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Producer/Engineer
Phil Ramone

#06691 (F)
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MODERN RECORDING

SERVING TODAY'S MUSIC / RECORDING-CONSCIOUS SOCIETY

VOL. 4 NO. 6
MARCH 1979

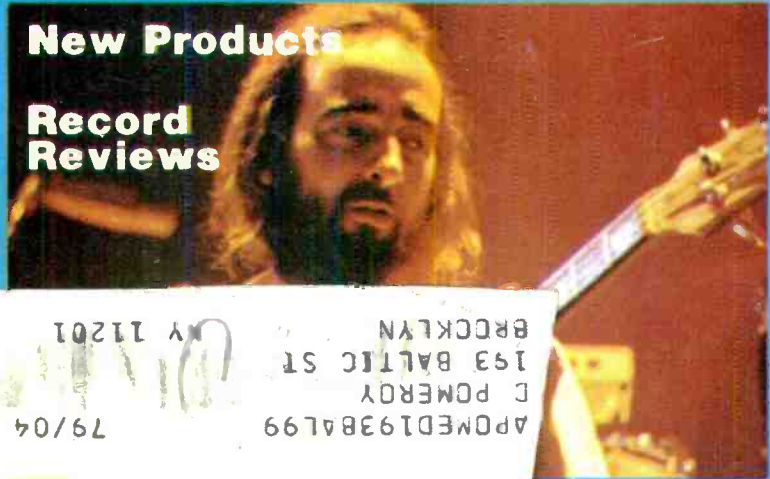
a session with fleetwood mac



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It was soon realized that this mysterious sound was actually the result of a time delay causing the cancellation of certain harmonically related frequencies whose sweep could be controlled.

Later, it was also discovered that the same sound could be attained electronically by splitting the signal, passing one half through time delay circuitry, and re-combining the signals. The only setback was that this effect could be produced only with expensive electronic equipment, limiting its use to large recording studios.



The MXR flanger is the first reasonably priced flanger designed for live performance. With the MXR flanger it is possible to repeatedly achieve a wide variety of flanging-related sounds through the manipulation of the controls provided. From classic flanging to a pulsating vibrato, you have control over the parameters of sweep width and speed. As well, you have manual control over the time delay

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Meters. Tascam meters are not options. They are an

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Where are our specs? In the equipment, where they belong. Because hearing is believing. So be a skeptic. Pick up the phone or drive to a TASCAM SERIES dealer near you. He has all the information and a personal systems planning brochure from us to you. And remember, whatever your recording needs, the TASCAM SERIES mixers are no problem.

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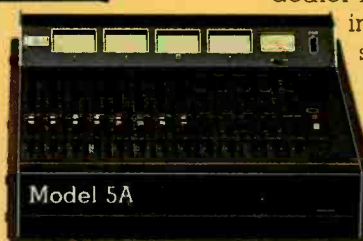
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Model 1



Model 3



Model 5A



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MODERN RECORDING

MARCH 1979

VOL. 4 NO. 6

SERVING TODAY'S MUSIC/RECORDING-CONSCIOUS SOCIETY

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By Bruce Swedien

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The final part of the three-part series on miking techniques. You've laid down the rhythm tracks and the vocals, so jump into this final section and get that album completed!

A SESSION WITH FLEETWOOD MAC

By Murray M. Silver, Jr.

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After your previous album sells over 14 million copies you are left with one very big question: What the hell do you do for an encore!?! *MR* talks with members of the band and with engineer Richard Dashut on recording techniques, life styles and motivation.

AN INTERVIEW WITH ENGINEER/PRODUCER PHIL RAMONE

By Peter Weiss

52

If the name Phil Ramone is not familiar, you either have lived in China for the past few years or, quite simply, don't listen to music. It seems that each artist he works with begins to hit his or her musical stride shortly after that particular album hits the stores. From Billy Joel to Paul Simon to major films, Mr. Ramone makes for a most interesting interview.

COMING NEXT ISSUE!

Interfacing Recording Equipment
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A Quiz for the Would-Be Recordist



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LETTERS TO THE EDITOR

More on Schools

We have heard of your magazine from several of our students in our Jon Miller Sound Studios School for Recording Arts and Sciences and recently picked up a copy at the Audio Engineering Society Convention in New York. One of our instructors happened to spot a letter written to you in the November 1978 issue, on pages 14 and 16, mentioning the fact that your magazine should publish a listing of schools for Recording Arts and Sciences.

May I say such a listing is available for the first time this year and was printed in this year's *Billboard* supplement entitled *1978-1979 International Recording Equipment and Studio Directory Section II* (Nov. 4, 1978). Separate copies of this book are available through *Billboard* at a cost of \$15 each (which includes postage and handling), by writing to *Billboard* Recording Equipment Directory, 2160 Patterson St., Cincinnati, Ohio 45214. They compiled their list by sending their regular status form to professional recording studios throughout the country. They offer free listings in the book for their facilities and asked us various questions on the type of equipment we use in the studio and the type of service and equipment we provide. They asked us to inform them of schools which teach the recording business that we were aware of and recommend.

We happen to have both professional recording facilities and a School for Recording Arts and Sciences. We were one of the first in the country to offer such a training program. As you mentioned in your reply to the letter-writer of November, you felt it was a good idea to write in with information about schools. Hope this proves of service.

—Jon K. Miller
President, Jon Miller
Sound Studios
Bath, Pa.

Mr. Miller also enclosed some information on courses offered by the school of his name, which we're pleased to pass on to those interested: The school offers 20- and 39-week courses—consisting of four hours of class one night each week—in "Audio Engineering," "Electronic Music," "Sound Reinforcement," "Audio-Visual-Multi-Media Production & Presentation Techniques," and "TV & Radio Broadcast." The classes are limited to between eight and 12 students. Write Box 455, RD 1, Bath, Pa. 18014 or call 215-837-0066 for further information.

*For the record, though, we were informed last month that the Audio Engineering Society published a compilation of schools prior to the *Billboard* listing that Mr. Miller describes. The AES Directory of Education may be obtained by writing the Society at 60 East 42nd St., New York, N.Y. 10017.*



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Writer Ridder Righted After Byline Omitted

Our apologies to Fred Ridder, a contributing editor for Modern Recording, for having failed to name him along with Don Ketteler on the opening page of "Meat Loaf 'Live' and Recorded," the cover story of our January 1979 issue. Fred was responsible for researching and writing the "Recorded" section of the article. (Don Ketteler authored the "Live" portion.)

—Ed.

Back Slaps, Pan Pots and Bibles

First of all, more praise and back-slapping to all of you down at *Modern Recording*. I'm a subscriber, and will be for the rest of my life. *MR* is, I feel, the best publication in the recording industry. So, keep up the fantastic work.

With regard to "Building a Mic Splitter" in *MR*, December '78, could Peter Weiss advise if it is possible to add more "buffer stages" to the basic design (i.e., a 1/5 splitter)? Would it be necessary to change the values of C1, R1, or R2? Are there any other changes that would need to be made? Also, is it possible to use his design with the Heil HN 801 mixing board, splitting each input module's "main out," or is there a better place to split the signal?

Could you please print the address for the Harris Electronics Corp., as my local electronics store doesn't seem to stock this integrated circuit? One more thing: is it possible to install pan pots between two outputs of the HA 2605s? How do I do this? Also, exactly how does the pan pot work? Is it a switch or circuit? I've searched in vain for some clues about pan pots.

Again, thanks for this "Bible and Hot Line" into the recording industry.

—Mark Vaszily
Grove City, Ohio

We passed your letter on to Peter Weiss, who wrote "Building a Mic Splitter." His answer follows:

Concerning modifications to the design of the mic splitter, please see the comprehensive discussion elsewhere in the Letters column. The mic splitter, as originally designed, was intended to accept microphone level inputs and furnish a 26 dB gain. These characteristics would make it unsuitable for splitting line-level signals.

Pan pots are normally employed in a mixing board to achieve left-to-right

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positioning of mix elements in a stereo "picture." Your intent with regard to this device is unclear, but if you wish further information, I would recommend *The Recording Studio Handbook* by John Woram [available through this office by sending \$35 plus tax for N.Y. State residents, and \$2 more for postage outside USA] for some practical examples of pan pot applications.

In order to help you locate the Harris products, contact the Harris sales office for your area; it is located at Suite 100,

4972 Northcutt Pl., Dayton, Ohio 45414 (phone) 513-226-0636.

—Peter Weiss
Contributing Editor
Modern Recording

Contemplative Guitarist

I am contemplating the purchase of a tape recorder and could use some assistance. I'd like to buy a stereo cassette deck with a pitch control so I could accompany recordings on the

guitar and adjust for pitch. Could you suggest manufacturers that offer models including this feature?

—Doran Smout
Rancho Cordova, Ca.

We'd like to be able to help you; really, though, you'd do better to visit any major audio dealer to get this sort of advice in a more serviceable way.

A Level Mix

I have been doing home recording and playing for over 15 years, all the while looking for information on mics, mixing etc., and articles on troubleshooting and the like. You people have it all, and more methods to do things than I had ever imagined. Keep up the high standards at a readable level for the beginner as well as the advanced engineers and recording persons.

—Pete Klinger
River Hills, Wisc.

Address Assistance

Greetings—I would appreciate it very much if you could supply me with the mailing address of Philips Audio Video Systems Corp. Philips' name was given in the July '78 *MR* issue as distributor for the "Neutrik" audio connectors. Thanks for your assistance in this matter.

—Dan May
Green Shift Music
and Electronics
Tampa, Fl.

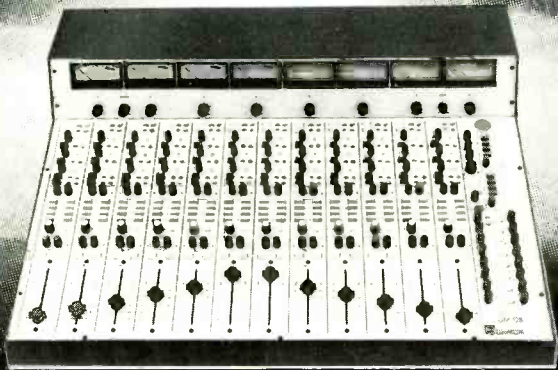
Address your correspondence regarding these connectors and other audio equipment in the Swiss Neutrik line to: Neutrik Products, Philips Audio Video Systems Corp., 91 McKee Dr., Mahwah, N.J. 07430.

Some Details on Bridgeport Program

I recently subscribed to your magazine and find it interesting reading as well as a source of valuable information. I was struck by Larry Siedentop's letter in the November '78 issue of *Modern Recording*. I know what he is going through, trying to find schools that offer programs in the recording sciences.

I am presently attending the University of Bridgeport in Connecticut, and am enrolled in the Audio Studies program which is offered by the Journalism/Communications department here. The course of study includes a

Dr. Les Remsen has faith in Quantum Mixers!



QM-128 — 12 In, 8 Out

WHO IS LES REMSEN . . . AND WHO CARES?


A while back, Les Remsen bought a Quantum QM-168 mixing board and set up a small studio in his church. Since that time, he's made over 100 classical music albums for about half a dozen labels, plus assorted demos and audition tapes. Incidentally, Les holds a Dr. of Music in performance, was formerly first trumpet in the L.A. Philharmonic, and heads Avant Records.

LES CARES

He may not be recording the Bee Gees or Peter Frampton (they have their own Quantum boards), but Les Remsen wants every track he lays down to be the best. That's why he chose Quantum.

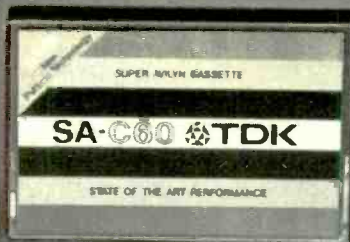
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CIRCLE 30 ON READER SERVICE CARD



While the others were catching up, TDK was moving ahead.

Shortly after it was introduced in 1975, TDK SA, the world's first non-chrome high bias cassette, was accepted by most quality deck manufacturers as their high bias reference standard. This advanced, new cassette enabled their decks to perform to the limit of their capabilities. And because the decks are set in the factory to sound their best with SA, music-loving consumers made SA the number one selling high bias cassette.

The other tape makers set out in pursuit of SA, hoping someday to equal the performance of its Super Avilyn particle formulation and the reliability of its super precision mechanism.

But making the world's most advanced cassette was nothing new for TDK's engineers. They pioneered the high fidelity cassette back in 1968 and for more than a decade they've led the way in cassette tape technology. Over the last three years, they've refined SA and made

it clearly superior to the '75 version.*

That makes the music lovers happy; it means more music with less distortion. It makes the deck makers happy; they've been improving their decks and SA makes them sound better than ever. But for the competition, unhappily, it means a whole new standard to catch up to.

So if you'd like to raise your own recording standards, step up to TDK SA, the high bias reference tape backed by high fidelity's original full lifetime warranty.**

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*Today's SA has a maximum output level (MOL) more than 3dB better than that of 1975 SA at the critical high frequencies, and improved sensitivity across the entire frequency range. **In the unlikely event that any TDK audio cassette ever fails to perform due to a defect in materials or workmanship, return it to your local dealer or to TDK for a free replacement. ©1978, TDK Electronics Corp.

CIRCLE 87 ON READER SERVICE CARD

summer session with "hands on" training at a professional studio, and may be one of the finest such programs available in the Northeast. The program is presently offered only as a minor, but there is a very good possibility that it will be offered as a major course of study beginning with the upcoming fall semester.

Interested persons should contact: Mr. David Moulton, Department of Journalism/Communications, University of Bridgeport, Bridgeport, Ct 06602, phone 203-576-4128/9.

— Andrew Wilson
Fayetteville, N.Y.

Aural Prophylaxis

In the December '78 issue of *MR*, you talked about a set of ear plugs called the Norton Sonic II Noise Filters. I would like to know the address of this company so I could give my eardrums a rest next time I go to a concert. I would greatly appreciate your speedy reply. Thank you! P.S. Keep up the good work on your fine publication.

— James Tate
Sharon, Pa.

Norton Safety Products, is a division of the Norton Co., located at 16624 Edwards Rd., Cerritos, Ca. 90701. The

manufacturer has been specific in describing the product, which was written of in our "Musical Newsicals" of that December issue, as noise filters, as opposed to ear plugs, in that they protect the ear with an acoustic valve that shuts off when the sound pressure approaches the danger level.

Studio Builder

I'm building a studio and need your rag for assistance. I wish to purchase all back issues you have available. Please list the months you have as well as their current cost.

The copy of your magazine that I've seen had the address/order form missing on an item I'd like to buy, so if you would also give me the name and address of the firm that sells the book titled *Building a Recording Studio*, I would be most indebted. And thanks again.

— L. Wendt
Careywood, Id.

A limited supply of Modern Recording, barely gathering dust, remains for the following months: April/May '76, June/July '76, Dec/Jan '77, Feb/Mar '77, May '77, June '77, Aug '77, Sept '77, Nov '77, Dec '77, Jan '78, Feb '78, and Nov '78.

There is a somewhat larger supply of the following: March, May, June, August, September, October and December, all of 1978. All other back issues are totally extinct. All back issues are \$2.00 each, plus 50¢ each to cover postage & handling.

Now some more bad news: Dismally, Building a Recording Studio, published by the Recording Institute of America (15 Columbus Circle, New York, N.Y. 10023), was heavily ordered even prior to publication. It received a limited print run, and the supply of copies was swiftly exhausted. It too has gone the way of the dodo and the moa.

Circuitry Modifications

The mic splitter circuit described in our December 1978 issue, when breadboarded in our modern East Mobeetie laboratories, performed pretty much as it was supposed to. However, *MR* Technical Editor Brian Roth, upon reviewing the circuit, pointed out some difficulties that might be encountered, and offered suggestions for modifications to the circuitry. These modifications are incorporated in the accompanying schematic.

In addition to circuit modifications,



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CIRCLE 31 ON READER SERVICE CARD

We don't make sound effects. We make sound effective.

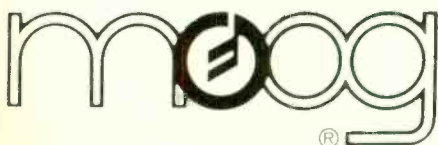
The Moog® family of signal processors let you make more of what your music says. More effectively.

The Moog Vocoder says it all the moment you talk into it, by giving your instrument an entirely new voice—yours. Talk, and the sound talks. Add new instrument voices. Or multiply instruments—a vocoder and a polyphonic instrument turn one violinist into a string section.

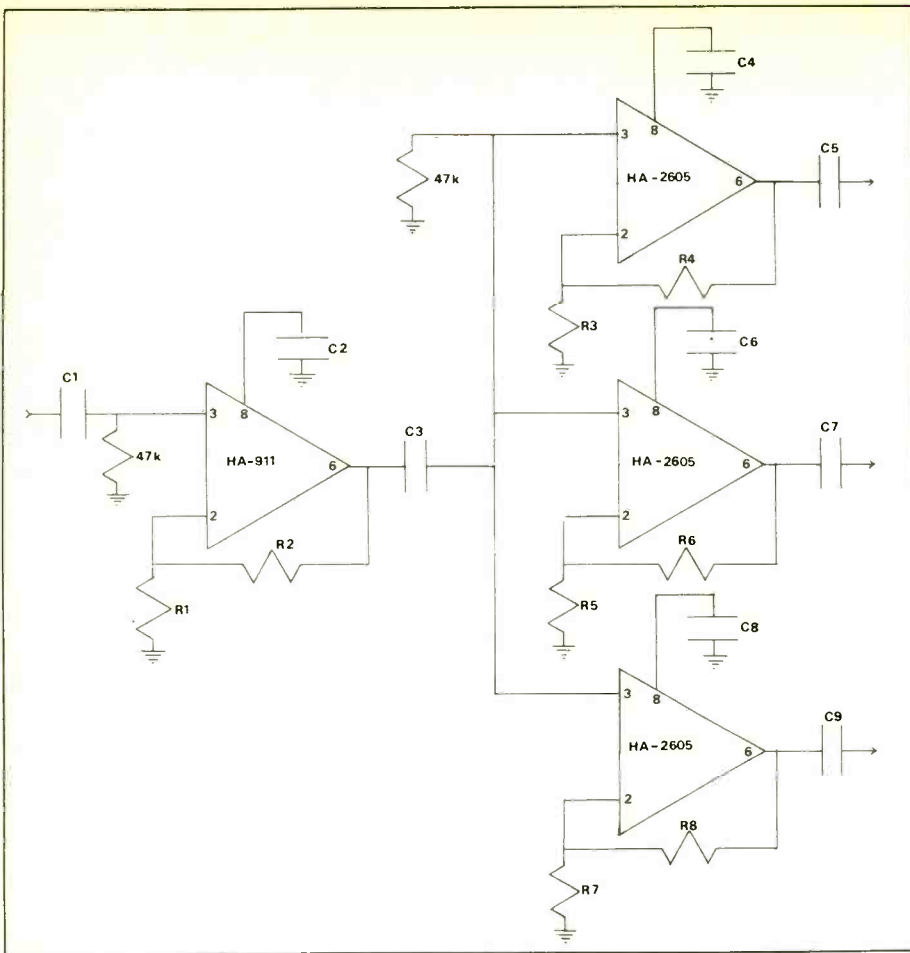
Nothing will phase you like Moog's new 12 Stage Phaser. It simply sounds better, with noiseless switching, more phasing stages and a higher signal-to-noise ratio than any phaser around. What's more, it does more. There's harmonic phasing, stereo panning, line driving, vibrato and a rotating speaker sound that brakes and accelerates. And don't forget Moog's graphic and parametric equalizers. Unequaled. Like all Moog signal processors, the graphic and parametric are great for live or studio work. For keyboards, guitars, almost any amplified instrument.

Moog is right at home in the studio — with rack mounting, external patching in front, big hand-sized controls and layouts made for making music. Best of all, each signal processor is a Moog, backed by Moog's musical engineering expertise.

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some corrections are required in the technical information supplied in the article. To begin, the correct formula for the gain of a non-inverting operational amplifier configuration is: $A_v = 1 + (R_{fb} \div R_{div})$. Although application of the correct formula changes the gain of the HA-911 input stage only slightly, the so-called unity-gain output buffers actually operate at a gain of 2, or equivalently 6 dB. Thus, the total gain of the splitter as shown in the December issue is 26 dB. This amount of gain can be excessive in many applications, and the modified schematic shown here reflects this fact by employing a combination of feedback and divider resistors to produce a gain for the input stage of 2 (equivalent to 6 dB). The total gain of the modified splitter is then 12 dB, a more useful figure.

Our readers will notice other areas of circuit modification. One is the addition of input resistors at the non-inverting input of the HA-911 and the common input point to the buffer stages. The second is a change in value for the bandwidth control capacitors from 400 pf to 50 pf. The third area of modification is the elimination of the load capacitance from all four op-amps. Blocking capacitors are added at the input and

Whirlwind's Medusa helps fight spaghetti.

If you do music professionally, you can appreciate the importance of getting your equipment together, as well as your act. At Whirlwind, we know what this means because we've been through it for many years. As a solution to many of the problems resulting from multiple-wiring situations, we have designed a line of multiple cable systems, or "snakes," called Whirlwind Medusas. They are among the most highly respected systems in the world for their ruggedness, reliability, and their ability to pass noise free signal consistently for years and years.

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- 1 3" x 5" "P"-pattern perf board
- 1 pkg. Vector T49DP Fork clips
- 1 pkg. Vector T42DP "Flag" clips
- 1 pkg. Vector K38DP pin terminals
- 1 Harris Electronics Corp. HA-911-2A Operational Amplifier
- 3 Harris Electronics Corp. HA-2605-2A Operational Amplifiers
- 8 33,000 ohm ¼-watt resistors
- 4 50 pF 25-volt ceramic capacitors
- 5 5 mfd 25-volt tubular capacitors
- 8 .1 mfd 25-volt ceramic capacitors
- No. 22 solid bus wire
- No. 20 solid insulated wire

buffer outputs to prevent DC from appearing where it is unwanted. Finally, the addition of .1 mfd, 25 volt ceramic

disc capacitors between the +15 volt and -15 volt power supply leads and ground *at each op-amp* is recommended to insure that any high-frequency signals impressed on the power supply leads will be bypassed to ground. These power supply bypass capacitors are not shown on the schematic for purposes of maintaining clarity.

We would like to thank Donald Person, David Wilson and of course, Brian Roth for their helpful contributions to these modifications.

—Peter Weiss
Contributing Editor
Modern Recording

Exhausted; One Last Hope

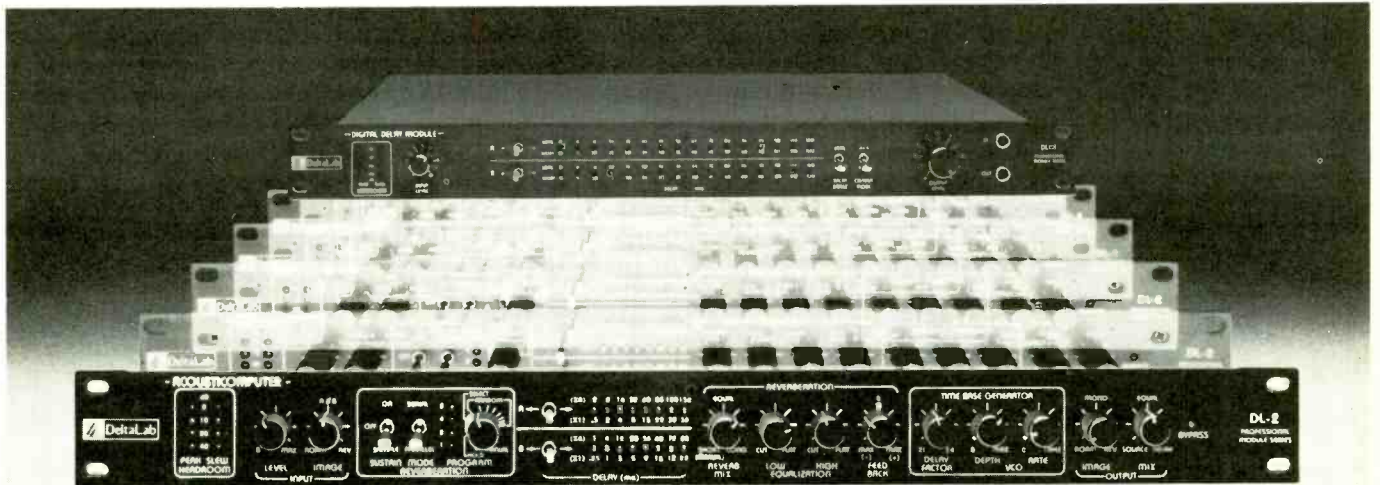
I am writing this letter as a last hope that you or maybe a reader out there

could help me. I have been trying to obtain an operating instructions and service manual for an Audio Instruments Co. Model 167D Ser. #223 Intermodulation Meter. I have exhausted all of my usual sources trying to locate one, and no one seems to know or have heard of the company or its whereabouts. If anyone has a manual I could copy, or can be of *any* help, I would sincerely appreciate it!

By the way—keep up the good work. Your magazine is getting better with each and every new issue.

—Barry Fuerst
Oak Park, Ill.

We've also come up dry on this one—readers who have the scoop on Audio Instruments Co. are invited to write in with particulars.



How's THIS for an encore?

Modern Recording called our DL-1 Delay "probably the best we have encountered" . . . a tough act to follow.* Now after more than a year in development DeltaLab introduces its encore - the ACOUSTICOMPUTER® - a combination digital-delay and special-effects processor designed for use both on-stage and in the studio, providing well-known functions (echo, doubling, chorusing, vibrato, flanging, etc.) plus new effects not available in any other device.

- Pre-reverb delay with two independent delay channels, variable from 0.25ms to 152ms with LED display.
- Delay up to 240ms in serial (mono) mode.
- Built in VCO with external control input at rear.
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- Computer-synthesized acoustic space with 16 selectable reverb programs plus a new special effect in which the ACOUSTICOMPUTER scans the 16 programs.
- Two channels in and out. Built in reverb mixing and stereo imaging controls.
- Foot-switch controlled bypass.

It's impossible to describe in this space everything the ACOUSTICOMPUTER does; you'll have to experiment with it yourself. By carefully minimizing the number of separate controls and grouping them logically, we've made it easy for non-engineers to operate the ACOUSTICOMPUTER.

For further information call or write Phil Markham at DeltaLab Research, Inc., 25 Drum Hill Road, Chelmsford, MA 01824 Tel. (617) 458-2545.

*See Modern Recording "Hands On Report," Sept. 1978.



DeltaLab Research, Inc. 27 Industrial Avenue, Chelmsford, Mass. 01824

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The new Sansui TA rack-mountable receivers offer both rack-mounting sophistication and all-in-one-unit simplicity. High performance and attractive pricing make them unmatched values.

The TA-500 receiver delivers a comfortable 50 watts per channel, min. RMS, both channels into 8 ohms from 20-20,000Hz, with no more than 0.05% total harmonic distortion. The DC power amplifier configuration, with wide frequency response and very low TIM distortion, ensures clean and true-to-life music reproduction.

The tuner section of the TA-500 performs better than most separates in a comparable price category. With a sensitivity of

10.8dBf (1.9 μ V IHF T-100) and a S/N of 75 dB, FM reproduction is of the highest quality.

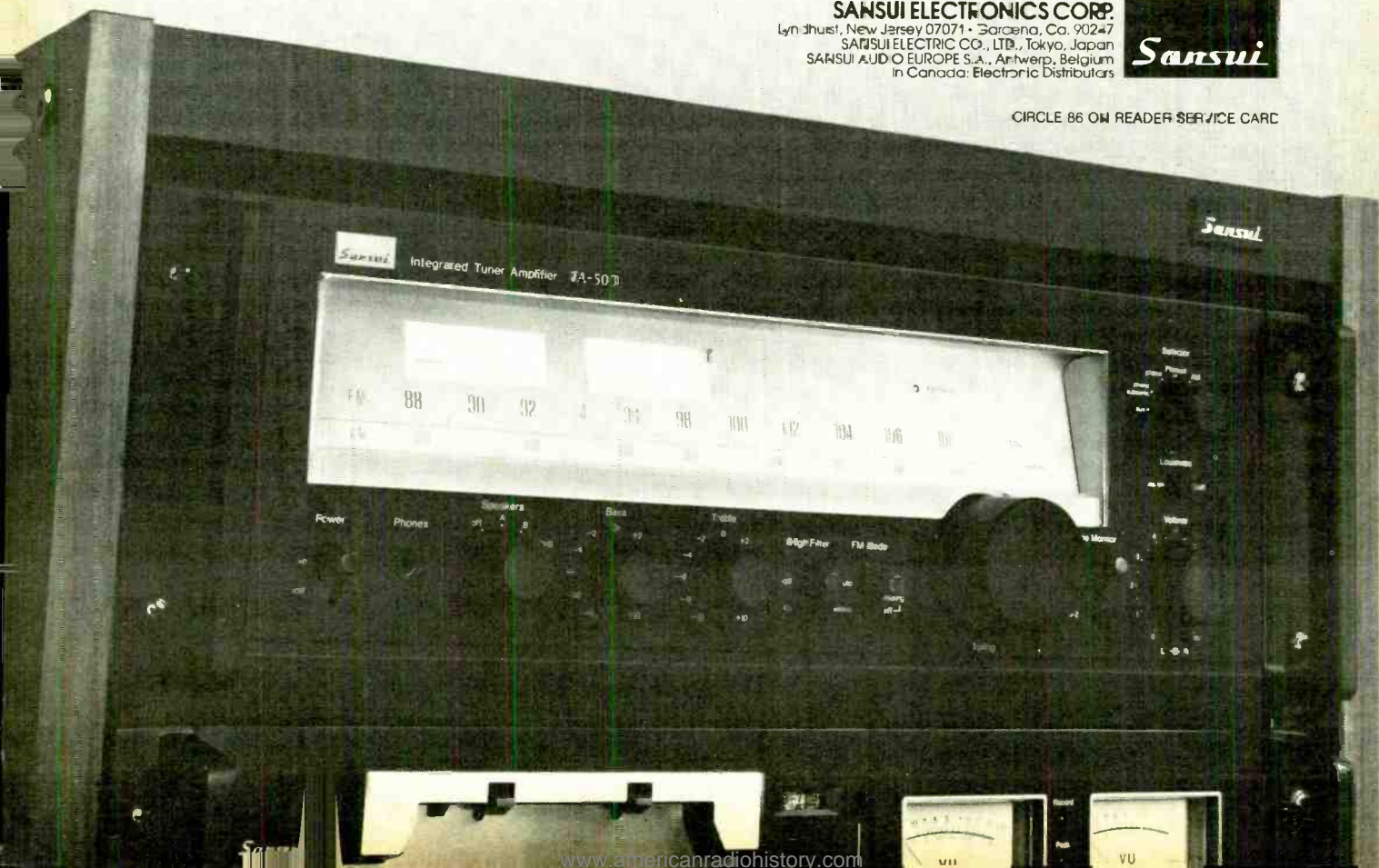
Also available in the TA series is the new TA-300, providing 30 watts per channel, with no more than 0.06% THD, under the same conditions. Offering specifications and features that are highly competitive with other receivers in the power/price class, and with the extra benefit of rack-mounting convenience, the TA-300 receiver will surely be one of this year's most popular components.

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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 reader's technical forum.

Personalizing Your Peavey

I am in the process of acquiring a Peavey 1200S mixer. In addition to sound reinforcement, I plan to use it for recording and for this reason would like to wire a direct output to each input channel. What would be the best way to accomplish this?

—Chuck Pierce
Beaumont, Tx.

The best way to modify your Peavey 1200S mixer is to follow the advice and schematics outlined by Peavey design engineer Lothar A. Krause, Jr. in our November 1978 issue. In the Talkback entitled (appropriately enough) "Modifying Your Mixing Console," on page 26 of that issue, L.A. described alterations to a 800S mixer similar to those you desire. (In case you had, by unfortunate coincidence, missed the November issue, it is still available by sending \$2.00 plus 50¢ postage and handling to our Back Issues Department.) Please do not be put off by the fact that the original piece dealt with a different model, L.A. assured us that "the facts remain the same." For additional information on this project, or if you should require any

other advice, please feel free to call L.A. at Peavey Electronics at 601-483-5365 during business hours. Do keep in mind, however, his warning to Mr. Bates that alterations of this kind, while often necessary to personalize your console, will void any warranty you hold on the piece, so be sure to have them completed by a top-notch engineer.

Consider Coexistence

I have an awful problem. I own a recording studio and I am located right next door to an arc welder. Whenever he is welding, it is impossible to do any type of recording. An incredible blast of static finds its way into any and all portions of the audio chain. His welding completely knocks AM radio off the air, and has a lesser effect on FM and television, but tampers with them, too.

The problem is transmission through the air, not in the AC power line. The area of interference extends several hundred feet beyond both our homes. I have tried some rather odd suggestions such as wrapping my entire console in foil, but nothing even reduces—to say nothing of stopping—the interference. The welder himself has no suggestions. I can think of only two solutions. One, there may be some way of stopping the problem at the source (short of murder, I hope!). Two, he may be breaking some F.C.C. regulations and perhaps I can seek legal remedy. In any case, help!

—John M. Peters
J.P.M. Recording
Whittier, Ca.

Your problem is one shared by many, even those not involved in recording. Apparently, you've eliminated AC line interference or internal studio wiring as a contributing source of the problem. It can't hurt to ask the local power company to call on you and verify your conclusions. Any additional data they offer may be helpful in finding the solution.

Contact the "Radio & Television Interference Department" of the Edison Company or the parallel department in the utility company serving you. You may also contact the F.C.C. and ask them to make an R.F. level measurement; however, don't expect them to blind you with the speed of their reaction to your request.

If the two procedures above do not improve the situation then the probable solution becomes one of politics or high expense. The political solution would involve coexisting on a scheduled basis with the welder. Perhaps the most critical blocks of time could be scheduled to avoid the interference, or at least some cooperative attempt to improve the situation could be made. If not, then significant dollars must probably be involved. The conventional solution would be to screen the room. Nonassembled screening rooms of appropriate design are available. Price for a "single thick" 10 x 12 nonassembled screen room is about \$15,000 to \$20,000. Additional expense is required for feed-throughs for audio and A.C. that preserve the shielded integrity of the room. Adding insult to injury, it is important to note that some elaborate and expensively treated R.F. screened rooms have failed to correct problems such as the one you describe.

In conclusion we suggest:

A. Re-examine the problem, be positive that it is airborne transmission by verifying R.F. levels in the air via the F.C.C. and in the AC line via your power company.

B. Thoroughly quantify the grounding scheme in your studio. The lack of, or faulty, mic transformers, poor interface practices, microphonic tubes or electronics and improper AC ground loading can contribute to the problem—usually the problems with interference are found in these areas.

C. Explore further the political solutions.

D. Screen the room thoroughly.

E. Turn your present studio over to rehearsal uses and start over in a location that is free of this kind of problem.

Your problem is a common one and probably the most frustrating one I know of. C.B.er's, arc welders, ham operators and the like can totally kill a location that is otherwise desirable for recording. If the interference is truly airborne and of such a level that basic preventions don't stop it, then the only real solution may be as unacceptable as the problem.

(We also suggest you see "And Now a Word About Grounding Problems" in the May '78 issue of *Modern Recording*.)

—Barry Ross
Chief Engineer
The Express Sound Co., Inc.
Costa Mesa, Ca.

Sensitive Settings

Having always experienced a problem with hiss when using my 4-channel tape deck, I began experimenting with different EQ settings (i.e. amp, mixing board, mid-range and tweeter attenuator settings on speakers, etc.). I found when I increased the tweeter volume, and reduced the mid-range volume on the crossover in each speaker cabinet, and then reduced the treble setting on the amp, the tape hiss almost vanished. As far as EQ on the board, I left that flat while experimenting. Why no noise? I've also noticed after resetting everything as indicated that the EQ controls on my board seem more sensitive. Is this possible?

—George R. Sutton
Lithonia, Ga.

Congratulations! The results of your experiments indicate to me you've improved the frequency response and lowered the phase shift in your monitor system. The previous response curve probably overemphasized the high frequencies.

Because of the treble setting on your amp, the noise (hiss) from your tape recorder would be mostly high frequency, while the amount of musical energy in the frequency range is relatively low. This condition of over-emphasized high frequencies would cause you to hear the tape hiss out of proportion to the fundamental frequencies of the musical instruments being recorded.

As for the EQ controls on your board seeming more sensitive, I believe there are two reasons for this. First, the



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previous hot spots in your monitor's frequency response would cause a masking of other frequencies. Second, by increasing the tweeter volume on the speaker crossover but reducing the amount of treble boost used on the amp, you would introduce less phase shift into your monitor system. This would allow you to hear the subtleties of a sound's fundamental and harmonic structure. Now that you can hear these details more clearly, you will be able to notice smaller EQ changes, making it seem more sensitive.

The location of your speakers in the control room is also a very important part of the sound. Therefore, you might also try experimenting with various speaker locations.

—Scott Rivard
Recording Engineer
Sound 80, Inc.
Minneapolis, Minn.

A Golden Oldie

I recently purchased a Presto GN CSE #2865 recording lathe with C and D cutting heads. This is quite an old piece of equipment but still usable. I am having some trouble locating the needles and

the blank discs that are needed to complete the system. The cutting heads require a #20 long shank stylus.

I would greatly appreciate any information that would lead me to the correct supplier. Also, any additional hints on this particular piece of equipment and how to obtain its maximum performance would be of great help to me.

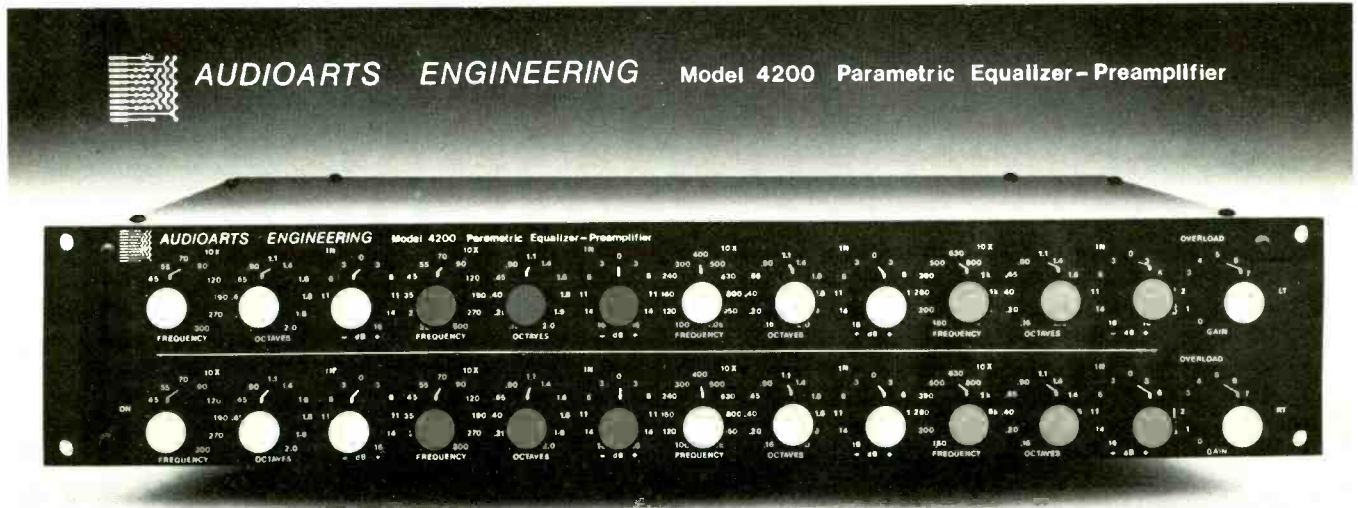
—Keith Evans
Marietta, Ga.

Well, Keith, you win a few and you lose a few. On this question, we'd have to call it a draw. After a myriad of phone calls we managed to find a complete answer to one of your two questions. Eric Porterfield of Columbia Recording Studios in Manhattan proved to have the most information regarding the firm that manufactured your recording lathe. Apparently, Presto was producing a line of budget-priced lathes even before the mass manufacture of tape recorders until about 1948. The company was most likely sold in 1950, but to whom and what happened to the firm after the sale, we could not find out.

However, since you feel the piece is still adequate for your needs, you'll be pleased to know that we can steer you

to several sources of accessories for use with the Presto. For styli, (Mr. Porterfield noted that you probably need an 8H cuttinghead) we suggest you contact Frank L. Capps and Co. (20 Addison Place, Valley Stream, N.Y. 11580), manufacturers of cutting systems and styli, at 516-825-4413 or Micro-Acoustics Corp. (8 Westchester Plaza, Elmsford, N.Y. 10523), manufacturers of Micro-Point styli at 914-592-7627. For discs, the following companies can most probably answer your needs: Allied Recording, 3232 Greenpoint Ave., Long Island City, N.Y. 11101, telephone 212-784-2318; Capitol, manufacturers of Audiodiscs by Capitol, 1750 N. Vine St., Los Angeles, Ca., 90028, telephone 213-462-6252, Transco by Singer, World Trade Center, Suite 2365, New York, N.Y. 10048, telephone 212-432-1400 or Martin Audio/Video Corp., 320 W. 46th St., New York, N.Y. 10036, telephone 212-541-5900 or try their Wats line 800-223-9823.

We don't by any means feel that this is the final word on Presto. We hereby announce an open call to anyone and everyone for additional information on Presto. Also, if any readers have equip-



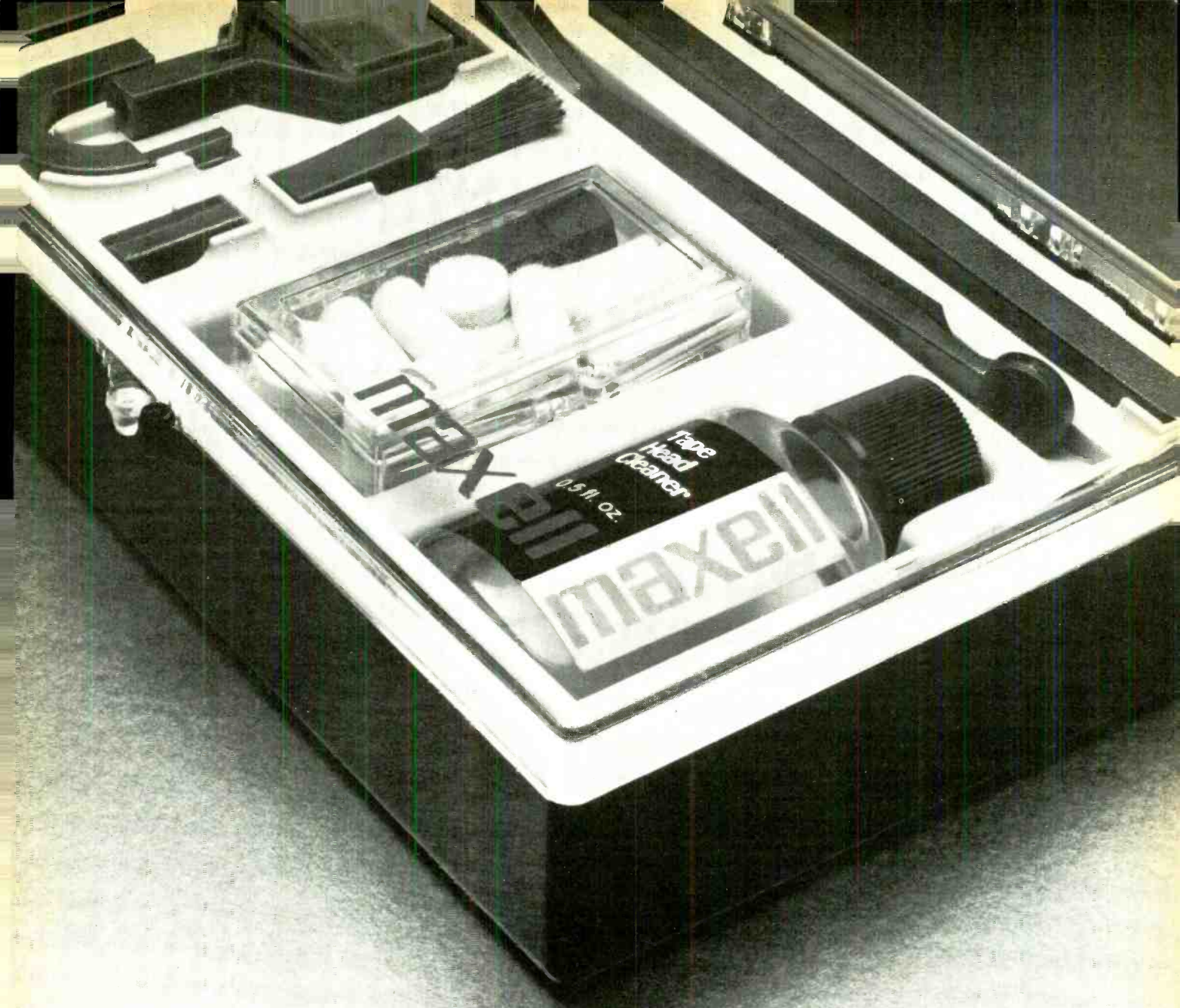
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keep even areas you can't see spotless. All of which means you'll be getting maximum performance out of your machine. Year after year.

And if that doesn't sound like a good idea, maybe you need to have more than your tape heads examined.



CIRCLE 79 ON READER SERVICE CARD

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ment from Presto and can offer some helpful hints on how to live happily ever after with one of these pieces, please send your advice to Modern Recording's editorial office (the address is in the front of each issue) and we'll see what we can do to answer Keith in greater detail.

We would like to thank, in addition to Mr. Porterfield, the following people who brainstormed a bit with us on this question: Russ Hamm of Gotham Audio Corp., John Kubick of Sterling Sound, David Moyssiadis and Peter Weiss. Thanks to all—and remember, we'll happily increase the list if anyone has some additional poop on Presto.

—Ed.

The Final Judgment?

I'm considering the purchase of a Shure M615AS-2E equalization analyzer for use in a sound reinforcement system for a road band which plays clubs of various sizes. My intention is to use the analyzer with a graphic equalizer to equalize the speaker system to the room and then, if any additional equalization is needed, it would be add-

ed via the board EQ. Would it be more advantageous to work from the "flat" response (I use the term flat loosely) obtained with the analyzer as opposed to setting the whole thing up "by ear"? In any case, as always, ears will be the final judge.

Although my main interest is in sound reinforcement, I usually find something useful in each of your issues. Keep up the good work.

—Paul Dimun
APO, N.Y.

The purpose of using an equalizer in any PA or sound reinforcement application really involves two objectives. One is to obtain a smooth or "flat" frequency response so that it sounds right. You can remove some of the aberrations due to the room effects and also a non-flat loudspeaker response. The second objective is to control feedback. Feedback, with regard to sound reinforcement microphones, can be a particular problem, especially in an indoor location where the mics are subjected to the resonant modes of the room. The objective is to smooth out the frequency response to prevent peaks and dips

from causing the microphones and the PA system to go into feedback. The M615 can be used to accomplish both of these objectives, the first one being a smooth, flat response. Now flat, in terms of equal energy per octave band, as the M615 measures, is probably too bright as perceived by a listener because of various interactions with a mic in the room. This has been discussed in a number of technical papers. The frequency response that has been subjectively, and somewhat experimentally, determined to be the most pleasing, is sometimes called the "concert hall" or "roll-off" response. This is a flat frequency response that goes out to about 1 or 2 kHz and then rolls off above that frequency about 3 dB per octave so it is down about 10 dB or so at 10 kHz. For big sound reinforcement systems, that's probably the most favorable response. There's a switch on the M615 to select either response tailoring. For more of a hi-fi system you usually prefer a little bit brighter high-frequency response so the flat response is more applicable. No matter which one you choose you can accomplish your objective of smoothing out or flattening

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THIS WEEK	LAST WEEK	ALWAYS	ARTIST/Title	THIS WEEK	LAST WEEK	ALWAYS	ARTIST/Title	THIS WEEK	LAST WEEK	ALWAYS	ARTIST/Title
★	1	1	HERB ALPERT — Wings	★	1	1	HOLLYWOOD STARS — Stay The Way You Are	★	1	1	ROSE ROYCE — Rose Royce Strikes Again
★	1	1	AMBROSIA — Life Beyond L.A.	★	1	1	JACKSON FIVE — Anthology	★	1	1	JOE SAMPLE — Rainbow Seeker
★	1	1	BURT BACHARACH — Greatest Hits	★	1	1	JACK JONES — Full Life	★	1	1	TOM SCOTT — Blow It Out
★	1	1	ROLAND BAUTISTA — Bautista	★	1	1	CHAKA KHAN — Chaka	★	1	1	SEAWIND — Window Of A Child
★	1	1	BEACH BOYS — All Summer Long	★	1	1	B.B. KING — Roots	★	1	1	JACK SHELDON — Merv Griffen Show
★	1	1	BELLAMY BROTHERS — Beautiful Friends	★	1	1	JOHN KLEMMER — Arabesque	★	1	1	SIDE EFFECT — Goin' Bananas
★	1	1	BARBI BENTON — Something New	★	1	1	HAROLD LAND — New Shade of Blue	★	1	1	ROD STEWART — Foot Loose And Fancy Free
★	1	1	STEVEN BISHOP — Bish	★	1	1	HUBERT LAWS — Say It With Silence	★	1	1	BARBRA STREISAND — Eyes Of Laura Mars
★	1	1	RICHIE BLACKMORE — Blackmore's Rainbow	★	1	1	RONNIE LAWS — Friends and Strangers	★	1	1	STUDIO INSTRUMENT RENTALS — Great Service
★	1	1	BLOOD, SWEAT, AND TEARS — Best of the Gold	★	1	1	LED ZEPPELIN — Song Remains The Same	★	1	1	DONNA SUMMER — Live And More
★	1	1	WILLIE BOBO — Tomorrow Is Here	★	1	1	LOGGINS AND MESSINA — Finale	★	1	1	SYLVERS — Best Of
★	1	1	LARRY CARLTON — Larry Carlton	★	1	1	CHUCK MANGIONE — Children of Sanchez	★	1	1	GABOR SZABO — Faces
★	1	1	CARPENTERS — Close To You	★	1	1	MANHATTAN TRANSFER — Pastiche	★	1	1	TASTE OF HONEY — Taste Of Honey
★	1	1	DAVID CASSIDY — Castle In The Sky	★	1	1	DAVE MASON — Split Coconut	★	1	1	TAVARES — Future Bound
★	1	1	RAY CHARLES — Best Of Ray Charles	★	1	1	HARVEY MASON — Marching in the Street	★	1	1	CLARK TERRY — Montreux '77 — Art Of The Jam Session
★	1	1	JOE COCKER — Luxury You Can Afford	★	1	1	THE MCCRARYS — Loving Is Living	★	1	1	THREE DOG NIGHT — At The Hop
★	1	1	NATALIE COLE — Inseparable	★	1	1	SERGIO MENDES — Pele	★	1	1	ROBIN TROWER — Caravan To Midnight
★	1	1	CHICK COREA — Return To Forever	★	1	1	BETTE MIDLER — Broken Blossom	★	1	1	IAN UNDERWOOD — Studio
★	1	1	CRUSADERS — Images	★	1	1	JONI MITCHELL — Don Juan's Reckless Daughter	★	1	1	PHIL UPCHURCH — Darkness Darkness
★	1	1	MAC DAVIS — Fantasy	★	1	1	RICK NELSON — Intakes	★	1	1	FRANKIE VALLI — Hits
★	1	1	SAMMY DAVIS — Golden Boy	★	1	1	TED NUGENT — Double Live Gonzo	★	1	1	VAN HALEN — I'm The One
★	1	1	KIKI DEE — I've Got The Music In Me	★	1	1	DONNIE OSMOND — Alone Together	★	1	1	BOBBY VINTON — Name Is Love
★	1	1	DEEP PURPLE — Made In Europe	★	1	1	PARLIAMENT — Funkentelechy	★	1	1	MICHAEL WALDEN — Garden Of Love Light
★	1	1	NEIL DIAMOND — Beautiful Noise	★	1	1	JOE PASS — Guitar Interludes	★	1	1	WAR — Youngblood
★	1	1	DOOBIE BROTHERS — Livin' On The Fault Line	★	1	1	PINK FLOYD — Masters Of Rock	★	1	1	WEATHER REPORT — Mr. Gone
★	1	1	DRAMATICS — Do What You Want To Do	★	1	1	POINTER SISTERS — Having a Party	★	1	1	TIM WEISBERG — Listen To The City
★	1	1	EARTH, WIND, AND FIRE — All n' All	★	1	1	JEAN LUC PONTY — Cosmic Messenger	★	1	1	NORMAN WHITFIELD — Production
★	1	1	DON ELLIS — Music From Other Galaxies & Planets	★	1	1	JEFF PORCARO — Studio	★	1	1	THE WHO — Who Are You
★	1	1	WILTON FELDER — Crusaders	★	1	1	MICHAEL POST — The Rockford Files	★	1	1	ANDY WILLIAMS — Andy's Newest Hits
★	1	1	MAYNARD FERGUSON — Conquistador	★	1	1	ELVIS PRESLEY — He Walks Beside Me	★	1	1	LENNY WILLIAMS — Choosing You
★	1	1	FLYING BURRITO BROTHERS — Airborne	★	1	1	LOU RAWLS — Best Of	★	1	1	STEVIE WONDER — Looking Back
★	1	1	JOHN GUERIN — Studio	★	1	1	RAYDIO — Raydio	★	1	1	FRANK ZAPPA — Zappa In New York
★	1	1	EDDIE HARRIS — How Can You Live Like That	★	1	1	LEE RITENOUR — Captain's Journey	★	1	1	STARWIND DESIGN GROUP — The Grand Design
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the frequency response by going through and equalizing the system at an average listening location with the equalizer microphone (check it at several different ones), analyzing with the M615 and using the equalizer to "flatten out" the room.

The feedback objective is obtained in much the same way. That is, first of all, just by eliminating the peaks and dips in the response and making the response smooth, you have eliminated most of the feedback problems already. Then, if feedback is still a problem, you can use the M615 as a means of looking at the area that's feeding back and the frequency that's feeding back. You can then simply set the system into feedback and notice which of the top row of LEDs on the M615 are lighting and staying on and then bring down the corresponding equalization control until the feedback stops. You are actually, then, putting additional dips in the frequency response corresponding with the frequencies that feed back.

As far as the ear being the final judgment, that is true. It's better to start with a flat response as measured by the M615 and then, as a final measure,

listen to the system and see if it needs a little bit more brightening or a little more bass. It's just a matter of "seasoning to taste" at the end. But by starting from a flat response, you at least have a base from which you can work.

— Al Groves
Manager, Hi-Fi Marketing Group
Shure Bros.
Evanston, Ill.

Peculiar Performance Problems

I assume my problem is with psychoacoustics. When I sing with just an acoustic guitar, I'm always right on pitch, but with my band behind me (medium-volume rock) I go off-key.

All I need are good monitors, right? Wrong! I've tried many good systems and even went to headphones, all absolutely to no avail.

The damndest part is that with all these systems, I can hear myself perfectly, and while on stage I'll think I'm doing a great job of keeping true pitch. It's only when I hear the playback that I cringe in disbelief that I could actually be so off when I thought I

had been so on!

The only thing I've found that helps is to stuff cotton in my ears and block out everything except bone conduction. This improves my pitch accuracy, but ruins my ability to judge dynamics and really get into a song.

My voice teacher says that there's nothing wrong with my ears, but I can't help wondering if other singers have this problem and, if so, how they manage to overcome it.

It seems to boil down to the fact that any loud sound (even my own amplified voice) dulls my natural pitch perception and fools me into singing slightly — and annoyingly — off key.

Is there any known scientific basis for this phenomenon?

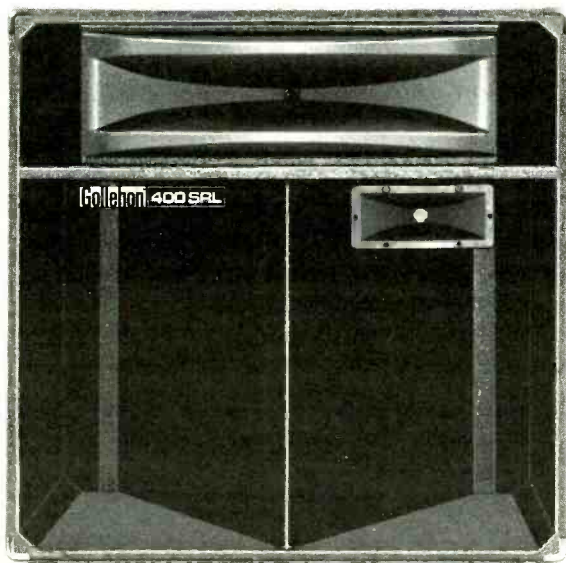
Moreover, is there any known scientific solution?

— Steve Notis
Flushing, N.Y.

Don't worry, your problem is not peculiar to you. It's a basic problem for every performer with "live" music and is often really tough in rock situations.

The problem is more of how and what you hear rather than what monitors

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you use. Pitch as perceived is not an absolute but a relative thing. Except for those extremely rare individuals who have absolute pitch, all musicians rely on relative pitch to keep themselves on. Some can go all day on one "calibration;" that is, on one listen to a correct note, but others require more frequent "recalibration." I've spent many hours recording symphony and solo performers with large and prestigious symphonies, those who've made many recordings and recitals, who've spent forty to fifty years perfecting their performance — they all can be fooled, and they all know how to cheat their instruments or their voices into tune with whatever group they're playing with at a given time.

Forget headphones! They, more than any other device can lead you down the primrose path to awfulness. Even too good a monitor system can help sink you. You need to hear something besides yourself and that something should be tuned to where you want to be and the rest of the band should tune there just as well.

Don't try to get pitch from very percussive sounds — quick rhythm guitar

sounds, very hard piano with no sustain. They don't supply enough pitch to help you. Further, some of the characteristics of the very hard picked or hit transient sound may not be at true resonance of the string(s). Some people tune up by barely plucking the strings and during performance literally pound or pull the life out of them. They may be playing sharper or flatter than they tune.

The band might be fooling themselves by playing loudly and you could actually be closer to a "true" pitch than the accompaniment. It's happened before. Use a strobe tuner of some sort on your recordings. This can be especially interesting if you've multitracked the session. You could be pulled off by some instrument or instruments. Try moving to different positions during the performance.

Watch the bass. Some people have a difficult time hearing the pitch of low notes. As a matter of fact, the lower the note, the more difficult to tune.

Another thing to try is singing without one band instrument. You may discover something interesting. If not, try dropping out two at a time and then

with only one. Record everything and see when you're best.

Assuming that none of the above is any help, try pushing yourself to sing higher when with the band. I'm assuming you're low. It's usually the case. You can retrain your ear in any situation to allow your product to be in tune, but it'll drive you crazy for a while, and may be wrong.

Don't forget that when you push your voice very hard you'll shift pitch too. When you play with one acoustic guitar you may not be singing the same way as with the band. You may have to let the PA do the work.

As to loudness being a problem, it is possible. "When all else fails, turn up" is a mixing maxim. When you get it loud enough, you won't hear the blemishes as well and will be excited by the sheer volume of the sound. It's a kind of acoustic dope. It won't help.

Good luck.

— Edward J. Rehm
Chief Engineer
The Ken Nordine Group
Chicago, Ill.

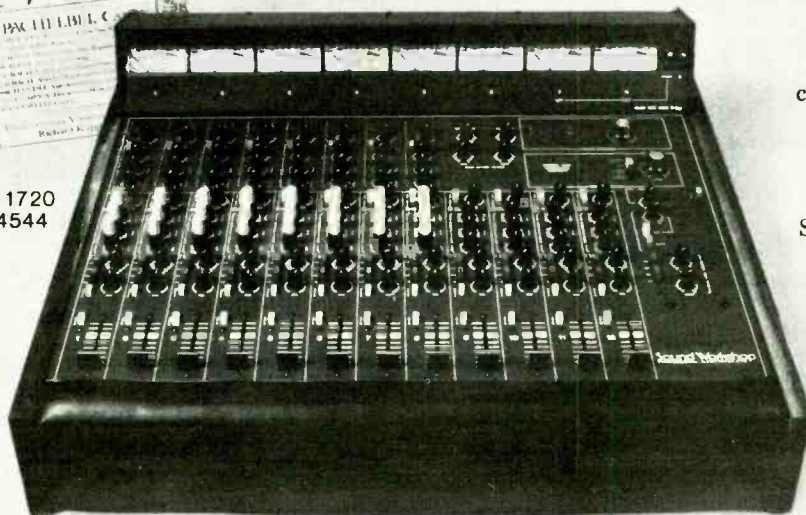


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The 4000 Series Two also spots low level gain riding, where the recording engineer adds volume to a low signal to overcome noise on the master tape. The

Downward Expander immediately expands the dynamics, so you hear the bass as the conductor called for it, not as the engineer delivered it.

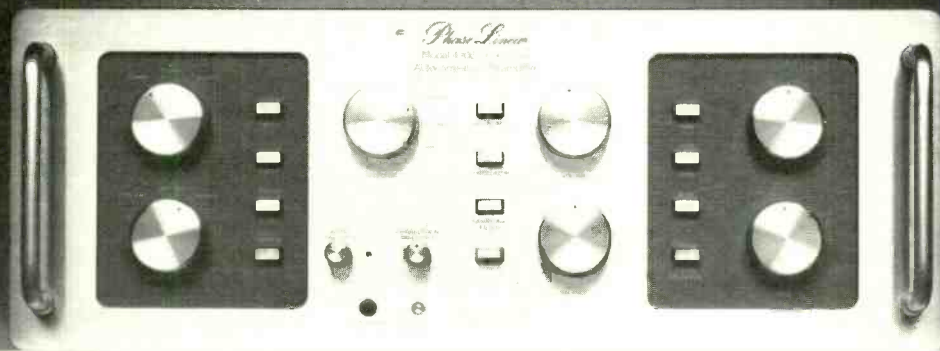
The 4000 Series Two second generation Autocorrelator reduces record hiss, tape hiss, and FM broadcast noise. Weighted overall noise reduction is -10dB from 20Hz to 20kHz. So your music comes clean, and the background is silent.

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THE **PRODUCT** SCENE

By Norman Eisenberg

ACOUSTIC SIMULATOR



Designed for professional use in room simulation and sound enhancement, the PY-10 from Polyfonic Sound Industries can be used during "live" sound mixing and recorded mixes. Main controls include a ten-band graphic EQ panel plus sliders for "room size," decay and balance. The input section is a two-channel mixer that allows separate signals to be mixed into the master level input control. A phase switch will maximize the effect of the decay control. Input level is monitored in VUs by LEDs.

CIRCLE 14 ON READER SERVICE CARD

TMI OFFERS PRO AUDIO DEVICES

A newly formed company, Tonmeister Instruments Co., Inc. (TMI), will specialize in offering innovative audio devices and test equipment to the professional industry. Included in its catalogue are Advanced Music Systems (AMS) digital delay lines, harmonizers, phasers and flangers; the Barth KG Dynaset (a limiter-compressor-expander gate that allows the selection of a predetermined dynamic range), special equalizers and the W308 Music Coder (a Vocoder for music applications); Sennheiser test instruments; and Woelke wow and flutter meters.

According to TMI, these items will be added to in the very near future.

CIRCLE 15 ON READER SERVICE CARD

TWO FROM AB SYSTEMS

AB Systems has announced two new products — the model 912 mixer preamp and the model 2400 electronic frequency divider. Designed as a slim-line version of AB's model 911, the model 912 offers its unique automatic input source selection. Tape dub, and mic mixing on program or tape out are provided.

The model 2400 provides front-panel controls for left and right channels, low and high frequency levels, as well as independent controls for gain and 40-Hz boost of the internal subwoofer output. Utilizing up to four standard AB plug-in crossover cards, the 2400 allows the user to select any combination of crossover frequencies and slopes, plus basic filter types. The unit fits rack mounts and may also be used for mono tri-amp or quad-amp systems. Prices are \$239 for the model 2400, and \$495 for the model 912.

CIRCLE 16 ON READER SERVICE CARD

DYNAMIC NOISE FILTER

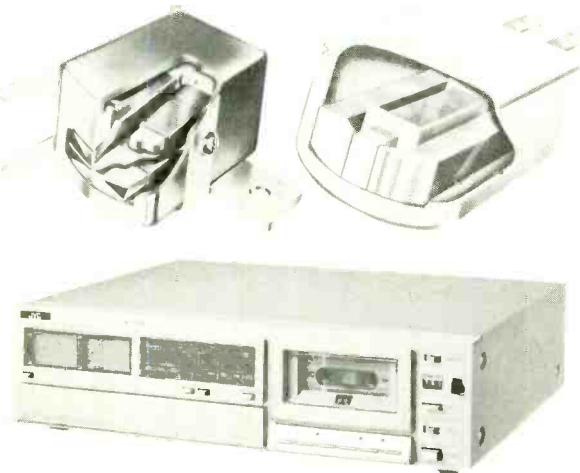
Logical Systems of Vancouver, Washington, has introduced its model 8800 Dynamic Noise Filter, a stereo device designed to remove noise from tapes, records and broadcasts with no encoding or decoding. Said to be useful for both record and playback applications, the model 8800 features a tri-color LED display. Circuitry employs a new gyrator-type variable low-pass filter with FET control circuitry with up to 15-dB of hiss reduction. Price is \$249.



CIRCLE 17 ON READER SERVICE CARD

JVC TO MARKET METAL TAPE DECK

Among the first tape decks on the U.S. market that can record and play the new metal tape formulations is the JVC KD-A8. It features microprocessing circuitry that automatically establishes bias, EQ and sensitivity settings for all currently available tape formulations. JVC calls its system "B.E.S.T."—the letters stand for "bias, equalization, sensitivity, total."



In addition, the new deck uses what JVC calls the "X-cut" head, which is said to offer improved contour effect for better low-end response. With metal tape at -20 VU, response is spec'd within ± 1 dB, 20 Hz to 18 kHz. S/N, with noise-reduction off, is 58 dB; with NR switched on, it improves by 5 dB at 1 kHz, and by 10 dB at 5 kHz. Wow and flutter are rated at 0.035 percent (WRMS); third harmonic distortion is claimed to be down to 0.5 percent. Retail price has been announced at about \$750.

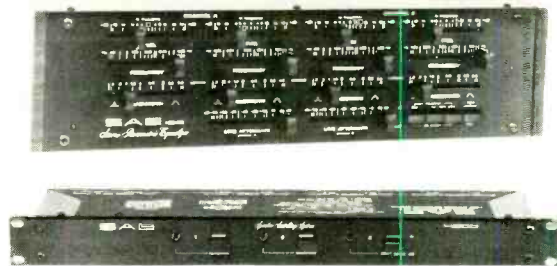
CIRCLE 18 ON READER SERVICE CARD

TWO-CHANNEL GRAPHIC EQ

The Model 562 from Automated Processes, Inc., is essentially two of the company's model 560s in one package. Of rack-mount size, the new unit offers ten bands of EQ on each channel. Slider controls offer continuously variable boost and cut (± 12 dB) with zero-detents. Connectors are barrier strip and XLR types. Clipping level for 3% THD is listed as $+30$ dBm. Rated frequency response (without EQ) is ± 0.25 dB, 30 Hz to 20 kHz.

CIRCLE 19 ON READER SERVICE CARD

SAE OFFERS NEW ITEMS



From SAE there's word of its model 180 parametric equalizer (the kind that allows the user to vary the bandwidth and frequency, as well as the boost or cut, of selected frequency segments). Offering two bands on each of its two channels, the model 180 can be connected to the inputs and outputs normally used for operating a tape recorder. The recorder itself then may be connected to the model 180. This hookup, says SAE, assures the best S/N ratio along with maximum flexibility in equalizing the source, the input to the tape or the output from the tape. Price of the model 180 is \$250.

SAE also has a new speaker switching system, the model 4200 priced at \$75. This rack-mountable device can accommodate up to three pairs of speakers or three sets of headphones, or any combination thereof. The third headphone jack is a direct output capable of handling the most inefficient types of conventional headphones as well as electrostatic headphones.

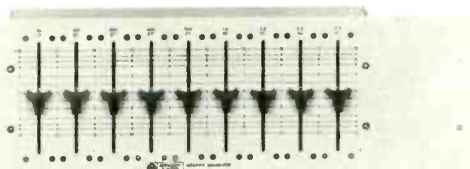
CIRCLE 20 ON READER SERVICE CARD

TIME PROCESSOR

The DN 34 from Klark-Teknik is an analogue time processor for creating special effects. Designed around two discrete, independently-controllable delay sections, the DN 34, says its manufacturer, achieves all the effects one would expect from this type of unit, "but cleanly and noiselessly." Effects listed include: positive flanging, negative flanging, double tracking, resonant flanging, triple tracking, loudness enhancement, pitch detune, pitch shifting, true vibrato, chorus, "cardboard tube" echo; Doppler/Leslie effects. In addition, the DN 34 offers crossover flanging (without the need for additional units), complex Doppler effects and time-related frequency synthesis.

CIRCLE 21 ON READER SERVICE CARD

TWO NEW ITEMS FROM OPAMP



The model G-9 from Opamp Labs is a line-level graphic equalizer with nine center frequencies adjustable over a ± 12 dB range. Amplifier output capability is ± 24 dBm. With rack-mount panel and weighing seven pounds, it is priced at \$325 in kit form, or \$400 wired.

Opamp also is offering its model 1155 mono reverb spring system for line-level operation. Bandwidth is 50 Hz to 6 kHz. This unit is supplied in an aluminum enclosure 17 inches wide; price is \$275.

CIRCLE 22 ON READER SERVICE CARD

PUCK DEWARPS DISCS

Resembling a hockey puck is a new gadget made in Sweden and marketed here by Elpa. It's called the "AudioMate Record De-Warper" and it is claimed to "true up" a warped disc recording. To use it, you simply slip it over the turntable spindle and let its weight flatten the disc. If the record is badly warped, Elpa says you can speed up the process by carefully pressing down on the puck. Price is \$5.



CIRCLE 23 ON READER SERVICE CARD

MIXING PANELS AND DIGIFADER

Elpa Marketing has announced availability of three models of Stanford mixing panels, and an automatic fading device known as "Digifader." All the mixers use peak-level meters that are said to be 8 dB faster, and with measuring ranges that are 22 dB larger, than on conventional VU meters. Other features include five adjustable inputs, separately adjustable pre-listening on inputs or on output, interchangeable mic/line inputs, tape 2 input switchable to echo on music, etc.

The Digifader provides completely automatic fading from one program source to another at the push of a button. The speed can be adjusted for instantaneous or slow, up to 10 seconds fade. The LED display shows the progression of the program fade and which program is "on." Other features include: separate level, treble and bass controls for each program; muting switch and level control for mic talkover; master volume and balance control; headphone monitor and volume control to set levels on standby program. The unit is of rack-mount size and may be started by remote switch to permit closer positioning of program sources.

CIRCLE 24 ON READER SERVICE CARD

AMANITA SOUND'S NEW MODEL

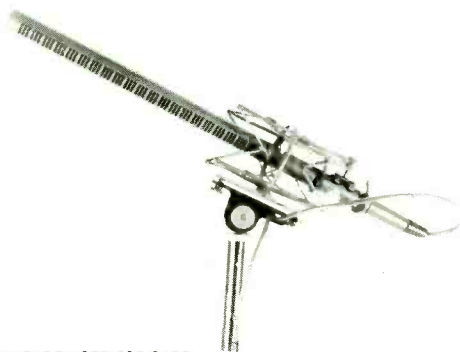
Amanita Sound Inc. has announced its model 909 PA. The 909 is a "two-way system with each enclosure consisting of two 12-inch speakers and one 2" by 6" ceramic-element horn." It is designed to have the two speaker cabinets clasp together, thereby affording protection in transit. Price for the Model 909 is \$240 *per pair* cash discount; net price is \$263.75 *per pair*.



CIRCLE 25 ON READER SERVICE CARD

NEUMANN'S SHOTGUN MIC

After years of experimentation to produce a unit "which is a significant alternative to the many now on the market," Neumann — through its U.S. outlet Gotham Audio — has announced that it will market its first ultra-directional shot-gun microphone under model number KMR 82i. The new mic is said to offer a smooth frequency response and a "remarkable" directional pattern which differentiates pattern vs. frequency less severely than traditional models. The result is less off-axis sound coloration. Price is about \$795.



CIRCLE 26 ON READER SERVICE CARD

BGW SHOWS NEW UNITS

New from BGW Systems are two power amps and an electronic crossover. The model 100B is of rack-mount width but only 1¼ inches high. In stereo use, output power is 50 watts per channel (minimum sine-wave continuous average power output, both channels driving 8-ohm loads, 20 Hz to 20 kHz). Switched for mono, it produces 120 watts (same provisions). XLR and quarter-inch input connectors are at the rear with the stereo/mono switch, plus barrier-strip availability to circuit and chassis grounds — said to be a BGW first. Front panel includes dual channel level controls, headphone output, power switch and LED readout of power.

The model 250D — newest in the 250 series — offers 100 watts per channel in stereo mode, and at least 251 watts in mono. It is 5¼ inches high with rack-mount panel.

The crossover is BGW model 10 — single channel input with two adjustable outputs. Crossover frequency operation provides a total of 120 possible curves; the subsonic filter provides the same number of options.

CIRCLE 27 ON READER SERVICE CARD

MY FIRST DIGITAL RECORDING

A trickle of disc recordings made with some degree of digital technology has reached these quarters. One is a stereo disc containing Stravinsky's *Firebird Suite* plus the *Overture* and *Polovetsian Dances* from *Prince Igor* by Borodin, performed by the Atlanta Symphony Orchestra conducted by Robert Shaw (Telarc DG-10039). Another is Aaron Copland's *Appalachian Spring* plus *Three Places in New England* by Charles Ives, performed by the Saint Paul Chamber Orchestra conducted by Dennis Russell Davies (Sound 80 DLR 101). A third is *Flim and the BB's* (several pop selections), also on the Sound 80 label (DLR 102). With the last two albums, sent from the 3M Company, there's information explaining that the mastering was done on 3M's digital tape system. The Telarc release does not state which digital machine was used, but the process was the same: record the original take digitally to create the master tape; then use conventional analog methods to cut the master disc.

While the full process, therefore, by which the final album is made cannot be termed completely digital, a significant major portion of the first recording stages is digital. And so, a performance margin is gained at the very outset in terms of dynamic range and signal-to-noise. In this regard, the use of digital for mastering combines the best of both worlds in terms of the cleanliness and dynamic span of direct-to-disc, plus the facility for overdubbing, synching-in tracks, splicing, and so on common to conventional tape recording.

Judging from what I hear on all three discs, it is an acoustic success. All three discs, played on my own stereo system, have ultra-clean sound, flawless surfaces (which probably is due as much to careful post-tape processing as to digital mastering) and ample dynamics. The Telarc release has, in addition, a very spacious feeling plus astonishingly powerful but clean bass response. The two from Sound 80 have a relatively "drier," more close-up, acoustic feeling which is suited to the music and its arrangements—all three discs in sum demonstrating that artistic and technical options on the part of performers and producers are still flexible and variable under the new digital technology.

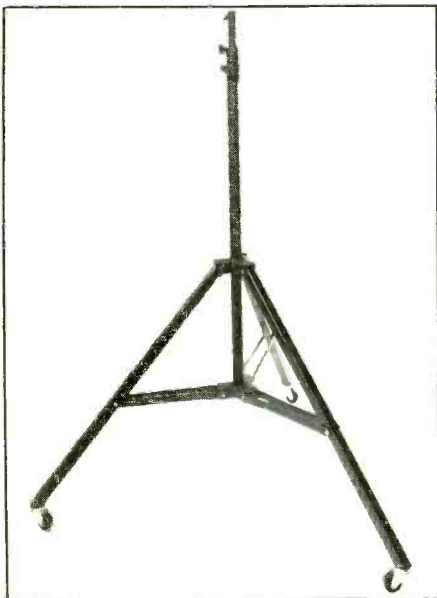
The three discs are excellent source material for making first-rate "homemade stereo" on one's own recorders, and for proving out audio playback equipment. Needless to say, I eagerly await future releases of this sort.



NEWSIGALS

SOUND REINFORCEMENT EQUIPMENT

Keith Monks (USA) Inc. has announced the availability of a new range of microphone stands designed for portability plus physical stability. The new models are constructed from steel and reinforced aluminum and feature an anti-shine black anodized



finish. The HD/1 is a tripod-type stand with three lockable casters on the legs. The SHD/3 is a super-heavy duty stand featuring a large center stem which rests on the floor with a suction pad for the utmost stability. As accessories to these new, heavy-duty stands, Keith Monks is offering a heavy duty boom arm with tilt head, and a loudspeaker mounting plate.

CIRCLE 6 ON READER SERVICE CARD

MUSICAL INSTRUMENT ACCESSORIES

RolandCorp US now includes a touch-controlled wah unit, designated

the TW-1, under its Boss line of accessory products. The TW-1 incorporates a sophisticated, voltage-controlled wah filter which is controlled by the voltage generated by an envelope follower circuit. The envelope follower is designed to follow the dynamics and attack and decay characteristics of the incoming notes so that the wah filter will be swept in direct relation to the loudness of the input. The unit is furnished with controls for sensitivity and peak, or filter sharpness, and a drive switch which determines whether the wah filter goes up or down in frequency in response to increasing input level.

CIRCLE 7 ON READER SERVICE CARD

One of the most unusual guitar accessories has been introduced by Gizmo Inc. The device is known as the Gizmotron, and is designed to simulate the sound of bowed string instruments such as violin and cello by mechanically bowing the strings of an electric guitar. The basic device was invented by Kevin Godley and Lol Creme, who were founding members of the group 10cc, and was originally known simply as "the gizmo." The Gizmotron attaches to virtually any guitar via a quick-release bracket. It is mounted over the bridge of the guitar so that pressing any of the six buttons on it will bring a motor-driven wheel into contact with the corresponding string, thus producing a bowed sound. Entire ensembles may be simulated by



engaging several of the wheels, and holding any of the buttons down results in infinite sustain of the note being played. The manufacturers are quick to point out that the Gizmotron is not an electronic effect; rather, it is a device which turns a guitarist's fingers into bows and his guitar into a whole new instrument.

CIRCLE 8 ON READER SERVICE CARD

From Electro-Harmonix comes news of the Micro-Synthesizer, a sophisticated accessory device which simulates many of the most popular synthesizer voicings from a guitar signal. The unit has four voices—guitar, octave, sub-octave and distortion—which are completely independent and which are mixed via front panel controls in any proportions. These signals are then modified within the Micro-Synthesizer



by an envelope control and a sophisticated filter circuit with highly variable sweep options, for a wide range of effects, including various "bowed" and "blown" note sounds. Also available from Electro-Harmonix is the Hot Tubes overdrive simulator. Hot Tubes is a solid-state device which is said to simulate to a remarkable degree the round, warm, sustained sound of an overdriven tube amplifier. Controls on the unit vary the volume, tone and overdrive for maximum tonal flexibility. The unit is AC powered, and is housed in a rugged aluminum chassis.

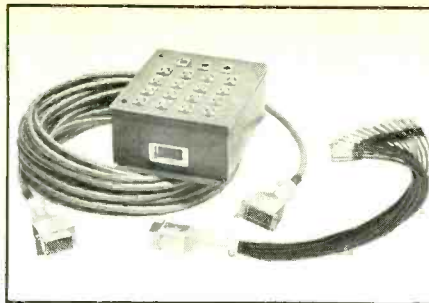
CIRCLE 9 ON READER SERVICE CARD

SOUND REINFORCEMENT EQUIPMENT

A new name in the field of P.A. equipment is ConcertAudio, who offers an extensive line of monitor and P.A. speakers and cabling systems. Heading their line of P.A. speaker systems is the 5845, a compact four-way system utilizing a Direct-Folded Radiation system for superior bass response from a relatively compact enclosure. Speaker complement for the 5845 includes a single 15-inch woofer, 8x5-inch midrange drivers, 2x6½-inch mid-high drivers and a horn-loaded ultra-high frequency transducer. Nominal impedance is 8 ohms and power handling capacity is rated at 350 watts RMS continuous. Also available is the SP-845A, a compact P.A. system using eight full-range 5-inch speakers in a Direct-Folded Radiation enclosure, which is ideal for stand mounting or use in a distributed system in a club. Monitor speaker systems are available



in several configurations ranging from the SP-245, a mini-monitor with two full-range 5-inch speakers, up to the SP-112B, a three-way floor system incorporating a 12-inch woofer, 6½-inch midrange and a high frequency horn. ConcertAudio also manufactures multi-pair snake cables in a variety of lengths and configurations. Two basic styles are available, the professional MXC series and the semi-pro MCC series. The MXC series is modular, using multi-pin connectors on each end of the cable length; at the stage end, the snake terminates in a steel connector box with a mating multi-pin connector on the side while an XLR fan-out plugs into the other end of the snake. The MCC series is an economical alternative for those who don't need the flexibility and ruggedness of



CIRCLE 10 ON READER SERVICE CARD

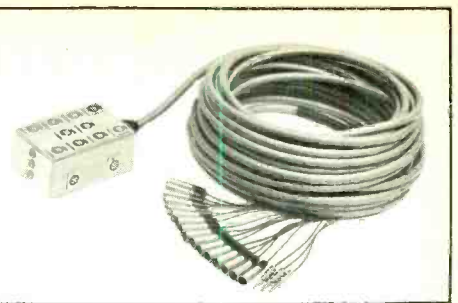
the MXC series; the MCC series features hard-wired construction on both ends with a cast aluminum connector box on the stage end, thus saving the cost of the multi-pin connectors. Various configurations are available in both series ranging from 9-pair up to 30-pair, and standard lengths are 125 feet and 250 feet for the MXC series and 100 feet and 200 feet for the MCC series.

All-Test Devices Corp. has come up with a clever accessory to help keep things neat on stage. The Hold-Up is a cast aluminum holder designed to slip onto any mic stand to hold drinks, cigarettes, spare picks or anything else that tends to mess up the stage. As an added feature, All-Test will imprint up to five lines of name, address or logo on the Hold-Up.

CIRCLE 11 ON READER SERVICE CARD

MUSICAL INSTRUMENTS

Elger Company has announced a new addition to Ibanez' Performer Series range of moderately priced electric guitars. The new model is designated the PF-400 and is the new top of the line model within the Performer Series. The construction of the PF-400 features a solid mahogany body with a carved top of bookmatched solid maple, and a rock maple neck for excellent sustain and exceptional brilliance. The model has a rather classic appearance thanks to its "old style," dished, contour top and a choice of Antique Violin or Midnight Olive finishes. The PF-400 is a two-pickup model with a conventional Ibanez high-output humbucker in the bridge position and a Super 70 Tri-Sound pickup in the neck position. The Tri-Sound pickup system utilizes a three-position mini-toggle switch to select standard humbucking, reverse-phase twin-coil, or single-coil modes for incredible versatility and range of sound. Separate volume and tone controls are provided for each

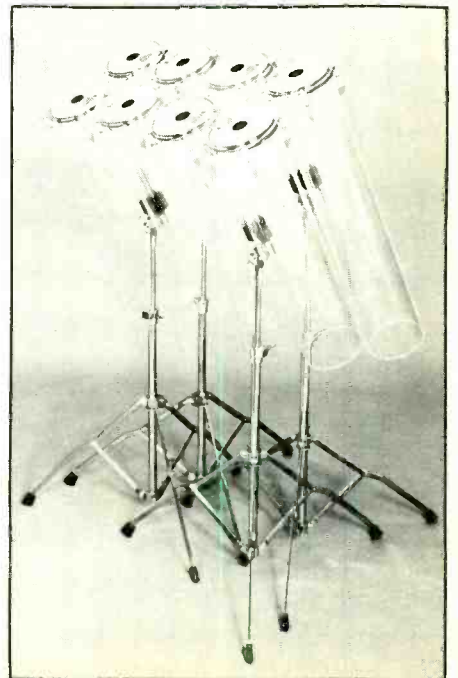


pickup and feature the new, Ibanez Sure Grip knobs with their special contour and rubber inserts. And, like the rest of the Performer models, the PF-400 uses the solid Gibraltar Bridge and Quik-Change Tailpiece which offer full adjustability without any compromise in sustain.

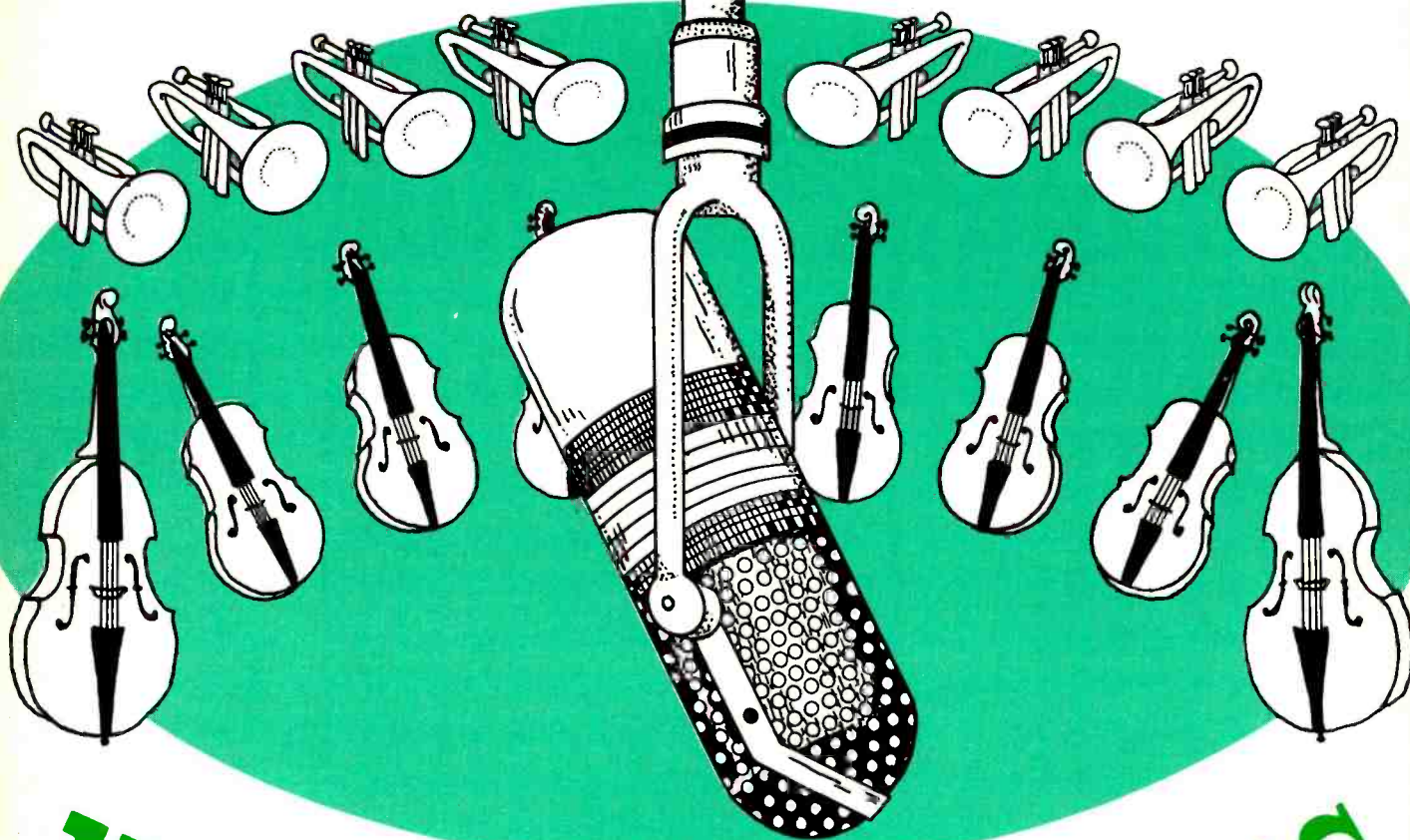
CIRCLE 12 ON READER SERVICE CARD

Elger has also announced new hardware to go with their Tama Octoban octave-tuned drums. Specifically, they now offer sets of four specially designed stands which accommodate the eight drums of an Octoban set in pairs for maximum strength and versatility of set-up. Tama Octobans are tuned drums which use 6-inch heads and single-diameter shells of graduated depth to yield a diatonic scale when all heads are tuned to the same tension. The shells of Octoban drums are made of transparent, seamless, cast acrylic for powerful sound and excellent strength. A full set of eight Octobans is said to occupy the same amount of space as two 15-inch tom-toms when set up in the most compact manner.

CIRCLE 13 ON READER SERVICE CARD



MIKING



HORNS & STRINGS

By Bruce Swedien

This is the final segment in what has grown into a three-part article on miking techniques. The first section ("Hot August Mics") appeared in our August 1978 issue; the second section ("Miking Vocals") appeared in the November 1978 issue. The three parts covered miking techniques for the rhythm section, lead and background vocals, and, finally in this issue, strings and horns.

Modern Recording is very pleased to have been able to pass along knowledge from the much-respected engineer Bruce Swedien, and we are sure that the articles have been rewarding for our readers.—Editor.

Recording the horn and string sections of a multi-track music session perhaps could be best referred to as recording the "traditional instruments" of the orchestra.

Using this as a premise then it would appear to follow that one should use "traditional recording methods" when recording this portion of the orchestra. Simply, a couple of mics high in the air and hit the record button. It isn't quite that simple.

To apply a blanket technique such as this to recording horns and strings is as hopeless as it is to attempt to standardize on a technique in any phase of today's recording; it certainly

keeps life from becoming dull. Knowing what these instruments sound like in a traditional music setting is extremely important; listening to high-quality "live" music in a good acoustical environment is the ear's best reference. Most music is conceived to be heard with acoustical support. This fact is extremely important to consider when recording strings and horns. My prime concern when recording an orchestra is to have the strings and horns reproduce with as natural a quality as possible.

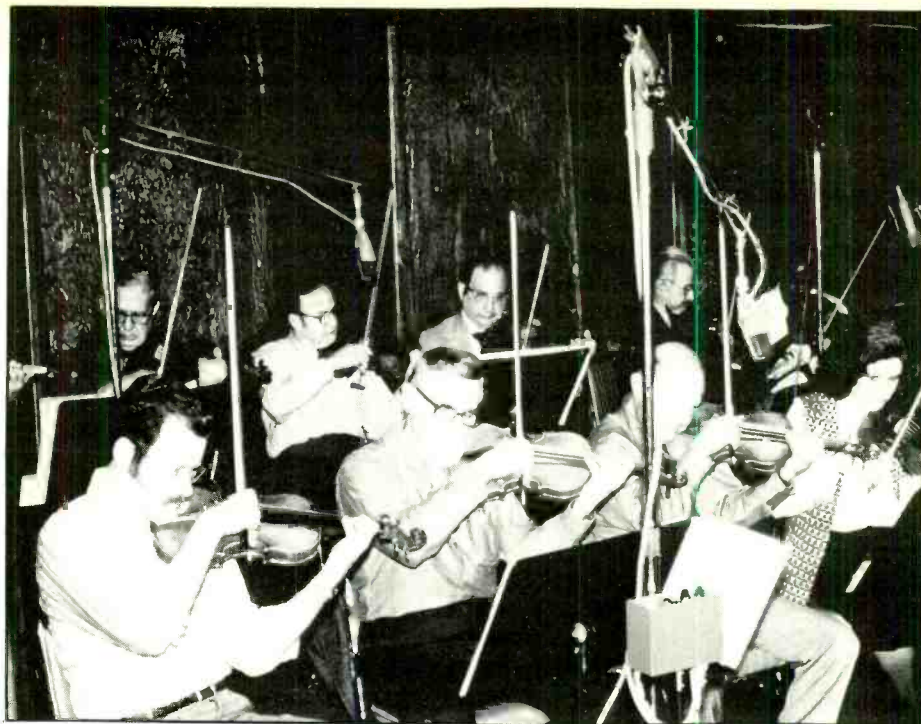
The acoustical quality of the recording room and the studio set-up are the first items to consider. A good-

sized room with a nice high ceiling, free of flutter echoes and standing waves is just about ideal. The orchestra should be set up with good visual contact with the conductor. If maximum separation between elements is required then the strings should be recorded separately from the horns. (For purposes of this article we will assume that the rhythm section and vocals have already been recorded on the multi-track tape master.)

Figure #1 — Basic String Section Set-up: My first choice of microphones for violins is the AKG 414EB. Any of the AKG mics of the 414EB earlier series also is fine for violins (i.e., AKG C-12, C-412, etc.). It seems that a good string section should be miked and recorded almost the same way you would a choir. There often is a definite similarity between these two musical sound sources.

A good choice of microphones for violas and celli is the Neumann U-87. The Neumann U-67 also works very well in this application. If the cello section is smallish (1-4 celli) I usually use my pet tube-type Telefunken U-47. This old mic has a "warm," rich sound on low strings.

When setting up the chairs in the recording room for the violins, each group of four players should be in a slight semi-circle so that each "fiddle" is approximately the same distance from the mic. The same applies to the low strings. To check for presence when the string section has assembled and is ready to start, have each player play the same pitch (note) separately. Listen in the control room to make sure that each player sounds equally present. You can then make individual adjustments by moving a player closer to the mic if he sounds far away, or have him move back a bit if he sounds too close.



I normally record a string section on two channels of the multi-track tape. These two channels are panned hard left and hard right in the monitor speakers. During the recording the violins are panned full left, the violas center but slightly to the right and the cello center but slightly to the right. With this string set-up there will be a good deal of acoustical cross-over creating a very satisfying string section image. As you can no doubt see, the pan-pot and physical position of the string section is the same as would normally appear on the concert stage. I have always felt that the real goal of microphone placement, particularly when recording strings, is to re-create the original sound field.

When recording a large string section playing well-written music in a good room I also use two large-capsule condenser microphones (i.e., U-87, C-

414EB, etc.) about twelve feet off the floor, one in front of the violins and one in front of the low strings. These two mics are then recorded left and right, mixed in with the other string mics.

Onward to the Horns

There are many techniques in use at the present time for horn recording. They can be reduced to two overall approaches. The traditional approach and the close-miked small horn section approach. The traditional or classical approach is suggested when recording classical horns or a big band. The close-mic technique is suggested for a small tight horn section such as is heard on many R&B and rock recordings.

The horn family of instruments would include far too many individual instruments to conveniently discuss here. To simplify, we will consider the following: trumpets, trombones, French horns, saxophones, double reeds (i.e., oboe, English horn, etc.), flutes, clarinets and a few solo instruments.

The traditional or classical approach to horn recording requires more planning during the set-up process than does a small horn section. The set-up should be done in such a manner that a good natural acoustical balance is created in the studio (see Figure #2). A minimum of microphones is used. With a good room and a little experimentation two over-all mics in an omni-directional pick-up pattern will do the best job.

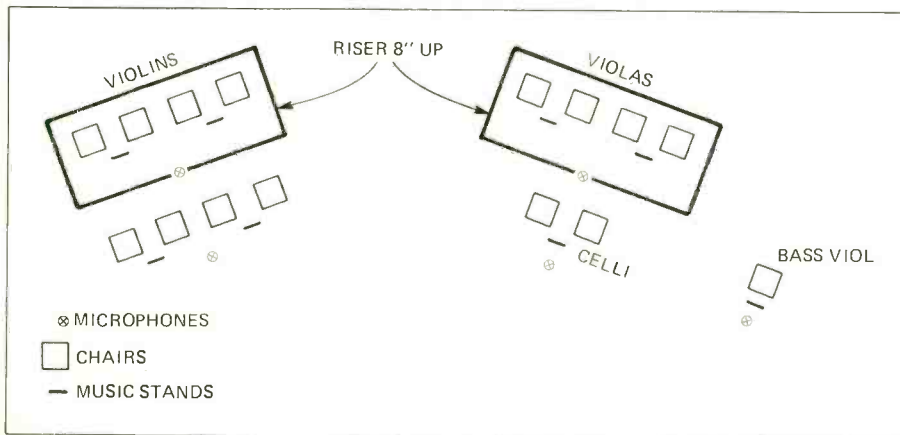


Fig. 1: Basic string section.

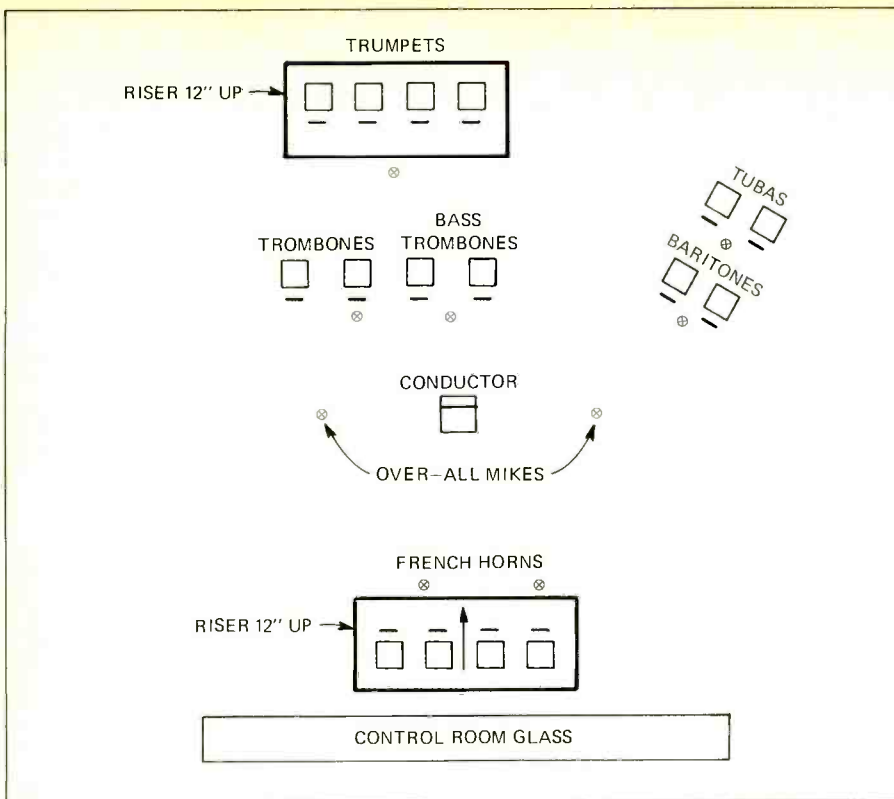


Fig. 2: Classical brass choir.

Close-Miking Drawbacks

There has been a trend in recent years to remove a good deal of room reverberation and acoustical support from the small-section recording of horns. To achieve this "dead" studios are used coupled with very close-mic technique. This has been done, I feel, to obtain more clarity from the horn

parts and also to allow nuances in the rhythm sound to be more easily heard due to the fact that these sounds are not covered up by room reverb, either natural or artificial. This approach to recording when carried to an extreme has a little-considered detrimental side effect. When recording in an extremely dead studio, using very close-miking,

the initial growth period of the sound is virtually eliminated. This component of sound is just as important as reverberation. It cannot be put back once it is removed. (Echo chambers won't do it.) A great deal of soft, absorbent material, indiscriminately placed in a studio will not only alter the growth rate component of sound, but it also will remove high frequencies from the sound. Again, once removed they cannot be restored.

When choosing a room to record in, make sure it is not an "audio closet." A good balance of absorption and reflection is necessary. In other words a mixture of soft, absorbent surfaces with hard reflective surfaces including as many non-parallel areas as is convenient.

My microphone choices for brass recording seems to be dictated by the music to be recorded. A good choice as an all-around mic for horns is the Neumann U-87. If I am asked to do a big band recording of mainly soft, lush songs I will opt for ribbon mics for the

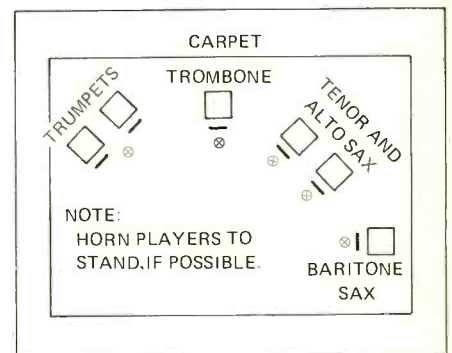


Fig. 4: Small horn section.

brass. RCA-44BX on trumpets, RCA-77DX on trombones. A small tight horn section for rock recording would require Neumann U-87 or U-67s on trumpets, AKG C-414EB on trombone, U-87s on the saxes or flutes.

Solo instruments seem to require a different mic for every situation. I do have some favorites, or first choices, that work well.

Harmonica: RCA-77DX

Solo trumpet: Neumann U-67

Flugelhorn: Neumann U-47 (tube-type)

Solo trombone: AKG 414EB

Solo flute: Neumann U-87

Solo saxophone: Neumann U-47 (tube-type)

Oboe or English Horn: Neumann U-87

Solo French Horn: Neumann M-49

The list could go on but this will give you an idea or two.

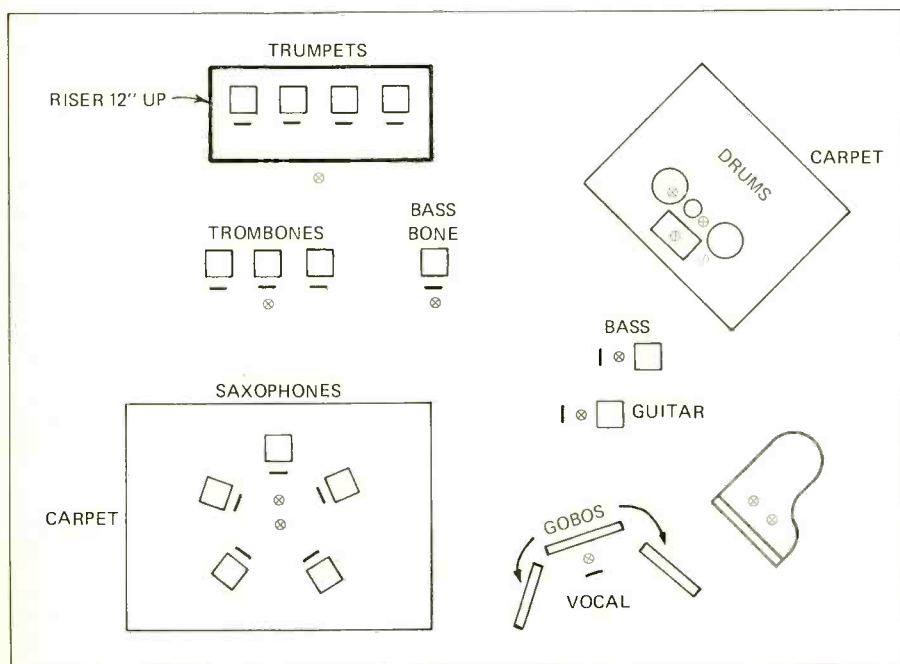


Fig. 3: Big band set-up.

THE ONE-KNOB SQUEEZER.

A compressor/limiter that gives you a free hand.

There are times in the life of every studio operator when an extra hand would make things a lot easier. It's for times like those that dbx designed its new Model 163 compressor/limiter. We call it the "one-knob squeezer" because it has only one control—to adjust the amount of compression desired. As you increase the compression ratio, the 163 automatically increases the output gain to maintain a constant output level. It's quite clearly the easiest-to-use compressor/limiter on the market.

But that's not all. Because the 163 is an "Over Easy" compressor/limiter, too. Which means that as the signal level crosses the threshold, the 163 gradually adds the desired amount of gain change over the range of several dB. The result is the most natural-sounding compression you've ever heard.

The 163 is as easy to install as it is to operate. It's light and compact—two may be rack mounted in a 1 3/4" space—and it interfaces easily with phono connectors.

But the easiest part of this "Over Easy" limiter is its cost. The nationally advertised value of the 163 is \$189.* With the money you save on a pair of 163s, you can get two extra hands in the studio. You can hire yourself an assistant.

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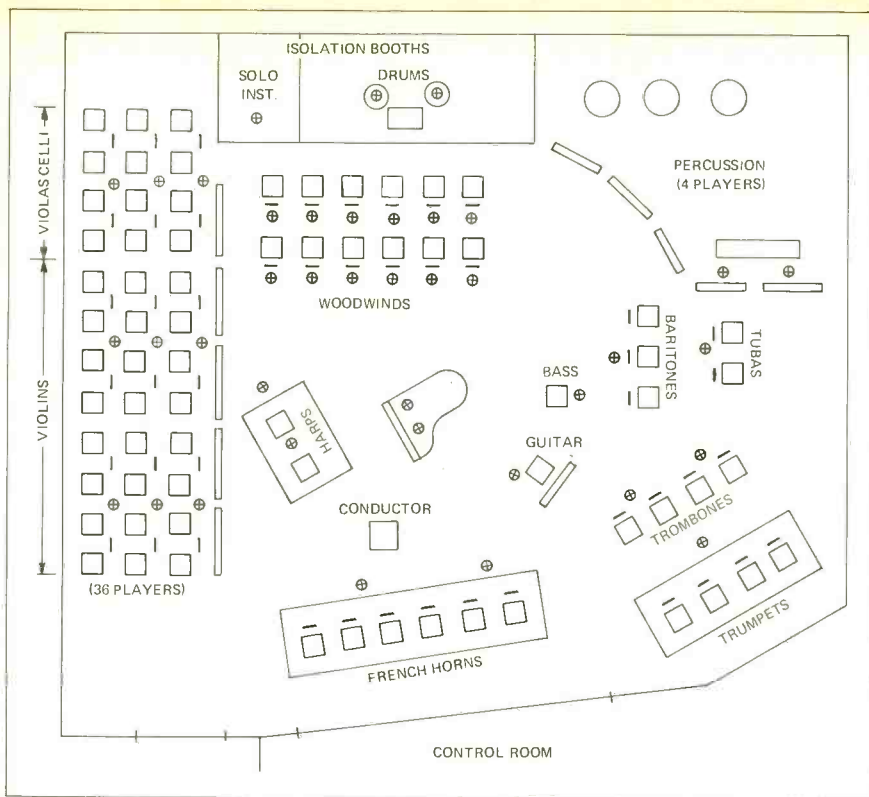


Fig. 5: Large orchestra straight ahead session (80 musicians).

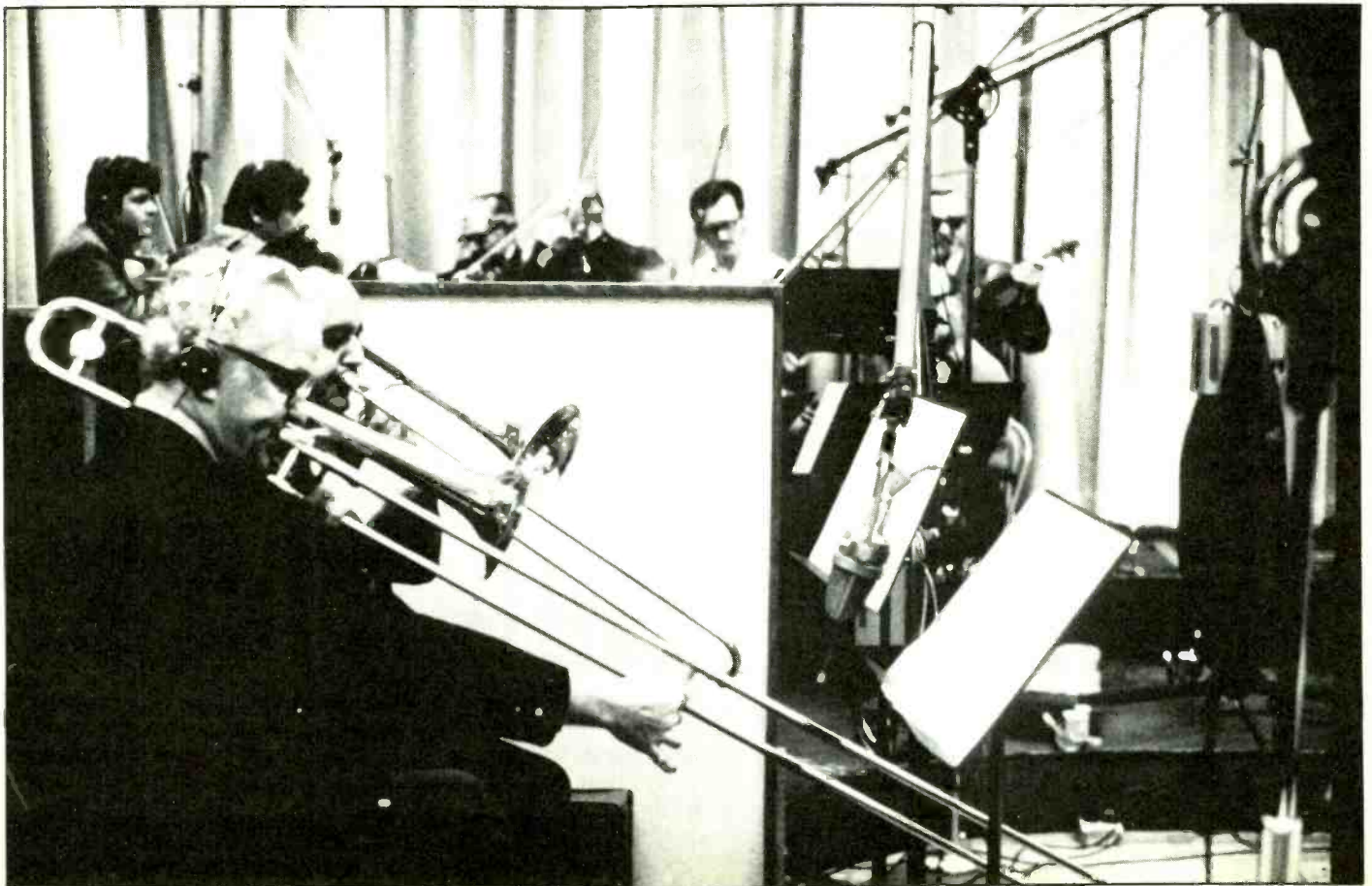
Amplification & Special Effects

Many instrumentalists are using electronic amplification and effects devices to augment the pure horn

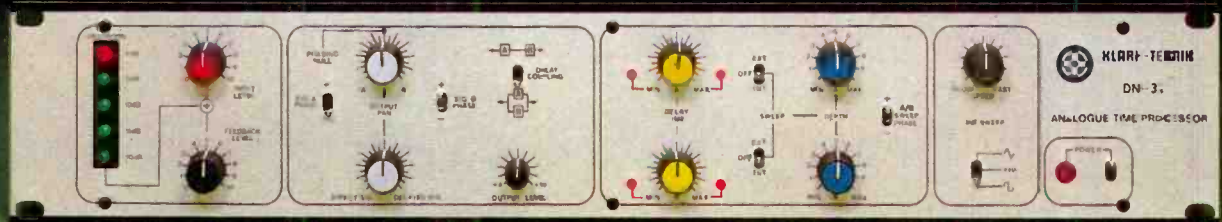
sound. The best results appear to be achieved by recording solos of this type on two separate tracks. One track is used to record the "live" sound by

placing a mic in front of the horn as you would do in a normal recording, the second track is used to record the processed signal. A mic in front of the amp is best for this. Some amplification noise is bound to be picked up. What is suggested here is to record the processed signal flat and unfiltered. Later, at your leisure, a good combination of equalization, filtering and mixing in of the "live" track can be accomplished. If the artist or producer wishes to hear an approximation of the "final" sound, a good rule of thumb is to add about 4 dB at 5 kHz and use a low pass filter set at 10 kHz. If there is excessive hum present in the signal a high pass filter set at 100 Hz will help. This is an attempt at generalization and cannot apply in all cases.

Since this is the final segment in this three-part series on microphone technique. I want to leave an observation with you. I have been a professional in this, my much-loved field of endeavor, since 1951. In this day of featherbedding, automation and barely-good-enough workmanship, isn't it great to be part of an industry that looks at its professional and asks, "How good are *you*?" Work hard, study a great deal. It is definitely worth it.



The new DN34 analogue time processor.



Think of the effect you'll have.

The new DN34 analogue time processor is an exceptionally versatile signal processing and special effects unit, designed around two discrete, independently controllable delay sections.

Like other Klark-Teknik products, the DN34 is the result of intensive research and development – the best there is in state-of-the-art analogue delay technology.

With a product of this stature you can achieve all these effects cleanly and noiselessly.

- Positive flanging.
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And, if this isn't enough, the DN34 can give you such new effects as: –

- Crossover flanging.
- Time-related frequency synthesis.
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The DN34 analogue time processor also offers you:–

- A dynamic range better than 90dB.
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- T.H.D. at less than 0.3%.
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The DN34 is unequalled in the signal processing field today.

And we're not just saying that for effect.



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For further information about the DN34, our new DN70 digital time processor, and also our DN27 and DN22 graphic equalisers:

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MR: Seated before our microphones today is Richard Dashut, one of two masterminds behind the recording and producing of the incredibly successful *Rumours* album. Richard, can you explain this unique association with your partner Ken Caillat and the band?

RD: Titles are too general. In every situation a producer and engineer might do something different, but in this case, Ken and I both co-engineer and co-produce. The credits will read: Produced by Fleetwood Mac with Richard Dashut and Ken Caillat. As far as the band goes, musically they are the only geniuses around here. They produce themselves when it comes to what they want in sounds and arrangements. As far as organization is concerned, the details, making suggestions, keeping things running and the instruments tuned, we have that responsibility.

MR: How long is the recording of this [new] album going to take?

RD: Hard to say right now. To give you an idea, *Rumours* took eleven months to record and it's only a single album. There is a possibility of a double album this time. So, I'm not sure how long it will take, but it will probably be a few months.

MR: Do you sense that the band is being cautious in following up *Rumours*? Is there any pressure in following a 14 million seller?

RD: No, not really. For us, the pressure is in making sure we come up with something different. We are always looking for a change. It is very important for us not to rest on our laurels and simply repeat the past. It is more important to grow and try things we haven't done. In that respect there is no pressure because this album will be a different character.

MR: Are the writers coming into the studio with the material and everything previously prepared?

RD: Yes. The songs have been

developed over the past year or two—since the end of *Rumours*. For the most part, they are not arranged. That is saved for the studio to get everyone's input; a lot of the words will have been yet unwritten. As far as exact wording, arrangements and how it will be approached, that is pretty much decided in the studio. The band will walk in with the basic ideas that they recorded at home on cassette but everything else is saved for the studio.

MR: Are there any collaborations between members or do they still prefer to write alone?

RD: As far as the writing goes, they do not pair up and write songs. "The Chain" was written that way [collaboration] because it was conceived in the studio. As far as working on background parts on the basic tracks, they will go over to each others' houses, sit around the piano and work things out. Although I haven't seen much of that on this album.

a session with

Fleetwood Mac

SPINNING PLATINUM

• By Murray M. Silver, Jr.

MR: On each of the last two albums there were two singles and four other songs chosen for FM airplay. The band does not go for themes and concept albums, so I'm wondering what will be the focus of a double LP. What is the purpose behind that?

RD: This album will purely be an expression of desire, of love, of music. We are thinking of doing a double because of the fact that there have been very few great double albums out. We're talking maybe the Beatles [the "White" album] and Elton's *Goodbye Yellow Brick Road*. I can't think of any others, unless you want to consider the first Chicago album where one side was completely free-form guitar and improv.

We feel we've got a lot of good material. The band is very prolific, so there is no problem in finding enough material for four sides; and there won't be any cereal filler, either. There will be four very strong sides or we simply

will not put out a double album. We're not doing it for the hell of it. We feel we have a lot to express and two sides won't cover it completely.

MR: Does Fleetwood Mac consider *Rumours* to be a pop classic?

RD: We knew we had something hot after the first two months of recording. We would sit back and listen to some of the basic tracks before the overdubs were added and we'd say, "My God, this is sounding really good; we've got something here."

We knew in our hearts and in the back of our minds that we were doing the heaviest stuff we'd ever done. The music was taking on an unexpected aura; the character was much different from anything else they had ever done. We had an idea that we had made a good album before it was released but we had no idea that it would stay #1 on the charts for six months.

How do you explain something like that? I don't know. It doesn't change

you that much, but it's funny . . . you can go into the studio and make a successful album, but it does not necessarily mean that you feel fulfilled just because it sells 14 million copies.

MR: Were there any mistakes on *Rumours*?

RD: Oh, yes. As far as mistakes go, we're talking about maybe the way Kenny and I wanted to record some things or maybe the way we wanted a song to sound. It really isn't a matter of mistakes, but rather a little bit of hindsight. After spending a year working on it we couldn't stand to listen to it; but today when we hear it, we are basically pleased.

MR: Who the hell are you, anyway?

RD: Hey, look, I went to college—philosophy, psychology, the whole thing. I quit because I was bored with not learning the things I wanted to know. I moved from Las Vegas to Los Angeles and I didn't have a clue as to what I wanted to do, with myself. I

considered getting into motion pictures, music, a bunch of things.

What did I know about music? Well, I grew up with a bunch of guys who were musicians and everybody around me was playing guitar so I took up a few instruments, but I never had the strict discipline to practice eight hours a day, seven days a week.

So the question I put to myself was how do I want to express myself. I was looking for a way to reach out and tell people I was alive. I was in that frame of mind when I heard about this studio that a friend's mother had a silent partnership in. That was Crystal Studios in Hollywood.

Because I had some sort of "in," I thought I would go down and apply for a job. I had never been in a recording studio and I hadn't a clue as to how albums were made. It wasn't a burning desire that prompted me to do it because I didn't even know what an engineer was and I wasn't the kind of guy who goes out and buys all the albums and sits for nine hours a day listening to them. For me, it was a matter of walking into the studio to get a job around musicians in order to get a sense of purpose. At Crystal I worked for nine months literally sweeping floors and cleaning out toilets. The only time I was allowed in the studio was to clean out ashtrays.

I remember the first time I walked into the control room and saw these tremendous speakers and tape machines and this big board with all these knobs—I hadn't a clue as to what it was all about. It was so far above me, it was such a long range goal, that it kept me going. The fact that I had to start from scratch and grow into something combined with the marvel of all the equipment made me realize that this was what I wanted to do. Here was a chance to combine what I enjoyed doing—listening to music and hanging around musicians—with a career which I hoped I could one day make money at. I never dreamed that I would ever make money at this business, it wasn't my initial intention.

MR: What groups did you work with at Crystal Studios?

RD: I was cleaning out the toilet for Jackson Browne and I had to sweep the floor one day when James Taylor walked in with muddy shoes. I was a biggie then. You could say I was in charge of "cleaning up everybody's act." You haven't lived until you've been on your knees scooping out a

toilet. It's the lowest common denominator. I played it safe. I started out with toilets and worked my way up.

MR: How did you get out of the bowl and into the studio?

RD: I met a gentleman named Keith Olson at Crystal. Keith engineered the *Fleetwood Mac* album. At the time, he was working at the mastering facilities and we would spend some time talking about our common interests.

A political thing came down at Crystal and a co-owner decided he didn't want me around anymore and he fired me for personal reasons. For two weeks I laid around in a depression, undecided between suicide and the French Foreign Legion. Keith and David DeVore got together and said, "Hey, you know that young punk who used to sweep floors in the studio? He's a good stickman, why don't we hire him for Sound City Studios?" Keith was head engineer at Sound City, so he asked me to come to work there. I jumped at it immediately.

MR: What sort of a job was it?

RD: Here's the funny part. I was an apprentice maintenance man, a boffin. A boffin is what the English call a technical genius, the man who knows how to fix everything.

MR: Did you?

RD: No. I was a total failure at it. They quickly realized that I was not cut out for fixing equipment. I think they got the message one day when they asked me to replace a resistor and I asked, "What's a resistor?" I kinda gave myself away there.

After three or four weeks of aligning tape machines only to have engineers playing tapes back finding no high end at all, they decided that I was not suitable. Keith still liked me in spite of all of this and he decided that I might make a good second engineer. So, finally, into the studio. Finally, a button pusher, tape changer and keeper of the logs—all the fun stuff.

MR: Who were you working with?

RD: We worked with such people as Emitt Rhoades and Domenic Troiano; nothing huge, but known people.

My first job at Sound City was to paint the control room. On the second day of the job there was a gentleman standing in the corner with his girlfriend smoking a joint, and because I like smoking joints myself, I went and joined them and we became instant friends. That couple was Lindsey Buckingham and Stevie Nicks.

MR: You're kidding.

RD: No, I'm not. This was about a

year before the *Buckingham Nicks* LP came out. They had been up north in a band called Fritz and had done a few demos with Keith when they decided to go off on their own. They were trying to cut a record deal. It took a year but it finally happened.

As it happened, I eventually moved in with Lindsey and Stevie and worked as Keith's second.

Lindsey had a Ampex 4-track and he set up a studio in my bedroom. It was delightful after spending all day in the studio to come home to more music. I had to sleep between the editing block and one of the empty reels.

All this time Lindsey spent co-writing and arranging the *Buckingham Nicks* album, most of which was dating back two years from the time when they were playing up north. That is the way Lindsey has always worked, at home on a 4-track. His music never came from magic—although he has lots of that—just a lot of hard work. He also gave me quite a bit of basic recording knowledge on such things as bouncing tracks and synching.

The *Buckingham Nicks* album was the first album that I ever seconded with Keith. I spent about two years as his second and another year with Mark Smith. Mark and I mixed the Bachman-Turner Overdrive *Not Fragile* album together. I only got the chance to work my own sessions on weekends when the studio wasn't booked and mostly worked for friends or people who could not afford to pay for the work. I was an easy touch.

MR: So, after Stevie and Lindsey dropped the second Buckingham-Nicks album to join Fleetwood Mac, how did you get into the picture?

RD: I got a call from Lindsey and he asked me if I wanted to go on the road to mix sounds for their concerts. So, I had this important decision to make—do I give up all of this or do I go on the road and eat? I made my decision before Lindsey was finished asking the question. And for a whole year, some ninety shows, I did the sound for the Fleetwood Mac tour in late '75 and through '76.

MR: Did you know how to mix "live" sound?

RD: Hadn't a clue. I hadn't even been to that many concerts much less mix them. It was a whole new thing, but I wasn't really happy except for the two hours during the show when I was in heaven. I love the aspect of losing myself in the mixing, it's like meditating. But it's the other 22 hours a

day on the road that I hate. Hey, these are great stories. The whole scene about this band is that it is so untypical, so un-what-you'd-expect.

MR: Where does your partner Ken Caillat come in?

RD: During the tour, we had stopped off to do a show for King Biscuit Flour Hour and I had to find a place to remix it because it had been recorded very poorly. I ended up at Wally Heider's Studio primarily because it was available and had a good mixdown room.

So, I come walking into the room with two tapes in my hands and there sits Ken. I sat down to begin work and I was feeling a little nervous. I introduced myself as an engineer, he said the same and we sat silent for a few minutes. Then he asked me if I smoked weed, and I said, "Yeah." He followed up by asking if I wanted to get high, and, like with Stevie and Lindsey, we became fast friends.

We put the tapes aside for a few minutes, smoked a joint and spent most of the night mixing tapes. The band liked the job and they liked Ken, I liked Ken, everybody liked Ken.

MR: How could Fleetwood Mac come to ask the two of you to engineer and produce their album if you virtually had no experience?

RD: Deke Richards was originally scheduled to engineer *Rumours*. I remember meeting him at a party shortly before recording was due to begin. The band had asked me to second on the album and I approached Deke and told him how much I was looking forward to working with him. Deke said, "Oh, I guess you haven't heard, I've got my own engineer I work with." And I said, "I thought you were the engineer." And Deke replied, "No, I'm producing."

The thing is, Fleetwood Mac doesn't hire producers. Deke was not hired to be a producer. The band doesn't need one. They are capable on their own. They don't need someone shouting in from the control room telling them what to do.

When the band found out about Deke's intentions and the fact that he was going to ask for a bit of money to do it, it didn't work out and they decided not to use him.

I remember walking out into the parking lot with Mick wondering what we were going to do for an engineer when he just turned to me and said, "You're going to do the next album," just like that.

If you want to know the truth, *Rumours* is the first album I've ever co-produced on my own and one of the first times I had engineered on my own. I'm not kidding. It's gross, isn't it? It's silly. What did you expect, heavyweights?

MR: Yes, quite frankly.

RD: That is what's fucked up about the music business. You've got a lot of experienced people running around with preconceived ideas of how music should sound. Album after album after album turn out the same. Maybe it's time for people who don't know what the fuck they are doing to come along and work solely from their feelings, not because they are [technically] knowledgeable, but because they may have something to offer artistically. Maybe out of a naive energy something heavy can come out. *Rumours* had not the slightest element of preconception. It was born out of an expression of desire. I'm sick of bullshit from producers who say, "Leave me alone, I know what I'm doing."

MR: Richard, you're getting a little angry...

RD: If you want to know exactly my sentiments on the matter, I'm bitter. The music business has become very disillusioning to me. I used to look up to the heavyweight producers and engineers because they were amazingly talented, but turn on the radio and maybe there's one out of ten songs that is decent.

Any huge moneymaking machine, like a dinosaur, is not going to adapt to change. The future of the music business lies in the hands of the musicians and writers, not the producers or engineers who try to manipulate them. They are safe with their formulas. They know the public is going to buy it and they stick with the tried and true. The business is commercially oriented, not artistically motivated.

MR: Do you think that is what prompted Fleetwood Mac to change from being Britain's #1 blues band to a west coast pop group? Did the Mac discover a formula to crank up its own moneymaking machine?

RD: Nothing prompted Fleetwood Mac to do anything. There is no motive behind them; it's all instinct. Fleetwood Mac got together in its present form because Mick felt Stevie and Lindsey had a lot to offer; it just happened. All Mick needed was a vocalist and a guitarist. He didn't say, "Aha! Let's mix a British blues band with a west coast sound and see what



Rumours producer Richard Dashut

we get." It worked out into an amazing combination, but it certainly wasn't planned that way.

MR: We have talked about what makes a great band, but what do you think makes a great producer and engineer? Are there any? Face it, *Rumours* was your first time out. What changed you from a men's room attendant into a successful engineer and producer?

RD: My high school education.

MR: No, seriously. Is there any such thing as a great engineer and producer or are they just fortunate?

RD: I think that the highest qualities that a producer or engineer can have are sensitivity and understanding. Being able to listen to and absorb what the artist is trying to express instead of making the artist fit into a preconceived mold of how the engineer or producer thinks they should sound. They must free their professional egos to allow them to become open to the song and the artist. The music can tell you what it needs.

MR: I can see how you can do that with a band that you have known intimately for many years. But what happens when a new act comes to you and says, "Do for me what you did for Fleetwood Mac"? Is it possible to do that without moving in with them for several years?

RD: No, it is not possible. Not to the degree of the relationship that I have with Fleetwood Mac. It's possible, in

as short a period as you might have, to be open enough and try to get to know them. I don't think musical engineering is that cut and dried to where you can go into a studio and get hot and do it. The initial steps are getting to know the artist and understanding what you are working with and what he hopes to achieve. Then you figure out how you can help him.

As far as a new act goes, the engineer should provide a center point and base from which the group can build. If I cannot establish a personal relationship with an artist, quite frankly, I won't do the project.

MR: What were some of the problems that you encountered in your first time out as an engineer and producer?

RD: The first problem was that Ken and I had never done an album together and that Ken had not been around us very long. The second problem was a basic feeling of insecurity, which turned out to be an asset.

I was going through feelings such as "Should I really be here?" I mean, I knew sound, but I was wondering if the band thought that I was doing a good job. Ken was going through the same sort of thing.

The sessions had a lot of problems. We went through seven pianos and five piano tuners. After awhile, Ken and I were wondering if we still remembered how to get sound down on tape. Before each session, I would tune drums for an hour-and-a-half to three hours in order to get the perfect sound. In the studio, Mick played his old beat-up road kit and after playing two takes, the drums would go flat because the screws were loose. A tremendous amount of time was spent just on getting drum sounds.

It took two months just for everyone to adjust to one another. Aside from equipment problems, there were psychological problems in that the band was going through a tremendous upheaval. There were break-ups and realignments which had a tremendous effect on their music. Defenses were wearing thin and they were quick to open up their feelings. Instead of going to friends to talk it out, their feelings were vented through their music. It created a certain sensitivity. Our personal lives were in shambles and the album was about the only thing we had left. We were huddled up in this little house in Sausalito working 18 hours a day and our only release was our work, so we were going to make sure that at least that

was going to work out right. We put everything we had into that album. There was no magic to it, no key to success, just a lot of hard work. It was no accident, it was eleven months of working and reworking.

MR: How do you and Ken divide your duties?

RD: Our roles were not exactly defined on *Rumours*. Here we were two engineers who did the same thing where there was room for only one person to turn the knobs and keep it coherent. In other words, if Ken is working on drum sounds and I am working on guitar sounds, we aren't going to match up. It has to be done step by step in order to layer the sound frequencies properly.

What I found myself doing—since Ken is much more technically able than I will ever be, because I know nothing about electronics—was assuming the role of producer. I was able to accept that I have a certain talent and certain deficiencies. I work with people who know what they are doing. I don't think one man should be able to walk around thinking, "Hey, I know everything." You have to be able to accept help.

Ken has always been a fiddler. You know the kind of guy who likes to put together models and take apart clocks. My gift is communication—being able to work with people. I know when something feels right even though I do not have the ability to sit down and work out a musical passage myself.

As it worked out, I assumed the role of producer—communicating with the band, providing input, keeping things going—and Ken sat behind the board on my left where the input modules were, so he was more the engineer.

Fleetwood Mac is very demanding. You have five individuals and each will want something different at the same time; it goes on constantly.

MR: How do you reconcile all five of the differences?

RD: We tried all of the ideas to see how each one sounded. If somebody has an idea, we will talk about it first. Then if they still think we should do it, we'll try it. No matter how good a musician is, you just don't know how good something is until you put it on tape and actually run it up through the speakers themselves.

It was a completely democratic process. We tried all of the approaches before making a final decision. I will say that Lindsey has the most concrete musical ideas of anyone. If any-

one has a final say, it's Lindsey.

MR: By album's end, how would you describe your function, as a co-producer and co-engineer?

RD: In order for Ken to be alone at the sound board long enough to get something happening, I had to be there directing, keeping things going and keeping the band off Ken's back. We would overlap in quite a few areas. On the new album, Ken will do most of the technical engineering and mic placement and I will be doing the organizing and communicating. It will be pretty much the same as before, only more defined and less overlapping.

MR: What had Ken done before *Rumours*?

RD: He was mostly a remote man. He worked with Joni Mitchell and Crosby, Stills and Nash on most of their "live" recordings. Doing "live" sound enables you to develop a keen sense of how to handle problems immediately as they arise and Ken is good at that. He keeps himself covered and has control over what he want.

MR: Many times a producer gets in the way between the artist and the engineer. I suppose that under this set-up you were working to alleviate that.

RD: Ken and I have never had that problem. In some instances our arrangement might have slowed things down a bit because I might have wanted to hear one thing played back and he might want another. It wasn't like we were fighting, it was just that we were working to get something that we both liked. We are here to make good music, not show each other how good we are. It was a matter of getting to know each other. We have no defenses and no egos to protect. That's the key; attitude is the most important thing in the studio. We learn from each other.

The same time and energy spent in combatting an ego can be redirected toward something more positive. Many producers fall into that game, where they don't want to be considered expendable in the least.

MR: Who do you mix for, the kid cruising in his car or the audiophile?

RD: We mix to please ourselves. We are not directed toward any particular market. We mix the way we think it should sound and at the end of a session, we walk out knowing that that's the best we can do.

MR: How much time do you spend in post-recording?

RD: That is the most important

stage. We will have basic tracks, but we really won't know what the final product will be like. We won't have any idea about what sort of overdubs we will use. We will have the drums and bass, so it is futile to try to lock yourself into a sound on the basic tracks. We leave things open as possible for mixdown.

We change sounds quite a bit during mixdown to fit things in. We might change the EQ radically, take a dolby out or run things through an amplifier. It's quite an involved process for us. We will have a lot of neat things on tape and if you're not sensitive to it, you can blow the hell out of a song.

MR: Are the special effects added in the studio or during the mix?

RD: Special effects will be recorded on tracks while we are cutting so they can get the feel. Not that we know what the feel is going to be, but sometimes we will provide a certain effect, such as delay, that might inspire them to do a part that they normally would not do. The sound in the headphones might be a certain way; or maybe there will be more delay on the guitar and Lindsey will want to play less busily because of the sustain. So, he will build his part around that rather than if he had no effects requiring him to fill in with more notes. Therefore, it is important to provide the atmosphere while cutting as far as effects go. By trying different sounds you never know where it might lead to.

MR: What do you hope to capture on the basic tracks?

RD: The purpose of the basic tracks is to get a solid drum track where the time is straight all the way through without worrying about anything else. Most often we have to combine several tracks to get the drums right. After one take, if only the first half is good, we will make a 24-track copy of that first verse and then make two other verses out it.

MR: Therefore, may we deduce that the rhythm section is the key to the Fleetwood Mac sound?

RD: Certainly, but as far as recording goes, the key is editing. We are not ashamed of creating an entire cut from editing and overdubbing and completely reworking a song. If you listen to *Rumours* you will find the timing on that quite good throughout both sides. The tracks are very solid, which is probably why it has sold so well. You pick up at the start and keep going without losing the feel. We took a tremendous amount of time just

doing the drum tracks to make sure they were on time, not too busy and had the right feel so that all of the overdubs would lay on them easier. It is a more basic approach. Rather than trying to get five instruments on a basic track, we will start with two or three and wind up taking everything off but the drums. That is one factor of the Fleetwood Mac sound.

MR: What are the other factors?

RD: The major factor of the Fleetwood Mac sound has been the group as a whole. Lindsey is amazing when it comes to knowing sounds. They are all gifted as musicians. Things that helped to shape and form their music have been in the editing: a meticulous care for perfection of every beat and the process of sitting with a song month after month until we've heard it so many times that what goes on tape has to be good simply because nothing else sounds better. When you've been with a song that long, anything that is mediocre simply is not going to make it.

Some groups can go in and do an entire album in six weeks, sometimes just to see how fast they can do it. That is fine for the others, but that's not how we work. It is a long process of staying with it, trying different things and getting the best possible edition.

MR: Is that why Fleetwood Mac will not do a "live" album?

RD: We will not do a "live" album because we believe that "live" music and studio sound are two different things. I personally do not like "live" albums. I would rather go to a concert and *feel* it rather than hear a recording of it. Editing in a studio is essentially the art of an album, and you can't very well do editing on stage.

MR: What differences are there in mixing Fleetwood Mac in the studio and mixing their concerts?

RD: In "live" mixing I start off by leaving everything flat until they get into the first number. I remain very flexible and treat each song individually. It is a very psychological thing that you are doing to the audience. If Lindsey takes off on a really hot solo, I bring it way up. When he steps into that spotlight, everyone's eyes are on just him; he's the center of attention, so I turn it up to emphasize that because I think the audience anticipates it. I don't think I mix the same songs or the same shows in the same manner from one concert to the next. The different locations can do funny things to

ambience and acoustics.

MR: How does the band react to criticism of its concerts?

RD: First of all, the band does not read reviews. They realize that they are human and that they make mistakes. On an off day, if a critic writes about something which he has accurately perceived, then criticism is a good thing.

Several reviews have been unfair in that the critics suppose too much. One article accused Stevie of being lackluster because she was [supposedly] bored with having to perform the same old songs, which isn't true.

Criticism is usually well received, but we do what we do best and the audiences love it. Maybe Stevie isn't feeling well; maybe it is 100° outside and she is wearing all these clothes and she's been singing the song for three years. Maybe she can't get herself psyched up each time even if there are 80,000 people out there. Ok, so she can't do it, so what? If there is a critic out there who wants to make something of the fact that her voice isn't in the best of shape, what's the point? That's reality. Fleetwood Mac is not a group of gods.

MR: Yes, they are.

RD: No, they're not. That's the thing I'm trying to relate. The phenomenon of their success can overshadow the actual music itself. Perhaps Fleetwood Mac has become such a sensation that people are more in tune with that rather than Fleetwood Mac's music itself.

MR: Well, heroes are hard to find . . .

RD: I know *Rumours* was one of the heaviest things out in a long time. To create that, the band just does its job better than anyone else does their job. They don't feel special about themselves.

MR: Will you improve on *Rumours*? Can you put the same effort into this album? Did the old feeling come back?

RD: That's a good point. The struggle to improve on what has come before is a great pressure. The approach we are taking is to do something different, to keep growing so that when we come into the studio we have that sense of urgency which is usually lost after a big album.

We worried all the way through *Rumours*. We worried that it was taking too long and that it might not sell. We spent damn near half a million dollars on the album and it could have just as easily gone nowhere. There was a sense of urgency and struggle which

kept us going at our peak.

Many people would think that same sense of urgency isn't here on this album, but it is. We created one by attempting to do a double album and to create such a variety of songs with different sounds and textures that at this point, we have no idea how it's going to turn out. So we have the same worries about creating something new. No one here is that secure in his success not to worry.

MR: How do you cultivate "different?"

RD: First, you look for the spark in wanting to find a different sound. You cultivate it by trying different sounds and techniques. There will be a lot of qualities from *Rumours* as well as a lot of new things.

At this point, we have the basic tracks to half of the songs and again, it's the overdubs that will take them in a particular direction. So, I'm not sure how "different" is cultivated; we are still looking for it.

We aren't here to do a technically perfect album; we want sounds with character. I think back to the fifties when the only songs came from the floor of the studio . . . but they had character. Why does the snare drum have to sound like a thick piece of beauty? Rock is the snare sound, the roomy sound, and I like that old Elvis quality. I tend to shy away from technical sterility.

MR: Do you think *Rumours* is Fleetwood Mac's best work?

RD: No.

MR: Do you think for its time it was your best work?

RD: Yes.

MR: Would there be drastic changes if you could remix *Rumours* today?

RD: No. I'd leave it the same as far as mixing is concerned. It is a statement for where we were at that time. From hindsight, I can say that we could have improved it, but I really wouldn't want to touch it. It was the best we could do at the time.

MR: What is the relationship that you and Ken have had with the band at this point?

RD: Technically, if the band doesn't like what we are doing, we abandon it. We all get together and discuss it. We don't say, "This is the way it's going to be." We work together for a common cause. It isn't like they do one thing in the studio and we do something else in the control room; we have a common ground. It works the other way, too. If the band is doing some-

thing that we don't like, we tell them.

MR: Mick, why did the band go on tour while recording this album?

Mick Fleetwood: I suppose we did it to feel like a band again. We needed a short break from the studio, but not a complete break from playing. So, we picked up a very few dates just to tighten up. Communication on stage is almost like mental telepathy and it was important to become attuned to one another before spending any more time in the studio.

MR: For the first time in recent recollection, the Mac's performances were sharply criticized. In point, one report blames Stevie for throwing off an otherwise exceptional performance because she appeared disinterested. Also, there were a few concert cancellations. How do you react, ultimately to such criticisms?

MF: We read what critics have to say, but that does not mean we are affected, just interested. I think occasionally they forget that we are human and that we will have our off days. Stevie, in particular, has had difficulties with her throat, and it tends to be a bit overpublicized. It's not so much a lack of interest, but sometimes it is hard to work yourself up to the same level of frenzy night after night. Some of the earlier cancellations were due to Stevie, but last time out it was Lindsey who collapsed. He was given a spinal tap which developed complications, but he's come around.

MR: Why does the band remain tight-lipped about a project in the works?

MF: Because of the way we go about recording only there isn't much to talk about until it's in the mix. Things are very flexible, very changeable up until the very last stages and there seems to be no point going into detail about the album while we are only recording the basic tracks.

MR: Do you hear from old friends from time to time?

MF: Jeremy Spencer is recording again and he is in L.A. from time to time. Peter Green is in the process of putting himself back together. He had been working on a solo album in England, but I'm not sure what's become of it.

Fleetwood Mac is presently recording in a new studio which was custom tailored for the Mac by the Village Recorder's [L.A.] staff in cooperation with Dashut and Caillat. The Mac had requested the use of two complete stu-

dios for one year's rental and were denied due to the fact that the one remaining studio would not be able to accommodate the long list of heavy-weights queuing to get in. So, while the band plays on in the comforts of Studio D, carpenters perch precariously overhead to make adjustments that the band may request.

To explain the instruments through which Mac music passes on its way to being grooved into vinyl, Ken Klinger, Chief of Electronic Maintenance guides us through Studio D. From the control room, there are four rooms which are capable of total isolation while remaining visually accessible. All rooms open on to the largest and centrally located room where the band is set up in very close proximity. The rooms come decked out with video cameras and playback units, track lighting which can facilitate television cameras and slide projectors which beam large scenic panoramas onto room walls to provide atmosphere.

"The board is the Neve 8078," Klinger proudly points out. "It is the newest and the only one in the country, one of two in the world presently. It's 40-in/24-out with a sixth generation Necam computer. It is a true digital computerized system in that the faders actually move by themselves after they have been programmed. It is able to store 999 mixes on one disk and its merge function makes it possible to select exactly what you want from any mix and combine them. The SMBTE time code allows the computer to run the tape machine and therefore the console and tape are linked in every aspect.

"The monitors are a custom job by Village Recorder personnel utilizing JBL components. The speakers are time-aligned, mounted physically in the cabinets so that the highs, mid-range and lows will arrive at the same time. The speaker cabinet adds no sound of its own. You get out only what you put into it."

"The room needs very little EQ," adds Dashut. "The sound is very clean so there is no definite setting."

Klinger continues: "We have two Studer A80 VU Mark IIs named Hansel and Gretel; they are Swiss, get it? They are 16/24 track machines. Then, there are Donald and Walter, named for Steely Dan. They are Ampex ATR-100s, 2-tracks. And also the MCI JH-110 2-tracks named Hymie and Saul because they're



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originally from Miami . . ."

MR: Explain the construction of Studio D and how it was customized for Fleetwood Mac.

KK: You will notice that no two walls connect and that walls do not directly join the floor or the ceiling. This completely eliminates low frequency vibrations leaking from one source into another room. The ceilings are movable. By pushing a button, it is possible to automatically revolve the slats in the roof to provide as "live" a sound or as dead a sound as you wish. Just let me know and I can make doors pop out of nowhere, make walls disappear . . .

We have a very sophisticated talk-back system between the control room and the isolation rooms. It operates independently of switch flipping and is activated automatically whenever recording is not in progress. There are tie lines in every wall of every room to connect any instrument to any amp in any room. Lindsey can play his guitar in room #1 and come through an amp in room #4 simply by patching his guitar into the tie line.

Finally, we have added direct boxes at comfortably convenient locations in the control room so that John can practice a part alone while the band is recording. That way, there is no interference and a lot of time is saved. There are forty mic inputs at every panel around this studio.

MR: Which headsets have you selected?

RD: I like the Koss Auditors for the highs and for more definition in the midrange. I like the AKG 240s for warmer sounds.

MR: What special effects do you employ in the studio?

RD: The limiters, tap slap and sometimes a digital delay.

MR: Let's discuss mic selection.

RD: McVie plays an Alembic bass which we take direct, no problem. Miking Mick's drums are a problem because he has a very strange habit of playing with his mouth open.

The drums are miked overall by two Neumann M49s about six feet away and at a 45° angle. Sometimes I use very few mics to avoid phasing problems and at other times I mic each drum individually for the separation. The drums are always meticulously tuned somewhat flat.

On the toms, I prefer the U-47 FET for the lows and the KM-86 for the highs [both Neumanns]. The Shure SM-57 is a good mic for the bass

[drum] and snare, but the Beyer M-88 is my favorite overall for the bass. I place one in the center and another on the side for the midrange attack.

The snares can be miked with any of the three among the KM-86, SM-57 or the AKG C-451E for the highs. The 451s are also used as overheads on hi-hats and the Neumann KM-84 is sometimes used because it isn't quite as "edgy" as the 451.

MR: What keyboards does Christine have set up in the studio?

RD: Christine plays a Yamaha Electric CP30, a Rhodes 73 and a Hohner Electric Pianet which are all miked direct. On the 9-foot Yamaha Grand piano, I use three mics placed for the highs, midrange and lows. In that manner I can then switch around to see which mics I want to keep.

MR: What do you use for the vocals?

RD: Neumann U-87 or a U-47 tube-type. Sometimes a M-49 if I want a brighter sound.

MR: The miking and special effects on Lindsey's guitars are of special interest. Let's take the miking procedures first.

RD: We sometimes use a Fat box to mic Lindsey direct. When he plays acoustic, we use a Sony ECM50 taped to the face of the guitar. We place a 451 and a SM-57 on the amps or use the U-47 tube-type in place of the 57.

MR: Lindsey, your fingers look like hamburger. I cannot recall having ever seen or heard of you using a pick. Could you give me a lesson or two in your technique?

Lindsey Buckingham: Right now I think I own about fifty guitars. My favorite electric guitars are a Gretsch, a Fender Stratocaster and an older Gibson Les Paul. I have never used a pick. I also tend to play with rather extreme pressure on the frets.

MR: What special effects do you use in the studio?

LB: Special effects in the studio are almost restricted to tape slap. On stage I use a Space Echo and a Morley Volume Pedal. I built my own fuzz box by using the guts out of something else.

MR: Richard, give me some idea of how you assign tracks.

RD: The bass guitar and drums are priorities so I run a direct from the bass onto track 1 and mic the bass amp on track 2. The bass drum is on track 3, the snare on 4 and the tom-toms on 5 and 6 with the cymbals, too. Tracks 7, 8 and 9 are reserved for the keyboards usually and 10 and 11 are

for Lindsey's guitars. The rest of the tracks are for vocals and overdubs.

MR: What's this thing?

KK: This thing is a "Dingle."

MR: And that is . . .?

KK: A microphone.

MR: But it is only an eighth-of-an-inch square and only as thick as a sheet of paper.

KK: And it costs \$7.86 and is as good as any Neumann. [Please Neumann, send all complaints directly to Mr. Klinger—Ed.]

MR: You mean to tell me that you are recording Fleetwood Mac on a dime-store microphone?

KK: Actually, that's not what it is made for [i.e., recording instruments].

MR: I didn't think so.

KK: They cost us \$7.86 including tax. We use them on acoustic guitars, pianos, drums and are as sharp and clear as any Neumann. Only we won't tell you who makes them because it is our secret. But I will tell you this: we have bought a crate of them and we are going to cover this studio with them—the walls, everything. We have named it Dingle for obvious reasons.

MR: I can't believe that I am sitting in the midst of one of the world's most lavish recording studios and they use 10¢-mics to record supergroups. The only thing that you need is a machine that talks back to you.

KK: We have that right over here. The Necam has made it almost impossible for an engineer to make a mistake. If you enter the wrong code, it tells you politely that you've fucked up.

[Taped across Necam's face is a quote from the motion picture *2001: A Space Odyssey* which reads: "I know I've made some mistakes in the past, but I'm better now.—Hal 2001 A.D."]

MR: And at home . . .

RD: At home, Mick and Lindsey have both 4-track and 8-track tape recorders. Lindsey uses his home studio for developing songs and Mick uses his as a music room—a breeding ground for creativity and to have friends over for a jam.

MR: On a social level, how are the members of Fleetwood Mac interacting?

RD: Most noticeably, Lindsey and Stevie no longer have to worry about survival. I think their prosperity has made each more of an individual.

Emotions are not running as high as they were during *Rumours*.

MR: And their music?

RD: Exceptional.

These are the "big guns" in "professional power amplifiers. Each of these amplifiers has individual features and abounds with specifications to impress potential buyers and to satisfy the professional user but they are not created equal, especially in reliability under professional (rack mounted) conditions.

Some of these "big guns" have been talking about everybody else being "behind", others are talking about comparator LED's, while others depend mostly on their good looks. The Peavey CS-800 comes out on top when you consider the features, the specifications (which are as good or better than anybody's), total power output, and price per watt of professional power.

Some companies have recently "discovered" LED's and comparator circuitry that Peavey pioneered and has been using for years. These recent "converts" were most vocal in the past against LED's...that is, until they updated their "plain Jane" units. Some of the

other companies spend a lot on cosmetics but not much on built-in forced air cooling and large numbers of output devices to enable reliable rack mounted operation under

continuous professional use.

Each channel of the Peavey CS-800 features 10 output devices and 2 TO-3 drivers bolted to massive modular heatsinks that are forced

cooled by a 2-speed fan, has special distortion detection circuitry and LED indicator (no simple overload), as well as a functional patch panel on the rear to facilitate the use of plug-in balanced transformer modules, electronic crossover modules and speaker equalization modules custom tailored to Peavey's SP-1 and SP-2 speaker systems.

In comparing pro amplifiers, one should apply the old commercial sound "dollar-per-watt" rule. The CS-800 is again "on top" at 81¢ per professional watt. The fact is...Peavey is not behind anyone in power, durability, features or performance.

Below are the respective published specifications of the "heavies" in pro amps. Check for yourself to see how we all stack up. You might be surprised.



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	OUTPUT TRANSISTORS RECC. LOAD	POWER @ MFRS. MIN.	COOLING SYSTEM	SPEAKER PROTECTION	CONSTRUCTION	TURN ON DELAY	OUTPUT CIRCUITRY	T.I.M.	LIST PRICE	DOLLARS PER WATT	
Peavey CS-800	800 W Total 400 Watts/Ch. @ 4 Ohms	260 Watts/Ch. @ 8 Ohms (Both Ch driven)	20	2 Speed forced air cooling	Yes	Totally Plug-In Modular	None Required	Quasi Complimentary, All rugged NPN Silicon Outputs	Not given. No accepted Measurement standards Presently exist.	\$649.50	\$0.81 per Watt Based on 4 Ohms/Ch. min. load
Crown DC-300A	360 W Total 180 Watts @ 8 Ohms	4 Ohms Not Given	16	Conventional Passive Airflow Only	No	Hard Wired	None Required	Quasi Complimentary, All rugged NPN Silicon Outputs	Not given. No accepted Measurement standards Presently exist.	\$919.00	\$2.55 per Watt Based on 8 Ohms/Ch. min. load
BGW 750 B	720 W Total 360 Watts/Ch. @ 4 Ohms	225 Watts/Ch. @ 8 Ohms	20	2 Speed forced air cooling	Yes	Modular	Relay Circuit	Collector drive Complimentary using PNP & NPN Silicon	02% No measurement details given.	\$1099.00	\$1.53 per Watt Based on 4 Ohms/Ch. min. load
Yamaha P 2200	700 W Total 350 Watts/Ch. @ 4 Ohms	200 Watts/Ch. @ 8 Ohms	12	Conventional Passive Airflow Only	No	Hard Wired	None Required	Emitter follower drive complimentary using PNP & NPN Silicon	Not given. No accepted Measurement standards Presently exist.	\$1095.00	\$1.56 per Watt Based on 4 Ohms/Ch. min. load

All above figures based on manufacturers' published specifications and minimum recommended load impedances as of 1/1/78

an interview with producer/engineer

phil ramone

By Peter Weiss

For years, A&R Recording Studios has been among one of the most active and successful members of the New York City recording studio community, and Phil Ramone is the original "R" in A&R. Since co-founding A&R, Phil has enjoyed a varied and remarkably successful career—first as an engineer, and in recent years as producer for Billy Joel,

Chicago, Paul Simon and others. He also has done extensive work in feature film soundtracks, including A Star Is Born.

The interview which follows took place as Phil was finishing work on Billy Joel's 52nd Street, in his office on Manhattan's West Side, in the building which also houses A&R's R1 and R2 studios.

MR: You have a couple of film scores going in Studio A. Is that occupying a lot of the studio time now, film work?

PR: Yes, recently quite a few films have been done in N.Y.

MR: Record producers seem to be very active in film now, and it seems not only in L.A.

PR: Right. Now with the hotness of musicals which will probably slack off soon, at least people are choosing record people to be involved with a film. Record producers, wherever they're locted are going to make that music, whether it's Miami, Nashville, or New York.

MR: Do the fancy farms and ranches entice you to record in those places?

PR: I want to be in the most comfortable surroundings for me and the musicians that are involved. I'm not looking to go on a cruise ship and make a record. That's not important. I mean it's a working period and I've got to be isolated and comfortable. But I don't need hot and cold running maids. That doesn't make a record.

MR: Speaking of records, how's the new Billy Joel album [52nd Street] coming along?

PR: Fine.

MR: Was all of it done here? Did you use Studio A for anything?

PR: I did all of it in Studio A. The big room. That's where I did the other album.

MR: *Stranger?*

PR: Yes.

MR: Does Billy Joel appeal to his audience as a writer, a performer or both of those?

PR: I love him as both. He's great. It's hard to tell exactly what his audience thinks, but it seems that they love him also.

MR: Do you think he is going to be writing standards?

PR: I think he writes standards. That's my feeling. He accomplishes both the musical sides where rock 'n' roll had to grow. In the old days he would have had almost twenty cover [a version of a Joel song done by another artist] records of almost any of the tunes he has written. Today it is a different market. We do get covers, but not the same. There are not the Andy Williamses or other artists in the middle-of-the-road because there really isn't a middle-of-the-road any longer.

MR: What's happened to it? Where did it go; where did those artists go?

PR: I don't like to catagorize it, but it's put certain rock 'n' roll people or people who came out of folk or rock, in the middle. It's just changed places. There is no straight singer coming down the middle of the road singing nice songs and ballads with big orchestras. I mean those days are gone.

MR: Will they ever return?

PR: No, I don't think so. I'm not one to reminisce, at all. What people used to say was that rock 'n' roll will never stay. Here we are twenty years later and they are still denying that it's here. Meanwhile the older people, who they thought didn't like it, are the ones going out buying *Saturday Night Fever*. Music is music, it goes on. There's simply a different kind of dance fan now, that's all.

MR: Right, people are still dancing, maybe as much now as in the late '50s, early '60s.

PR: Yes, the resurgence of dancing over the last five years is incredible. You go to clubs now and you hear "Twist and Shout." That's happening again because it's danceable. People's tastes have gone more mature, they just do. Kids are far better off than when I was a kid.

MR: You mean as far as musical choices available to them?

PR: Yes, I still think radio—because of the commercial problem of FM having to compete with AM—limits the amount of interesting material. The free-form radio that was prevalent maybe seven or ten years ago—progressive radio—has suffered. It's a shame. You know the George Bensons and other people have come through the market place. The CTI group of records that has been around for a few years really brought a lot of great artists forward. Now you see Quincy Jones, who was a big seller, not a huge seller, as a regular part of the Top 10 selling albums.

MR: But his music and its recorded sound have sort of changed over the years, haven't they?

PR: I don't think so.

MR: Not his talent, but the kind of music and the recording approach.

PR: Maybe it's because of the package, maybe that's what you're seeing. Electronic instruments have become more a part of the way we record today. It's more funky. The rhythm section is far stronger than it was in

the old days when the bass was acoustic, or it was a collage of electric guitars. Now you have some finesse. That's what I'm saying.

Musically, people are just not accepting noise. They'll accept a group; they'll accept rock 'n' roll and sophistication. Which is why Billy Joel and people like him have been around eight or nine years before they exploded. It's because they have "musicality" going along with the fact that they grew up with so-called rock 'n' roll. I keep using the words, but it's important to see that the style of that rhythm was coming anyhow and it was never going to go away.

I thought it was a healthy situation when producers became independent; the record companies weren't dependent on what some group of people said was going to make it. What's happened is records that weren't predictable have become hits. I've had some unusual records become hits. The word ballad is almost poison to those people.

MR: What do you mean by ballad?

PR: A soft song. Billy Joel has both ballads and up-tempo stuff. So does Paul Simon and other people like that. Paul is unique and consistent, because he has his "own place" [in music] where people will always go to find that type of material or uniqueness. He's crossed many lines.

The nice thing about records is that you don't deal with a vision—you don't have to deal with it. It's your choice how hard or loud you listen, and how it penetrates people. When you start figuring out the market place, though we have a so-called big hit, I mean, we're not even talking about what the television audience is for one morning game show. If you sell two million records or three million . . . you know, a gold record a few years ago was very important. Now the word is platinum. If you're talking about a million sales that says you've got a platinum record, you're a pretty hot producer, you're up there. That's one million out of 250 million people. I'm not complaining. I'm just saying that multiplied by the amount of records per month, per week, and so forth, it's a pretty tiny market place. Although it's as big an industry as it is.

So the total effect—as much as everybody's ego would like to believe otherwise—is that it's an amazing, wonderful, artistic little world we live in. I'm always amazed because whenever you argue about music being on

television, in particular, which is always a high point of argument, how does rock 'n' roll or any kind of modern day music survive? There's a very limited market in television.

MR: You're talking about the concert shows that are on?

PR: Yes, those kinds of shows. I think the networks put them on because they kind of feel they have to do something for the young people. Other than situation comedies.

MR: Have you been pleased with the quality of sound on concert shows?

PR: I don't happen to think that those concert formats work; they're not my style. We obviously suffer tremendously just trying to get the audio down. You can't reproduce it in your home anyway.

MR: Getting back to the changes in the sound of recorded music over the last, say fifteen years, which would you say came first . . . ?

PR: I think there was a technical advancement first. I think the demand came from the independent market. The major record companies had their policies and the way they worked. The independent studios were trying to survive on a whole different level, as were producers who were not at a label anymore . . . independent. Those independent studios were the first to buy the sophisticated equipment. I'm not saying that Columbia or RCA didn't buy 24-track machines, but they followed the lead, always, of the Record Plants and the other studios in the country that had Jacuzzis in the middle of them. There was a style in the late '60s that almost was to see who could outdo each other with external gear.

MR: Can you pick out a turning point, either musically or in time?

PR: There was a whole era of recording during which you got a tremendous influence out of the Beatles, the Rolling Stones, the Who, the Kinks. I don't care what group you take. A concert never sounded like the group did on record. It just never did. With that as a problem, that was the first challenge, I feel. You would go to hear groups that were creating a stir, they were at the college level; they were at the nightclub level; the funky clubs. And you're making records in these grandiose studios, no separation, everyone trying to record at once.

Here comes along somebody with a 68-track, or whatever machine was available at that time and he is taking

advantage of the sel-sync process. He's got to change to fix the vocal; he's gotta change to fix something else. He's working in a dry room; he's starting to understand isolation.

I'm not saying it's gotten to the point where the equipment is needing the star rather than the other way around. But then you have that stubbornness of different people who don't want to recognize it. Just let it pass right over their heads. Which is difficult. I remember sitting through all those years of watching people argue with the musicians' union about putting strings on afterwards or not putting them on and allowing musicians as a group to come in at different hours. This is a major revolution.

MR: Has the revolution affected musicians as well as it's affected music and technology?

PR: It changed the social structure of almost all of the musical people in the business. Rhythm section works Monday, Tuesday. Horns come in Wednesday. Thursday and Friday are the string dates. What happened to the twenty-six guys you see all at once? It's amazing what's happened. There is a whole stratum of people you don't see at the same time anymore. I must have waited for months for groups of guys I used to see all the time. It happens to me also because of the type of records I make. Sometimes, if it's an internally self-contained rhythm section, I'm not going to see the players I would use on other dates.

MR: Automated mixing is one of the latest aspects of the continuing changes in recording technology, and I wonder whether you think it is a real timesaver.

PR: I'll tell you. It takes people twice as long to do a computer mix as it does to do a regular mix. It's a logical thing to do and I'm involved very heavily now; I know how much time it takes and I see what the evolution is. The "repeatability" is what's important. That's what I like about it.

MR: People used to depend on the engineer for repeatability. "Let's do a mix just like that one except . . ."

PR: Yeah, "I'm coming back Friday." Calls me up on a Thursday night with the same mix except, "I just want a little more vocal." And so forth. You go reset your board and start up. You get it just the way you had it. And get the exact same sound, maybe you can make an edit if you're lucky. Or you have to make it in a new mix.

MR: Make an edit between tapes mixed on separate days?

PR: I've done that a lot through my career. But it's so time consuming and it hurts to go back for a minor error, or a major error or maybe a lyric change. A guy might say, "Oh, you can get that mix like you did." He forgets that it took you all day Monday to get it. Well, that's where the memory system is important. That's when the computer takes over for you. At least it puts the mix back where we started.

MR: Then it [computer mixing] does save time?

PR: Of course it does, but to get the mix to where you want it, exactly the way you want it. You have a different attitude because you know it's a memory system. There is a little more sophistication going for it. You can really sectionalize everything, and do one layer at a time, till you get your mix level. Do the rhythm section, rhythm and voice, then put the strings in behind it. Then you start to realize you can do things to that and the horns that you never could do because you were "live" mixing. You've got twenty-four things happening whether

you sub-mix them or not.

You [ordinarily] can't sit there and just ride the snare up and down like you can with a computer. You just make another pass. At least with the system I use, the floppy disc system, which is probably the only way to go as far as I'm concerned because it's independent of the tape machine. The tape machine only has the time code on it and that's it.

MR: Do you think the Neve board will be outdated more quickly than previous generations of consoles?

PR: I obviously didn't order a board that was 24 track. There is no such thing. The logic from 16 was to go to 32 track. Twenty-four is an interval and I didn't want to be caught with it. To me the 24-track machine that I bought is just sitting there hoping that its year or two-year life will be gone when the 32s come. Or the 40s or the 90s or whatever they are going to be when we go to digital recording. That's fine with me. As long as it sounds good.

I grew up going from 8 to 16 when a whole bunch of guys went to 12 track. And I said how the heck do you go

from 8 and only pick up four more tracks when the logic is you cut the baby in half and you call it a 16 track.

And I argued with people for years about cassettes. The two things that I predicted for myself, that I wanted, most of all, tied into a studio was a video cassette system and an audio cassette system. That's logical. The 8-track car system didn't mean anything to me. As quad didn't mean anything to me. Those are all games.

MR: You have, over the years, shifted your working emphasis from engineering to production. Do you find your engineering background still drawing you to do that job in addition to production?

PR: Having come from an engineering background, I try not to over-engineer my records. I don't want to do that to people who can help me by being good, and relieve me from sitting down at the console. I don't want to sit at the console except when I'm needed. Or when I want to take over something.

I deal with a lot of young people that I'm breaking in, and they can't understand that you can mic an amp, ten



Some People Are Going To Hate The New Altec Lansing 934...

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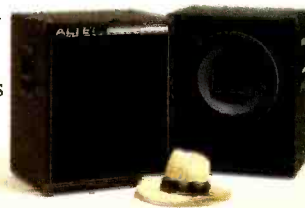
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Compare frequency response. The 934 utilizes a



feet away, in the big room to get a sound along with something from a close mic. It's just an automatic to put a microphone six inches or a foot away from the speaker.

MR: Is that because they see other people working that way? Or is it some memories that they have of things that they've heard?

PR: At every concert, every PA system you've ever seen is close-miked. There is no way to get around it. Plus how much of that reinforcement has to be brought back out to the house? Everything has to be brought out. There is nothing that is not electronically reproduced.

The major problem with "live" stuff, of course, is that the poor guy [sound engineer] is doing a mix for the house. Then you've got an on-stage mixer who's mixing for the guys on stage. They [the musicians] can't hear anything in that house. There is no reflection of anything but hollow delay. They have to lose all of that. So now you're getting automatic close miking.

So that kid starts with concerts. Now he comes along and he either gets into instruments or he buys a piece of

recording gear. He reads articles. Almost every article you've ever read in *Modern Recording* or any recording magazine shows pictures, diagrams of microphones closely placed. It's almost automatic. You'll see somebody occasionally write an article on a string date with stereo mics.

People today don't understand that [in the past] we didn't have thirty-two inputs or multiple microphones to get around a set of drums. How did you get the kick, the snare, the high-hat and all eighteen tom-toms? Well, that's history and it's a style; I grew up with it. I use it for my own purposes. And I teach it to people if they want to use it. They don't take advantage of their own rooms. A lot of them [the studios] are so dry they can't maneuver the walls.

Again, the evolution in what's happened is for me, and for people who grew up with both sides of the coin. I make the music work for me first. I drive [recording and audio] manufacturers and everybody else crazy. They have become like the car manufacturers—they tell you how to drive your car. You can have only so many Rolls

Royces and Swedish hand-made pieces of gear. The final result is: Do I have a record, can I put in the presses and can it go out to the public?

MR: And will they buy it?

PR: Will they buy it is a whole other question. We're not even talking about that. There is a budget; somebody's got to have a budget. You're working with all of the gear that's available.

[Getting back to the engineering vs. production question] I do have a particular demand. I refuse to become part of waiting around for a half hour for somebody to get a bass and drum sound. I won't allow it. I don't believe in it. If you're a good engineer and know what you're doing, you better do your homework. You gotta get in that studio before I'm there. While the guys are just tuning up their drums. When I say let's run the song down, I want to record it. I don't want to run it down six times for you so you can get your ear together and fix your monitor system and play games with your EQ.

The big transition for me, and for anybody who cares about what production is about, is that musicians, as slow or fast as they wake-up, provide



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CIRCLE 52 ON READER SERVICE CARD

you with a period to catch what they are going to do. There is a freshness from the start of the song. Even if they've never seen the song. There is always something unique that happens in that first approach. It's a little unsteady, it's a little bit raw and there are other mistakes, but you rise to a certain height. And if the engineer is sitting there worrying about all his problems and ignoring the fact that two great solos just went by that might have been important for me to play back for the guy. . . . Four other guys are ignored while this guy's working on this fat snare sound. You know, "I definitely want to deal with a drum sound like so and so's" and "I want a fat back snare." Some colorful comment which sends an engineer out into what he wants to do. Which is to create something for you that you hear. The problem is translating that back and forth. So you don't lose time. The guy says I want tape reverb on that. To me any group of good engineering people is ready for you. I don't want to sit and wait while they're ordering a DDL or a flanger. It should be there. I order that before the date. I'm not going to stop the date at its inception. I might do it afterwards. Take a 15-minute break with everybody and start playing around with an idea. Then develop the song to where we're going to take it. It's going to take a long time to do a song. I don't do it in the immediate one hour session. [Perhaps] it happens in eight minutes. Maybe the first ten minutes we're in the studio—if that's when it happens. It may also be in the sixth hour when it happens.

MR: Do you treat songs or records as whole concepts from the beginning or do you build an idea as you go along working on it?

PR: You're talking about an album or you're talking about per song. How about per song?

MR: Okay, per song.

PR: Definitely [deal with it as a concept]. The beginning of the song, the end of the song, what's it going to do, what it's going to become. A lot of it comes about in the studio. Sometimes I'm rehearsing in the studio, which is something I do.

MR: Would a rehearsal hall be a less productive atmosphere?

PR: Going to a rehearsal hall is fine. But there is something wrong with that if you're not taking advantage of

the [recording studio] equipment. It's [the studio] expensive; but, at the same time, if you've got two songs that are complete or that are nearly ready [you can get some recording done]. Therefore, the next day you're building towards [a goal]. Every other day you're adding on something to the song or your idea, or you may re-cut the song which you started first. You get a chance to learn from it [recording].

These years I've spent in the studios have taught me what time waste is, and the difference between proper rehearsal or creating in the studio. There are two atmospheres, you know. A rehearsal hall is a bit sterile, but there are times you need to go out and work with an artist for a week at his house or a rehearsal hall just to sort out the material.

MR: In an atmosphere with no pressure or interference.

PR: Yeah, you don't want to pay recording studio rates for someone just sitting around at a piano while you're messing around. It depends on the group and who you're working with because the drums, the bass, all those things come about much quicker than the song. The song is the hardest thing to put together.

I guess I'm tough because I grew up with having to work as an engineer when people walked in and you had three hours [total time for the recording date]. If you couldn't get at least three songs in you were second or third rate; you just never made it. You never could have survived.

MR: How do you achieve more from studios and musicians so that budgets can be met?

PR: The waste of studio hours piles up. Yes it's important to spend the days to get the sound right, but then call them rehearsal days—don't put any pressure on anybody. There are many times I'll go into a studio—other than the studio I know—and call the date a recording date and pay the musicians recording scale, but use it as a pure rehearsal. Try running down six or seven songs so we can know what the room will do. If the engineer decides to move the drums from one side of the room to the other, fine. Let's move this; we're uncomfortable over here. The bass player would rather face this way; I don't want to use the booth; I want to use the booth. Whatever you gotta do. In that

manner you don't put pressure on the people you're working with.

You're telling the musicians, in essence, this is a sound check. Like a sound check in a "live" show. He doesn't perform anything near what he would do for a "live" show, because he is like a ball player. He has to be excited. He has to be thrilled by it. He has to be interested. On the technical side, his earphones better work; his sound in the room should work. Someway, he must have eye contact. *He must have a chemistry or there is no music.* You could win all the technical awards in the world, but if it doesn't come out music we don't have anything to talk about. It's kind of a rule for me—music first; then we'll worry about the rest afterwards. Everything else is there to serve that purpose. You can't let the tail wag the dog. It's just wrong.

Earlier I compared the recording industry to the auto industry; it's not really a true comparison, but my pet peeve with a lot of equipment manufacturers is—and always has been—that they make things available that have not been tested well enough. By people. They test them at the factory of course, but the *human* testing of it. . . . Look at today's consoles—there's hardly any room for your hand. *That's* the problem. You want all the sophistication and they want it all small and in one place. Take earphone mixing systems, it's getting difficult to communicate back and forth—to decipher the needs of each guy; and each guy has his own needs. It's like a P.A. system, a monitoring system. You can't communicate with just one system. There is no way you can do it even with four. Each guy requires a mix and he's too good not to hear it. He knows what he wants. And the era of the dominating people who used to say, "Shut-up and just take what you get," is over.

MR: I think most people are glad it's gone; it caused tension in the studio.

In your experience did it create bad feelings between the musical people and the technical people—because the technology got in the way of the music rather than helping it?

PR: Yes, it's always been that way.

MR: Getting back to movie soundtracks and such, do you see a growing together of advanced audio and video technologies and marketing packages?

PR: Do you mean movies in theaters

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or home entertainment?

MR: Both, since you've had wide experience in motion picture and television audio.

PR: Basically we're talking about the same problems we've grown with in audio. It has to grow. But video and audio don't grow at the same time. They never have. For example, there is no reason that we shouldn't now have stereo television readily available. There's just no reason why we shouldn't. You want to put a market

place on it in ten years, fine. But prepare for it. Don't say the audience doesn't know. They've said that for years about movies.

You want to know how many theaters are no longer optical, that are magnetic now or available to be? Well, I know what we did four years ago when we did *A Star is Born*. Because of the company that was involved, because we were going Dolby and because we were making the investment, those artists, who were the pic-

ture company, went out and completely reconverted something like forty theaters. The theater owners didn't want to know about it. But they got a Dolby system and put it in and had to have a magnetic playback system. The movie company put it in on the basis that if you didn't like it you could take it out. After *A Star is Born* came two or three other pictures [with similar requirements]. Now what's happened is a lot of your first-run houses are totally re-equipped. Somebody obviously went around with *Nashville* and pictures like that which were issued prior to *A Star is Born*.

There were several pictures that came out in Dolby houses; but there weren't too many Dolbys around or too many magnetic houses. It's tripled and quadrupled since. Which makes people say, "Oh, you didn't see *Jaws* in a stereo theater?" Boy, if you didn't hear it in stereo you don't have the total effect that a lot of those pictures create. *Star Wars* is incredible seen in a good stereo theater. I've seen it in the theater and I have a video cassette of it. It's just not as thrilling to watch it in a smaller circumstance or hear it just from an optical track.

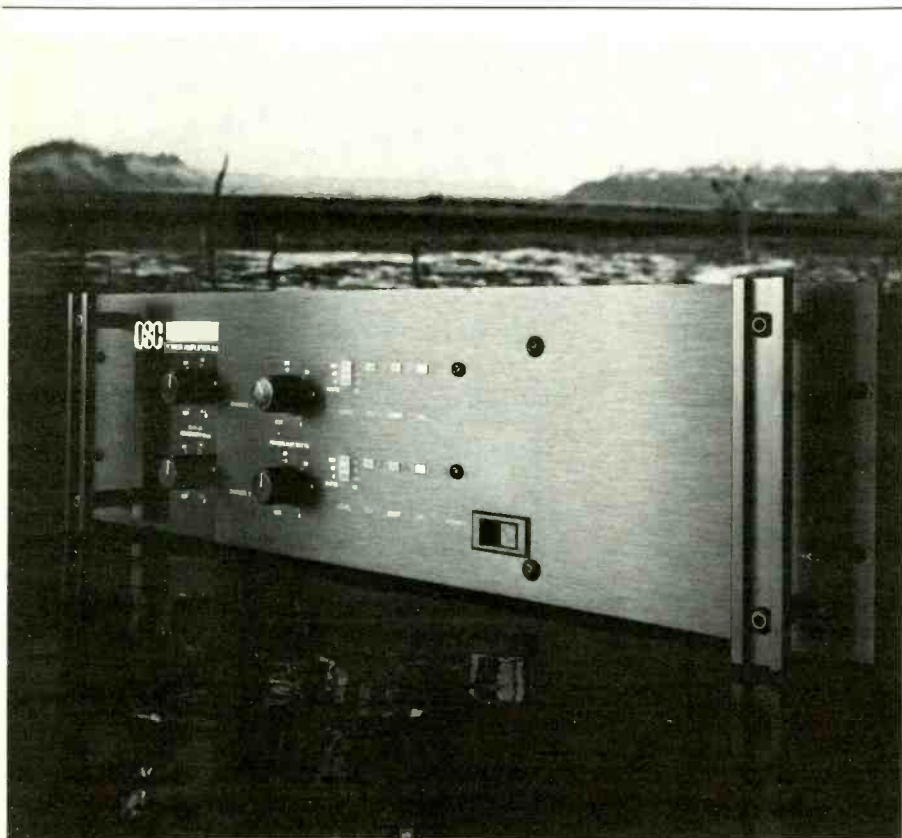
MR: One of the arguments against any radical changes or radical improvements in TV sound is that the optical quality of the picture doesn't warrant it; you begin to overwhelm the 21-inch picture with magnificent sound. It's somehow psychologically not compatible. With movies you have a big screen so big sound is okay.

PR: Well, you see a future. You don't think you're going to sit and watch a 21-inch monitor for the rest of your entire life, do you?

MR: Oh no. I want one of those giant screens like the rich kid down the block.

PR: You bet. You want 3'x4' or something like that. You're gonna want it. You're not going to watch football on a small screen. It's not good enough. That's for your bedroom. Home entertainment is a center of things—of your room. Your sound and your picture, your sophistication.

Give me ten years, at any time, and let me have a market and I'll promise you that the market demand would be as high as it could be. Because I heard that same comment when I used to do commercials for people. I was hired to make what was called a "pop" sound. People argued against this, but I said, let's watch when you do a Pepsi com-



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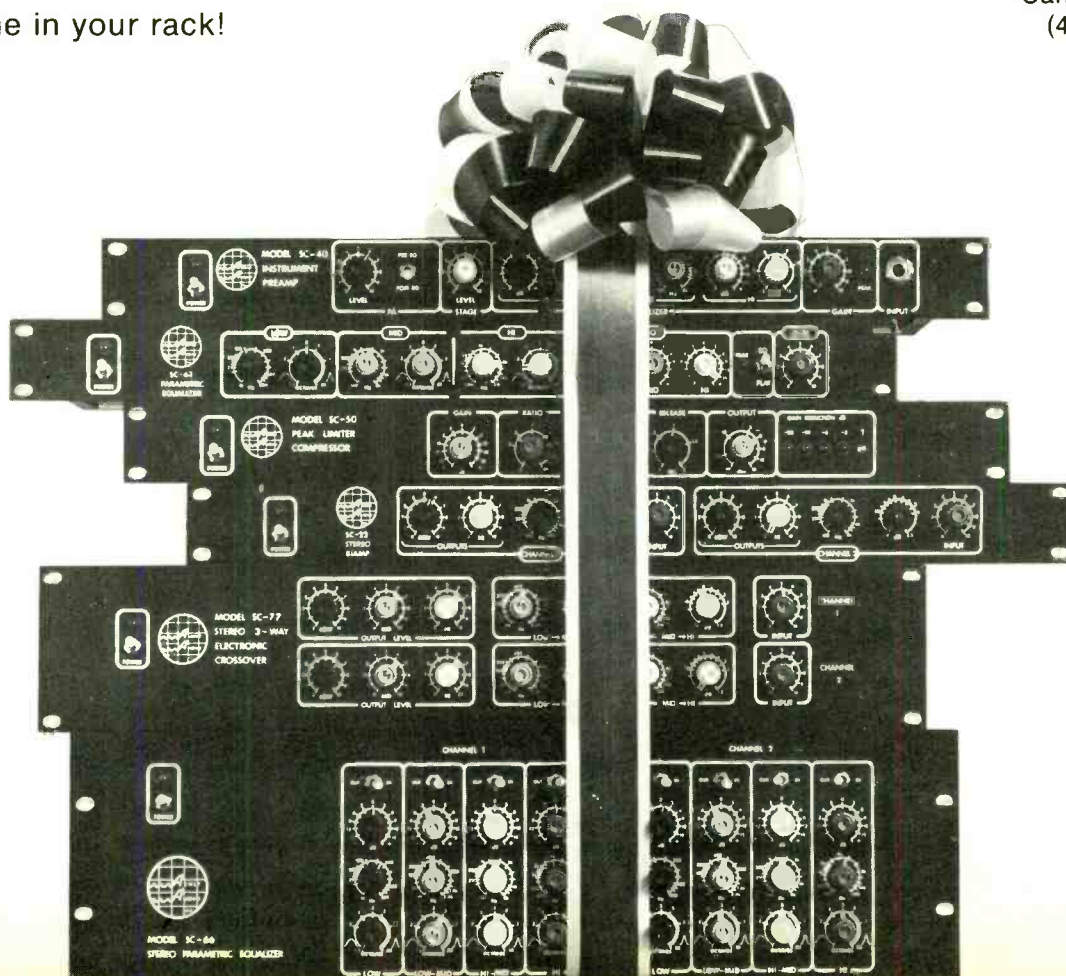
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mercial and it sounds like a record on a top-40 station instead of this other kind of sound. Once it started it was an evolution for a lot of people. They said it wasn't important until you make something for a product that out-sells another one. That agency suddenly suffers and realizes that it blew it; some other revolutionary agency spent the time to get a sound, a real optical sound for television. You know damn well that on a little speaker that optical happens to work real great.

The *Saturday Night Live* show has got a pretty revolutionary audio console which NBC has spent a lot of money to put together. The first couple of weeks on the air we realized everytime the commercial would come through a chain on their "live" that our sound wasn't as good as theirs. It's not as compressed, you have all the EQ but you haven't got it together. Or a video commercial comes through on video tape and it has a different sound than yours. You've got some hot records coming through there as part of commercials for the show, because that's the kind of market that's out there. So they've got

good commercials. You know the competition becomes quite heavy.

Now, you make a show in this day and age and someone says don't worry, stereo television will never be here. If you spend a million dollars or a half-a-million dollars making a television show and you don't record it with a multi-track behind it, you're crazy. It's the same thing as "Color will never come." Color came; black and white didn't go away. It's a natural evolution. It's all tied together. If you look at the picture, the audio doesn't distort the picture, it doesn't change it. We're the ones who took the FM transmission that goes so easy with television and ruined it so that it sounds as crummy as it does. We're the ones who are still using old-type transmitters, radio format and then sending it through all these loops, all these coils . . . from city to city. Paying incredible line charges for the audio you send along with video.

It will take a few large independents. Maybe Stigwood, or somebody else, who produced the Bee Gees and the Rolling Stones "live." Play it [a "live" performance] at twenty theaters

"live" at the same time. Broadcasting video that sounds like something and then put it in home video. You watch, next time out the networks are going to feel threatened.

The same little tiny speaker that was in the television set was also in your radio. Then they made two little speakers called FM stereo. They are not great speakers, but your FM radio sounds pretty damn good. We're not kidding around about AM stereo either, because they're going to do it—they better.

If you travel around the world and you see what other people are doing you know you can't be dogmatic and say that it's going to stay crummy. It won't stay crummy because there is always someone who's got a few bucks who can make it sound good. That's always what it takes; it takes a company that's looking for the market. What is the market? It's the youth market that goes out and buys. Those are the people who *buy*, whether it's socks, shoes, stereos, whatever you're selling. If that ego is right and the company is hot, they'll spend the money.

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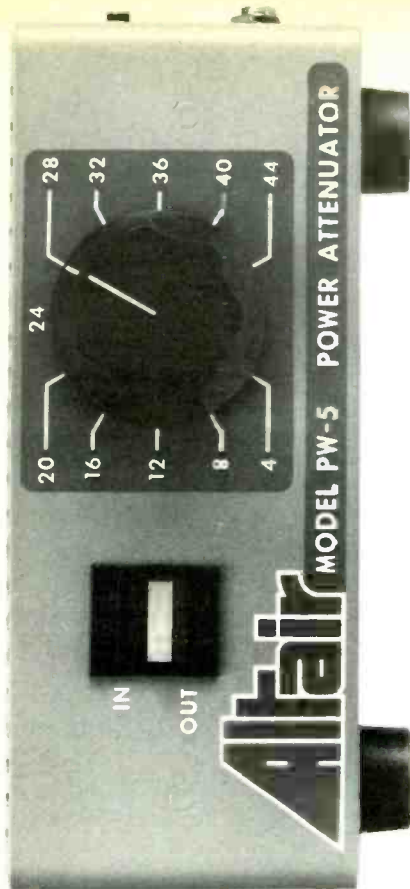
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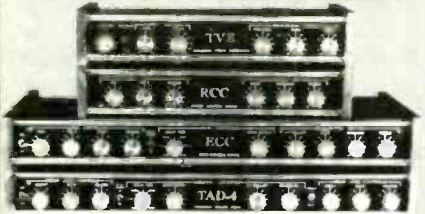
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MR: Many consumers are spending money on fairly sophisticated "semi-pro" audio equipment. Do you have any contact with that group of people?

PR: You should hear the stuff made at home. It's so competitive with commercial product it's amazing. You get a cassette and it's made by a kid who's got a four-track machine or sometimes an 8-track. He is a song producer putting stuff together for himself at home. And the sound quality, I mean I'm not judging it on a total picture, but what he is capable of doing, what he is capable of buying in the audio store will almost out-do anything in the studio. Sometimes with a demonstration tape you get a letter of apology: "I'm sorry, my dbx's or my Dolby B, weren't working."

MR: Do you see this kind of activity as a source for new talent in the business? New technical talent?

PR: I think what it does is help people to come into a studio and understand what you are going to start with and how you're going to get from a demo to a final. But remember, what used to be a demo is no longer a demo. I worked in demo studios when I started—a demo was done as fast as you could get them in and out. No longer is that possible because that person who "buys" talent at the record label wants to hear something that's really close to production. Technically however, an artist can't afford to go to a major studio and pay those kind of dollars to make a demo—unless the record company puts up the dollars. So with a reasonable amount of gear he can make good sound at home. Especially if he can layer it. What's the problem? He puts the bass down, then maybe keyboards and then vocals. He may record the drums as one, he might even put down one of those digital drummer effect things just to keep the thing in time. Then put the drums over it; that's what they do. Some of them actually don't even put a real drum in it. That's all they give you. They've got a lot of models to study from. I mean you've got Stevie Wonder, from whom you get every kind of sound you can think of. And these kids? Why not. For the first hundred dollars he gets, he starts with something. It's great. [Commercial record] People are always afraid they're going to be put out of business, but actually all it does is make it even better.

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If you'd like to know what else Herb Friedman thinks about the B77, please circle reader service number or write to us for complete information including a reprint of his article and a list of dealers where you may see and hear the ReVox B77 demonstrated.

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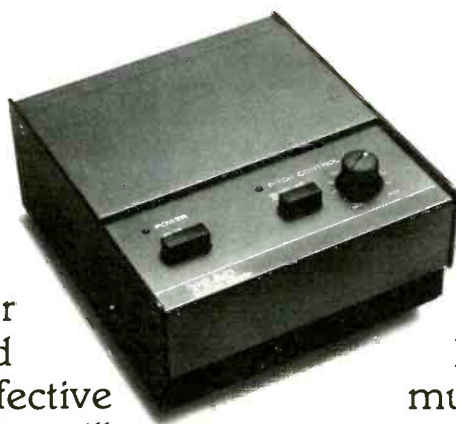
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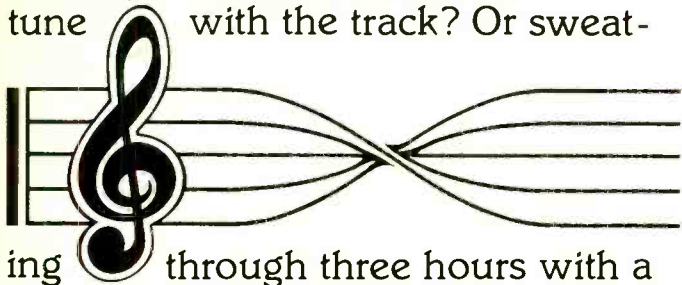
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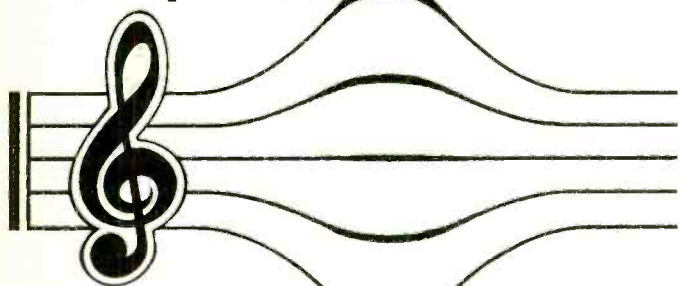
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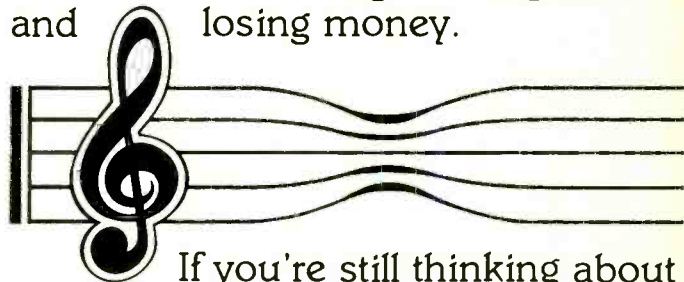
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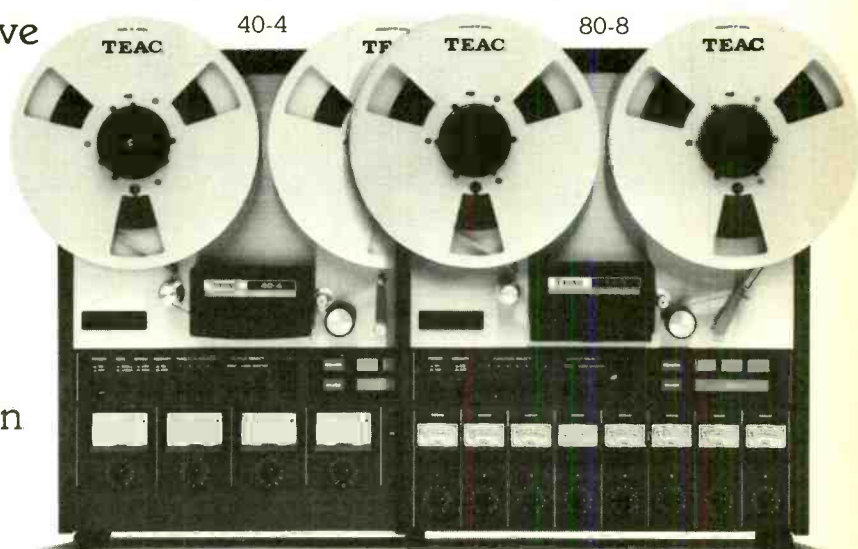
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Ambient Sound

BY LEN FELDMAN

Video Tape—Potential Problems

Everyone is talking about the imminent “marriage” between audio and video. Clearly, the availability of video discs which must, regardless of their format, accommodate signal bandwidths up to and beyond 4.0 MHz will mean the accommodation of digital audio, or PCM signals as well, since such signals also require ultra wide bandwidth capabilities. However, the video/digital audio disc, though “threatening” to appear on the market in 1979 (we heard that for 1976, 1977 and all through 1978) probably has a tough road ahead of it. That’s because there are at least four systems vying for public acceptance and, since video/digital audio discs are a “one sided” entertainment program source (you won’t be able to *make* your own video or digital audio discs at home or in your studio), it is essential that some order or uniformity of standards occur. If all four (or even more) systems continue to compete with each other *after* the first hardware and software products appear (whether that happens in 1979, 1980 or whenever), we will have an even worse state of confusion than we had during the little-lamented quadraphonic record era.

That is *not* the case when we talk about video tape recording. In the consumer marketplace, both the Beta format (developed by Sony) and the VHS system (Panasonic and JVC) are doing very nicely, thank you! And there is a third system about to be announced, known as LVR (Linear Video Recording) which, according to preliminary reports, is even simpler in concept than Beta or VHS and which, among other features, will include a pair of stereo audio tracks besides being able to record a color video signal in all its glorious luminance and chrominance.

On the professional front, Sony’s U-Matic system, first developed way back in 1970, dominates the field though there are other professional color video tape recording formats that pre-date that system by several years. Here, too, the fact that there is more

than one system around hasn’t hurt the pro VTR business at all, since professionals and home recordists alike are concerned only with availability of good quality raw tape and a reasonably good selection of pre-recorded material. In the case of home VCRs, most of the suppliers of home pre-recorded video entertainment make their entire catalog of subject matter available in both VHS and Beta. The market is now big enough to warrant such “double inventory” stocking and, since the grade or quality of tape used in each format needs to be just about the same, the problem becomes one of duplicating tape in each format separately and packaging the tape in video cassettes suitable or compatible with these popular home systems.

Video Tape Cassette Quality

What few people in the audio world realize is that the requirements for good video tape are very similar to those of good audio tape. After all, the video signal is, at least in present VCR formats, an *analog* signal. It is a continuously varying amplitude signal. True, in order to be able to handle bandwidths up to 4 MHz, rotating heads and a so-called FM signal are used to compress the required bandwidth and to minimize the effects that might be caused by fluctuations in playback output level, but make no mistake about it, the “heads” of a VCR are picking up purely analog (continuous waveform) signals. There are no “bits” or pulses involved here, as there are in the case of digital audio tape recording. When one speaks of tape recording, it is necessary to think in terms of wavelengths, rather than signal frequency. If the tape travels fast enough so that the *wavelength* of a given frequency is long enough to be able to magnetize the tape, it doesn’t really matter what the signal *frequency* is. For example, with tape traveling at 15 ips, the *wavelength* of a 20 kHz signal is 0.00075 inches. On the other

hand, if the tape speed relative to a *rotating* tape head is 750 inches per second, the *wavelength* of a single alternation of a 1 Megahertz signal also turns out to be 0.00075 inches. And, speaking in terms of magnetizing the tape, the tape itself couldn't care less that it is "recording" such a high frequency. In the case of the VHS system, for example, the actual tape speed is only 33.35 millimeters per second (around 1.32 inches per second). However, the rotating head spins at a rate of 30 revolutions per second. The diameter of this cylindrical head is 62.0 millimeters, which makes its circumference equal to 194.78 millimeters. If you multiply the *linear* distance traveled by the rotating head surface in one second by the linear distance of the tape travel, you come up with a relative speed between the tape head surface and the tape itself of nearly six meters per second (approximately 236 inches per second), or more than fifteen times the 15 ips "professional" audio speed.

Requirements For Good Video Tape

As you can readily see from the above discussion, the electrical or magnetic properties of a good video tape are not much different from those of good audio tape. For example, the tape should have excellent frequency response capability. It should afford a high signal-to-noise ratio both with respect to the luminance (video brightness) signal and with respect to the chrominance or color signal being recorded. Since the tape is being called upon to store such a dense complex of signals, it should be as free as possible of drop-outs. In the case of audio recording, particularly at high tape speeds, drop-outs are not all that much of a problem. Our ears tend to "fill in" missing signals, especially if they are of extremely short duration (in the order of a few milliseconds). In the case of video recorded signals, a drop out can cause loss of vertical or horizontal synchronization during one or more picture frames or, at the very least, a streak of "noise" across the picture, to which the eye is very sensitive.

From purely mechanical considerations, the requirements for good video tape are far more stringent perhaps than those of audio tape. The tape itself must have excellent dimensional precision. Tape width, thickness and length must be precisely maintained. Residual elongation of the tape must be kept to a minimum. Yield strength must be high and surface friction must be extremely low. In addition, the cassette shell dimensions must also be extremely carefully controlled, since any variation in these dimensions can affect smoothness of tape motion.

Some of the practical characteristics that must be taken into account by video tape manufacturers

include such things as the tapes' resistance to "jitter," skew and long-term demagnetization. Since some of the newer VCRs incorporate a still-frame feature, the tape must be resistant to wear itself and must not subject the polished, fast-rotating head to undue wear. During still-frame video reproduction, the tape remains stationary while the rotating head spins around and around, contacting the same small length of tape over and over again. There is no analogous situation in audio tape recording where, even if a "pause" control does not disengage the tape from the surface of the head, at least the tape is motionless with respect to the head (though, as we all know, this type of pause action can play havoc with the capstan/pinch wheel combination of the drive system), so no tape or head-wear occurs.

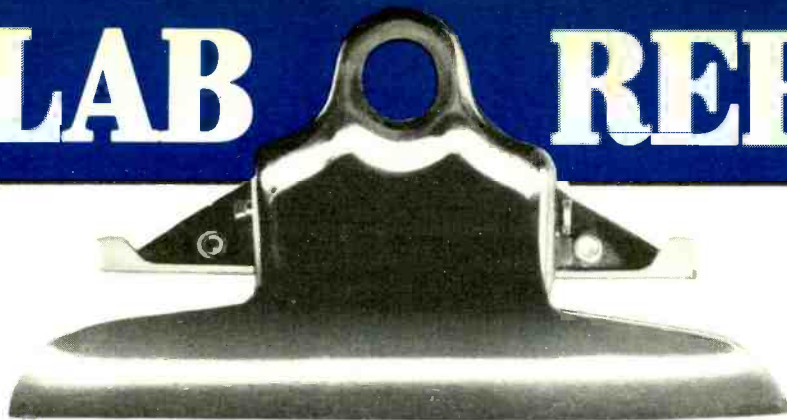
Some Typical Video Tape Characteristics

As an example of how high the quality of video tape must be, here are some specifications and tolerances offered by TDK Electronics in connection with their Super Avilyn (SA) video cassette tapes for both the VHS and Beta recording formats. Tape width is held to 12.65 millimeters, plus or minus no more than 0.01 mm. Tape thickness is 0.02 millimeters (+0.001, -0.002 mm). Fluctuation of width over the length of a given tape varies by no more than 0.005 millimeters, peak-to-peak. Yield strength is spec'd at more than 2.0 kilograms while residual elongation is less than 0.2%. The tape is reported as being able to handle a still-frame time of in excess of 60 minutes without suffering or sustaining significant wear.

Audio Has To Be Recorded Too

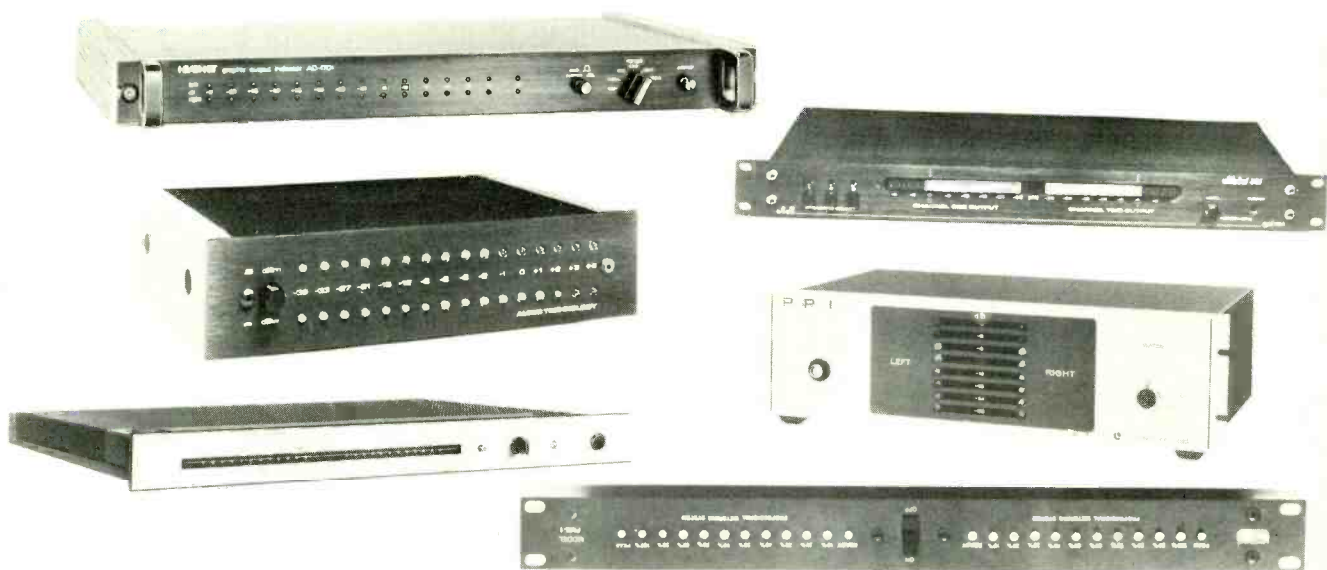
When you stop to think of it, every video tape format must include provision for audio recording too. In the case of VHS-type VCR's the mono audio track width is only 1.0 millimeter while for the Beta system it is only slightly wider, at 1.05 mm. Since we are dealing with an actual tape speed of only 1.31 ips for VHS and 1.57 ips for Beta, that is slower than the standard 1 7/8 ips audio cassette tape speed. Yet, typically, even with this slow speed, narrow-track format, the audio tracks of video cassette recorders are able to provide signal-to-noise ratios of more than 40 dB and a frequency response range which extends from around 50 Hz to 10 kHz. Bear in mind that for the audio recording track, the record head used remains stationary so we are dealing here with a minimal-width track and a very slow tape speed.

Clearly, the requirements for good video tape are much like those for good audio tape—only more so!



NORMAN EISENBERG AND LEN FELDMAN

Six LED Output Indicators



With LED output indicators growing in abundance and popularity, *MR's* editors thought it a good idea to offer our readers an in-depth report on six models currently available. Because of the unusual nature of this group report, the usual test-report format has been replaced, in this issue of *MR*, with one that combines descriptions, comments, and so on for each unit. The "Vital Statistics" on each model are presented in the form of a comparative table at the end of the text.

Why LEDs?

It is apparent by now that the old tried-and-true VU meter is facing stiff competition these days. The interest in alternate readout systems seems prompted by a growing feeling that while most professional sound people do have an "intuitive" understanding of the difference between true VU and peak levels, even the pros can be fooled by some of the high-transient-content and by the high-frequency-energy-content so often embodied in much of today's music and program sources which no longer follow older "rules" of spectral energy distribution.

While the pro and semi-pro recordist have an obvious need for accurate peak indications, so too do those involved in sound-reinforcement, and even in high-fidelity reproduction. Ballistically sluggish mechanical meters—whether used on the front panels of power amplifiers, or on the control boards of mixing consoles—simply do not convey enough information. Signal peaks have a way of exceeding amplitude expectations, and when they do they cause amplifiers to go into clipping, and tape to become over-recorded. Small wonder then that a new category of add-on products has recently appeared, intended to replace or to augment conventional level meters.

The key element in all these devices is the light-emitting diode (LED), a small semi-conductor that gives off light when its voltage breakdown level is exceeded. Originally available only in red, LEDs now can be had in other colors such as yellow and green.

Their chief virtue in this application is their ability to respond to voltage level changes very quickly—so quickly in fact that in several of the units tested for this report, the manufacturers have deliberately

slowed them down so that the human eye will have enough time to perceive the light flashes. (For instance, in the Heath AD-1701 specs, it is noted that the "hold" time is 50 milliseconds, even though it takes only 13 *microseconds* for an LED to respond to a voltage that is high enough to cause it to light up.)

The LED in sum is a most effective device for indicating instantaneous peaks clearly and accurately. How has this remarkable device been used in each of the six add-on units under consideration?

Similarities Among Six Units

The six models tested are, alphabetically: AB Systems model 301; Audio Technology model 510; Heath AD-1701; Lectrotech model PPI-400; Lux model 5E24; and Uni-Sync model PMS-1. Prices (and dimensions, etc.) are given in the comparative table accompanying this report.

All of the units tested, with the exception of the Lectrotech, can be rack-mounted. The Lux model requires adapter brackets to do so (optionally available). The Audio Technology unit may be ordered for either rack-mounting or bench placement.

The AB Systems indicator utilizes three different colors of LEDs (green below 0 dB; yellow for 0 dB; red above 0 dB). So do recent models by Audio Technology. The Lectrotech also employs these three colors for its LEDs, but since it is intended strictly for peak-power measurements (calibration notations are for power across various load impedances), only the top

two LEDs up to 0 dB are red. The other three units employ only red LEDs.

All models tested—except for the Lectrotech—are designed to read *both* power-output levels and line-voltage levels. (The Lectrotech offers, however, another feature that is unique to this unit; see below). In the Uni-Sync, the change from power readout to voltage readout requires changing two internal resistors. In the other four units, the change may be accomplished externally by signal jacks, adjustments and switching. Of course, whether reading power output or line voltage levels, the LEDs themselves always are responding only to voltage levels, since the units are always connected in parallel with the output circuit to be monitored, and they draw virtually no power from the circuit or device being "measured." All six units also had sufficiently high input impedances so as to prevent loading of the circuits or devices with which they may be used.

A remarkable diversity of appearance and features is apparent among the six models, despite the relatively simple job they are intended to do. Obviously, the basic arrangement of a number of LED indicators can take on different forms or "cosmetics" depending on the designer's ideas of how such a unit should conveniently be used. The rundown on individual models that follows is not intended to proclaim whether one is better than another (they all perform as intended), but rather to suggest and discuss the possible performance applications for each.

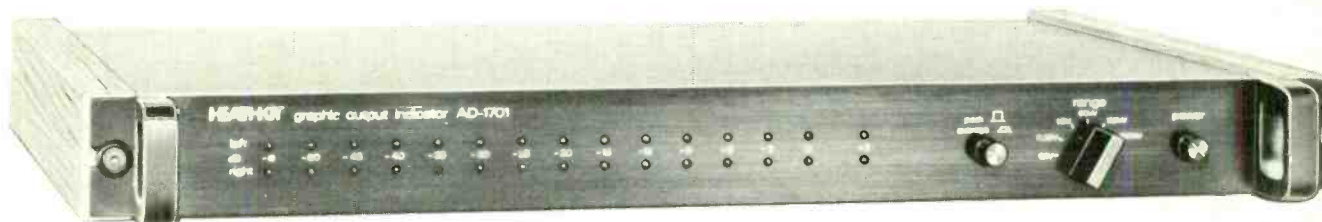
Heath AD-1701

This unit is the only one of the six tested that must be built from a kit of parts. It also is the only one tested that has a special switch setting for "average" readings, which suggests that it could be used to replace VU meters entirely rather than simply to augment them.

Superficially, its LEDs cover the widest range of all, from -50 dB to +3 dB which represents a total possible dynamic range of 53 dB. Practically, however, one is still dealing with a total of fifteen LEDs per

channel, which means that below -15 dB the LED indications are in increments of 5 dB. One could read voltages as low as 31.6 mV, and power levels across 8 ohms as low as 6 milliwatts. For impedances other than 8-ohm loads, it is necessary to calculate actual power, since the three available power ranges are referenced only to 8-ohm loads.

We liked the fact that the Heath unit has line-in and line-out jacks which eliminate the need for a Y-connector when using this device as a recording-level indicator.



CIRCLE 1 ON READER SERVICE CARD

Lux 5E24

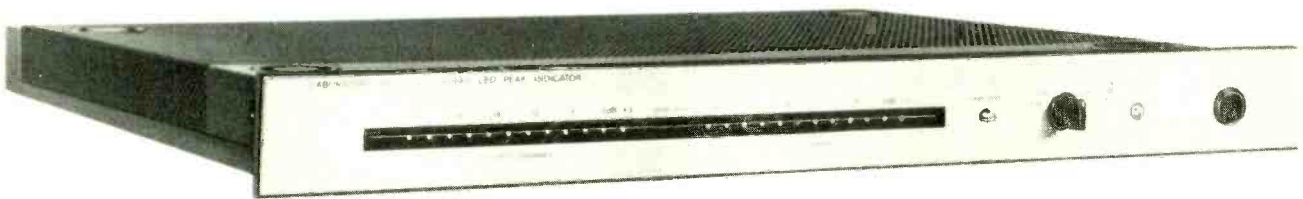
This unit is the costliest and heaviest of the six models tested. It is one of several components in Lux's "Laboratory Reference Series" of high-end audio products. Doubtless, part of its cost is reflected in its "classy" front panel whose cosmetics are intended to match the appearance of other series components.

Be that as it may, the Lux indicator boasts a feature not found on any of the others: peak hold. That is, when using the device either for power or line-level voltage indications, if you press a small button on the unit's front panel, the highest peak-indicating LED during any signal sequence will remain lit until either a greater peak occurs or until the button is released.

In recording work, this feature could be used in two

ways. One is to permit the recordist to observe the highest retained peak and make certain that it is never exceeded. The other would be to allow the user to pre-calibrate the device by feeding in a sine-wave signal known to be the highest in amplitude that one might ever want to feed into a recording system and then make sure that musical signals recorded never reach that level as indicated by the "permanently illuminated" LED. This feature was judged to be useful and easy to master. It works for all LEDs from the -18 dB light and above.

The Lux unit also has a convenience AC outlet (un-switched, and rated for 500 watts maximum) located at its rear.



CIRCLE 2 ON READER SERVICE CARD

Uni-Sync PMS-1

Of the twelve LEDs on each channel of this unit, one serves as a "ready" indicator (it comes on when power is applied), and another serves as a non-calibrated peak indicator. The other ten LEDs are marked in percentages (10 to 100 in increments of 10) rather than in decibels. We cannot "justify" this design flourish since the "percentage" of full power being produced by an amplifier is in itself of little interest; to translate those values into dB values requires of course some additional calculation by the user—which is not required by any of the other units tested.

Moreover, while the unit is designed primarily for reading power (it can be modified by changing two internal resistors to read line-level voltages), the percentages being read by the LEDs (as nearly as we could judge) are percentages of voltage and not percentages of watts delivered to the load. There is a calibration control on the rear panel that enables the user to set full-scale (100-percent readings) at any level from 2 watts to 200 watts, and the last "peak" designated LED then will flash on when that 100-percent level is exceeded, whether the unit is used in power or voltage indication mode. When modified for line-level indications, the rear calibration slider has numerical values that differ from those printed on the panel. The new

numerical values are given in the owner's instruction folder, but in our view they should be present on the unit itself. For that matter, a switch to change the circuit from power to voltage indications (a matter of substituting two 11 K ohm resistors) would make this device a lot easier to use.

In any event, the PMS-1 does have an advantageous feature. Its inputs (5-way banana binding posts) are balanced and of high impedance (72 K ohms). There is no common ground between the two channels, and so the device can be used with amplifiers having floating grounds or in the bridged mode without affecting the balanced line or causing shorts between two such bridged amplifiers.

The calibration adjustment on the rear panel was found to be only nominally accurate, and for correct calibration of the "100 percent" point we found it desirable to use external metering. (The instructions suggest monitoring the amplifier output on a 'scope.) Once calibrated properly, however, the unit maintains its accuracy to within less than 1.0 percent. The real usefulness of this unit is in guarding against amplifier overload and peak clipping; the lower-level LEDs really help in letting the user know when that clipping point is being reached rather than serving as an accurate indication of instantaneous power.



CIRCLE 3 ON READER SERVICE CARD

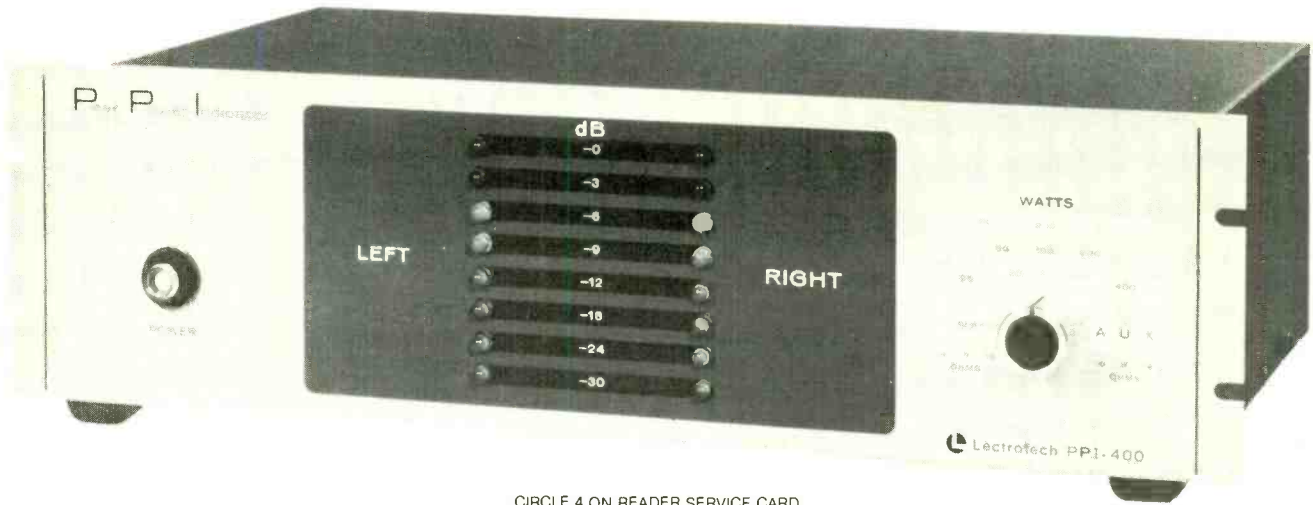
Lectrotech PPI-400

This model is the only one of the six tested that has front-panel power scales and switch settings for all three popular speaker impedances of 4, 8 and 16 ohms. In addition to the fixed "0 dB" switch settings, it is possible to vary "0 dB" to represent any level from 3.13 watts (at 8 ohms) to 1250 watts. This may be done by externally wiring in a couple of resistors as explained in the owner's manual.

The Lectrotech also is the only unit on which the LEDs are arranged vertically (all the LEDs on the others are horizontal), probably because this unit is intended strictly for power output level indications and

not for line-level readout. In this sense, the vertical rows of colored LEDs suggest the "low" and "high" signal levels to be monitored. In any event, the unit's applications are obviously with power amplifiers. The auxiliary inputs at the rear—when used in conjunction with suitable resistors as explained in the owner's manual—may be adapted to permit calibrating two mono amplifiers of different power ratings for "0 dB." In this application, the left and right channel LEDs will show the different power levels for each mono amplifier.

Finally, the Lectrotech can be used to check the correct phasing of left and right channel loudspeakers.



CIRCLE 4 ON READER SERVICE CARD

AB Systems 301

This unit provides for continuously variable adjustment of the "0 dB" point. When used for power indications, it goes a step further. While its rear-panel individual sensitivity controls are rather crudely calibrated in watts (i.e., the markings are not accurate enough to afford true precision), there is an additional potentiometer on the front panel which, when it is rotated to left or right of its center position, can be used to "zero in" on precise calibration when a test signal of known intensity is available.

The AB Systems 301 also has a special feature that may appeal particularly to the serious recordist who is accustomed to viewing a moving meter pointer and

who therefore finds observing a series of flashing lights somewhat unnerving. At the push of a front-panel switch, it is possible to have only a single LED flash at any given time. That is to say, instead of all the LEDs from the instantaneously reading peak downward remaining lit during signal monitoring, only the uppermost-reading LED (at any instant) flashes.

The overall effect of this option is that of a "moving LED" instead of a number of LEDs going on at once. It may be that this novel technique is easier to concentrate on for extended periods of time rather than the alternate "moving bar graph" approach used in all the other units.



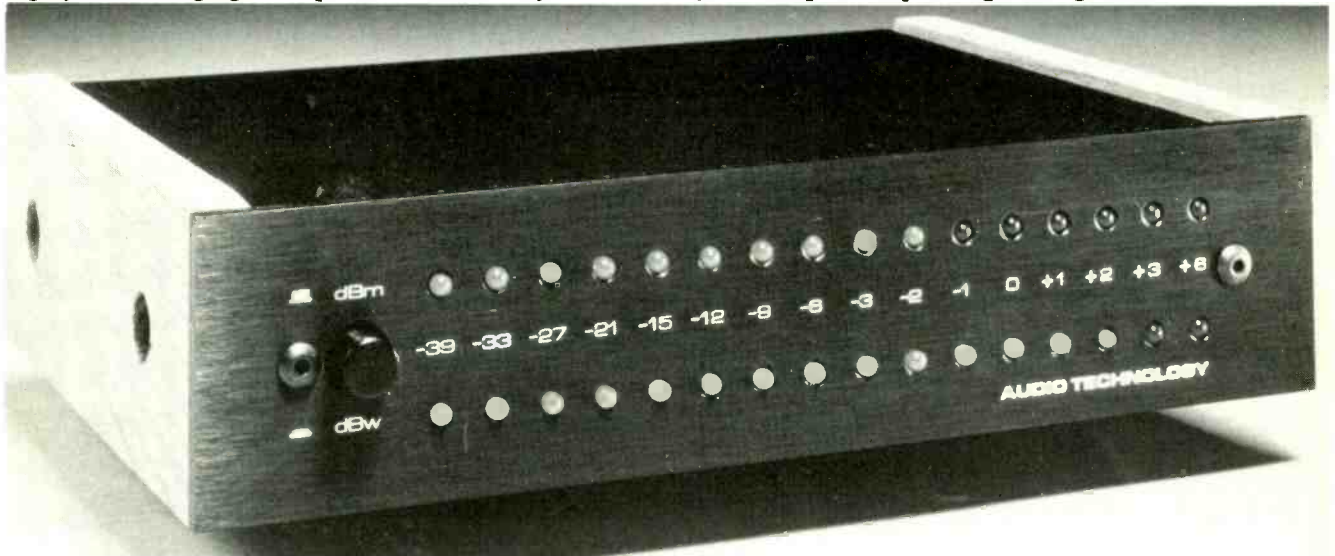
CIRCLE 5 ON READER SERVICE CARD

Audio Technology 510

The most petite of the six models tested, the Audio Technology 510 could have special appeal to the recorder since it is the only one that has a built-in calibration tone for setting up +4 dBm, which is the recording industry's standard for "0 VU." The unit also, of course, can monitor power output levels. It is supplied with a test record for easy setup with tape recorders. In its compact version (\$129.95), it comes with oak side panels that may be attached, plus attachable felt "feet." A rack-mount "B" version costs \$149.95. The 510 may be converted to rack mount or vertical reading by interchanging front panels. Continuously vari-

able input sensitivity controls (on the rear panel) for each channel permit setting it up precisely to read 0 dB at whatever power or voltage level is desired. In addition, it has an impedance switch (also on the rear) that pre-sets 0 dB at 25, 50 or 100 watts (in the power mode the calibration pots are not operative). That means the device can read power levels up to 400 watts per channel (+6 dB above 100 watts), and down to 36 dB below 25 watts, which corresponds to about 6 milliwatts.

The inputs for power-level indications use "isolated" terminals which means that this unit can be used safely with amplifiers operating in bridge mode.



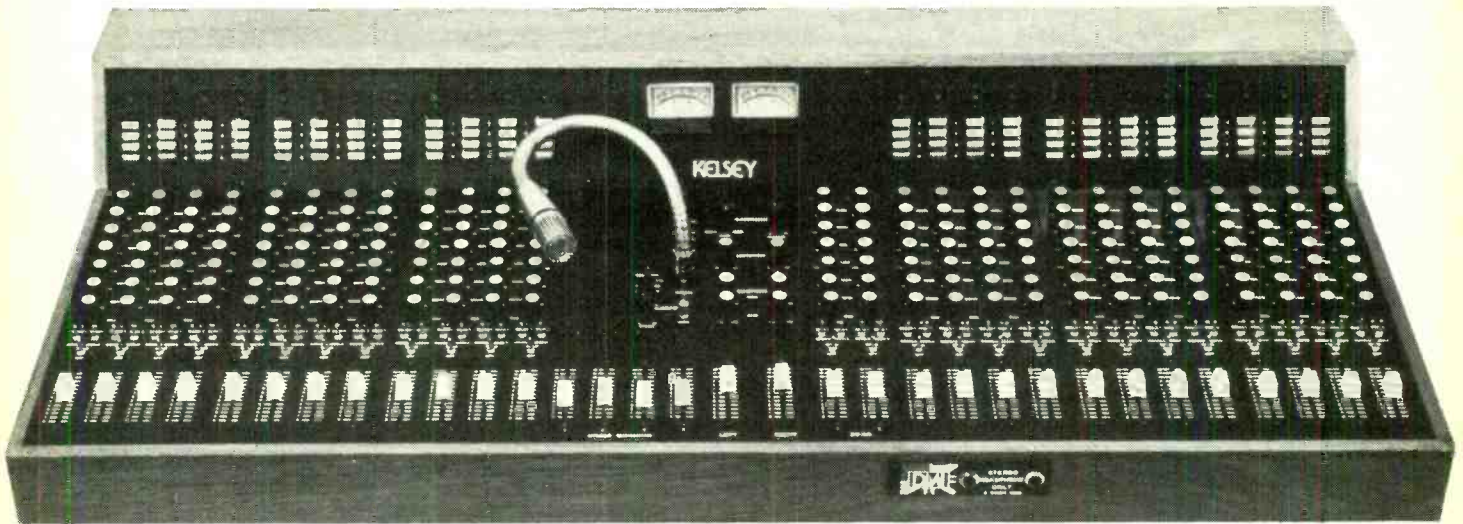
CIRCLE 28 ON READER SERVICE CARD

LED OUTPUT INDICATORS: Vital Statistics

MODEL	AB SYSTEMS 301	AUDIO TECHNOLOGY 510	HEATH AD-1701	LECTROTECH PPI-400	LUX 5E24	UNI-SYNC PMS-1
No. LEDs/Channel	15	16	15	8	12	12
Range (in dB)	-36 to +6	-39 to +6	-50 to +3	-30 to 0	-30 to +3	10% to 100%
Reads Power/Volts	P/V	P/V	P/V	P	P/V	P/V*
Power Range for 0 dB Reading(W)	1 to 500 adjustable	0.25 to 100 (cont. adj.)	60/125/250 (8 ohms)	3.13, 400 (8 ohms)	20,200 (8 ohms)	2 to 200
Impedance Select.	No	Yes	No	Multi-scales	No	No
Voltage Range for 0 dB Reading (V)	N/A	50mV to 5V (cont. adj.)	0.1, 0.32, 1.0	N/A	0.316, 1.0	+4 dBm to +24 dBm
Frequency Response (± 3 dB)	13 Hz to 10 kHz	15 Hz to 25 kHz	10 Hz to 28 kHz	10 Hz to 60 kHz	1 Hz to 100 kHz	10 Hz to 23 kHz
Accuracy	± 0.5 dB	± 0.25 dB	± 0.5 dB to -30 dB ± 1.0 dB to -50 dB	± 0.25 dB	± 0.5 dB to -12 dB ± 1 dB to -30 dB	± 0.5 dB
Peak Hold Capability	No	No	No	No	Yes	No
Attack Time	N/A	50 µSec for 20dB 750 µSec for 45dB	13 µSec (for 50 dB rise)	N/A	100 µSec	N/A
Decay Time	N/A	300 mSec for 20dB 650 mSec for 45dB	3 mSec	N/A (Same as attack time)	300 mSec	N/A
Calibration	Adjustable	Adjustable	Fixed	Fixed	Fixed	Adjustable
Size (W x H x D) (Inches)	19 x 1½ x 10½	7½ x 1¾ x 5½ (19 panel version)	19 x 1¾ x 13 (19¼ x 2 w/side panels)	14 x 3¾ x 8	17 3/8 x 2¼ x 15 3/16 (19 panel adaptor)	19 x 1¾ x 5
Weight (lbs)	10	2.21	15	3.5	12.1	6
Power Consumption (W)	2.0	9.0	9.0	5.0	7.0	8.0
Suggested Price	\$199	\$129.95/"B" version 149.95	\$189.95 (Kit only)	\$129.95	\$295	\$149
Special Features	Highest reading LED can be made to flash alone. Dual calibration facility.	Internal cal. for +4 dBm. Supplied with test record for easy setup with tape recorders	Peak or Average readings. Line in and out jacks. Power on indicators	Aux terminals for specific calibration	Peak-hold to -18 dB	*Line level or power. Easily modified to 230V operation

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Audio Perceptions

Model 201 Active Crossover

By Jim Ford and John Murphy

This month we are reviewing the Model 201 Active Crossover by Audio Perceptions. This was our first encounter with a product manufactured by this Diamond Bar, California company.

Also, since this is our first review of an active crossover, we thought that it would be appropriate to first provide our readers with some background discussion on crossovers and bi-amplification. This is especially appropriate for any discussion of bi-amplification when you consider the confusion regarding this subject that is rampant among the audio community.

Crossovers

If we could make loudspeaker drivers that could reproduce the entire spectrum of audio frequencies then we wouldn't need crossovers. Unfortunately some of the characteristics that make a driver good for reproducing low frequencies make it unsuitable for reproducing high frequencies. The most basic incompatibility is in the size of the driver required for good reproduction at the opposite frequency extremes. A good low-frequency transducer is typically large in order to move a lot of air, and high-frequency transducers are usually small in order to radiate sound over an acceptably wide listening area. So, if a driver is a good low-frequency reproducer then it probably won't be good on the highs, and vice versa. Since high-quality audio requires good reproduction of the entire spectrum of audio frequencies, we are left with no choice but to use separate drivers for different frequency ranges.

The simplest full-range loudspeaker systems use two drivers, a woofer for bass, and a tweeter for the highs. In this case the middle frequencies are shared by the two drivers, and each driver has to perform well in the midrange in addition to performing well at the frequency extreme it specializes in. This means that the frequency coverage of the two drivers must overlap. In order to maintain accurate frequency balance through the shared frequency range we must carefully control this frequency overlap. If the drivers overlap too much, the mid range will be overemphasized and if they don't overlap enough, there will be insufficient midrange response.

The crossover is a set of electrical frequency filters used to shape the frequency response applied to the different drivers in the range where they overlap. One filter removes the lows from the signal sent to the tweeter and another filters out the highs from the signal sent to the woofer. For example, an ideal crossover for a two-way (i.e., two driver) system might pass all



the audio signal with frequencies below 1000 Hz (a middle frequency) to the woofer and pass all the audio signal with frequencies above 1000 Hz to the tweeter. (1000 Hz would be called the crossover point or frequency.) Ideally we would want the crossover to pass none of the signal above 1000 Hz to the woofer, and none of the signal below 1000 Hz to the tweeter. Unfortunately we cannot build an ideal filter like this. All of the real filters that we can build will pass some of the signal above 1000 Hz to the woofer and some of the signal below 1000 Hz to the tweeter. As we move away from the crossover frequency (1000 Hz for our example) the filter will pass less and less signal to the "wrong" driver. That is, the crossover does a good job of filtering the highs out of the signal sent to the woofer and the lows out of the signal sent to the tweeter, but it only works gradually through the crossover region. As we go up in frequency past the crossover point less and less signal is sent to the woofer and as we go down in frequency past the crossover point less and less signal is sent to the tweeter. How rapidly the filter cuts the signal after passing the crossover point depends on the particular filter design. Some filters can cut the signal response very quickly once past the crossover frequency and closely approximate our ideal crossover, others attenuate the response more gradually and are less ideal. This characteristic is referred to as the "slope" of the filter. Typical crossovers have slopes of 6, 12 or 18 dB per octave. In other words, the filters cut response by 6, 12, or 18 dB for each octave change in frequency past the crossover point. The 18 dB per octave filters have the highest slope and are most nearly ideal.

Bi-amplification

The crossover filters that we most frequently encounter are the type that are included as a component of a loudspeaker system. When you connect speaker



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wires to such a loudspeaker you are actually making connections to the crossover filters which in turn connect to the individual drivers in the system. Note that in this configuration the input to the crossover is the output of the amplifier powering the speakers and the output of the crossover connects directly to the loudspeaker drivers. This way the same power amplifier is used to energize all the drivers of the loudspeaker system through the crossover.

As an alternate configuration, it is possible to filter the output of the preamplifier and perform the crossover function before going through the power amplifier. The output of the preamp is now split by the crossover filters into high- and low-frequency signals. Each signal is then independently fed to its own power amp and then directly to the appropriate high- or low-frequency driver. There are no filter components between the power amps and the loudspeaker drivers. This constitutes what is generally known as bi-amplification, that is, using two amplifiers per loudspeaker system.

One distinct advantage of the biamped system is that the crossover filtering is done at line level (the output of the preamp is a line level signal with an average level of roughly 1 volt) rather than at the power levels (average of about 10 to 50 volts) that are required to energize loudspeaker drivers. When filtering power level signals we are restricted to using passive components (i.e., capacitors, inductors and resistors) and relatively simple filter designs, whereas at line level we can make our filters using active devices (transistors, integrated circuits, etc.) and any filter design we choose. This gives us the freedom to make line level crossovers with high slopes (18 dB per octave)—something which is difficult to do at high power levels without significant power loss. Thus, a significant advantage of bi-amplification is the freedom we gain in designing or selecting crossover filters that

are more nearly ideal than the filters we can achieve at high power levels using passive components.

Because the different drivers in a biamped system are connected to separate power amps, the high frequency distortion products from the woofer amp are not reproduced by the tweeter and overall distortion is reduced. The woofer system can actually be driven into significant amounts of distortion and as long as the tweeter system is not overdriven the listener will perceive clean, undistorted sound (up to a point at least). This characteristic of biamped systems makes them especially useful when high sound levels are required (such as for stage or concert sound systems). Another benefit gained by biamping is the reduction in amplifier intermodulation (IM) distortion that results when the amps are used for only a restricted range of frequencies. It has also been pointed out that the motion of the driver diaphragm is better controlled or more highly damped when there is no passive crossover between the amps and the drivers. There are even more points that can be made in favor of biamping but we have covered the most important ones — or at least the ones generally agreed on.

The proposed advantage of biamping that is not generally agreed on concerns a power advantage gained over single amp systems using the same total amount of power. One group looks at the power available to reproduce musical peaks and declares a definite power advantage for the biamped system while another group looks at average (RMS) signal levels and says there is no advantage. The truth is probably between the two positions but the issue is as yet unsettled. As stated before, however, nearly everyone agrees that biamping is better. We have discussed only two-way loudspeaker systems in the interest of simplicity but be aware that this discussion also applies to triamping three-way systems and so on. With this for background we'll get on with the product review.

General Description: The Model 201 Active Crossover by Audio Perceptions is a line level crossover that can be used to biamp a stereo system or triamp a mono system. The filters are Butterworth type with slopes of 12 dB per octave. The unit has an attractive black anodized aluminum finish and can be mounted in 3½ inches of standard 19 inch rack space. It costs \$350 and is covered by a two year limited warranty for parts and factory labor.

Inputs to the device can be either balanced or single-ended and the single-ended output is capable of driving a 600-ohm load to +20 dBm. The crossover can be specially ordered with transformer balanced outputs at extra charge.

The front panel has identical controls for each of the two channels. To the left is the crossover frequency selector which is used to select frequencies from 100 Hz to 1100 Hz in 100 Hz steps. If the "×10" button to the left of the crossover frequency selector knob is pushed, an LED lights to indicate that crossover frequencies can now be selected from 1000 Hz to 11,000 Hz in 1000 Hz steps.

To the right of the crossover frequency selector knob are the low pass and high pass gain control knobs.

Each of these is adjustable over a ± 5 dB range in 1 dB steps. In the 0 dB position the crossover has unity gain. An LED peak overload indicator is provided for both the high and low outputs of each channel. These indicators illuminate whenever an output exceeds approximately +17 dBm. To the far right is a push button line switch with LED indicator.

On the rear panel there is a push button for selecting either stereo biamp operation or the mono triamp mode. In the triamp mode the low frequency crossover point is selected on channel 1 and the high frequency crossover point is selected on channel 2. All input and output connections are made by way of appropriately labeled ¼-inch phone jacks on the rear panel. The manufacturer claims RFI protection on all of the Model 201's inputs and outputs.

Comment: We used the crossover in a biamped system with good results. The unit introduces no sound of its own and was very easy to set up. Since the drivers in our loudspeaker systems had only a minimal amount of frequency response overlap, we would have preferred filter slopes of 18 dB per octave to insure rapid transition from one driver to the other.

Lab Test: On the test bench we found the unit to be well-constructed using high-quality integrated circuit operational amplifiers throughout.

Noise was measured on channel one as -84.6 dBV (with respect to .775 V) at the high output and -79 dBV at the low output. For channel two, the noise

measured -80.3 dBV and -89.3 dBV for high and low outputs, respectively.

Distortion was measured at 0 dBV (.775 V) and found to be very good. For channel one, the distortion for a 100 Hz test tone through the low output was only .015%. Using a 2 kHz test tone through the high output resulted in .0064% distortion. For channel two, distortion was .005% and .001% for the low and high outputs, respectively.

The bandwidth (-3 dB points) was found to be 3 Hz to 85 kHz. With a 1 kHz square wave input there was no sign of ringing when the output waveform was observed on the scope. The output waveform was not clipped until it reached a level of 12.5 v RMS. The maximum slew rate through the unit was measured as 3.3 volts per microsecond. The crossover frequencies agreed very well with the selector switch setting. Response at both the high- and low-frequency outputs was typically -2.6 dB at the crossover point rather than the standard -3 dB. However this is only a slight error and should be of little concern to most users.

Conclusion: This is a high-quality active crossover that is suitable for most biamping or triamping requirements. Input and output connections can be made quickly and easily and operation is straightforward. The unit provides good visual indication of operating modes and settings along with indications of signal overload.

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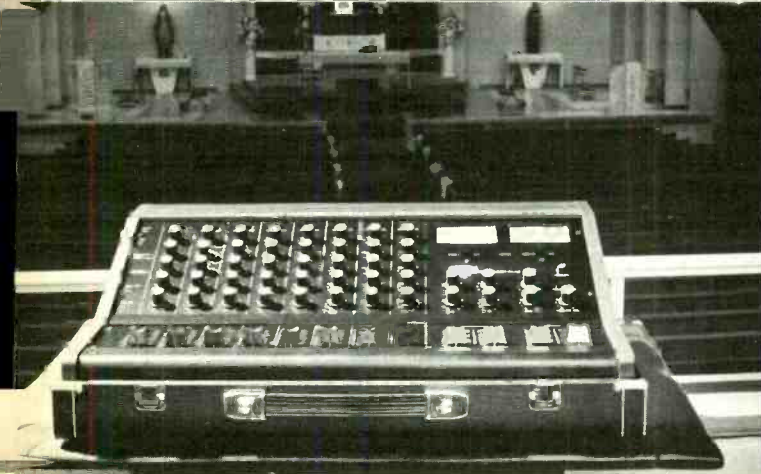
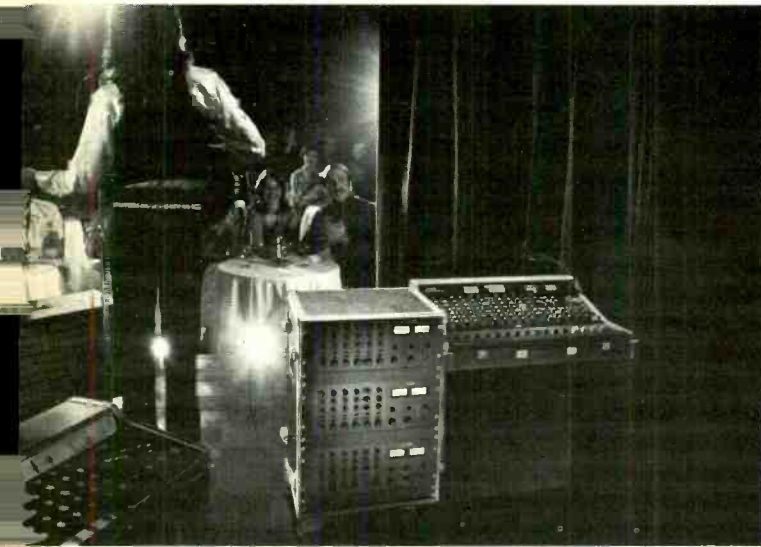
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GROOVE VIEWS

Reviewed By:
ROBERT HENSCHEN
NAT HENTOFF
JOE KLEE
JEFF TAMARKIN

POPULAR

THE CLASH: *Give 'Em Enough Rope.*
[Sandy Pearlman, producer; Corky Stasiar, engineer; no location listed.]
Epic JE 35543.

Performance: **English Civil War**
Recording: **Tommy Gun**

All the left/right wing of today's New Wave movement asks is that the middle classists give 'em enough rope to hang themselves. Or is it the other way around? That's the challenge of this attrition-oriented music; stay with us or fall. Once you give up on the volume and violence, the punks win their battle. Not necessarily the war. Replete with pieces like "Guns On The Roof," "Drug-

Stabbing Time," and "Tommy Gun," The Clash is adept at terrorizing the MOR status quo with harsh specters of rock revolution.

"Safe European Home" commences the action at brutal levels of instrumentation. Lyrics, as with many of the hardcore punk groups, are almost undecipherable...but the tune somehow communicates at subconscious levels anyway. There's an abundance of inciteful, gun-toting rock at chaotic speeds, but The Clash actually lightens up near the end side, perhaps to get their message across. "Julie's In The Drug Squad," with its goodtime piano *way* in the background, may be as close to normalcy as this band is willing to go. But "Stay Free" and "Cheapskate" approach the kind of early sixties rock that the New Wave obviously reveres. The album ending "All The Young Punks (New Boots And Contracts)," formerly titled "That's No Way To Spend Your

Youth," is a pretty strong tune, even in conventional rock terms.

The thematic centerpiece of *Give 'Em Enough Rope* is probably "English Civil War," a companion to the Sex Pistols' "God Save The Queen" and "Anarchy In The U.K." in that it plays on the traditional melody and lyrics of "When Johnny Comes Marching Home." Some of the music here is rather powerful, or shocking, and The Clash is gaining on better British realists like Generation X and The Jam. Whether the music survives an incredible record biz New Wave hype, and goes on to achieve some sort of relevance, remains to be seen. Of course, from the hands-off production and engineering standpoint, New Wave music has already made a least one major statement in rather blunt terms—late-seventies technology has put the cart before the horse. *Anybody* can make a *pretty* record these days.

R.H.



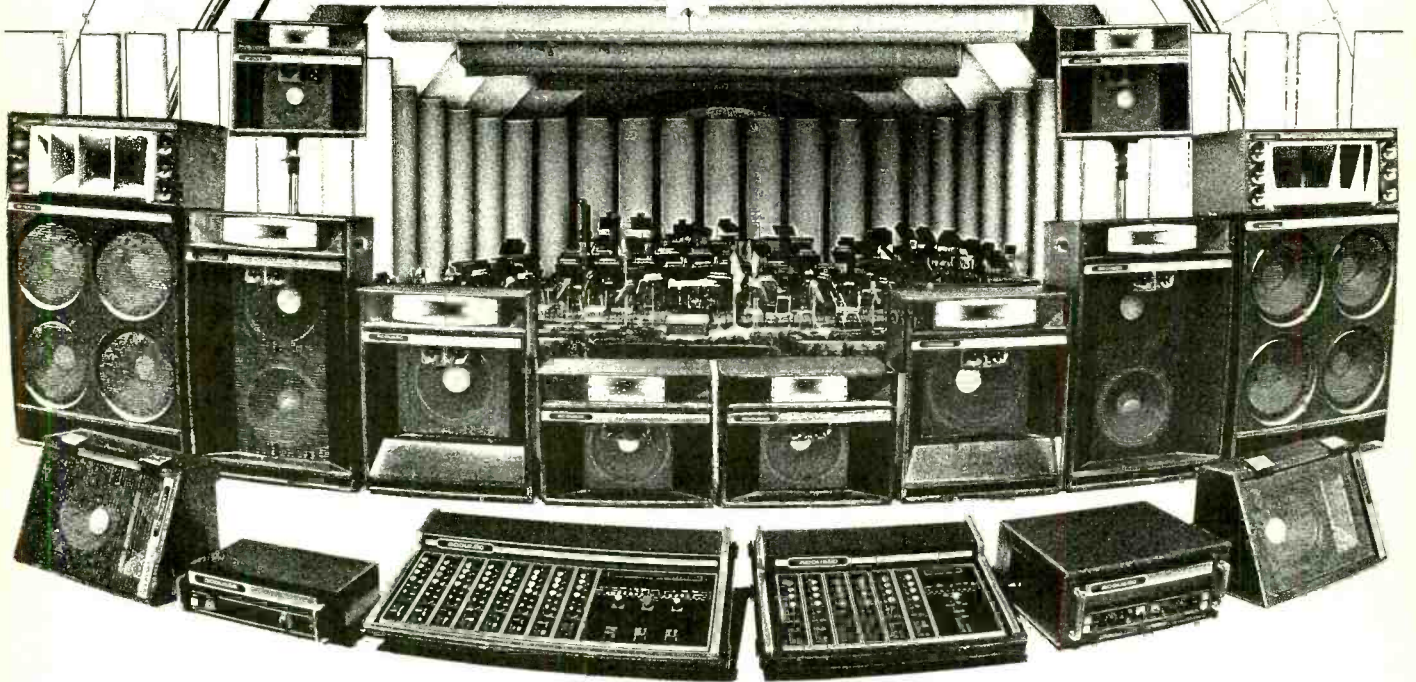
THE CLASH: Adept at terrorizing the MOR status quo

THE SONICS: *Original Northwest Punk.* [Jerry Dennon, producer; Kearney Barton, Larry Levine, engineers; "The Witch and "Psycho" by Etiquette Productions; no studios listed; recorded in 1964 and 1966. Reissued 1977.] First American Records FA 7715.

Performance: **Early garage punk**
Recording: **Early garage punk**

There is a curious case of history repeating itself in rock music today. Punk rock, it is well known by now, grew as a direct response to the "mellow sound" of the early 1970s, which the current crop of young, rebellious (and older rebellious) kids could not exactly get excited about. Punk's advocates stood by the premise that rock 'n' roll had abandoned its roots, and that it had actually become

“good acoustics”



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exactly what it originally sought to replace. The early, raw punk of the Sex Pistols, the Ramones, and their like provided as a by-product a much-needed shot in the limp arm of the rock 'n' roll of a few years back. Admittedly, the new wave itself didn't exactly eliminate the powerful voice of mellow from the charts, and accordingly, it took a turn in order to survive.

The current line is that punk is now on the wane, and that having exhausted its initial adrenalin supply, is now injecting small to large doses of progression into its veins. The Ramones are attempting mid-tempo and country-oriented numbers on their newest, and Blondie has scrapped their pop image for a more sophisticated one. Gaining strength now are the more progressive new wave bands like Devo and the Cars, which borrow from the commercially-accepted rock and also the artsy-experimental types, while holding onto a basic new wave framework as their pivotal point. Which brings us to the Sonics and 1966.

You see all this happened before. Before the Beatles, Stones, and Who there was Fabian, Frankie Avalon, Leslie Gore, and innocence. Then the

British invasion tore loose, shattering *that* status quo permanently. American groups formed and took up the call, and by 1965, a new generation of rock 'n' rolling long-haired bands had totally obliterated the "mellow sound" of its era. However, by 1966-67, as moustaches were added to the long hair, psychedelia, in the form of *Sgt. Pepper's*, the Doors, and San Francisco rock had elevated the idiom to a high level of respectable art which set the tone for the music which would dominate 70's rock. Somehow, it eventually deteriorated into terminal mellowness again, until the punk explosion brought some temporary life back to the music.

The Sonics, an obscure Seattle band of the mid-60s, bill themselves on this reissue as "original northwest punk." Although it's a good attempt at cashing in, their mark is wrong. The original punk of the northwest belonged to the Kingsmen of "Louie Louie" fame, and pop-rockers like Paul Revere and the Raiders, the Astronauts and the Wailers (not Bob Marley's Wailers, so save the stamp). If anything, the Sonics probably *were* the northwest's original psychedelic band. Except for the two

singles, "Psycho" and "The Witch," both alleged classics around Seattle, this is not the three-chord jackhammer variety we've come to call punk. The blues-based improvisations, decidedly non-pop arrangements, and adherence to post-*Rubber Sole*, pre-*Pepper's* coolness techniques automatically place the Sonics in the acid category.

To expect anything but tin can recording quality out of this LP would be unfair to it, so if you're thinking of using it to test out your new speakers' response to a good synthesizer solo, don't bother. Instead, dig out the old Victrola and turn it up, then you'll be doing this record justice. This is, after all, admittedly a period piece and nothing else. It's a collector's item with limited appeal, and as such, is a gem in its class. The Sonics were a killer band in their day, and it amazes me that they've gone unnoticed till now. There are musical moments here approaching the best of the lower-echelon early psychedelia on Elektra/Asylums's precious 1972 *Nuggets* collection, which brought together forgotten wonders of the '65-68 era by bands such as the Barbarians, the Chocolate Watch Band, the Magic Mushrooms, and others.

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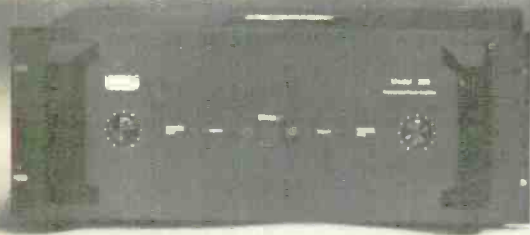
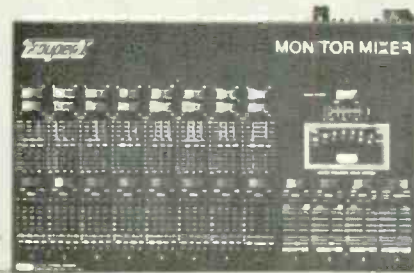
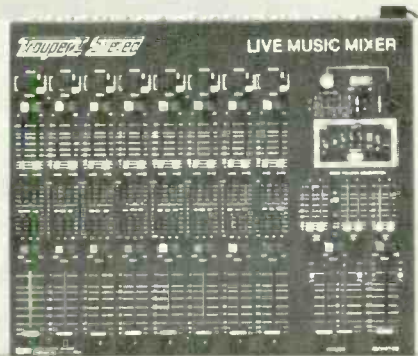
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THE SONICS: Original northwest punk—thirteen years later

There's not much more to say about the Sonics. There were probably a hundred bands just like them in every metropolitan/suburban center in the late '60s, but the Sonics were lucky enough to be recorded, and even luckier to be dug up again now when they can be appreciated for what they were doing. If you understood all of the above,

and are prepared to listen to the Sonics in spite of, perhaps even because of, their rawness and lack of polish, this record belongs in your collection. If you could care less about thirteen-year old recordings of noise-rock, probably recorded on a portable cassette recorder, you should have moved on to the next review long ago. J.T.

DARYL HALL & JOHN OATES: *Along The Red Ledge*. [David Foster, producer; Tom Knox, Humberto Gatica, Ed Sprigg, engineers; recorded at Davlen Studios, Los Angeles; Sunset Sound, Los Angeles, Ca., and Hit Factory, New York, N.Y.] RCA AFL1-2804.

Performance: **Excessive yet ultimately insubstantial**
Recording: **Fair to poor**

This is an album of extremes for Hall & Oates, bracketed by three or four decent opening and closing tunes, but filled with undernourished, uninspired excesses. "It's A Laugh," the opener, should make some sort of run at the charts with its catchable pop chorus, slowing right into "Melody For A Memory" which plays up the duo's Philly soul roots. But "The Last Time" cops its big opening beat directly from Phil Spector and its melody, revamped into highly produced upbeat pop, is rather second generation too. Side one finishes weakly with a forgettable dance orchestration ("I Don't Wanna Lose You") and an overdramatic vocal display by Hall on "Have I Been Away Too Long."

Turning on a dime (or was that a Krugerrand?), the boys open side two with a couple of wobbly hard-rockers. "Alley Katz," for one, is super fast and New Wavish—an unsuitable, ankle-deep test for H & O and their formidable backing band (with Caleb Quaye, Kenny Passarelli, producer-keyboardist Foster, and drop-ins like George Harrison, Todd Rundgren, and Robert Fripp). "Serious Music" attempts to alternate between sections of

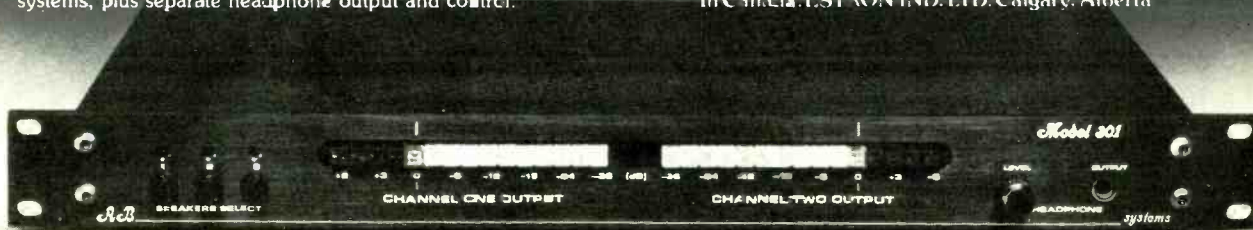
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DARYL HALL AND JOHN OATES: A collection of extremes

rock and lighter pop, an effort hampered by unclear vocals but aided by good guitar and an orchestral "solo."

To this point, however, there has been nothing to compare with "Sara Smile" or the other early gems from *Abandoned Luncheonette* (Atlantic, 1973). "Pleasure Beach," while not destined for rock anthologies, is an ex-

citing development near the end of side two. After a pretty vocal prologue, the cut explodes into partytime rock, somewhat reminiscent of Freddie Cannon and "Palisades Park." And as an epilogue to this largely unsuccessful collection of extremes, Hall turns in one of his all-time greatest solo melancholias, "August Day." R.H.

BUDDY RICH: *Class of 78.* [Norman Schwartz, producer; Keith Grant, engineer; recorded at RCA Studio, New York, N.Y., October, 1977.] Gryphon G 781.

Performance: **Classy Riches**
Recording: **Bright and shiny**

BUDDY RICH AND MEL TORME: *Together Again For The First Time.* [Norman Schwartz, producer; Keith Grant, engineer; recorded at RCA Studios, New York, N.Y., January, 1978.] Gryphon G 784.

Performance: **Classy Riches plus a marvelous Mel-ody**
Recording: **Still bright and shiny but a little too much bottom**

As a drummer Buddy Rich has always been straight ahead but as a bandleader it's been an up and down career. He's had good bands, some were almost great in fact. He's had bad bands. He's had bands that played bebop, bands that

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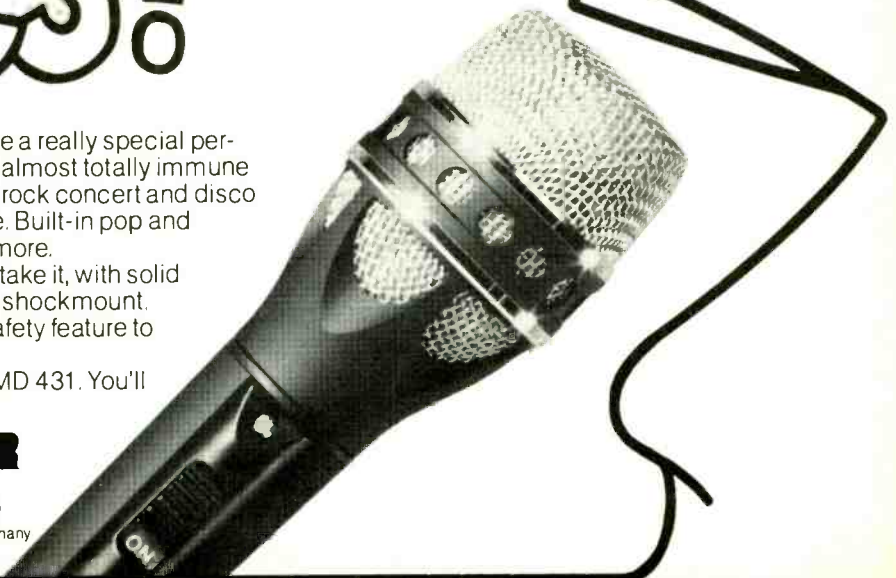
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played swing and bands that played more rock 'n' droll than anything else. More than anything he's had bands that fluctuate. It's a disease of the times. Those of us who are old enough to remember going to hear Benny Goodman's band and knowing that Gene Krupa would be the drummer and Harry James would be the trumpeter find it difficult to get used to these days where players run back and forth between the orchestras of Buddy Rich, Woody Herman, Maynard Ferguson so quickly that a daily tally would be necessary to know who is playing where this week. But here are two recordings of the Buddy Rich band made a whole three months apart and the reed section is intact. There has been only one change in the trumpet section. Only the trombones have hinted at instability, with two out of three who were there in October gone by January. And for Buddy Rich that's pretty stable.

This is also one of the better bands. It swings like a banner in the breeze, and without a guitar at that. It also sticks closer to jazz roots. The album *Class of 78* has tunes by Bud Powell and Horace Silver as well as by such artists of jazz/rock fusion as Joe Zawinul and Chick Corea. Even more incredible, Buddy doesn't take one solo on the album, this from a drummer who has frequently been accused, by such writers as me, of having a band only to accompany his drum solos. It's a band album and a darned good one with some fine players like Dean Pratt on trumpet and Barry Keiner on piano making a glorious sound on Horace Silver's tune "Cape Verdean Blues." If Buddy keeps this band and keeps it headed in this direction Basie and Thad Jones and Mel Lewis better look to their laurels.

As for the Rich band and Rich as accompanists to a good ballad singer, Mel Torme, it's a far cry from the days in Tommy Dorsey's band when Buddy used to hit rim shots behind Frank Sinatra's vocals just to distract the singer and his fans. The band plays for Mel and Mel brings along some fine charts for the band to play. Unfortunately, Mel has recorded most of these tunes with other bands on other labels. Somehow they sound better enriched on Gryphon. Like I said it's one heck of a band. Phil Woods comes along for the ride on "Here's That Rainy Day" and Mel Torme and Buddy Rich exchange some good natured fun on "Ella Be Good," as Mel sometimes calls it, that makes it far better than his previous version on the *Live at the Misonnette* LP on Atlantic.

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CIRCLE 60 ON READER SERVICE CARD

Two Jazz Essentials: Thad Jones and Jim Hall

By Nat Hentoff

Miles Davis is the most astute—and certainly the most quotable jazz critic I know. He once said of Thad Jones: "I'd rather hear Thad miss a note than hear Freddie Hubbard make twelve." All I would add to that is I'd rather hear Thad in a small combo than as part of any big band, including the one he co-leads with Mel Lewis. Not that Thad isn't full of surprises in any context; but because he is so thoughtful and probing a soloist, Thad is most absorbing when he can stretch out at whatever length feels right to him—without having to worry about crowding a horde of waiting soloists.

Accordingly, his most sustainedly imaginative playing in a long time is in *The Thad Jones/Mel Lewis Quartet* (Artists House), recorded in 1977 at the Airliner Lounge in Miami. And his associates could hardly be more attuned to Thad's incisively lyrical conception—drummer Mel Lewis, (a model of discreet tastefulness), pianist Harold Danko, and bassist Rufus Reid. Practically all of this was spontaneous, and it fuses together so well because these players exemplify Duke Ellington's rule: the best musicians are those who listen best.

The sound quality is about the best I've heard on a "live" date. Indeed, so conscientious and proud is this new label of its engineering that the accompanying booklet—in addition to discographies and transcripts of solos—identifies all the equipment, from the bass drum mic (Sony 55P) to the one on Thad's cornet (AKG 414).

Another, even more extraordinary, Artists House set *Jim Hall-Red Mitchell*. Hall is without peer on jazz guitar—quality of imagination, tone, and time-ease. Mitchell is among the first five or six world-class bassists. Together—and they've worked with

each other, off and on, since 1955—Hall and Mitchell are the most astonishingly empathic jazz duo in my experience. The interchanges, however subtle and daring, are so seamless that at times it's as if it were all coming out of one oversize instrument.

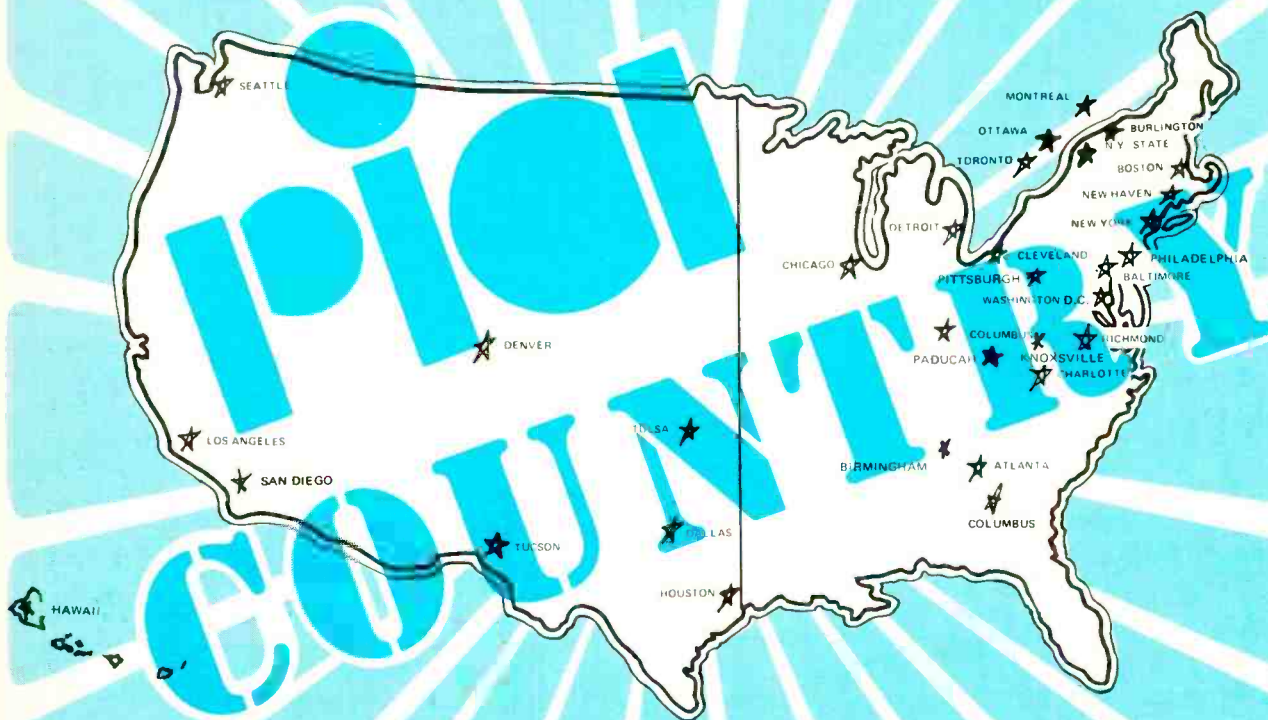
Each, moreover, is apparently incapable of coasting on old licks. The perennial freshness of ideas is what makes this so utterly absorbing a session. With regard to Mitchell, as Jim Hall says, "he can play the melody and sound better than most horn players. . . It has almost nothing to do with the string bass. It's just music coming out, going way beyond the instrument per se." The same can be said of Hall. He too transcends his instrument, creating sheer music. (Both remind me of conductor George Szell's remark that there was a time when pianists made music rather than played the piano).

Again, as has been true of all the initial Artists House releases, the engineering is without any fault I can discern. There is exceptional presence, but there is no sense of the sound having been hyped. The booklet here too includes transcriptions of solos by Red and Jim, and complete technical information. (Artists House sets are in some stores and can also be ordered from the label at 40 West 37th Street, New York, N.Y. 10018).

THAD JONES/MEL LEWIS: *The Thad Jones/Mel Lewis Quartet*. [John Snyder, producer; Mack Emerman, engineer]. Artists House AH3.

JIM HALL/RED MITCHELL: *Jim Hall/Red Mitchell*. [John Snyder, producer; David Baker and Chip Stokes, engineers.] Artist House AH5.

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Of the new tunes, I don't think either "When I Found You" or "I Won't Last A Day Without You" are choice material but Mel does the best he can with them. It's hard to believe that this really is the first time Rich and Torme have recorded together. They're old friends and they've worked together frequently but they had to wait for Norman Schwartz to come along and bring it together.

There is, by the way, a most interesting five paragraph statement by Schwartz outlining his views on recording techniques in the liner notes for *Class of 78*. Otherwise, I need only mention that this is a commercial version of the direct-to disc recordings which was taped at the same session and released at half the price of the directly recorded disc. The sound is fine, although on the Torme LP the bass seems a bit boomy (on my equipment at least). I know that Tony Price was added on tuba for the session but that shouldn't make that much difference. Maybe the engineer just couldn't resist that big beautiful sound that Tony gets out of the horn and miked it too closely. At least that's how it sounds to me.

If there's any fault with *Class Of 78* it's the short playing time—I make it about half an hour. When I asked Norman Schwartz about this he explained that doing direct-to-disc recording he was somewhat limited by the medium itself. You can't crowd a direct-to-disc the way you can your average LP. But the *Together Again* album has a longer playing time so it would seem like they're getting that together as they go along. I haven't heard the direct-to-disc versions of these LPs. At twice the price I would hope they would have some sonic advantage over these records processed in the normal way. These sound so good, though, that it sets me to wondering if any further technical excellence is really necessary—especially at those prices.

J.K.

DEXTER GORDON: *Manhattan Symphony*. [Michael Cuscuna and Maxine Gregg, producers; Jerry Smith, engineer; recorded at CBS Studios, New York, N.Y., May 2, 3, 4, 1978.] Columbia 35608.

Performance: **Top-deck Dexter**
Recording: **Boxy, but it gets it all down**

On October 11, 1939, Coleman Hawkins and his nine-piece orchestra were doing a recording session for

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Bluebird, RCA's 35¢ label. There was just enough time left for one take on what had been a long session, one of the sides having gone up to take number twelve before they got it right. Hawk picked up his tenor sax and blew "Body And Soul" one time, packed up and went home not even realizing that he had recorded the side that would be his greatest claim to fame. Ever since then, tenor sax men have been working out on "Body And Soul" as though it was their national anthem. Ben Webster cut it for Savoy. Charlie Ventura and Gene Krupa made it one of their features. Chu Berry recorded it for Commodore. Hawkins even recorded it a second time under the name of "Rainbow Mist" for Apollo Records (close but no cigar). I once heard the late Paul Gonzalves, practically falling down drunk only months before his passing, play an unaccompanied version at a church service that even surpassed the Hawkins classic version in my considered opinion. Now here the tune turns up again on Dexter Gordon's latest LP for Columbia. The circumstances forecast well for the meeting.

Dexter, after such a prolonged absence from America that people



DEXTER GORDON: Back home again

would greet news about him with the attitude of oh-gosh-is-he-still-around, is back home again playing better than ever. I don't know if Dexter had ever recorded "Body And Soul" before this but I'm sure he must have played the tune on gigs. His ballad work, however, has long been legend from the days of

his "Ghost Of A Chance" and "Sweet and Lovely" on Dial Records. The match is right. Dexter plays the tune like it was written for him. It's no imitation of Coleman Hawkins' either. The tempo's brighter than Bean's was and the harmonic changes are more modern than Hawkins even during his bebop period. The rhythm section of George Cables on piano, Rufus Reid on bass and Eddie Gladden on drums helps move things along nicely—and there's a freewheeling tour-de-force Dexter Gordon cadenza that just blows the mind tacked on the end of the cut.

I find the sound somewhat boxy. If it hadn't been done in the CBS 30th Street Studio I wouldn't be so surprised but I'd expect a more lively sound from 30th Street remembering some of the other sessions I've heard come out of there—but then lively isn't as important when you're doing one horn with rhythm as it would be for a full band.

I know there are other cuts on the album ranging all the way from "As Time Goes By" for you Bogart-Bergman freaks to Dexter's own up-tempo blues "LTD." But I know that one track on this album is going to be worn out and played to death before the others show



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any signs of wear and tear. Maybe I am just a sloppy old sentimentalist, but I can imagine Dexter Gordon, aged 16, listening to Coleman Hawkins "Body And Soul" saying something like "yeah, that gets it—but someday I'm gonna find my own thing to say on that tune." Sure enough, he did. J.K.

GERALD WILSON: *The Best Of The Gerald Wilson Orchestra.* [Albert Marx Productions and Jerry Bock, producers; no engineer or studio listed; recorded in Los Angeles, Ca. in the early-mid 1960s.] Pacific Jazz LA 889H.

Performance: **The real thing—not a dress rehearsal**

Recording: **Sixties—tasty but a bit flat**

All the album cover tells the listener is "The Gerald Wilson Orchestra is unquestionably the finest orchestra to emanate from California in a decade. Composer, arranger, musician, lecturer, disk jockey, bullfight aficionado Gerald Wilson is a personality of great distinction." It sounds more like a whiskey ad than a liner note—in fact it is more like a whiskey ad than a liner note. It doesn't tell you Wilson's background as

trumpeter and arranger for such classic jazz bands as Jimmie Lunceford, Count Basie and Duke Ellington. It doesn't give recording dates, places and the names of engineers (though it does list two producers). It doesn't give the personnel of the band, only the soloists. That, however, would take a bit of doing because this was originally a rehearsal band (guys who get together for the kicks and fun of playing good charts for their own pleasure—if somebody else wants to listen okay). And as with any rehearsal band (Thad Jones and Mel Lewis, etc.) the personnel fluctuates according to who is in town and available when and where. This band has a lot of dynamite soloists like Carmel Jones on trumpet, Teddy Edwards and Harold Land on saxophones, Bobby Hutcherson on vibes and Joe Pass on guitar. Some like Harold Land were already names when they played in Wilson's crew, others like Joe Pass (just out of Synanon and on his way to becoming a virtuoso guitarist) were still newcomers to the jazz game. The band also made recordings with some big names who were signed to the Pacific Jazz label such as organist Richard Groove Holmes and, as I recall, pianist Les McCann and singer Lou Rawls.

This is more or less of a sampler made of various recordings that Wilson's band recorded in the 1960s in L.A. The second is not spectacular but in a way that's a relief from the kind of hot rock sound of so many jazz records today. There are a lot of good cuts especially Wilson's "Blues For Yna Yna" which superimposes blues changes over three quarter time (if W. C. Handy ever collaborated with Johann Strauss it might have turned out this way). There are nice solo spots provided for Carmel Jones, Harold Land and Groove Holmes who do very well with them.

If wishes were horses, I would wish that a little more data about dates, places and names had been supplied with this recording. I would wish that it had been less of a haphazard picking from here and there in the Pacific Jazz Catalog. I might even have gone for a little judicious use of an echo chamber to give a little more shape to the overall sound. But wishes aren't horses and I'm glad that the Pacific Jazz Catalog is finally up for re-issue and I hope that sales are enough to convince United Artists to keep this worthy project alive.

J.K.



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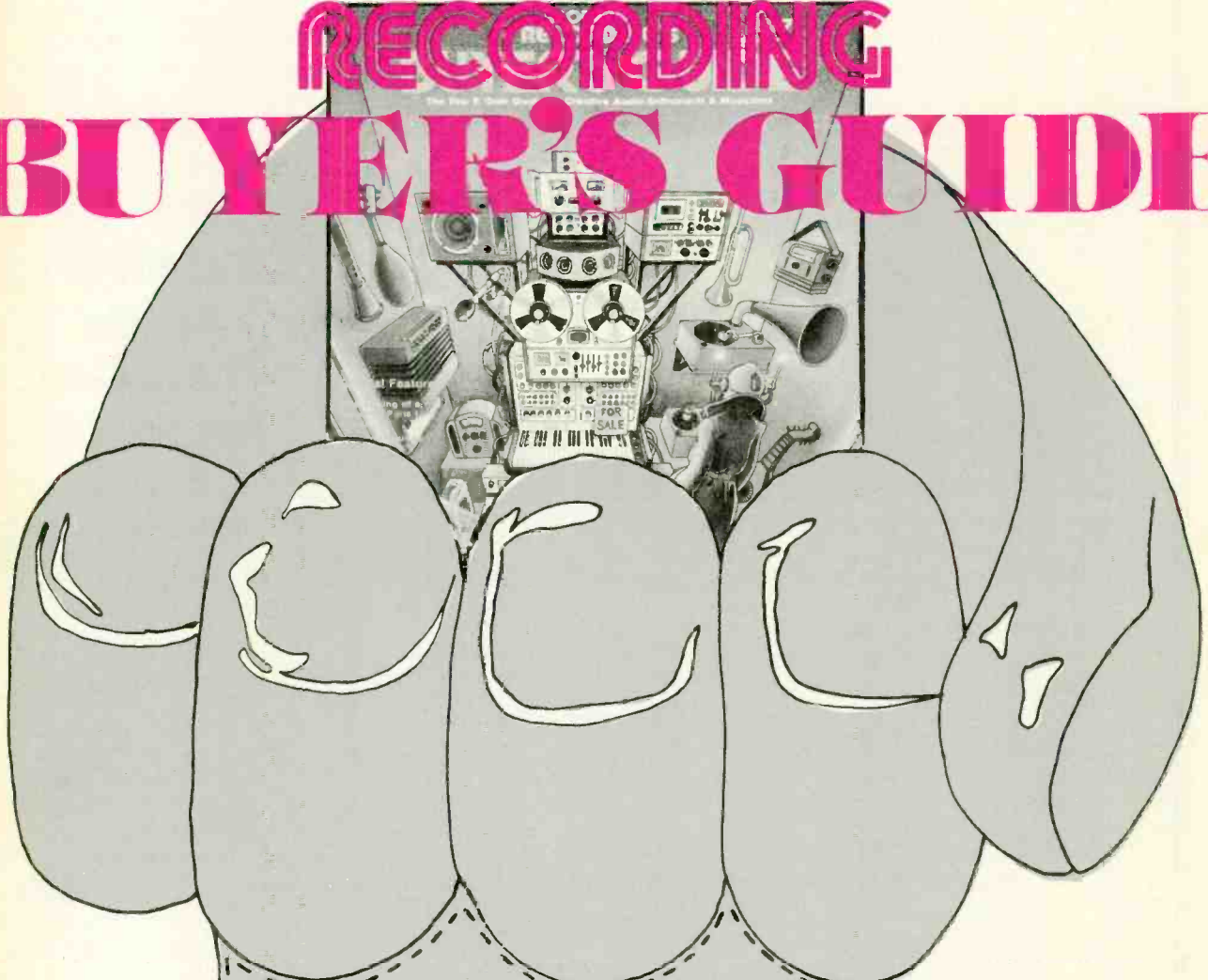
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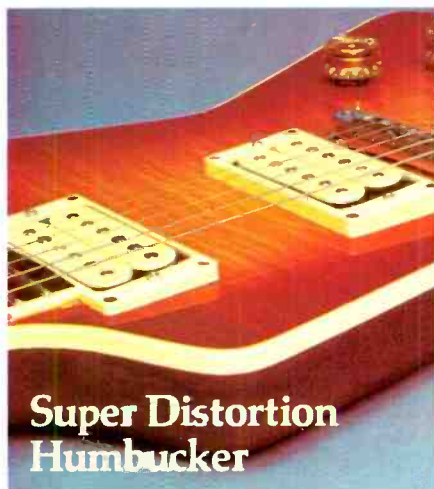
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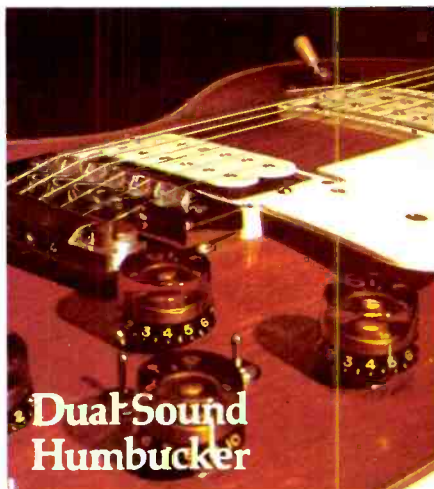
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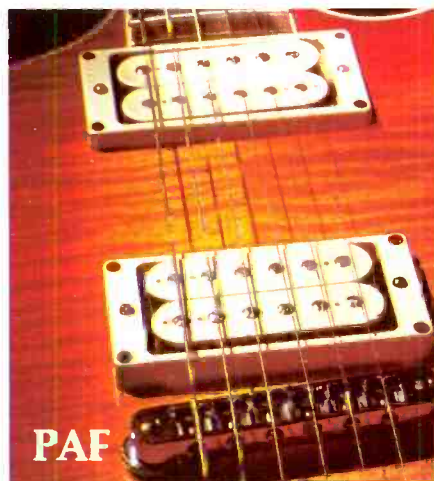
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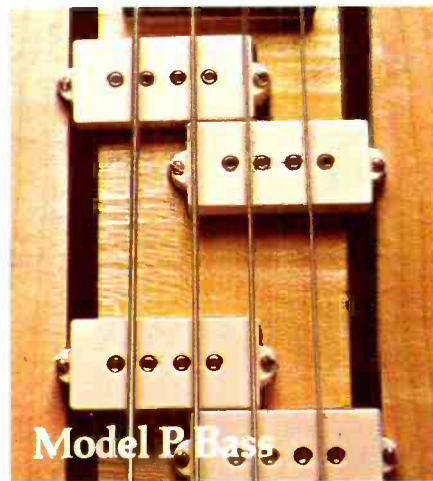
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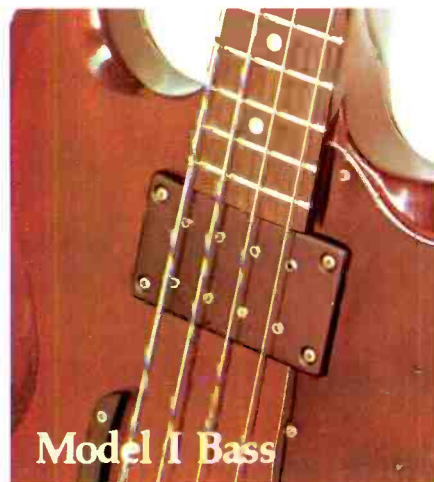
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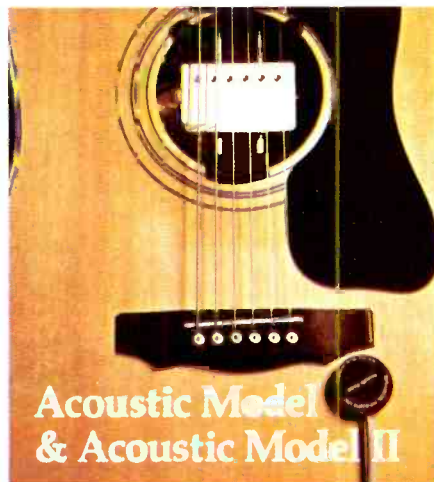
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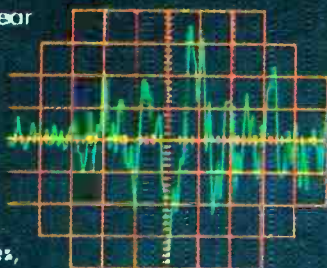


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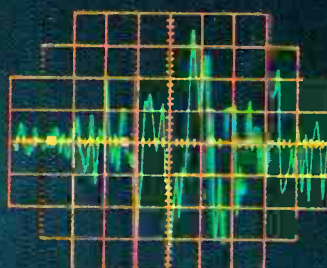
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While our competitors were listening to Technics Linear Phase speakers, we introduced phase two.

When Technics introduced Linear Phase speakers two years ago, we took the audio world by surprise. And why not? After all, Technics Linear Phase speakers were the first speakers to actually show you waveform fidelity. Not simply with tone bursts and sine waves, but by actually comparing the waveforms of live musical instruments



Piano Waveform



Piano Waveform reproduced by SB-7070

to the output waveforms of our Linear Phase speakers.

Now with the 3-way SB-6060 and 4-way SB-7070 (shown below), Technics takes you to phase two. Because compared to our first Linear Phase speakers both give you wider frequency extension, flatter frequency response and even more phase linearity, which means even better waveform fidelity.

How did we make such good speakers even better? We started with BASS (Basic Acoustic Simulation System), an IBM 370-based interactive computer system. With it, Technics engineers can do what they only dreamed of doing in the past: Calculate the sound pressure and dispersion characteristics of transducers without physical building and measuring countless prototypes.

Next we took these computer-derived drivers and combined them with Technics unique phase-controlling crossover network. And of course we staggered the drivers to align their acoustic centers precisely.

It's easy to see the result of all this technology. Just compare the waveforms. On the left is a waveform of a live piano. On the right, the piano as reproduced by the SB-7070. That's waveform fidelity.

Listen to the 4-way SB-7070. What you'll hear is its smooth transition between low, midrange and high frequencies. Then notice the bass response. It's deep and tight. With much more punch, better definition and even less IM distortion than its predecessor. That's because when the upper bass

frequencies are handled by a separate driver, the woofer does a much better job at handling the lower bass frequencies.

You'll also hear vocals that are smooth and natural. That's because the SB-7070's high-midrange driver was designed with "free edge" construction to avoid coloration of

the critical upper-midrange frequencies.

And by adding a new, smaller tweeter with improved dispersion characteristics, the SB-7070's high-end frequency response was extended to 32 kHz.

Technics 3-way SB-6060 and 4-way SB-7070. For music that sounds like it was originally played. Live.



All cabinetry is simulated wood.

Technics
Professional Series