB down, or -100 dB (each vertical division on the display is worth 10 dB). In the case of the 20 kHz distortion measurement, the 2nd order component—just to the right of the reference signal—was 96 dB below reference level (70 dB plus 26 dB). For *Fig. 2* the sweep was changed to a linear one, and it extends from 0 Hz to 100 kHz which accounts for the spread-out distortion components at 40 kHz, 60 kHz, 80 kHz and 100 kHz.

If all this seems too complex to worry about, you are probably right. The important point to make here is that the Onkyo M-5060 is a ruggedly built, good performer that is well designed, inside and out. Although the manufacturer has no spec for power into 4-ohm loads, we measured better than 190 watts per channel into 4 ohms, still at that extremely low rated distortion. Trying to measure IM on this amplifier was an exercise in futility—it is literally too low to determine accurately.

General Info: Dimensions are 17¾ inches wide; 6 ¾ inches high; 15½ inches deep. Weight is 39.2 pounds. Price: \$795.

Individual Comment by L.F.: I'm reminded of the medieval theological debates dealing with the question of how many angels can fit on the head of a pin. Does it really matter whether a power amplifier has a harmonic distortion rating of 0.005% or 0.001% (the figure we laboriously worked out for this fine Onkyo amplifier using a couple of test instruments in tandem) when so many tests have shown that most people can't

hear harmonic distortion unless it exceeds 1% (some say 2%; some even claim 6%)? I'm convinced that the real audible benefits which I believe I hear when listening to this amplifier come not from the lowered static distortion figures (SMPTE-IM was also under 0.005% up to and beyond rated power) but rather from some of the other circuit developments which Onkyo and other Japanese manufacturers have been incorporating in their higher powered amps in recent years.

Onkyo introduced a DC servo system (in which two separate overall negative feedback loops are used—one operating over the audible frequency range, the other at ultra sub-sonic frequencies only to increase DC stability and ultra-low frequency damping) a couple of years ago. Now they have augmented that circuit with an additional one called a Dual Super Servo circuit which, according to Onkyo, in addition to eliminating the harmful effects of ultra-low frequency components generated within the amplifier, also suppresses any reverse or counter electromotive forces generated by speaker systems connected to the amplifier. Audible benefit, again according to Onkyo, is supposed to be an improvement in transient response in the bass region, and to reduce to negligible values any DC drift at the output of the amplifier which might cause speaker voice coil damage or, at the very least, distortion owing to non-linear operating of speaker cones.

The M-5060, like many other recent power amps, employs a dynamic form of output stage biasing which reduces switching and notch distortion while preserving the efficiency benefits of class B operation. Were I not familiar with this circuit approach, I might

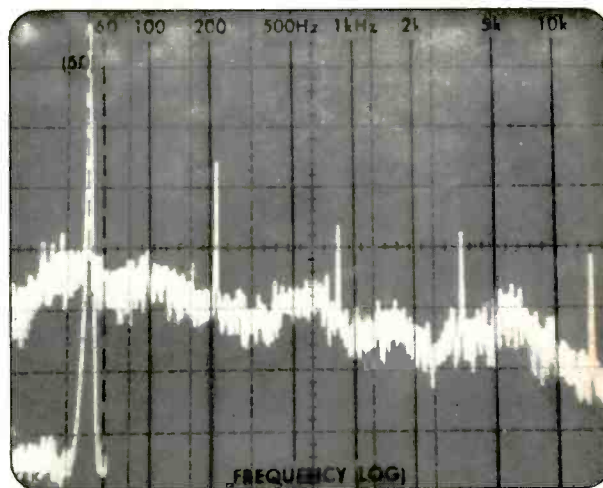


Fig. 2: Onkyo M-5060: Combined system of distortion analysis and spectrum analysis was used to determine THD at 20 kHz, as in *Figure 1*. In this display, however, sweep is *linear*, and extends from 0 Hz to 100 kHz. 2nd-order distortion component was 96 dB below reference (rated output) level.

never have guessed that it is what's happening. You'll see what I mean if you read the following paragraph, quoted directly from the owner's manual:

"Although the linear switching circuit employed in the M-5060 is rather similar in circuit design to the two-transistor class B amplifiers, a special bias circuit is employed for compensatory purposes at the point of intersection between the characteristic operational curves of the two transistors. This ultimately results in the switching circuit operating as if in accordance to a single operation curve of exceptional linearity."

Everyone understand that OK?

Back to the serious stuff, our lab measurements for this amp are summarized in the "Vital Statistics" chart and, as you might have expected, all of the published specs are met or exceeded. Dynamic headroom was on the low side (0.63 dB) and while we certainly don't look upon this spec as a qualitative measurement, we would simply caution users that the M-5060 is designed with a rather stiff supply, so don't expect much headroom beyond the rated continuous power levels even for short-term musical transients. If 120 watts is what you need, you'll get that plus a bit more, whether you feed in steady-state tones or music.

I found the amplifier to be one of those that handles the entire audio spectrum very well, doesn't seem to strain so long as it isn't driven into clipping, and offers good reliable metering facilities, plus even a few extras, such as speaker switching, headphone jack, meter range selection and, best of all, a price tag that is not out of line.

Individual Comment by N.E.: This is the first amplifier from Onkyo we have tested. Onkyo has been

identified mainly with "home hi-fi"—type products, albeit very good ones. The TA-2080 had more than a touch of genuine "professionalism" however. It delivered the performance claimed, and it was sensibly designed and easy to use.

Much the same could be said of this new model M-5060 amplifier which, like so many other recent amplifiers, does seem to bridge the "gap" between home-audiophile equipment and pro equipment, in terms of power reserves (at least up to and a little beyond its rated capability), and general reliability (at least to the degree we were able to determine within the limited time available for testing and meeting publication deadlines). Still, I think that while doubtless there may be many pro applications for which this amplifier would be suited, its main appeal will be to the home audiophile who likely will be more concerned with the advantages of its "super servo" configuration and its vanishingly low distortion, and less concerned over the fact that it does not have pro-type inputs, or that the two meters cannot be independently switched, or that—while the owner's manual does say that 4-ohm loads are permissible—there is no spec given for 4-ohm operation (despite the fact that we did measure better than 190 watts into 4-ohms), and the speaker selector switch will choose either speaker terminals "1" or "2" but not both at the same time. Furthermore, the manual advises that to make the most of the amplifier's servo system it should be used with Onkyo's own preamp, the model P-3060. And of course, there is no provision for rack-mounting the M-5060.

On the other hand, those front panel meters are unusually large and very easy to read. And—even without the Onkyo preamp driving it—the M-5060 does sound uncommonly good. So...?

ONKYO M-5060 AMPLIFIER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Continuous power for rated THD, 1 kHz		
8 ohms	120 watts	131 watts
4 ohms	NA	192 watts
FTC rated power (20 Hz to 20 kHz)	120 watts	130 watts
THD at rated output, 1 kHz, 8 ohms	0.005%	0.001%
20 Hz, 8 ohms	0.005%	0.003%
20 kHz, 8 ohms	0.005%	0.002%
IM distortion, rated output, SMPTE	0.005%	0.004%
CCIF	NA	0.003%
IHF	NA	unmeasurable
Frequency response, 1 watt output	+0, -1.5 dB, 1 Hz to 100 kHz	+0, -3 dB 1 Hz to 80 kHz
S/N ratio re; 1 watt, "A" wtd, IHF	94 dB	97 dB
S/N ratio re; rated output, "A" wtd	NA	116 dB
Dynamic headroom, IHF	NA	0.63 dB
Damping factor at 50 Hz	140	Greater than 100
IHF input sensitivity	NA	0.14 volt
Input sensitivity re; rated output	1.5 V	1.5 V
Power consumption: idling; maximum	NA; NA	111; 585 watts

CIRCLE 18 ON READER SERVICE CARD

Uher 4400 "Report Monitor" Portable Tape Recorder



General Description: The Uher 4400 "Report Monitor" is an open-reel portable tape recorder with 5-inch reel capacity and selectable speeds of $7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{1}{2}$ and $\frac{3}{16}$ inches-per-second. The head configuration is quarter-track on $\frac{1}{4}$ -inch tape, permitting stereo in both directions of tape travel, or mono back and forth twice over the full length of tape. Three heads are used, with the separate record and play heads permitting off-the-tape monitoring while recording.

The 4400 runs on five size-D dry cells which fit into the bottom of the machine. It also runs on a power unit/charger (Uher model Z125 A1) which may be substituted for the dry cells and used either externally or also fitted into the space otherwise used for the dry cells. When used externally, the charger's line cord must be plugged into an AC outlet, while a special multi-pin socketed cable links the charger to a connector on the recorder. When placed inside the machine, the AC line cord still is used but the cable link between the charger and the deck is no longer needed. The charger has a voltage selector for running off 220 or 115 volts AC mains. The model 4400 also will run off a special storage battery available from Uher which too fits into the deck's battery compartment. The 4400 also can be used with vehicular batteries via a special Uher connecting harness. For carrying the 4400, there is a detachable handle that slips over projecting pins on the deck's sides. In addition, optional leather carrying cases are available.

Except for the headphone monitor jack, signal input and output connectors are the European-type multi-pin types requiring either corresponding connectors or suitable adaptors for microphones and line signal devices. Provision is made for two microphones, and high-level inputs.

For playback, the model 4400 has a small built-in speaker, and there are connectors for feeding signals to external speakers, amplifier or headphones.

The topside of the deck contains the reel compartment and head assembly under a hinged transparent cover. The speaker opening is below and to the left; the transport keys are below and to the right.

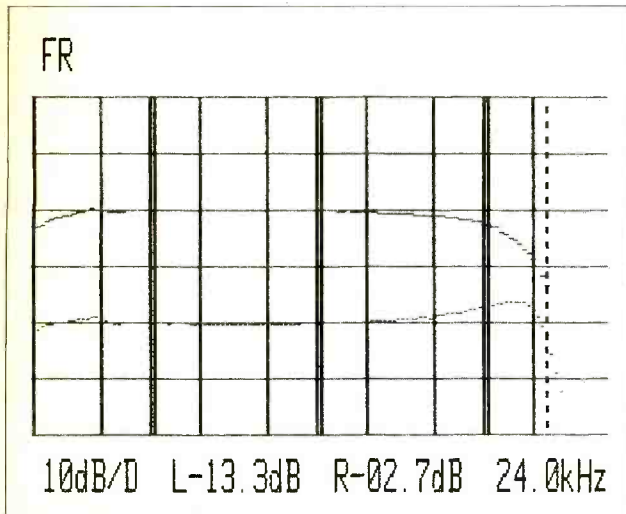
The labels for the transport keys are printed along

the front edge of the machine and include the functions of rewind; start; pause; stop; record; fast-forward. The keys are mechanically operated, and they permit a limited kind of "fast-buttoning." From rewind you can go directly into fast-forward, and also into the record mode by holding down the start (play) and record keys at the same time. You cannot, however, go directly into the play mode from rewind. From fast-forward, you can go directly into record or play. From the record mode you can go into fast-forward but not rewind. From play you can go directly into fast-forward (but not rewind), and you also can go directly into record by holding down the start and record buttons at the same time. The pause button must be manually released if it is engaged.

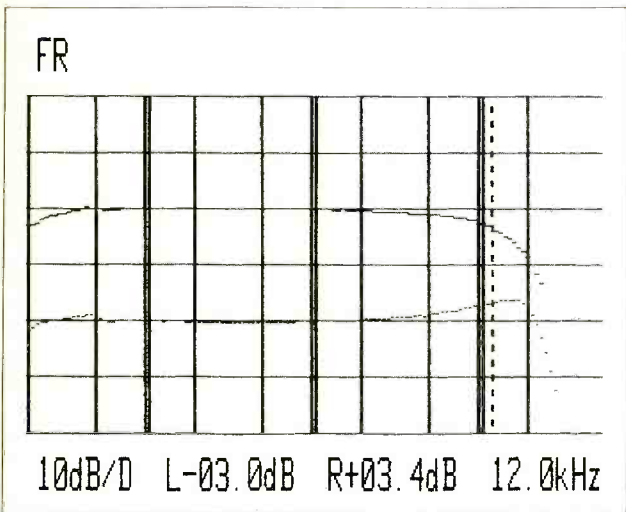
The left-hand portion of the front panel contains two peak level signal meters calibrated from under -20 to $+3$ dB. The second meter also contains a battery-check reading. Between the meters are three LEDs indicating operating mode, and a tape/source monitor switch. Below the meters are three knobs for channel 1, channel 2 and master recording level which may be used as a fader for handling both stereo channels at once and also for handling the combined signal when two inputs are being mixed to a mono signal.

The right-hand portion of this panel contains a 3-digit tape-index counter and reset button; a switch for checking battery condition; a second switch for lighting the meters; a mono/stereo selector; the tape-speed selector (marked in cm) which also serves as the power on/off switch; a monitor volume control; and a tone-control (treble cut) combined with a switch to turn on or off the deck's built-in speaker (which, in stereo mode, presents an "A plus B" mono-summed signal). The two mic inputs near the bottom may be used for individual channel microphones. The mic 1 input also may be used for a stereo microphone when a small switch at the extreme right is used; in this case, the mic-2 socket is inactive.

Test Results: For a portable, the Uher 4400 has some pretty rigorous specifications—and they all were confirmed or bettered in our lab tests—(see our table of



(A)



(B)

Fig. 1: Uher 4400: Frequency response, record/play of unit. In upper traces, cursor is positioned to show cut-off point (-2.7 dB) for -10 dB record level (A). In lower graphs, cursor has been set to show cut-off (12 kHz) for 0 dB record level.

"Vital Statistics"). Some of the highlights are shown in the accompanying graphic plots. We measured frequency response at the deck's highest speed of 7½ ips for two record levels of 0 dB and -10 dB. Both response curves are shown in Fig. 1. In both (A) and (B) of Fig. 1, the upper plot shows response at the 0 dB level; the lower plot, at -10 dB.

It must be noted that "0 dB" on this machine's peak-reading meters is like no other "0 dB" we have seen recently. It corresponds here to a whopping record level of about 450 nanowebers-per-meter. That's more than twice as much magnetization level as Dolby calibration level, which accounts for the seemingly

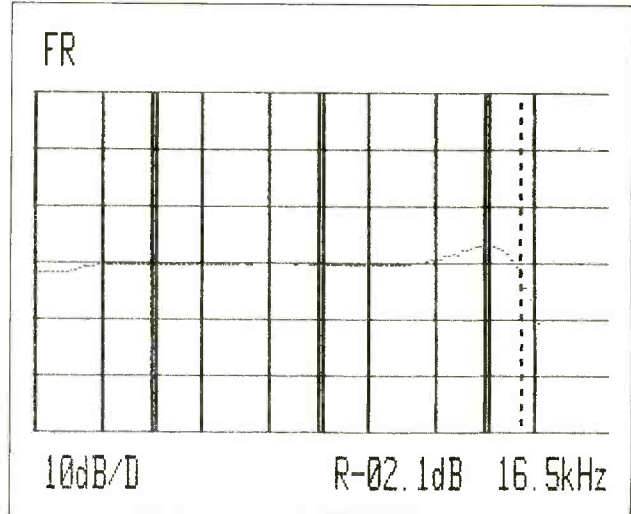


Fig. 2: Uher 4400: Record/play response at -10 dB record level, 3¾ ips.

high third-order distortion figures shown in the "Vital Statistics" table. These figures are all with reference to this inordinately high "0 dB" level as shown on the deck's meters.

At a more realistic -10 dB record level, response extended to beyond 24 kHz (represented by the "R" curve in Fig. 1A, which shows the response as being down by 2.7 dB at 24 kHz). At this highest speed headroom is, of course, far better than one would find on any cassette deck, as evidenced by the upper trace of Fig. 1B, which was recorded at a "0 dB" level and which extends to 12 kHz for the -3 dB rolloff point at this very intense magnetization level.

As might be expected, the slower speeds pulled down the high-end response, as shown in Figs. 2 and 3, for 3¾ and 1⅞ ips, respectively. These plots were made at a record level of -10 dB relative to the Uher's "0 dB" meter indications, so we are still dealing with a fairly high record level (around 150 nWb/m), considerably higher than would be obtained by using a nominal -20 dB level on most cassette decks.

Third-order distortion levels for mid-frequencies are shown in Figs. 4, 5 and 6. In each display, the cursor has been set to read third-order distortion for a nominal 0-dB record level as per the Uher's own meters. Of course, if we were to back off a little—even by a few dB—we can see that in all three cases, the distortion decreases rapidly to more reasonable amounts. We did not bother to present results for the lowest speed of 1⅞ ips, since the pattern for both frequency response and distortion is clearly established by the presentations for the three higher speeds.

Mechanically, the Uher 4400 was faultless. Wow-and-flutter for the higher two speeds came in well below spec, and while the transport keys are mechanically activated they did prove responsive, and even permitted a measure of fast-buttoning including run-in recording directly from playback.

General Info: Dimensions are 11½ inches wide; 4 inches high; 9 inches deep. Weight is c. 3.8 kg (c. 8.4 lbs.) less batteries. Price is \$1,361.25.

Individual Comment by L.F.: I must confess that I have problems understanding the philosophy of the Uher Company of West Germany. They seem to have been left behind by the rest of the recording world and continue to live under the delusion that portable cassette recorders are just a fad that will soon go away. Mind you, I think their little model 4400 is quite a mechanical and electronic achievement, but why anyone in his or her right mind would spend well over a thousand dollars for an open-reel machine that accommodates only 5-inch reels is something I fail to understand. Not when there are some magnificent portable cassette decks around that are far easier to handle in the field, yield excellent fidelity, low wow and flutter and—at the standard cassette speed of 1½ ips—deliver frequency response at least as good as that of this Uher machine when it is operated at 3¾ ips.

I also wonder why, for example, with such excellent engineering in the electronic section of the model 4400, Uher couldn't have come up with a transport system that turns itself off when the tape runs out. Even lowly portable dictation-type cassette decks selling for under \$100 have that feature. And how come the pause key has to be physically lifted or retracted to terminate the pause action, instead of simply pushing down on it as one does with every other piano-key type pause button?

Oh, I know there are some readers who swear by their Nagra open-reel recorders and are hoping that I will say that the Uher is a poor recordist's Nagra. Sorry folks, that is just not the case. Any machine that carries a plus-or-minus 1.5 percent tolerance for speed accuracy is not, to my way of thinking, a professional machine. I suppose if you are a journalist out in the

field and need to do a long, long interview, or record a very long event on tape with no interruptions whatever, the 4-hour recording time per tape run using "double-play" tape at the 15/16 ips speed may be something you will cherish. Just think, however, if the designers of this machine had moved the hubs upward and outward by just about one inch, the machine would have been able to accommodate 7-inch reels, and so the same recording time could have been available at a higher speed, such as 1¾ ips, where response extends to beyond 13 kHz instead of only to the measured 5.4 kHz for the -3 dB point at the 15/16 ips speed. Admittedly, this would have meant that the machine would have to be operated with its hinged cover open, but I at least would prefer that to the 5-inch reel limitation.

Having said all that, I get to the good news, which is the remarkable electronic performance of this deck as

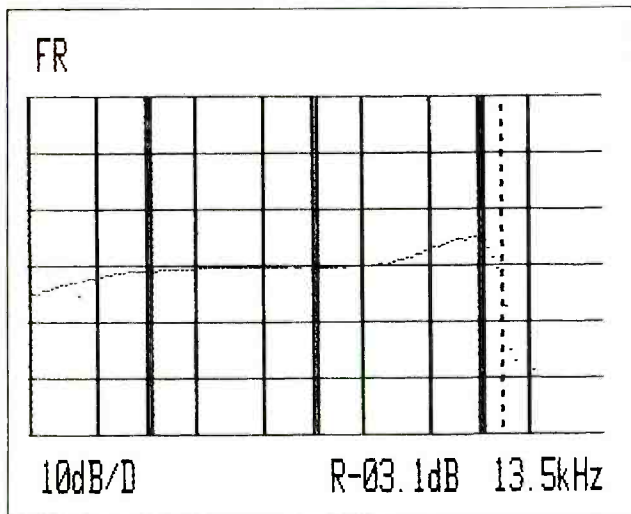


Fig. 3: Uher 4400: Record/play response at -10 dB record level, 1 1/8 ips.

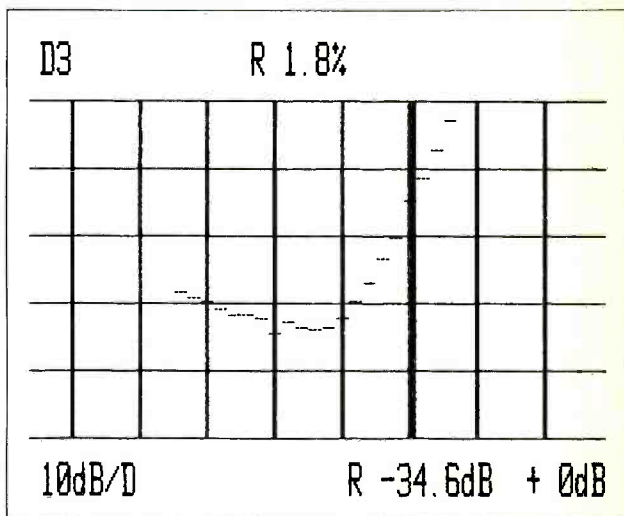


Fig. 4: Uher 4400: Third-order distortion vs. record level at 7½ ips.

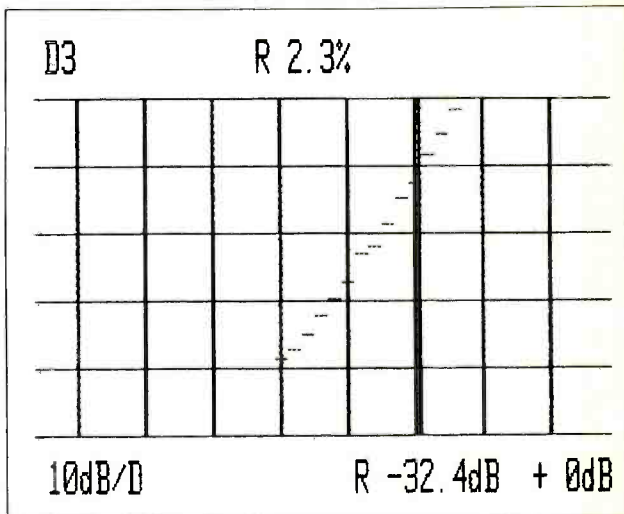


Fig. 5: Uher 4400: Third-order distortion vs. record level at 3¾ ips.

presented elsewhere in this report. The 4400 does have excellent response and headroom at its higher speeds, and even at 1 7/8 ips headroom is still higher than found on most cassette decks using the nominal -20 dB record level. Having a built-in speaker is useful for monitoring in the field, and of course the multiple ways in which the unit can be powered (AC, dry cells, special storage battery, and even car battery with suitable cable adaptor) constitute the basic reason for the existence of this little open-reel machine. Now, if only I could find a basic reason for its price...

Individual Comment by N.E.: In the context of so much ongoing development and refinement of the cassette format, a portable open-reel recorder such as this Uher seems somewhat like an antique automobile—all spruced up and elegant and even capable of splendid performance, but obviously outdated as a general interest product. At least, that is a first impression.

On second look, however, the Uher 4400 has specific things going for it that no cassette deck—portable or not—can offer. One is its enormous signal headroom as confirmed in our lab tests. The other thing—which is self-evident and requires no test to discern—is the simple fact that it is the open-reel format using standard quarter-inch tape. Thus, whatever one records on this kind of deck is instantly compatible with any larger fixed-installation deck also using quarter-inch tape. This means, for instance, if you record something in the field that is later to be edited, or used for mixing down, or for any kind of processing in which an open-

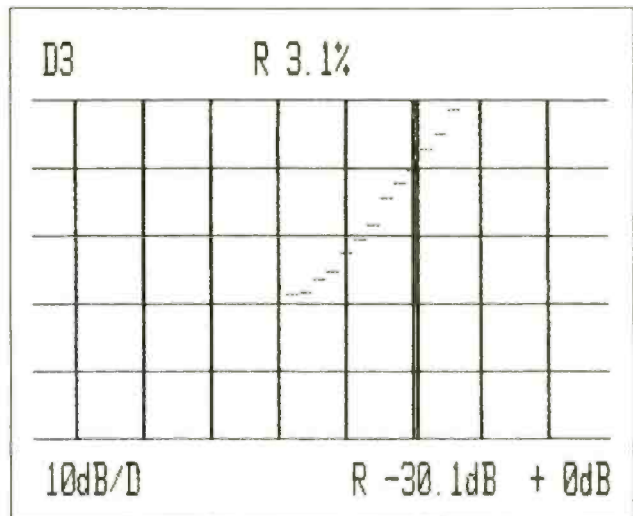


Fig. 6: Uher 4400: Third-order distortion vs. record level at 1 7/8 ips.

reel end-result tape is the desired goal, you do not first have to dub a second generation tape from the original, as you most certainly would have to do if you started with a cassette tape.

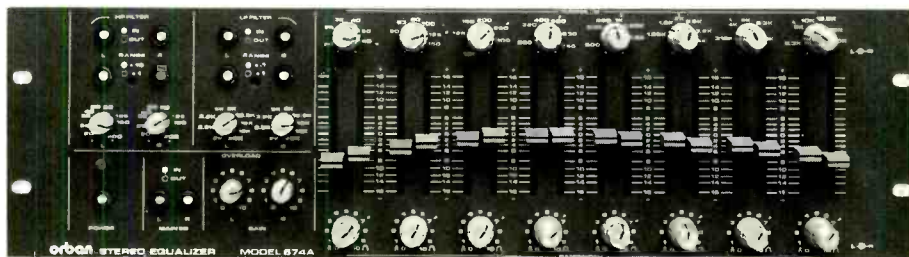
The big question then becomes one of weighing that kind of convenience and "signal purity" against the size, cost and weight of the Uher vis-a-vis those of a high-quality portable cassette recorder. And it is how any individual recordist answers this question that may well determine whether it should be added to one's supply of recording devices.

UHER 4400 TAPE RECORDER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Frequency response, 7 1/2 ips	20 Hz to 25 kHz	± 3 dB, 20 Hz to 24.5 kHz
3 3/4 ips	20 Hz to 16 kHz	20 Hz to 17 kHz
1 7/8 ips	25 Hz to 13 kHz	20 Hz to 13.5 kHz
1 1/8 ips	25 Hz to 6 kHz	25 Hz to 5.4 kHz
Wow-and-flutter, 7 1/2 ips	0.15% (DIN)	0.10% (DIN); 0.07% WRMS
3 3/4 ips	0.20% (DIN)	0.13% (DIN); 0.08% WRMS
1 7/8 ips	NA	0.25% (DIN); 0.14% WRMS
3rd order HD @ 0 VU (450 nWb/m)		
7 1/2 ips	NA	1.8%
3 3/4 ips		2.3% (see text)
1 7/8 ips		3.1%
Record level for 3% THD		
7 1/2 ips	NA	+ 1 dB
3 3/4 ips		+ 0.5 dB (see text)
1 7/8 ips		0 dB
Best S/N ratio, std tape, 7 1/2 ips	64 dB	62 dB
Mic input sensitivity	0.1 mV	0.1 to 40 mV (variable)
Line input sensitivity	50 mV	50 mV min (variable)
Line output level	0.775 V	0.8 V
Phone output level	2 V	2 V
Bias frequency	100 kHz	Confirmed
Erase ratio	80 dB	80 dB
Speed accuracy	± 1.5%	- 0.3%

CIRCLE 19 ON READER SERVICE CARD

Orban 674A Stereo Equalizer



General Description: The Orban 674A is a stereo version of the Orban 672A (*MR&M*, November 1979). Each channel is divided into eight frequency bands, each band with its own slider for graphic equalization. As in the former model, parametric operation is provided by continuously variable controls for adjusting center frequency and bandwidth of each frequency segment. In addition, each EQ section is followed by wide-range low-pass and high-pass filters (12 dB/octave). The filters also may be used as an electronic crossover in bi-amped systems.

Each of the sixteen EQ sliders has a nominal boost/cut range of ± 16 dB, marked in gradations of 2 dB and with center detents for 0 dB. Above each pair of sliders is a dual-concentric knob control for left- and right-channel tuning of the center frequency. Each knob has six frequencies marked, with a box around the ISO frequency for that particular range. Below each pair of sliders are additional dual-concentric knobs for varying the bandwidth ("Q") separately on each channel. These knobs are labeled from 0 to 10, representing a range from a very steep Q to a very broad Q. The average Q of 7 is denoted by the box marking.

Each filter section has individual controls for left and right channels. The HP filter controls include in/out and selectable range buttons plus continuously variable frequency selector knobs. The markings for the knobs indicate frequencies of 20, 25, 32, 40, 50, 80, 125, 160 and 200 Hz. Pushing in the range button, of course, multiplies these frequencies by 10.

Similarly, the LP filter section has its own input and range buttons and tuning knobs. Here the knobs are marked 2 K, 2.5 K, 3.2 K, 5 K, 8 K, 12.5 K, 16 K, 18 K and 20 K. Pushing in the range button here multiplies these frequencies by 0.1—that is, it reduces the range to a span of 200 Hz to 2 kHz. Thus, when the HP range switch is set for "X 0.1" and the LP range switch is set for "X 10" both filters cover the same range of 200 Hz to 2 kHz which facilitates the device's use as an electronic crossover for any frequencies within that range.

Below the filter controls are the unit's power off/on switch and indicator; separate EQ in/out buttons for each channel; separate gain controls with overload indicators for each channel. The panel is colored light blue with white markings, and is rack mountable.

Signal input and output connections are made via screws on a barrier strip. As supplied, the unit is ready

for use with two-conductor shielded cable. However, it also may be used with optional XLR connectors which may be installed and wired behind a removable plate on the rear of the chassis. In addition, the owner's manual includes instructions for using single-conductor shielded cable and ¼-inch phone-plugs. Each channel's input is balanced. The output is unbalanced, although it can be changed to balanced with an optional transformer. A block diagram showing signal paths is printed on the rear, which also contains the unit's fuse-holder and the AC power cord fitted with a three-prong plug.

The Orban 674A may be used as a stereo graphic/parametric equalizer with stereo high- and low-pass filters, or as a stereo equalizer followed by stereo electronic crossover for two bi-amplified speaker systems. Among its suggested applications, covered in the owner's manual, are stereo matching; sound reinforcement, including "house tuning" and notch filtering; full and partial electronic crossover (the latter involves equalizing individual drivers in a given speaker system); special uses in dance bars, recording studios, motion picture sound, broadcasting and electronic music.

Test Results: Neither the temporary operating manual which arrived with our test sample, nor the full manual that came a bit later, contained a formal list of performance specs for the model 674A. There were some references to a few items such as the ± 16 dB EQ range and so on, and a statement of "very low noise and distortion." Without formal specs, but mindful of the fact that the 674A is essentially a stereo version of the 672A which had been tested some time ago, we were not "in the dark" with this service, and between bench tests (see "Vital Statistics") and 'scope analyses we did run a comprehensive series on the new Orban and came up with very favorable results that confirm the model 674A as a most versatile, clean-performing, equalizer of impressive capabilities.

Figs. 1 and 2 show our plots of the high-pass (low cut) and low-pass (high-cut) filter sections. The slopes are 12 dB per octave (as claimed), and the overlap (from about 100 Hz to 2 kHz) does allow these filters to be used as adjustable electronic crossovers, with frequencies of your own choosing.

Fig. 3 shows the wide range of adjustment of center frequency possible for one of the device's eight bands (the one chosen for this test was nominally centered at

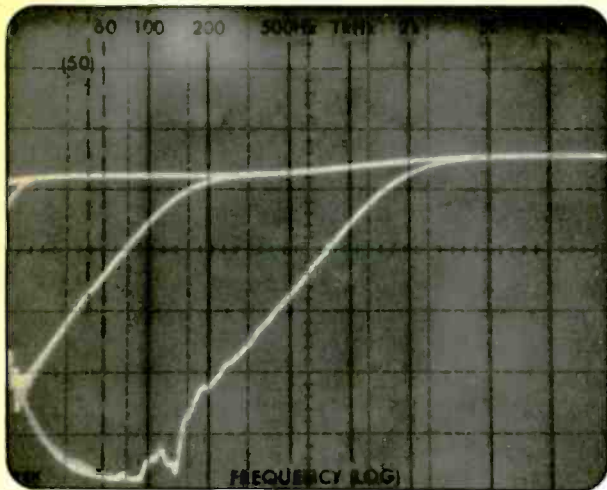


Fig. 1: Orban 674A: Extreme and intermediate frequency settings of high-pass (low-cut) filter yields these curves. Slopes are 12 dB per octave.

1 kHz). Again, the results confirm the manufacturer's claim of a 3:1 range in actual frequency for the band.

The variable bandwidth or "Q" characteristic was examined as shown in Fig. 4. For the multiple response curves shown here we allowed the center frequency to remain fixed at around 800 Hz, and we varied the "Q" control for that band from its narrowest (about 0.5 Q) to its widest (about 10).

For use as a simple graphic equalizer, we ran the test whose results are shown in Fig. 5. In this instance we set all of the frequency controls at their indicated marks on the front panel, which puts the centers approximately an octave apart. We then adjusted the Q-controls to their front-panel indicated marks. Then, by varying each band's slider control (as we normally do for plotting the response of any graphic equalizer), we obtained the multiple response curves shown in Fig. 5. We did note that by using the suggested settings

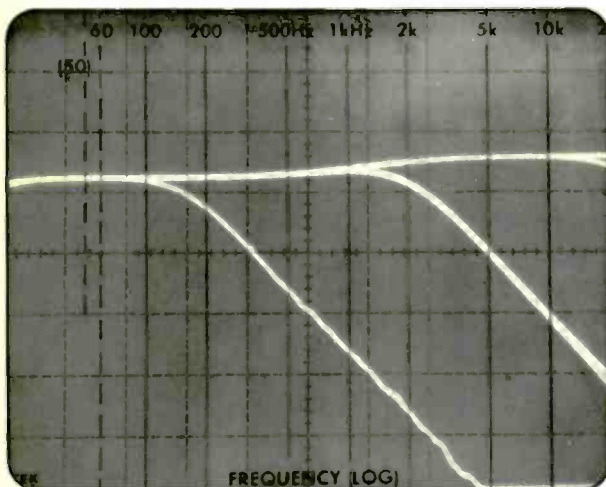


Fig. 2: Orban 674A: Extreme and intermediate frequency settings of low-pass (high-cut) filter yields curves shown. Slopes of this filter are also 12 dB per octave.

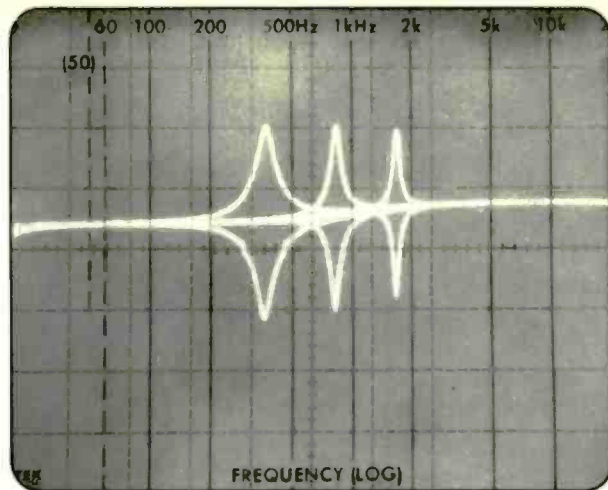


Fig. 3: Orban 674A: Each band of this quasi-parametric/graphic equalizer can be tuned over a range of approximately 3:1 in frequency. Boost and cut response curves shown are for two of the extreme settings and a mid-frequency setting of the nominal 1 kHz band control.

shown on the front panel we did not end up with equal values of Q (bandwidth) for each of the band filters. However, with a bit of experience, we could have readjusted the Q settings to make all of them more nearly equal. The point here was merely to show how the 674A could be used as a simple graphic equalizer.

As a final test of the tremendous flexibility of this combination graphic/parametric equalizer/filter set/crossover network, we decided to create the kind of complex response curve that many acoustic environments might make you wish you could do with a less "powerful" equalizer. This is shown in Fig. 6. Those experienced in room equalization might appreciate what can be accomplished with this one instrument: For instance, a narrow bass peak that needs

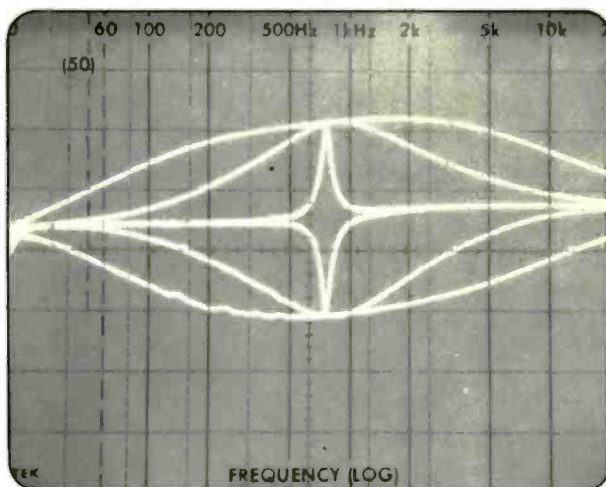


Fig. 4: Orban 674A: The "Q" or bandwidth of each of the 8 bands of the unit is variable between 0.5 (narrowest display) and 10 (broadest looking curve covering the entire audio spectrum).

"sucking out" (without losing a good deal of the music); the desirability of a more gradual bass boost below that frequency to get another fraction of an octave from the speaker system; a smooth dip in the upper midrange to take care of midrange drivers that may sound a bit "squawky;" and finally, a gradually rising response to perk up the top of the tweeter's range.

General Info: Dimensions are 19 inches wide; 5¼ inches high; 5¼ inches deep (behind panel). Weight is 13.5 lbs. Price: \$1179.

Individual Comment by L.F.: I can't help thinking that manufacturers of semi-pro and pro audio consider it a sacred obligation to send out first production units of any new product with "temporary" operating manuals and the usual letter of apology telling us that if we will but be patient, the final fancily printed (and more complete) owner's manual will be along in due time. Perhaps I've become so accustomed to these omissions because most manufacturers want us to get a chance to evaluate new equipment as quickly as possible. Still, it is rather a pity that this Orban equalizer did not come with its final booklet during our tests, because there is so much more about this magnificent and flexible equalizer that I'd like to know.

Since no central listing of basic specifications were supplied with the unit, we measured the usual things such as distortion at several frequencies, signal-to-noise and frequency response. These measurements, though, do not tell you anything about the true worth of this unit. As far as I'm concerned, the debate over whether parametric or graphic equalizers are more useful in pro audio work can stop right now. With the Orban 674A you have the best of both EQ approaches, plus lots more, such as continuously adjustable electronic crossovers.

Most parametric equalizers we have tested previously had three, four or—at most—five control bands. Here is a unit that has eight bands, all of them totally controllable in terms of boost and cut, center frequency and bandwidth or "Q." And the range of the control for each of these parameters is awesome, making this the most powerful equalizing tool for pro audio work that I have yet come across. Especially revealing is the curve shown in Fig. 6—I can't think of any equalizer I have ever checked out that could create such a response curve. I think, in a way, that curve tells it all. By the time this appears in print, the Orban 674A will come with its "permanent" owner's manual, which should increase my enthusiasm for this device—if that's possible.

Individual Comment by N.E.: As I commented earlier on the Orban 672A (the mono forerunner of the 674A), the parametric options for eight bands were most impressive and "ear opening" and handling the device really gives you a feel for its utter flexibility and professionalism, covering a whole span of possible tonal variations from subtle to major. Offering all this for stereo is something of an engineering tour-de-force

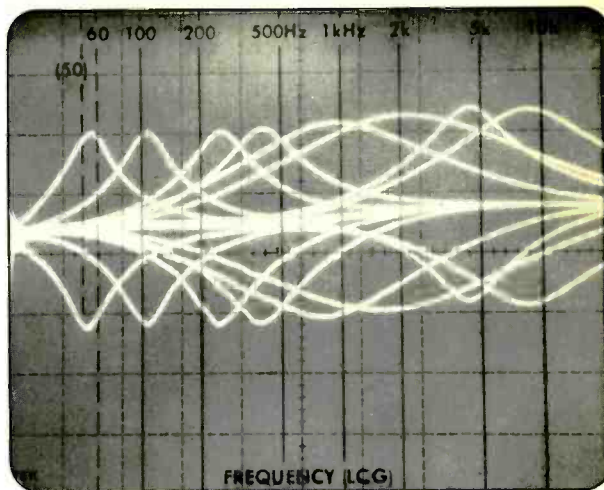


Fig. 5: Orban 674A: By following the suggested "Tic" marks on tuning and bandwidth controls for each band of the equalizer, we obtained the eight boost and cut curves shown above. Note that "Q" seems to be broader at high-frequency of the display.

which, as far as I know, is unmatched by any other single device.

As with any "combination" unit, the old question comes up of its merit in any of its numerous functions vis-a-vis other devices that specialize in only one or two of those functions. In other words, as a pure parametric equalizer, how does the Orban stack up against others that are basically parametric? How does it compare to others that are purely graphic equalizers? How does a stereo unit of this type compare with two otherwise equally competent mono units? The last question is somewhat answered by Orban in the owner's manual—and it strikes me as an honest statement of its "limitations." Since the corresponding "A"

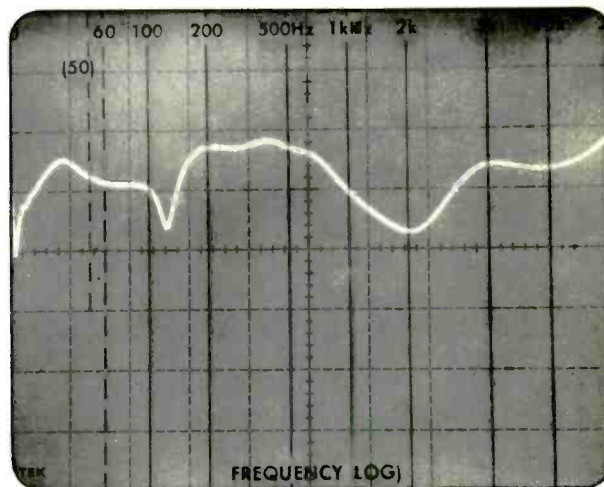


Fig. 6: Orban 674A: Neither a simple 8-band graphic equalizer nor the typical three or four band parametric equalizer could have produced the complex and precision overall response curve obtainable with this Orban EQ, which attests to its extreme flexibility of control.

and "B" controls had to be placed physically close to each other, "there is slight crosstalk between the channels at very high frequencies (typically better than -55 dB at 20 kHz, falling at 6 dB/octave at lower frequencies). A small amount of leakage from one channel to the other may be heard if you attempt to use each 674A channel to equalize entirely independent program material, and we recommend that the 674A be used only with stereophonic program material. If you require absolute isolation between the two channels, we recommend use of a pair of 672A equalizers instead."

Orban says this right up front, to its credit. As to parametric options, the 674A is clearly in a class of its own, what with eight frequency bands rather than the

customary three or four. Are eight bands of parametric "too much?" I don't know. There are many audio pros who feel that really good low-pass and high-pass filters combined with three or four bands of parametric are all that they need. And yet, there is that "weird" response curve we were able to get (Fig. 6) with this device that documents a complexity and precision that seem unprecedented for a single-unit equalizer. As a straightforward graphic equalizer, the eight bands of the Orban are, of course, two less than the usual ten octaves found on pro-grade units. How important those extra two segments are, as against all the other versatility of this model (including its electronic crossover options), is something you'll have to decide for yourself. Whatever, the Orban 674A merits very serious consideration.

ORBAN 674A STEREO EQUALIZER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Frequency response (-3 dB)	NA	10 Hz to 70 kHz
Harmonic distortion		
1 kHz	NA	0.12% (1 V input)
20 Hz	NA	0.10% (1 V input)
20 kHz	NA	0.13% (1 V input)
IM distortion (SMPTE)	NA	0.13% (1 V input)
Signal-to-noise ("A" wtd)	NA	85 dB (1 V input)
All stated operating parameters		Confirmed

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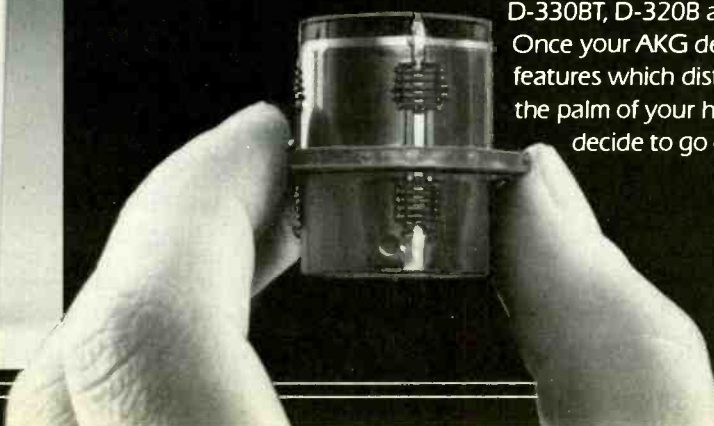


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The Great British Spring - Stereo Reverberation System

By John Murphy and Jim Ford

The Great British Spring (GBS) (distributed by Omnisound) is a two-channel spring reverb system which can be used as two separate mono reverbs, or as a single reverb with a mono input and stereo outputs. The output signal from the GBS consists of 100% reverberation (no direct signal) so it will be necessary to combine the reverb return signal with the direct signal at the mixer. This is usually achieved either by using the mixer's "effects return" section, or by using a spare input channel of the mixer.

The packaging of the GBS is somewhat unusual as the unit is housed in a large grey plastic tube about four inches in diameter and some 40 inches long. An outboard power supply for the GBS is supplied in a separate small plastic enclosure which connects to the AC line (120/250 VAC, 50/60 Hz). The price of the Great British Spring is approximately \$650.

General Description: As a "spring"-type reverb system the GBS operates by exciting one end of a long, carefully suspended spring with the input audio signal. The audio information is then reflected back and forth between the spring boundaries (much as sound is reflected from the walls of a "live" room) and eventually decays away. The audio output signal from the spring is obtained by detecting the vibrations of the spring (at the end opposite from which it is driven) using a suitable "pickup." This "reverb return" signal is then mixed with the direct signal to obtain the desired degree of reverberation. The suspended spring approach to artificial reverberation is one of the oldest and most widely used techniques: it can result in reverberation with sonic quality ranging from poor to excellent.

In order to install the Great British Spring in the location where it will be used the unit is supplied with two mounting brackets. It is important that the surface on which the unit is mounted be vertical and reasonably free of vibrations (since the springs are sensitive to any mechanical stimulation). Also, the unit should be located at least three feet away from any electric power cables, or any other strong sources of electric or magnetic fields (motors for example).

With the tubular chassis mounted in an appropriate

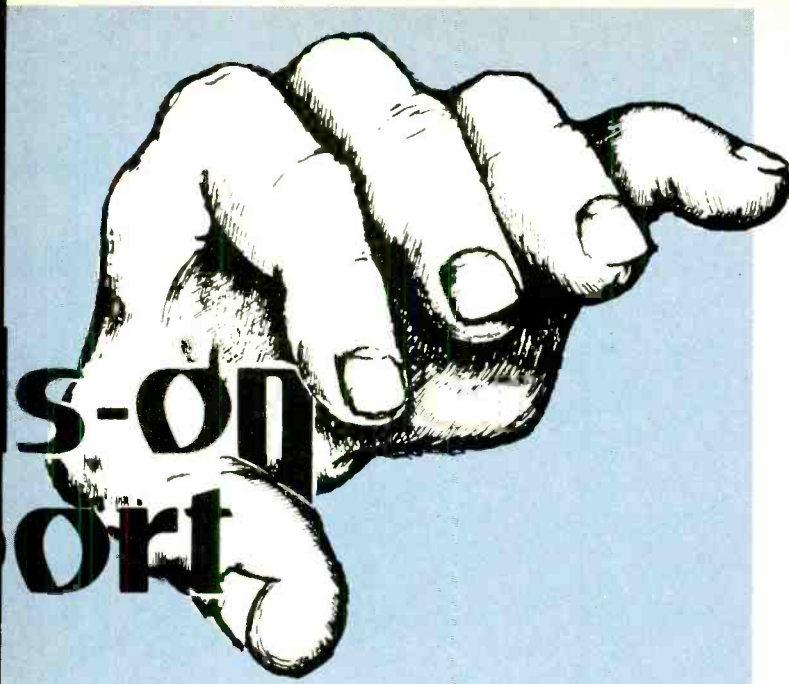


location it is necessary to connect the unit to the power supply. This is accomplished using the DIN cable supplied with the unit. The small size of the power supply should allow it to be conveniently positioned for connection to both the wall-mount unit and an AC power outlet.

Audio signal connections to the GBS are made at the top of the tubular chassis. The inputs for each of the two channels of the unit are unbalanced with a single 1/4-inch phone jack (stereo) used for both connections. Likewise, the two output signals are unbalanced and share a stereo phone jack. The only control on the unit is an input level control which is located next to the input/output jacks and is labeled simply "OFF" and "MAX" at the extreme settings.

Listening Test: A reverberation system is difficult to evaluate objectively in the lab because most of the audible flaws of reverberation (flutter, lack of diffusion, "boing," etc.) are difficult or impossible to measure. So, in selecting a reverberation unit for recording work the emphasis should be on the listening test.

Our listening test on the GBS was performed using a popular mixer with a multi-track master tape as our program source. The GBS was interfaced using the mixer's effects send and return system. After setting up a nominal effects send signal level at the mixer, the input level control on the GBS was set up according to the manufacturer's instructions. That is, the input level was increased while listening to the reverb return signal until the unit was heard to overload and then the level control was backed off until the return signal was



heard to clean up. The input level control was then left at that setting for the duration of our listening test.

We began our listening with a solo, lead-vocal track and added in a healthy amount of reverberation. The quality of the reverberation was fair, but not in the same league with some of the better spring reverberation systems we've heard (of course, the price of the GBS is considerably lower). Next we listened to a solo snare drum track to see how the GBS would stand up to heavy transients. The unit responded with a "splat" kind of sound to each snare pop followed by the same fair quality reverberation heard on the solo vocal track. Similar results were obtained when we auditioned the unit with acoustic guitar and piano. Although the GBS

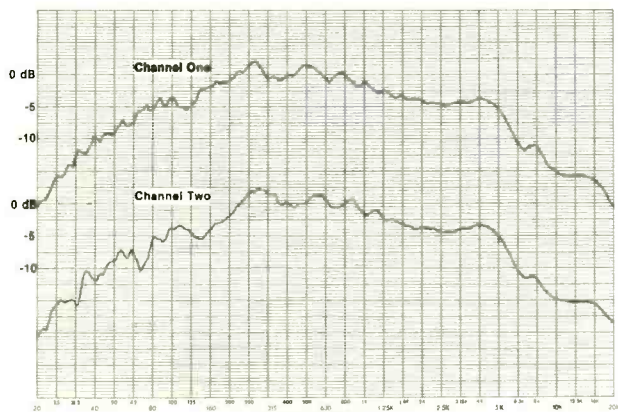


Fig. 1: Great British Spring: Response of the unit to pink noise.

didn't have any real problems with either the guitar or piano, it didn't really provide the level of enhancement that we're used to hearing with studio quality reverberation units. A solo conga track gave a "splat" kind of response similar to what was heard with the snare drum.

The overall tonal coloration of the reverberation was neutral (as it should be) with no tendency to be bass heavy or overly bright; we felt like the addition of some simple EQ controls would make the unit more versatile by allowing the coloration to be varied for different applications.

The only documentation supplied with the GBS was a sheet which briefly outlined the installation, interfacing and operation of the system, and a second sheet with performance verification graphs showing the response of each channel of the unit to pink noise.

Lab Test: Since there is no direct signal path through the GBS our lab test was somewhat limited. The detailed results of our testing are provided in the "Lab Test Summary" below.

The unit's input sensitivity and headroom are appropriate for professional recording work. The maximum output level into a high-impedance load (20 K ohms) is about +17 dBV with the maximum output

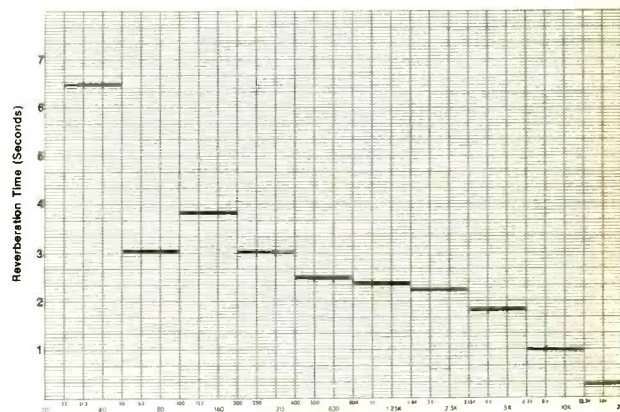


Fig. 2: Great British Spring: Reverberation time by octaves.

level into a 600-ohm load reduced to +13 dBV. Considering the reduced output capability into 600 ohms we would recommend operating the unit into higher load impedances whenever possible.

We observed unweighted output noise levels at about -62 dBV. Considering that the reverb return signal is typically added in with other signals at a reduced level, the noise from the reverb will probably not be troublesome. Fig. 1 shows the response of each channel of the GBS to pink noise and is indicative of the overall steady-state coloration of the system. We measured the reverberation time (60 dB) of the unit for each of ten-octave wide frequency bands and have provided the results in Fig. 2. There is a general tendency toward longer decay times at lower frequencies which is consistent with natural room reverberation as well as being consistent with most other studio reverberation systems. It might be a good idea to avoid stimulating the unit with much very low frequency information (20-50 Hz) because of the long decay time at the octave centered on 31.5 Hz.

Conclusion: The Great British Spring reverberation system has been evaluated and was found to provide reverberation of moderate sonic quality.

LAB TEST SUMMARY

(Note: 0 dBV is referenced to .775 Vrms)

Input/Output Levels

Minimum input level for 0 dBV output (level control at maximum): -23 dBV
 Maximum input level before clipping: greater than +20 dBV
 Maximum output level before clipping:
 into 600 ohms: +13.5 dBV
 into 20 K ohms: +17.5 dBV

Noise Performance

(Note: 20 kHz filter, unweighted, level control at minimum setting)

Channel One: -62.3 dBV
 Channel Two: -62.5 dBV

Reverberation Decay Time

RT₆₀ at 1 kHz: 2.5 seconds (see Figure 2)

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Conventional delays take one input signal and produce one output signal at one delay length. When a signal enters the STD-1, it is delayed, then tapped at six different non-harmonically related points ranging from 1.3 to 55.5 ms. This produces six variations of the signal, each capable of being assigned and mixed into two output channels. The non-harmonically related taps create a natural sounding time delay, while other units at best, are multiples of some fixed delay time, creating predictable sounding effects.

The extensive delay section produces a 1-5x continuously variable delay range from each tap. The delay time can be swept at rates varying from .1 to 25 seconds. As the Sweep rate is increased, the Sweep range automatically tapers so you perceive a change in rate only, without an accompanying change in

range as is common with other units. (You're not forced to compensate by backing off the CV Mix when you increase the Sweep speed). Further, the Sweep Modulation control superimposes a higher frequency sweep pattern over the regular sweep. This allows effects like a vibrato sweep to sweeps which appear to move randomly like sample and hold on synthesizers.

The regeneration section has been carefully tailored to achieve mechanical to natural sounding ambiances by providing separate Level, High Cut equalization, and Tap select controls that can be switched in or out from the front panel or remotely via the rear panel jack. The Level control determines the decay time at long delays (up to 15 seconds), and the amount of resonance at short delays (up to -12 dB). Since a reverberant signal primarily consists of bass and lower midrange frequencies, the High Cut feature in the STD-1 reduces the high-frequency content in the program material as it recirculates through the system for a more natural sounding echo. At longer delay

times, echoes can be textured from a hard reverb to a soft spacious drone. At short delay times, the resonance can be shaped from a sharp "metallic ringing" sound to "boomy" bass peaking.

All these features working independently and in conjunction, allow such effects as high flanging, low flanging, voice doubling, multi-voice chorusing, echo, reverberation, machine gun reverb, singular to multiple "doppler" effects, vibrato, and highly resonant flanging. Never before has such an unlimited number of delay combinations been available to the musician, engineer, or concert sound technician.



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GROOVE VIEWS

Reviewed By:
ROBERT HENSCHEN
NAT HENTOFF
JOE KLEE
STAN SOOCHER
NORMAN WEINSTEIN

POPULAR

GET WET: *Get Wet*. [Phil Ramone, producer; Bradshaw Leigh, engineer; recorded at Power Station Recording Studios, Automated Sound Studios, and A&R Recording, New York, N.Y.] Boardwalk FW 37134.

Performance: '80s bubblegum
Recording: Pure pop

There's this disturbingly pink album cover with beach blanket bingo look-alikes cavorting in what seems to be a rather winsome innocence for the '80s. The music inside is equally effervescent and just as puzzling.

One Sherri Beachfront is the lead vocalist and Annette Funicello clone in *Get Wet*, a band in which a keyboard player named Zecca writes all the material. In the pits are Liberty DeVitto (drums) and Doug Stegmeyer (bass) from Billy Joel's band, plus producer Phil Ramone—a combination of total unknowns and superstar support.

The strange stage names hint of New Wave humor, and you can feel an '80s beat right from the opening cut "Lucky You." But even more prevalent and twice as infectious are influences of '50s pop-rock, delivered with a kind of cute show biz chutzpah akin to Bette Midler or *Grease*. Side one is dominated by the upbeat hooks of "Just So Lonely," "Morton Street," and "Which Window," all done with unflagging vigor. The side-ending ballad "It's You, It's Me" even has a

latent soulful feel.

Side two starts right out with a studied (heavy on the cheese, hold the anchovies) rendition of Connie Francis' "Where The Boys Are," complete with a tear in Beachfront's voice. Credibility ends somewhere just short of this sentimental display, as accurate...musically speaking...as it no doubt is. But DeVitto picks up the beat again, "New Mod Kings" and "Turn On Your Lights" regain a kind of teen appeal, and "Single" succeeds on a small scale as heartfelt lament.

If Bermuda shorts and clamdiggers follow the preppy look, a couple of these tunes might catch on. Phil Ramone has done a good job of accommodating this mash of Motown licks, nostalgia, and mod styles without losing the kind of lightweight, airy touch that pure pop requires. If the music herein gets wet to the point



GET WET: Like bubblegum, quite palatable in small doses.

of innocuousness, that's what it was meant to do. Like all bubblegum, it's quite palatable in small doses. R.H.

JOE WALSH: *There Goes The Neighborhood*. [Joe Walsh, producer; Jim Nipar, engineer; recorded and mixed at Santa Barbara Sound Recording, Santa Barbara, Ca.] Asylum 5E-523.

Performance: A direct hit
Recording: A crazy, curious quilt

Will Joe Walsh ever grow up? If you've been listening to his solo albums, you probably know him as a madcap prankster with a heavy metal heart. Even if he didn't pose for album covers submerged under water or astride a military tank, his mischievous, sardonic lyrics would give him away.

Walsh actually performs a literate, complexly-layered style of heavy metal which pits megaphone vocals against cascading guitar riffs and thickly-punching bass and drums. *There Goes The Neighborhood* exemplifies Walsh's off-handed vision of life. The lyrics of "Down On The Farm," a fantasy about bored animals, aptly describes Walsh's message in a comical way: "They was tired of the daily routine/Havin' themselves a great big bash/And they was gathering steam." (Watch out, George Orwell!)

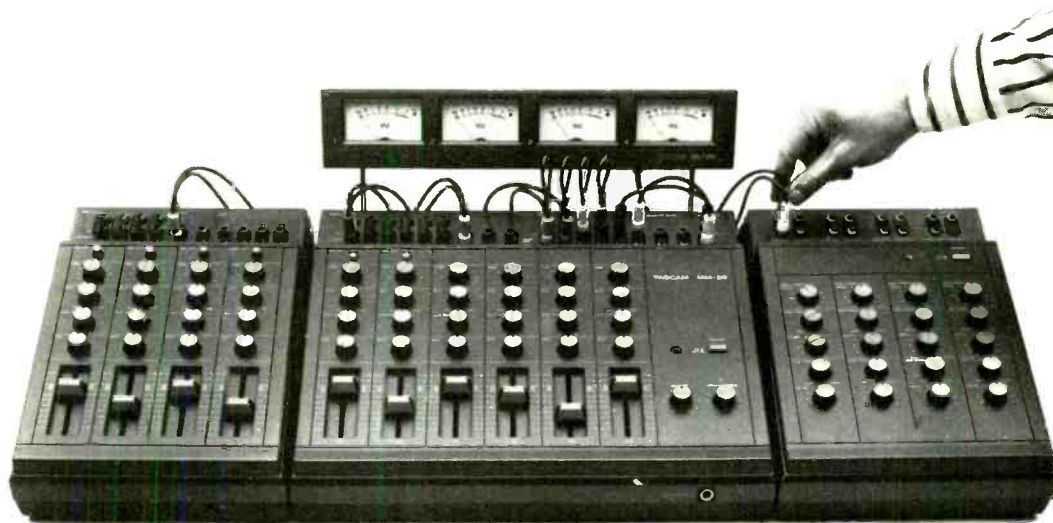
Just as he did with the James Gang and Barnstorm, Walsh builds his songs from a basic guitar-bass-drums triad that unfurls off melodic twists or surprise instrumental turns. Compared to this, his work with the Eagles

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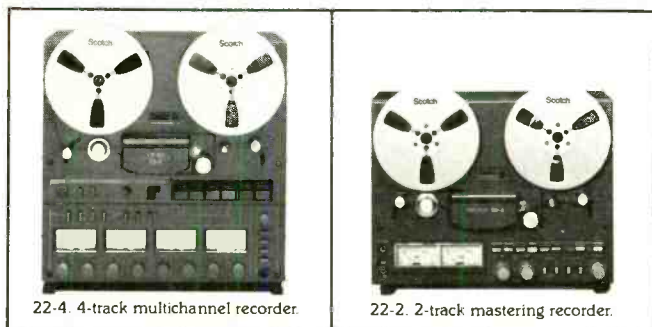


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sounds downright restrained, most likely out of the necessity of working within a group. Joe Vitale's years of experience with Walsh in Barnstorm and on the solo works make it easy for him on *There Goes The Neighborhood* as he sets up his drum arrangements under Walsh's wild guitar waves without drowning. George (Chocolate) Perry also navigates his bass through this tempest with relative ease.

There Goes The Neighborhood reveals each new twist with the subtlety of a timed cold capsule. There's the ice cream bell introduction of "You'll Never Know," a thundering indictment of politics that ends with a bratish "nah-nah-nah-nah-nah-nah." "A Life of Illusion" springs sprightly to life punctuated by former Barnstormer Kenny Passarelli's jumping bean trumpets. "Things" trails off laughingly into an acappella goon chorus. Meanwhile, "Rivers (Of the Hidden Funk)," an album high point originally slated to appear on the Eagles' *The Long Run*, hauntingly rains guitars over an apocalyptic "until the rivers run dry" refrain that is both frightening and fascinating.

"After 15 years, I still can't spell Szymczyk," Walsh jokingly writes on the inner vinyl of *There Goes The Neighborhood*. But, while breaking free of Eagles and Walsh solo producer Bill Szymczyk for this outing, Walsh still pushes as many parts as he can into his mixes. There hardly seems room for even one more breath. It's possible, though, that this influence goes back even further than 15 years. Perhaps Walsh's real mission is to go through life trying to recreate the compression-happy sound of his stage debut in a high school talent show where he played "Exodus" through a Wollensack tape recorder. S.S.

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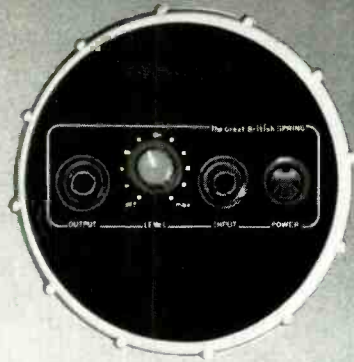


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DAVE GRUSIN: *Mountain Dance*.
[Dave Grusin and Larry Rosen, producers; Larry Rosen, Ollie Cotton, and Jeff Ostler, engineers; recorded at A&R Studios, New York, N.Y.]
Arista/GRP 5010.

Performance: **Instant appeal pop-jazz**
Recording: **Clean, perky digital**



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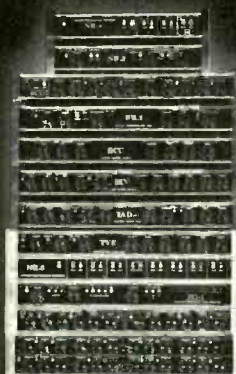
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Dave Grusin's new album is immediately likeable. Catchy tunes, good musicianship, tender loving care for a finished product. The question is, was this kind of instant appeal pop-jazz built to last?

There's no question that the audio end of things is bright and shiny. *Mountain Dance* was digitally recorded and mixed by Larry Rosen on equipment from Soundstream of Salt Lake City, Utah and the sound is as clean and perky as Grusin's melodies.

As for material, there's nary a cut here that's not danceable...some cause for concern. With so much emphasis on tight riffs and tunesome hooks, spontaneity takes a backseat. ("Instrumental music" sans "improvisation" may not equal "jazz.") There is only an occasional hint on *Mountain Dance* of notes that *couldn't* be put to paper.

Whether he qualifies as a "jazz" artist or not, Grusin certainly has a knack for the kind of hip tunes that currently pass for jazz in 1981 America. Side one is loaded with positive feelings and easy melodies. "Rag Bag" is a promising opener, Grusin's Corea-like acoustic piano creating a Spanish riff that twin synthesizers by Ian Underwood and Ed Walsh later pick up on. The rest of Grusin's band for the LP, by the way, is comprised of the kind of studio persona you'd expect to play with a session man of Grusin's magnitude: Harvey Mason (drums); Marcus Miller (bass); Jeff Mironov (guitar); Rubens Bassini (percussion).



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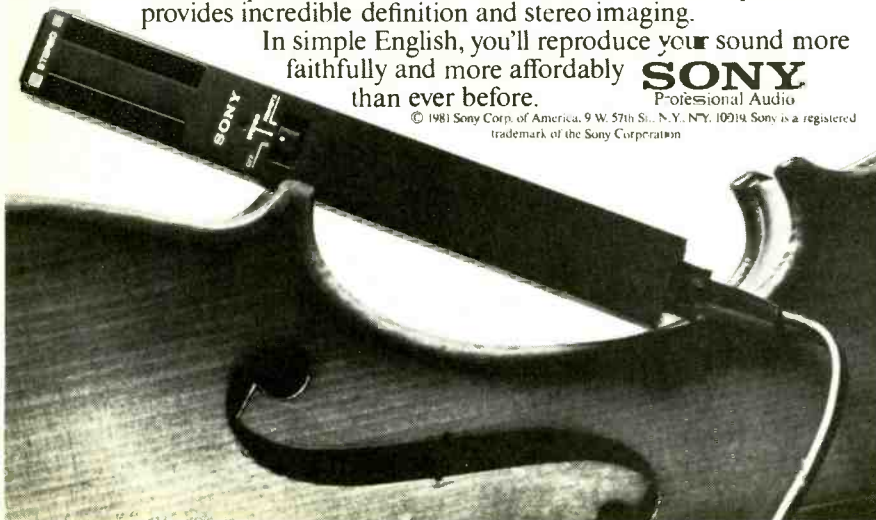
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Side two opens with the six-minute title track and probably the most substantive playing on the album. Again, the effervescent piano melodies and mini-suite construction are reminiscent of Chick Corea...a favorable comparison that Grusin may hate to always get saddled with. Similar grooves happen on 80% of the selections here.

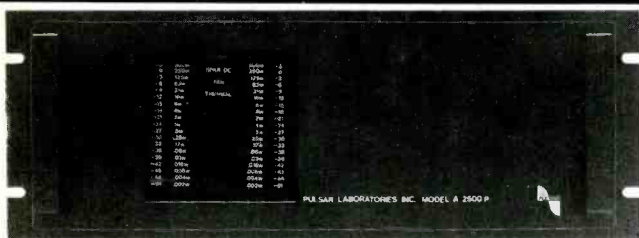
More cuts like "Thanksong" might help establish Grusin as more of an original and not just a flawless composite of style and studio savvy. It's unaccompanied solo piano of greater depth and beauty, something to savor for more than just the moment. Dave Grusin ought to jump out of his groove often enough for a look 'round...to make sure he isn't in a rut. R.H.

PAUL WINTER: Callings. [Paul Winter, producer; Dixon Van Winkle and Chris Brown, engineers; recorded at Cathedral of St. John the Divine, New York, N.Y., August-September, 1980.] Living Music Records LMR-1.

Performance: **Awesome and rousing**
Recording: **Spectacular**

For over a decade musician Paul Winter has gathered about him a remarkable band of young musicians trained in both jazz and classical traditions and the result has been a music transcending all genres. The Paul Winter Consort has freely borrowed from third world traditions, has relied upon a staggering number of exotic instruments from Asia and Africa, and in this current recording, utilizes taped sounds from various members of the animal kingdom to augment their group sound. In lesser hands, a musical project of the dimensions of *Callings* could have turned into a fiasco of ineptly collaged instruments imitating animal howls. *Callings* is nothing of the sort. It is an enchanting composition that utilizes the sounds of nature in a startling synthesis with horns, cello, guitar, keyboards, and percussion.

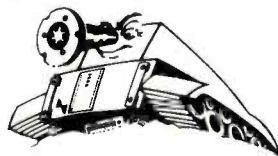
The desire to incorporate animal sounds into the fabric of music is hardly novel. Delius was diligent in trying to capture bird songs within a symphonic context. The dangers of having instruments simply imitate animal language are obvious. The stuff can become tiresome and corny rather



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VERY MELLOW TONES: SVEND ASMUSSEN AND BEN WEBSTER

By Nat Hentoff

Stephane Grappelli is not the only jazz violinist whose verve grows along with his years. Svend Asmussen, the mellow Danish swinger, is 65, but *Prize Winners* (Matrix) is the warmest, most inventive, and diversely searching album of his career.

Its title comes from the fact that this quartet—with pianist Kerny Drew, bassist Niels-Henning Orsted Pedersen, and drummer Ed Thigpen—won an annual TV competition at Knokke, Belgium, for musical integrity. (It was the first jazz group, by the way, ever to play that festival.)

In this set, considering the impressive jazz backgrounds of all the participants, musical integrity is a given. What makes this so thoroughly satisfying is the graceful taste of the soloists, the finely nuanced dynamics (as in Ed Thigpen's brushwork), and above all, the sheer mutual delight in continually creating fresh lines and colors.

Also unusually variegated is the repertory—John Lewis' "Django," Stevie Wonder's "You Are The Sunshine of My Life," a marvelously lyrical "Careless Love," and Kenny Drew's "Evening in the Park."

Giving the proceedings a particularly distinctive flavor is Svend Asmussen. He plays the violin with utterly authentic jazz phrasing and dancing textures, and his sound is both lively and appealingly mellow. The engineering is itself warm and spacious, while letting the instruments breathe for themselves.

In the last years of his life, Ben Webster spent much of his time in Denmark, in part because there were so many compatible jazz musicians

there, like Asmussen. Ben's own great strength, of course, was in the romantic breadth and lyrical power he could draw from his tenor saxophone. Other tenors could perhaps play more notes, but Ben's notes were the only ones to play.

Ben Webster and Associates (Verve) is part of a series of Verve reissues under the aegis of the parent Polygram label. They are being imported from Japan, a tribute to the quality control of record manufacturing there.

This is a 1959 assembly of larger-than-life-size jazz souls—not only Ben but also Coleman Hawkins, Roy Eldridge, Jo Jones, Ray Brown, along with pianist Jimmy Jones and guitarist Lester Spann. The entire first side is a ceaselessly swinging exploration of Duke Ellington's "In a Mellow Tone." Among other tunes are a slow, deep blues by Ben Webster, "De-Dar," and a rhapsodic transformation by him of "Time After Time." If I were making a list of music to make love by, both those tracks would be at the top of the list.

The recording quality is such that the horns, particularly Webster, have exceptional presence. Indeed, for sound itself, this may be the best of all Ben Webster's recordings.

SVEND ASMUSSEN/KENNY DREW/NIELS-HENNING ORSTED PEDERSEN: *Prize Winners*. [Kenny Drew and Sahib Shihab, producers; Henrik Lund, engineer.] Matrix MTX 1001.

BEN WEBSTER: *Ben Webster and Associates*. [No information about producer or engineer.] Verve UMW 2515.

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quickly. Winter and his fellow players largely solve this dilemma by incorporating tape recordings of various creatures and superimposing their instrumental tracks over the tapes.

"Lullaby From the Great Mother Whale" opens this two-record set with the booming lament of a Humpback Whale quickly followed by the mournful lilt of Paul Winter's E-Flat contrabass sarrusophone (can you remember the last time you ever heard one outside of a symphony orchestra?). Nancy Rumbel joins Winter on plaintive English horn as a guitar, tambura, pipe organ and harmonium gently issue waves of rousing melody. The mood set by this opening cut tends to dominate *Callings'* four sides. Winter links it with the Brazilian word "Saudade," meaning a feeling tone somewhere between sentimentalism and sympathy. Since so many of the animals whose taped voices we hear on this recording are on the "endangered species" list, the feelings evoked by this melancholy music seem wholly appropriate.

Two outstanding moments declare a radically different mood. "Sea Storm" features Bill Cahn pounding away with absolute fury on a symphonic bass drum and Chinese Opera gongs. The sheer density of sizzling sound generated by Cahn is shockingly counterpointed by the sounds of a massive thunder clap that invited itself into this recording session. Winter wryly thanks "The Great Drummer in the Sky" for his/her contribution. "Sea Joy" is my favorite composition—a light hearted romp featuring Nancy Rumbel's crystalline oboe complementing the recorded barks of a Fur Seal.

The digital recording process attains new heights in this release. The sound textures are intoxicating. Underwater recordings of dolphins leap out of your speakers with striking fidelity. The acoustics of the Cathedral of St. John in New York provide what no studio on earth could provide: a space designed for sacred song.

Callings is packaged in a box featuring the most tasteful and refined graphics and text I've seen in many a moon. The entire project conveys a feeling of loving care. Just try to imagine CBS or Warner Bros. marketing their products with such conscientiousness. The record is being distributed by the Living Music Foundation and might not show up in any but

the largest record stores. Part of the profits from this release will go to several organizations working to protect wildlife interests. So don't let the rather steep (\$15) price tag put you off. Even if the proceeds weren't going to such worthwhile people, this recording would still be worth every penny. Listen to the music of the natural—while there's still time and hope left. (Available for \$15 plus \$1.50 from the Living Music Foundation, Box 68, Litchfield, Connecticut 06759.) N.W.

SHOWS and SOUNDTRACKS

ORIGINAL CAST: Duke Ellington's *Sophisticated Ladies*. [Thomas Shepard, producer; Joaquin J. Lopes, engineer; recorded March 23, 24, 27 and 30, 1981, at RCA Studios, New York, N.Y.] RCA CBL-2 4053.

Performance: **Just like Broadway**
Recording: **Big, spacey theatrical sound**

I don't think anyone has ever been foolhardy enough to attempt to count how many songs Duke Ellington either wrote, or at least had a part in composing. They go all the way from "Soda Fountain Rag" which the Duke wrote as a teenager to whatever untitled, unfinished business was going around in his head that sad day in 1974 when we lost him. A show based on a sampling of these Ellingtunes was inevitable from the day that Broadway got around to celebrating jazz giants with reviews. If *Ain't Misbehavin'* came first, it certainly paved the way for better things to come and, if we can judge from this 2-record original cast recording, *Sophisticated Ladies* is certainly among those better things.

If we want to make comparisons, we can begin with the fact that Duke Ellington's output dwarfs Fats Waller's in size and scope. Just how much of this is due to who lived the longest I'd rather not be the one to say. However, fine songs like "Honeysuckle Rose" may have been how Ellington transcended the popular song and brought Jazz (or Black American Music since Duke disliked the word Jazz per se) that much closer to an artform which could stand on its own in the concert hall. Benny Goodman may have beaten Duke Ellington into Carnegie Hall but Goodman went in with



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his standard dance band/swing band repertoire. Duke went in with "Black, Brown and Beige" which is much more than the average repertoire of even the Ellington band. If Duke's longer, and heavier, works are missing from *Sophisticated Ladies*, it's because a Broadway show is not the place for them. They belong in the concert hall and I'm sure this is where they will be as soon as the symphony orchestras wake up to the fact that Ellington belongs with Bach and Mozart every bit as much as he does with Basie and Waller.

What is here is much more than a few of Duke's biggest hits (or as he used to say "a medley of our award winning compositions") going all the way from "The Mooche" of 1929 to "Satin Doll" of 1958. There are also many of Duke's lesser known numbers. Among my favorites of these is a Duke Ellington/Billy Strayhorn collaboration called "Something To Live For" excellently sung by Gregory Hines. Another of my favorites is the early Ellington instrumental "Jubilee Stomp" which appears here as a background for an excusable piece of show biz called "Music Is A Woman." Just how many of Duke Ellington's masterpieces revolved around some kind of female dedication or inspiration is something that's easy to miss until you scrutinize them as closely as you are forced to do by a double album like this one.

The performances are altogether more professional than I would have expected from some of the negative reports I'd heard about the show before it hit town. Gregory Hines is a gem. I expected him to be, not only from *Eubie* or from *Black Broadway* but from my memories of his vaudeville act with his father and his brother, Maurice. They were billed as Hines, Hines and Dad and they were great. Gregory still is. I presume the others are as well, but since they're not aboard the Ellington special I can't say for sure. I've always been the first to complain about some of those pallid bands that Duke led in his final years and those which his son Mercer led immediately following Duke's death, but this band is fine and thank heavens it's not augmented by harps and strings and things. The other performers are passable with one exception. On side two someone named Priscilla Baskerville sings "Solitude" as Duke Ellington must have heard it only in his mind. Her performance is truly outstanding. Too bad the Duke had to miss it. He would have loved it madly.

J.K.



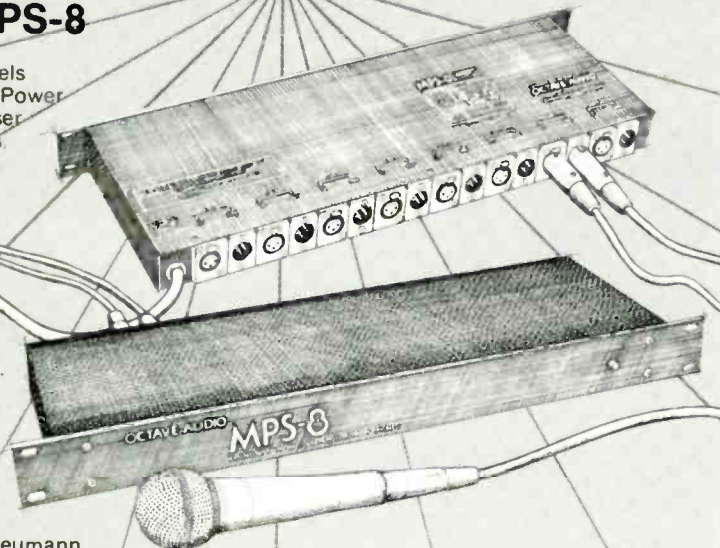
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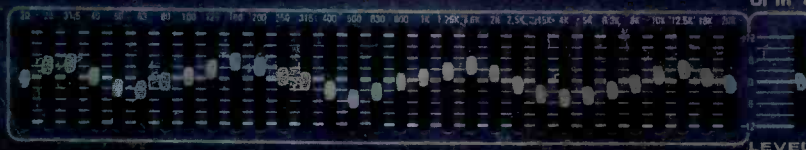
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