Profile: Producer/Artist Allen Toussaint

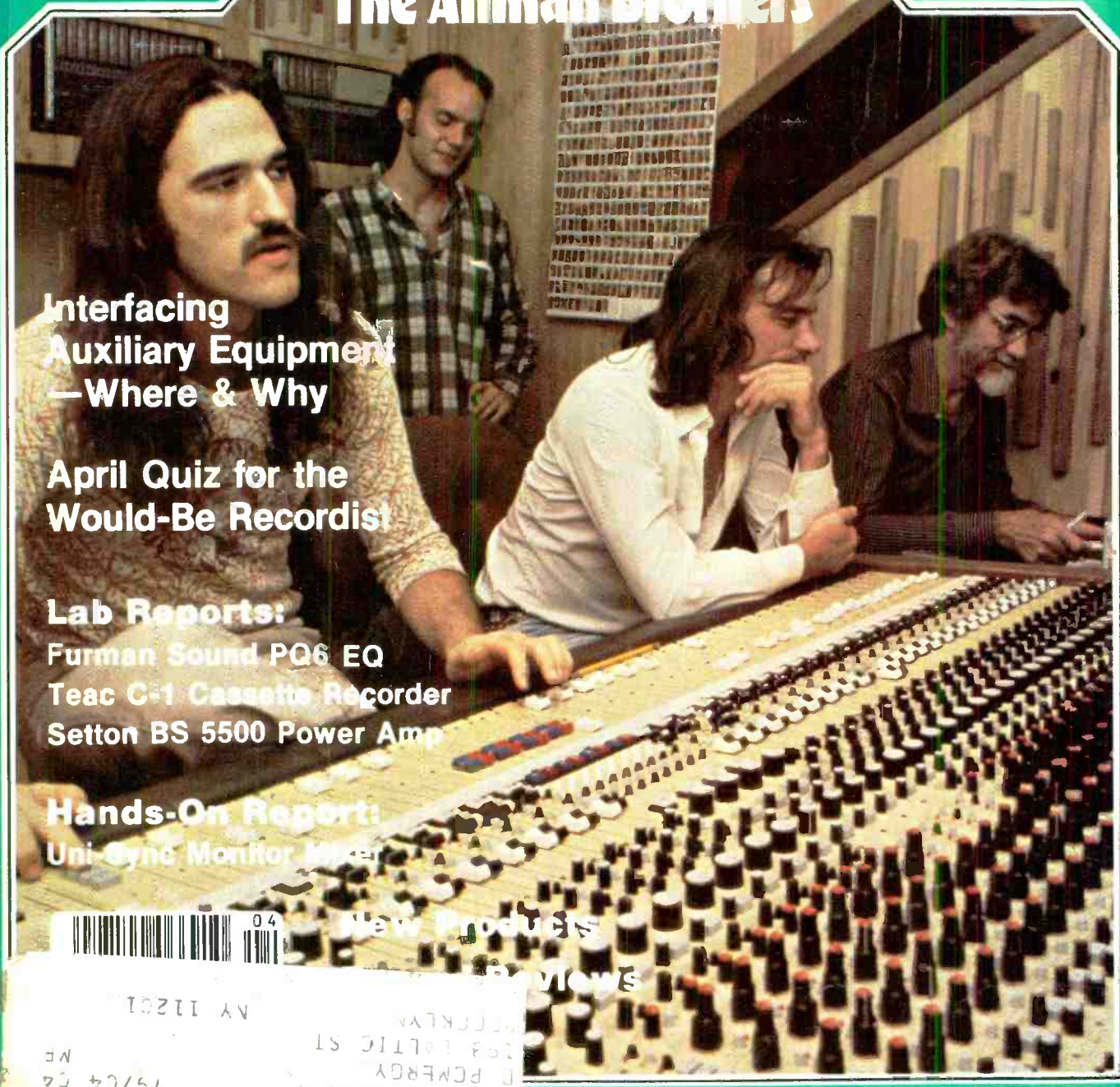
MODERN RECORDING

SERVING TODAY'S MUSIC/RECORDING-CONSCIOUS SOCIETY

#06691 (F)
$1.50

VOL. 4 NO. 7
APRIL 1979

A Session with The Allman Brothers



Interfacing Auxiliary Equipment —Where & Why

April Quiz for the Would-Be Recordist

Lab Reports:
Furman Sound PQ6 EQ
Teac C-1 Cassette Recorder
Setton BS 5500 Power Amp

Hands-On Report:
Uni-Sync Monitor Mixer

New Products

Reviews

YAMAHA'S NEWEST TOURING PROFESSIONAL.

Yamaha's new PM-2000 Mixer. Ideal for professional sound reinforcement, it's the kind of full production console pros have always had in mind, but never in hand.

The PM-2000. The touch is solid, smooth, consistent. It feels like the professional console that it is.

The knob, switch and slider placement anticipate where your hands will naturally fall.

With 5-position, 4-band equalization and six independent sends on all 32 inputs, plus a full function, 14x8 matrix, the PM-2000 has everything you would expect from the consummate professional console.

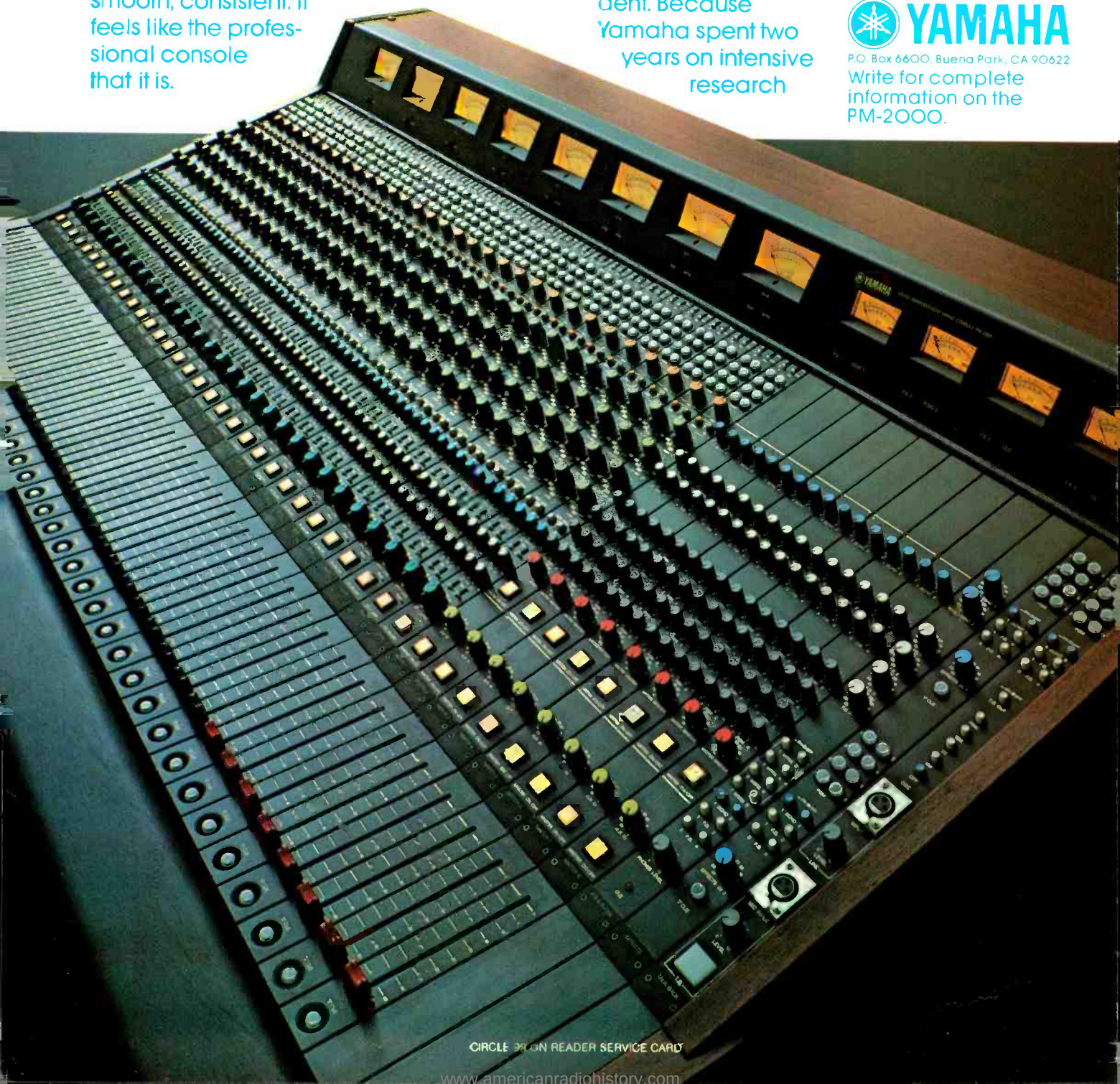
And if the PM-2000 looks and feels like a custom console, and seems to have read your mind, it is no accident. Because Yamaha spent two years on intensive research and prototypes based on input from professionals. One touch and you'll realize: the PM-2000 feels how you think.

Available early 1979, on a limited basis, through select Yamaha dealerships.

YAMAHA

P.O. Box 6600, Buena Park, CA 90622

Write for complete information on the PM-2000.



CIRCLE 38 ON READER SERVICE CARD

The Studiomasters

Let us introduce ourselves. We are Studiomaster, the maker of the most dramatic 16/4 mixing console you can find on the market today. We don't settle for basic features only.

On each input channel our 16/4 board has five equalization controls. An input gain control. Peak overload indicators. 0/-50db padding. 2 echo sends and foldback (monitor) level faders ...and our output is as interesting as our input. We have a 1kHz line-up oscillator. Line output level faders. Individual channel master panning, foldback, and monitoring controls. Both echo returns have 3-position routing capabilities. And our exclusive mix-down feature. . . a remix switch that converts the first four input channels to stereo mix-down channels automatically from the same board. Imagine the patch cord and second mixer confusion that can be overcome.

The best feature that Studiomaster has to offer is that we are sold *by Studiomasters*. Let us present our nationwide dealers. Select your closest and visit him *soon* to discover why we are the *Studiomasters*.

ALABAMA

Nunnie's Music
1917 5th Ave. No.
Birmingham 35203
205-252-4498

ARIZONA

Bill ry's Music Center
8322 N. 7th St.
Phoenix 85020
602-497-6253

The Music Stand
2229 Country Club
Tuscon 85716
602-427-6375

ARKANSAS

Strum & Hum
751. Geyer Springs
Little Rock 72209
501-562-4751

CALIFORNIA

Cali. Musical Inst. Co.
101 E. Vermont Ave.
Anaheim, 92805
714-533-8610

Hanich Music
235 N. Azusa
West Covina 91791
213-966-1781

K & K Music
190 W. San Carlos St.
San Jose 95128
408-249-5760

WAll Sound
111 R Street
Sacramento 95814
916-344-5491

Gospel Sound & Music
555 Lighthouse Ave
Monterey 93940
408-375-5272

Fancy Music
744 State St.
Santa Barbara 93101
805-963-3505

Guitar Showcase
3090 S. Bascom Ave.
San Jose 95124
408-377-5864

Don Wehr's Music City
817 Columbus Ave.
San Francisco 94133
415-673-9700

COLORADO

Solid Sound
2690 28th St.
Boulder 80301
303-444-1734

Pro-Sound
2432 S. Colorado Blvd.
Denver 80222
303-759-4455

CONNECTICUT

East Coast Sound
440 Candlewood
New Milford 06776
203-354-9374

FLORIDA

Warehouse Music
1010 S. Wooten Ave.
Orlando 32805
305-423-4204

Music City
1713 S. Lois Ave.
Tampa 33609
813-879-8327

Music City
2580 Atlantic Blvd.
Jacksonville 32207
904-399-5715

Ace Music
13630 W. Dixie Hwy.
N. Miami 33 61
305-891-6201

ILLINOIS

AAA Swing City Music
1312 Vandalia
Collinsville 62234
314-421-1558
618-345-6200

[illegible]'s Music
5055 W. 31st St.
Cicero 60650
312-863-7400

INDIANA

I.R.C. Music Store
5708 E. 38th St.
Indianapolis 46218
317-547-2159

Lifesound Productions
P.O. Box 9172
Ft. Wayne 46819
219-447-6543

KANSAS

E.M. Shorts Guitars
115 S. Green
Wichita 67211
316-684-6252

KENTUCKY

Owensboro Music Center
611 Park Plaza Dr.
Owensboro 423 1
502-684-2156

LOUISIANA

Sound City
506 N. Carrollton Ave.
New Orleans 70 19
504-482-7894

MASSACHUSETTS

E & L Audio
28 Acton St.
Watertown 02172
617-926-6100

MICHIGAN

By James Enterprises
712 Catherine Ave.
Ann Arbor 48104
313-994-0934

Stage Gear Music
473 Elizabeth Lake Rd.
Pontiac 48053
313-683-2844

Progressive Music
416 W. Kilgore
Kalamazoo 49001
616-381-1831

MINNESOTA

Marguerite's Music
2309 10th Street S.
Moorhead 56560
218-233-7546

FVC Systems
1517 East Lake St.
Minneapolis 55407
612-729-8305

MISSISSIPPI

CMS Music
Cook Center, Terry Rd.
Jackson 39212
601-373-1604

CMS Music
N. Bryon Rd.
Cleveland 38732
601-846-7216

MISSOURI

Big Lude's Music City
3817 Broadway
Kansas City 64111
816-531-4638

NEBRASKA

Mid-City Music
117 N. 16th St.
Omaha 68102
402-342-3393

NEVADA

Pro Drum Shop
608 Maryland Pkwy.
Las Vegas 89101
702-382-9147

NEW JERSEY

Rondo Music
Hwy. [illegible] Vaux Hall Rd.
Union 07083
201-6[illegible]-5250

M & M Music Co.
2006 Chelsea Dr.
Vineland 08360
609-6[illegible]-[illegible]568

NEW YORK

Whirlwind Music
100 Boxart St.
Rochester 146[illegible]
716-6[illegible]-[illegible]820

Audio by Zimet
1038 Northern Blvd.
Roslyn 11576
516-6[illegible]-[illegible]138

Music Instrument Outlet
2511 Middle Country Rd.
Centereach 11720
516-5[illegible]-[illegible]776

NORTH CAROLINA

Reliable Music
1001 S. Independence Blvd
Charlotte 28202
704-3[illegible]-[illegible]662

OHIO

Coyle Music
2864 N. High St.
Columbus 43202
614-2[illegible]-[illegible]891

The Music Connection
14312 Pearl
Strongsville 44136
216-2[illegible]-[illegible]066

Howard Early Music Center
3[illegible]1 Glendale-Milford Rd.
Cincinnati 452[illegible]1
5[illegible]-563-9600

OKLAHOMA

Driver Music Co.
6[illegible]0 NW 39th Expressway
Bethany 730[illegible]
4[illegible]-789-[illegible]11

OREGON

Portland Music
5[illegible] SW 3rd
Portland [illegible]27[illegible]
5[illegible]-226-[illegible]19

PENNSYLVANIA

Cartioli Music Center
5[illegible]9 Oxford Ave.
Philadelphia [illegible]124
2[illegible]-742-[illegible]15

D.C. Short Sound Systems
2[illegible] Center Ave
Emsworth 15202
4[illegible]-761-[illegible]72[illegible]

Markham Music
1[illegible]1 W. 26th St.
Erie 16508
8[illegible]-452-[illegible]4[illegible]

Swissvale Music
2[illegible]5 Noble
Pittsburgh 152[illegible]8
4[illegible]-351-[illegible]8[illegible]

SOUTH CAROLINA

Smith Music House
1[illegible] Magnolia St.
Spartanburg 29301
8[illegible]-582-[illegible]0[illegible]

TENNESSEE

Strings & Things in Memphis
2[illegible] S. Cooper St.
Memphis 38[illegible]
9[illegible]-278-[illegible]00

TEXAS

Dannes Music [illegible]
4303 Montana
El Paso 799[illegible]
915-[illegible]-[illegible]867

Riverway Music
6718 San Pedro
San Antonio 78216
512-[illegible]-410

Parker Music Co.
5005 Gulf Freeway
Houston 77023
713-[illegible]-903

Billy's Band Aid
150 Hamlet Shopping Center
Amarillo 79 06
806-[illegible]-323

UTAH

Guitar City Studio
67 N. Main
Kaysville 84037
801-[illegible]-938

VERMONT

S.D.L. Audio Services
179 1/2 Pearl St.
Burlington 05401
802-[illegible]-190[illegible]

VIRGINIA

Ambassador Music
7461 Tidewater Dr.
Norfolk 235[illegible]5
804-[illegible]-189[illegible]

WASHINGTON

American Music Retailers
4450 Fremont No.
Seattle 981[illegible]
206-[illegible]-177[illegible]

WASHINGTON D.C.

Washington Music Center
11151 Viers Mill Rd.
Wheaton 20902
[illegible]01-946-8808

WEST VIRGINIA

The Pied Piper
200 3rd Ave.
Huntington 25701
[illegible]04-529-3355

WISCONSIN

Regenberg Music
5615 University Ave.
Middleton 53562
608-836 150

Uncle Bob's Music
5635 W. Capitol
Milwaukee 53216
414-462-270[illegible]

Music Tree Ltd.
219 Jefferson St.
Wausau 54401
715-845-595[illegible]

CANADA

Axis Music
959 Hastings St. E.
Burnaby B.C.
[illegible]04-299-7521

Mother's Music
10611 Jasper Ave.
Edmonton, Alberta
[illegible]03-424-7174

Mother's Music
415 17th Ave. SW
Calgary, Alberta
[illegible]03-245-3725

Guitarland
38 Broadway Ave.
Winnepeg, Manitoba
[illegible]04-775-846[illegible]

Kalua Music
227 Kingston Rd.
Scarborough, Ontario
416-264-2347

Ken Parisien Music
109[illegible] St. Laurent Blvd
Ottawa Ontario
613-74[illegible]-[illegible]11

Richard's Music
607[illegible] Sherbrooke St. W
Montreal Quebec
514-48[illegible]-[illegible]11

The Music Stop
169 Wyse Rd.
Dartmouth, Nova Scotia
902-466-3565

Studiomaster has a limited number of openings for qualified pro sound dealers in areas not covered by our dealership list above. For information or recommendations, please contact Studiomaster, 885 S. East Street, Anaheim, California 92805.

CIRCLE [illegible] ON READER SERVICE CARD

The new standard.

The new TEAC A-3440

We set the old standard. In fact, we set the first standard. In 1969 we were the only company with the courage to make this commitment to the creative recordist: a 4-track ¼" multi-channel recorder with sync. Now, with the A-3440, our commitment is stronger than ever. The new standard.

WE BEGAN BY SIMPLIFYING SWITCHING PROCEDURES DRASTICALLY.

Now, you can concentrate more on your music and less on the mechanics of recording.

Instead of the old Rec Mode, Sync and Monitor switches, there is now a simple Function Select feature. So instead of having to simultaneously activate many different switches on each track—TAPE/SOURCE, PLAYBACK/RECORD, and dbx® ENCODE/DECODE—all functions are now controlled by a single Function Select button.

NEXT, WE BUILT IN MORE MONITORING FLEXIBILITY.

A headphone mixer is an integral part of the A-3440. Plug in your headphones and you can listen to any or all four tracks, and get a mono mix. An independent level control means you can adjust the mix volume.

AND THEN, WE ADDED THE RX-9 DBX UNIT

The A-3440 accepts an optional dbx unit, so you can add up to 30dB to the overall signal-to-noise ratio. (As mentioned, it's automatically tied to single Function Select button.)

FOR A FINAL TOUCH, THERE'S NOW A PITCH CONTROL.

The built-in pitch control gives you special effects by slowing down or speeding up the tape by 5%. It also means you can add instruments days or weeks after your initial recording, and tune the tape instead of tuning the piano.

BUT WE DIDN'T CHANGE EVERYTHING

Micro-Switch Transport Controls, with optional remote, highly stable DC servo-controlled capstan motor for an absolute minimum of wow and flutter, expanded-scale VU Meters, and all the time-tested and studio-proven features that came with the A-3340 are still yours on the A-3440.

The new standard. At your TEAC dealer. Now.

TEAC®

First. Because they last.

TEAC Corporation of America
7733 Telegraph Road
Montebello, CA 90640

CIRCLE 71 ON READER SERVICE CARD

®dbx is a trademark of dbx, Inc.

APRIL 1979
VOL. 4 NO. 7

MODERN RECORDING

SERVING TODAY'S MUSIC/RECORDING-CONSCIOUS SOCIETY

THE FEATURES

Cover Photo by Herb Kossover

Modern Recording (ISSN 0361-0004) is published monthly by Cowan Publishing Corp., 14 Vanderventer Ave., Port Washington, N.Y. 11050. Second class postage paid at Port Washington, New York, and at additional mailing offices. Subscription rates: $12.00 for 12 issues; $22.00 for 24 issues. Add $3.00 per year for subscriptions outside of U.S. Subscriptions must be paid in American currency. Postmaster: Send Form 3579 to Modern Recording, Cowan Publishing Corp., 14 Vanderventer Ave., Port Washington, N.Y. 11050.

THE STAPLES

COMING NEXT ISSUE!
Interfacing Auxiliary Equipment —Part II
An Interview with the Brecker Brothers

MODERN RECORDING
SERVING TODAY'S MUSIC / RECORDING CONSCIOUS SOCIETY

H.G. La TORRE
Editor

PAM HIGHTON
AUDREY KURLAND
Assistant Editors

NORMAN EISENBERG
LEONARD FELDMAN
JIM FORD
JOHN MURPHY
BRIAN ROTH
Technical Editors

ROBERT ANGUS
NAT HENTOFF
DAVID MOYSSIADIS
FRED RIDDER
PETER WEISS
Contributing Editors

SEDGWICK CLARK
JOE KLEE
GIL PODOLINSKY
RUSSELL SHAW
Music Reviewers

LORI RESSA
Production Manager

BONNIE BRENNAN
CHRIS KELLY
KIM SMITH
Production Staff

BILL TRAVIS
Art Director

HAROLD PERRY
LIZ RYAN
BARRY SIMON
Art Staff

JANET KURTZ
Circulation Manager

MELANIE DEUTSCH
Assistant to the Publisher

BILL SLAPIN
West Coast
Advertising Representative

MYLES GROSSMAN
Advertising Director

VINCENT P. TESTA
Publisher

Editorial and Executive Offices
Modern Recording
14 Vanderventer Ave.
Port Washington, N.Y. 11050
516-883-5705

COWAN PUBLISHING CORP.
RICHARD A. COWAN Chairman of the Board & President
CARY L. COWAN Vice President
JACK N. SCHNEIDER Vice President, Marketing
RICHARD A. ROSS Vice President, General Manager
MARC L. GILMAN Credit Manager
AMY C. GILMAN Secretary/Treasurer
SANFORD R. COWAN Founder & President Emeritus

Editorial contributions should be addressed to The Editor, Modern Recording, 14 Vanderventer Ave., Port Washington, N.Y. 11050. Unsolicited manuscripts will be treated with care and must be accompanied by return postage.

Letters to the Editor

Substantial Modifications

I ran across your fine magazine a while ago and have just now had the opportunity to comment on its high caliber and ask a few questions, too.

Have you published any technical reports on the new Peavey MR-7 mixer? If so, I would appreciate getting my hands on this report. Incidentally, I've found that the MR and MC series, although advertised as being the same breed, are substantially different internally, with respect to inputs, outputs and preamplifier circuitry.

I am in possession of a pair of MR-7s and, although I have modified them substantially, I find them to be excellent pieces of equipment out of the box both electronically and financially.

You might also be interested in what I have done to them and how I am using them, i.e., the LED ladders are red only from +3 VU to +22 VU. Zero VU is now yellow and everything below is green. This may not sound like major technical accomplishment; however, according to a company technician, this was technically infeasible. These mixers are mounted in an aluminum console of my own design (it looks like something out of Star Trek), and along with associated modifications and additions, the equipment is being used to tape groups, play records, feed an audience and remote broadcast "live", all simultaneously! In addition, it feeds individual monitor to performers and associated cueing to the board engineer and/or DJ while also displaying remote indication of stereo color organs in addition to a 21-channel illuminated annunciator panel. It also removes clicks, scratches and lead singers from records and tapes. All this in a 4 by 2 by 1-foot portable package weighing less than 50 pounds!

Hope this is of some interest to your readers.

—R.A. Bowen
Radio Intelligence Communications Systems
Hudson, N.H.

Our contact at Peavey, while having no specific comment on your modifications, did warn that the changes would null and void the unit's warranty and added that such modifications were not recommended. It is heartening to know, though, that you've been successful and pleased with the results of your adaptation.

As far as a review of the MR-7, no—we've not tackled it yet, but we will look into it. Thanks for writing.

D.B.A. Studio

One problem that I've encountered in owning a small studio is that no one seems to have any information on the business of running a small studio profitably. It's one thing to have a good-sounding facility and competent staff, and another thing to market it properly to the musicians. Reaching musicians, developing an ad campaign without a bottomless budget is a tough problem. Also, finding industry data on operating ratios, market studies and industry growth seems to be next to impossible.

This information is invaluable when trying to raise growth capital or even to really know if you're operating profitably enough to sustain growth.

Quiet. Naturally.

No man-made instrument can equal the accomplishments of nature. But the engineering excellence of the Spectra Sound 10 band graphic equalizer has now approached the ultimate quiet of nature.

As any audio engineer knows, noise plays an important role to the total performance of the signal being processed. The Spectra Sound graphic equalizer represents a significant departure from conventional L-C type circuits. By comparison most L-C type circuits have been limited to a more narrow bandwidth, greater noise, higher distortion and low slew. The adoption of Bi-Fet circuitry makes our equalizer a standard for others to follow. Wide bandwidth, low noise and distortion, and high slew, make this equalizer an intelligent addition to any recording facility, road system, or application where accurate signal processing is desired.

Features

- Indepencent channels/E.Q. defeat
- LED overload indicators for each channel
- Level control for each channel ± 15 dE gain
- Active balanced inputs and outputs/optional line drivers
- Intrasonic filter
- Boost and Cut range of either 16dB or 32dB

Specifications

Signal Noise	— 100dBm
Distortion	IM: .008
	THD: .008
Slew Rate	13 volts/msec
Frequency Response	±.5 dB 20Hz-20KHz
Output Level	18dBm
Input Impedance	Balanced 20K ohms
	Unbalanced 100K ohms
Output Impedance	Balanced 600 ohms
	Unbalanced 100 ohms

Spectra Sound Products Inc.

For more information contact Spectra Sound Products 2245 South West Temple, Salt Lake City, Utah 84115
Telephone (801) 467-2842 — Dealer Inquiries Welcome

CIRCLE 86 ON READER SERVICE CARD

Also, being a good engineer doesn't always mean having a good business background as well.

If you have access to this kind of information and wouldn't mind sharing it, I'm sure countless other studio owners as well as myself would really appreciate it.

Thank you for providing a good magazine and for the space to voice my problems. Please keep it up — thanks!

—T.M. DeRouin
Bayside, Wisc.

Mind? Why should we mind? Of course we don't mind. We know of a few publications, organizations and courses of action for you to follow up on:

First off, join the Audio Engineering Society. They're located at 60 East 42nd St., New York, N.Y. 10017 (212) 661-8528. At their November 1978 Convention, a technical session entitled "Management/Engineering; Semi-Pro Studios" dealt, among other things, with technical and administrative aspects of the semi-pro setup, with a survey of hardware, financing and general management. We feel confident that they'll have more information to help you with and can refer you to articles in their Journal, *if not to professional studio consultants (such as the one who chaired the above-mentioned technical session) who might be able to answer your questions and give advice.*

Look into also the Recording Industry Association of America (RIAA), 1 E. 57th St., New York, N.Y. 10022 (212) 688-3778.

Billboard, *the International Music-Record-Tape Newsweekly, and its substantial directories and supplements, published by Billboard Publications, Inc., 9000 Sunset Blvd., Los Angeles, Ca. 90069 is a likely candidate to keep you up to date on the market. Subscriptions (they are* not cheap) *are $95/year in the continental U.S. and are available from* Billboard, *P.O. Box 2156, Radnor, Pa. 19089. They will take your order, should you desire, on major (Master Charge, American Express, VISA) credit cards.*

Getting closer to grass roots, we know of one publication in California (they have two editions, one for Northern and one for Southern areas of the state) that could probably assist you in some way. It is The Mix, *a Recording Studio Publication, issued four times yearly at $7.50. Single issues are available at $2.00, and their mailing address is P.O. Box 6395, Albany Station, Berkeley, Ca. 94706, (415) 526-6102. Whereas they serve a California readership, much of their editorial matter could be of interest to you.*

Items pertinent to your particular dilemma have been few and far between across our desks; otherwise, we're sure we'd have a few more sources for you. Do write again and tell us what you come up with.

Another thought: You might try establishing lines of communication with neighboring studios (yes, your competitors) and develop a mutual growth kind of relationship. Perhaps they are involved in—or know of, or would care to establish together with you—a demographic publication akin to The Mix.

John Happy, But Not on Slide

As a member of the Johnny Winter band for the 1977 Summer Tour and as a participant on the *White, Hot & Blue* album, I would like to correct two misstatements made by J.T. in his December '78 review of the album in *Modern Recording.*

One: that there was "little or no overdubbing" and the other: that it is

You want authentic strings, horns, and a big sound.

Allan Zavod of Jean-Luc Ponty

When you play an ARP Omni-2, your music has a full, rich quality.

Your strings have those clean and crisp highs, full and resonant lows. An exclusive process called *asynchronous phase modulation* makes it virtually impossible to distinguish your sound from real strings.

The horn section is hot, too. Your dynamic, punchy brass chorus is enough to make Tower of Power a little nervous.

When you quickly change from horns to harpsichord to pipe organ to combinations of bass, piano and strings it's hard for your audience to believe all that sound is coming from one musician.

But *you* believe. You know that ARP has always delivered uncompromised quality to keyboard artists like Joe Zawinul, George Duke, Ronnie Foster, Tom Coster, Les McCann, Tony Banks, and countless others. Even better, you know the Omni has come across with great sounds for you and your band.

If you've never experienced the ARP Omni-2, do it now. Move on to your nearest Certified ARP Dealer for a first-hand demonstration.

Move up to an ARP.

It's the sound.

ARP

For a copy of ARP's full color catalog, and the names of Certified ARP Dealers in your area, send $1.00 to: ARP, 45 Hartwell Avenue, Lexington, Massachusetts 02173.

CIRCLE 56 ON READER SERVICE CARD

Johnny playing slide on "Walkin' By Myself." I am the slide guitarist on that entire cut, and John plays lead and rhythm *standard* guitar. (And there *was* overdubbing.)

J.T. is quite right, though, in this respect—John is finally where he always wanted to be and happy about it.

—Pat Rush
New Haven, Ct.

Reviewer Jeff Tamarkin responds:

Since there are no credits on the album sleeve, and the guitar playing on "Walkin' By Myself" is so hot, I just assumed it was Johnny's solo. I'm sorry about the mistake, but I hope it can be taken as a compliment that I mistook the playing for Johnny's. There aren't many who can match him.

—Jeff Tamarkin
Record Reviewer
Modern Recording

Springsteen a la MSG

I am a collector interested in obtaining any articles, photos, reviews etc., regarding Bruce Springsteen and/or the E Street Band. If there are any back publications available containing this information, please send me the pertinent data (issue numbers; dates) so that I might order them.

—Jacquelyn Walsh
Jersey City, N.J.

Volume 4, Number 3, Modern Recording's *December 1978 issue, boasted a cover story on Bruce Springsteen "Live" at Madison Square Garden in August 1978. The issue is available from our back issue department for the asking and pre-payment of $2.50.*

Mixing From Scratch

I am interested in obtaining a mixer in kit form and would greatly appreciate any information as to companies that manufacture such kits.

—Evan R. Hughes
Rochester, N.Y.

The Audio Amateur *has published a number of articles dealing with the building of one's own mixer, including those detailing design and those with specific plans for building. The sister ship, Old Colony Sound Lab, stocks hardware for building your own. Write them for details, specifying exactly what you're interested in achieving.*

Heath Co., located in Benton Harbor, Michigan 49022, manufactures one stereo mixer console kit, Model TM-1626. Otherwise, we've only been able to round up information on kit-less building according to step-by-step instructions and plans. Check out TAB Books' The ABC Book of Hi-Fi/Audio Projects *($4.95), by George deLucenay Leon, which includes chapters on making printed circuit boards, power supplies, audio amplifiers, preamplifiers, and, of course, mixers, among others. TAB Books is in Blue Ridge Summit, Pennsylvania 17214.* The Audio Amateur *journal and Old Colony Sound Lab are at Box 176 and Box 243, respectively, in Peterborough, N.H. 03458.*

Miking, Miking and More Miking

The table of contents in your November 1978 issue, in describing "Vocal Miking Techniques" by Bruce Swedien, refers to the fact that Mr. Swedien "previously has given us an article on miking the rhythm section, miking overdubs and miking the piano;" I'm

CLEAN UP YOUR TRACKS WITHOUT CLEANING OUT YOUR POCKETS.

The past few years have seen a proliferation of exciting, inexpensive new multi-track hardware. Unfortunately, this hardware retains two shortcomings which prevent the small studio from really competing with the "big boys"—noise and lack of headroom. These shortcomings become especially apparent when the tracks you're bouncing start sounding like a transmission from outer space.

dbx, maker of state-of-the-art tape noise reduction for the world's leading studios, also makes a line of products designed for the small studio: the 155, the RM-155 and the 158. All offer the same 30dB of tape noise reduction and 10dB of headroom improvement as our more expensive units, with which they are fully compatible.

The 155 offers four channels of tape noise reduction, switchable to record, play or bypass. Each channel is self-contained on a user-changeable modular circuit board. All this, for under $600. Also available rack-mounted (RM-155) for four-channel simultaneous or eight-channel switchable use.

The 158 offers eight channels of simultaneous tape noise reduction, rack-mounted in a compact chassis. It lets you monitor the noise-reduced signal while you record. Spare channel included.

A dbx tape noise reduction system is simple to install and use. It will give your demos the sound quality of master tapes. And when you're ready to expand, your dbx system grows with you, easily and inexpensively.

Above all, the product you produce will be very close to that of the "big boys," for a lot less bucks. That is why, for the small studio, dbx tape noise reduction is a necessity, not an accessory. dbx, Incorporated 71 Chapel Street, Newton, MA 02195 617-964-3210

dbx

UNLOCK YOUR EARS

CIRCLE 92 ON READER SERVICE CARD

really interested in seeing this article. Please let me know what issue of *MR* it appeared in.

—Larry Feeney
Wilmington, Ma.

Modern Recording's *August 1978 issue was devoted to the topic of miking, with two featured articles; one was "Miking Effects for Amplifiers," the other was Bruce Swedien's first piece for us on miking techniques, titled, "Hot August Miking Techniques." The issue is available from our Back Issue Dept., at Modern Recording, 14 Vanderventer Ave., Port Washington, N.Y. 11050 for $2.50 (this includes postage and handling charges).*

The third and final Swedien article in this series appears in this *issue.*

Sending "Over 'There' "

I run a small studio in Hammerdal, Sweden. I am a current subscriber to *MR* and I think it is a great magazine. But I have a small problem. Sometimes I find interesting advertisements like those for *Modern Recording's Buyer's Guide*, for example. If you live in the U.S.A., you pay $1.75 for each copy (as a subscriber) and get it sent home to you. But if you live outside the U.S.A. (Sweden, for example), what shall you do to get your copy? Shall I send $2 or $3 extra and hope that it is enough for postage and handling? Or shall I write in advance to each company that places such an ad, and ask how much to add? Why don't they write in all advertisements: "Outside the U.S.A., add $?" Because I think I'm not the only one outside the U.S.A. who's reading *MR* magazine and who's interested in your advertisements.

—Roger Cederwall
Hammerdal, Jamtland
Sweden

Sometimes, in the mad dash to write effective ad copy and get artists to draft an attractive advertisement, one simply forgets to ask the circulation department for particulars on overseas mailing and/or to give these particulars to the artists readying the display ad.

Admittedly, this is a rather flimsy excuse, and we'd like to rectify the situation: Readers overseas should add $1.25 per copy for surface delivery of the Buyer's Guide; *if desired via airmail, send an additional $3.00 per copy. Back issues, sent surface rate, require no additional postage, but if requested airmail, an additional $2.00 is necessary. The coupon for John Woram's* Recording Studio Handbook *requests $2.00 postage for overseas mailing already, but the RIA has stated that it will absorb mailing costs for its Music Industry Cassette Library and Home Recording Techniques if sent surface. If you want those items sent via airmail, it is suggested that you check out with your local post office and send an approximate additional amount to cover.*

We will try in the future not to slight our overseas readers.

Signal Processor Signals Satisfaction

I will be graduating with a Master's degree in electrical engineering in the spring of '79. My entire college curriculum has been geared toward audio signal processing (digital and analog) and the physics of acoustics and music. In addition, I have had a lot of experience playing guitar, keyboards, bass and drums in various bands.

I would like to pursue a career as a recording engineer, but I have no knowledge of what a reputable studio

Up to now you had to choose between the turntable you wanted and the turntable you could afford.

Technics MKII Series. The SL-1300 MKII automatic, the SL-1400 MKII semi-automatic and the SL-1500 MKII manual.

You expect a quartz turntable to give unparalleled speed accuracy. And these do. What you didn't expect were all the other advantages Technics totally quartz-controlled direct-drive system gives you.

Like torque that cuts buildup time to an incredible 0.7 seconds. And at the same time maintains 0% speed fluctuations with loads up to 300 gms. That's equivalent to 150 tonearms tracking at 2 gms. each.

And that's not all. Technics MKII Series adds quartz accuracy to whatever pitch variation you desire. In exact 0.1% increments. At the touch of a button. And instantaneously displayed by the front-panel LEDs.

And to take advantage of all that accuracy, Technics has a low-mass S-shaped universal tonearm that's so accurate, friction is down to 7 mg. (vertical and horizontal).

Technics MKII Series. Compare specifications. Compare quartz. And you'll realize there's really no comparison.

MOTOR: Brushless DC motor, quartz-controlled phase-locked servo circuit. SPEED: 33⅓ and 45 RPM. STARTING TORQUE: 1.5 kg · cm. BUILDUP TIME: 0.7 seconds (= 90° rotation) to 33⅓ RPM. SPEED DRIFT: Within ±0.002%. WOW & FLUTTER: 0.025% WRMS. RUMBLE: −78 dB. PITCH VARIATION: ±9.9%.

Technics MKII Series. A rare combination of audio technology. A new standard of audio excellence.

Technics
Professional Series

expects in terms of technical ability or musical experience. I am also curious as to how much a starting recording engineer can expect to be paid and what my chances are of finding a studio in need of such an engineer. I'm finding, though that the more time I spend—either as a musician or an engineering student—in and near studios, the more privy I become to all facets of the trade.

Whether or not I become a recording engineer, I will continue to enjoy *Modern Recording* and shall rely on it as a source of state-of-the-art information.

—Mick Martin
Newark, Del.

Lost in the Mail?

We've been informed that yet another company had moved without telling us, their new address missing from our files. The address we gave in our November 1978 issue (p. 14) for United Recording Electronics Industries was not current. Their correct address is: 8460 San Fernando Rd., Sun Valley, Ca. 91352. We'd like to add, however, that our 1978 Buyer's Guide *did reflect U.R.E.I.'s address accurately.* —*Ed.*

Prime for Primer

I am interested in obtaining a copy of the "P.A. Primer" by Brian Roth. If there is a cost involved, please let me know. I'd also like to say that your excellent magazine has been of immense help in setting up and getting optimum results from my equipment.

—Steven F. Rue
Xenia, Ohio

I became a subscriber to your fine magazine just about the time that the 1978 *Buyer's Guide* became unavailable. Since that time, I've noticed several requests along the same line as mine—I'm very interested in getting a reprint of the series of articles reprinted in that *Buyer's Guide* as the "P.A. Primer." Can you tell me if the back issues containing these articles are still available, and, if so, which are they? Also, have you considered making the entire article available again in some form or another? Thanks.

—Charles Horn
Blue Lake, Ca.

Many readers who missed it have expressed hopes of seeing the "P.A. Primer" in print once again. We've been considering reprinting the article by Jim Ford and Brian Roth—which originally ran in the June/July, August/September and October/November 1976 issues (of these, we have a few copies left of only the June/July issue) and was reprinted in the 1978 Modern Recording's Buyer's Guide—*in booklet form, but there have been obstacles to this endeavor.*

Reader Service

In your January 1979 issue, in the "Musical Newsicals" column, page 38, there is a line output converter shown. This product is made by Musical Research Laboratories.

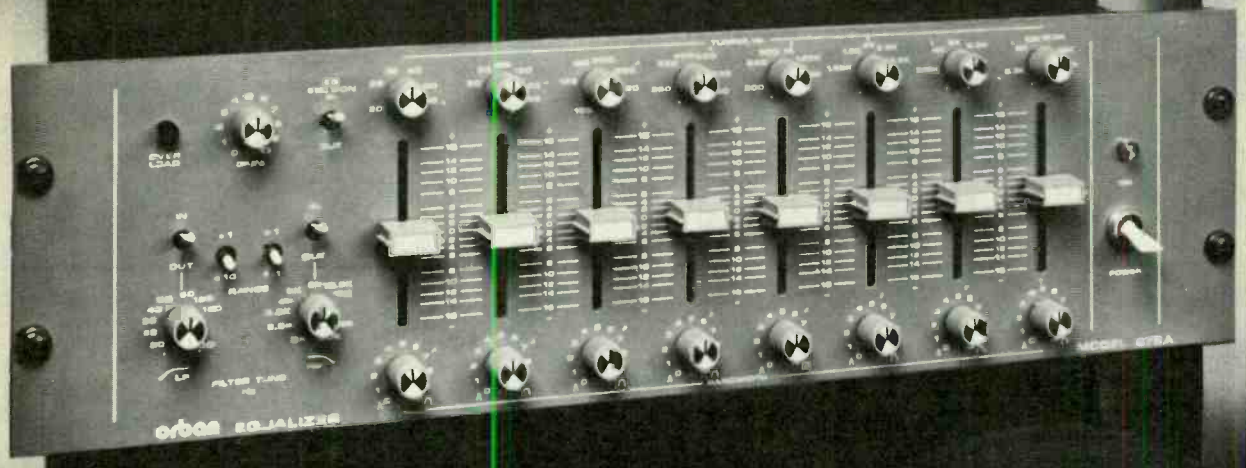
Please inform me of their mailing address so that I may obtain some information concerning this product.

—Steve Ballard
Glen Ellyn,Ill.

Musical Research Labs is located at 540 S.W. 119th Ave., Miami, Florida 33184. Next time, though, do make use of our free information service by mailing us the Reader Service Card bound into every issue (after circling the numbers for products that interest you). The

Announcing the new 672A Equalizer

8 bands + tunable filters + electronic crossover = $499*



The 672A is a fully professional 8-band single-channel parametric with extra tunable highpass and lowpass filters. The filters can be used to shape the response at the ends of the spectrum — Or, the 672A's *split output* lets you use the filters as a full electronic crossover *cascaded* with the 8-band parametric.

At $499* it's an unbeatable machine for sound reinforcement, monitor tuning or general-purpose program equalization in recording, broadcasting, cinema, theater, and disco.

Despite its attractive price the 672A contains no quality compromises. Balanced input (with output transformer option), RFI suppression, and state-of-the-art specs are all there as are Orban's traditional industrial quality, serviceablity, and comprehensive software. Orban's advanced engineering and manufacturing expertise are the keys to this extraordinary value.

Discover more about this remarkable, easy to use equalizer. See your Orban Dealer or contact us directly.

orban

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

*suggested list

CIRCLE 100 ON READER SERVICE CARD

manufacturer will send you product information directly.

Tidy Tucson Reader Reardon Tired of Stacking Mags

I have steadily read your magazine for two years now and as I retain every copy, I am accumulating quite a stack. I am wondering if you have available or plan to have the storage boxes that I see for other magazines. I would like very much to store issues on my bookcase for easy reference and safekeeping. I search every issue of MR, but I don't see anything offered by you for this use. If this type of book boxes are available, please let me know.

I enjoy the magazine very much—thanks for all the helping hands.

—Kevin Reardon
Tucson, Az.

We have bandied about the prospect of boxes or holders specifically for Modern Recording *collections. We too would like to see them, but it may not be in the stars of the near future.*

Easy reference and safekeeping are possible, though, with use of cardboard or fiberboard boxes—albethey non-personalized—that we know of, sold through office supply or stationery stores. One of our staff members names Bankers Box (Frandlin Park, Illinois) as manufacturer of a Magazine File (item no. 7223) which is the right size for Modern Recording. *Also, Frank Eastern Co., at 625 Broadway in New York City (zip code 10012) markets boxes or files in various sizes for all your magazines.*

Our Back Issue Dept. now informs us that for $6.50 apiece while they last, it will send you red vinyl-covered binders that securely and without hole-punching hold one volume (12 issues) of Modern Recording. *Again, these do not have the* MR *logo, so they can even be used for other (perish the thought) magazines you might have in your burgeoning collection.*

Acoustic Analysis Systems

The Urei Model 100-A "Sonipulse" acoustic audio analyzer system seems to be a very attractive alternative to some real time display/analysis devices commonly used by studios and sound reinforcement engineers. I'd like someone who is well-acquainted with both methods and types of devices to comment on them and point out any pluses one might have over the other.

—Tom Young
S. Salem, N.Y.

Since you're familiar with the devices to a degree and since their use is highly subjective, a decision on your part as to which to purchase would have much to do with your own practices. It might be most wise for you to visit a dealership and try the units out. Talking with your dealer directly may point out to him/her (and/or you) critical points that apply to your own operation that we'd be unable to approach from this angle.

Reading Your Rights

Can you recommend a book which deals with the legal protection of musicians and/or songwriters? If such a volume is available and can be ordered through your magazine, please give details. Thanks in advance.

—Mortimer Baptiste
Port of Spain, Trinidad

The Record Producer's handbook, *a simple, step-by-step guide by Don Gere may prove valuable to you; it incorporates information on copyrighting,*

The difference between these cassette decks isn't sound.

The Nakamichi 1000II: $1,650*

The Pioneer CT-F1000 $600*

There's hardly an audio enthusiast alive who doesn't admire the Nakamichi 1000II.

But at $1,650*, admiring it is about all most people can do.

That's why Pioneer created the new CT-F1000. A cassette deck that offers all the features and performance of the Nakamichi 1000II, but costs almost $1,000 less.

(We realize this is hard to believe, but be patient. The facts bear us out.)

It's a fact that the $600* Pioneer CT-F1000 and the $1,650 Nakamichi 1000II are both honest three headed cassette decks that let you monitor right off the tape as you record.

Both feature separate Dolby systems for the playback and recording heads. So when you're recording with the Dolby on, you can monitor the same way.

And both are filled with all the remarkable features you'd expect to find on cassette decks of this caliber: there's everything from jam proof solenoid logic controls, to multiplex filters for making cleaner FM recordings to memories that automatically let you go back to a particular spot on the tape.

It's value.

The comparison holds up equally well when it comes to performance.

The CT-F1000 and the Nakamichi 1000II both have total harmonic distortion levels of less than 1.5%.

Both have all but conquered the problem of wow and flutter. (An identical 0.05% for each deck.)

And both have signal to noise ratios that are so similar only sophisticated laboratory equipment can tell them apart.

If the incredible value of the CT-F1000 still sounds a bit hard to believe, we suggest you go hear it for yourself at any Pioneer dealer.

Our viewpoint is simple: if you can't hear the difference, why pay the difference?

PIONEER®
We bring it back alive.

*Manufacturer's suggested retail price. Handles optional at extra cost.

CIRCLE 57 ON READER SERVICE CARD

the American Protection Service (a program "designed for the songwriter who wants a fast, convenient and inexpensive way to protect his/her intellectual property" of The American Song Festival, Inc., P.O. Box 57, Hollywood, Ca. 0 90028), and checklists on the bases you must cover to protect your property, among other record-production hints. The softcover book is available by mail from Acrobat Books, 213 S. Arden Blvd., Los Angeles, Ca. 90004 for $7.95 plus 75¢ postage and handling. California residents are requested to add 48¢ in sales tax.

ASCAP (American Society of Composers, Authors and Publishers, 1 Lincoln Plaza, New York, N.Y. 10023 (212) 595-3050) and BMI (Broadcast Music, Inc., 40 W. 57th St., New York, N.Y. 10019 (212) 586-2000) are industry service organizations that will help you enormously.

But we do know of a volume, exhaustive in nature, that seems to speak to your situation perfectly: This Business of Music *by Sidney Shemel and M. William Krasilovsky, edited by the late Paul Ackerman and published in 1971 by Billboard Publications, Inc., New York, contains practically 600 pages of vital information on the business, legal, practical and procedural aspects of the music industry.*

Emphasizing the Highs

I have been an avid reader of *Modern Recording* since its inception, and although I also subscribe to most of the other generally recognized audio publications, *MR* is of particular interest to me. My primary involvement in the field of sound is "live" concert recording on a non-professional level.

What sets *MR* apart from the "other" audio publications is that it is directed toward the professonal soundman as well as toward the serious amateur. In this regard, I have been a little disappointed with the subjects of some recent "Lab Reports." I feel that you should emphasize high-end open-reel equipment, mics, mixers and other gear designed for recording purposes. My contention is that most *MR* readers are not generally interested in cassette units, even the most sophisticated machines that have been reviewed in recent issues.

Again, I have found every issue of MR to be interesting and informative, and these comments are offered only as "constructive criticism" so that you can direct your efforts toward better serving your readers.

—Richard C. Carraway
Mentor, Ohio

"Hands-on" is the "staple" feature we devote to in-depth bench looks at mixers and high-end recording equipment. Otherwise, our incoming mail shows a great deal of interest in the performance of the high-end cassette decks that we have given attention to. But do keep reading and enjoying. We're working on obtaining more open-reel decks to test in "Lab Reports."

Plaza Gets a Kiss

In the review of the group of four solo albums from the members of Kiss—which appeared in Modern Recording, *February 1979 (pp. 109-113)—no mention was made of Plaza Sound in New York City, where the Ace Frehley album was primarily recorded. We regret the oversight (the reviewer is being appropriately docked).* —*Ed.*

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 (not 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.

Peavey Electronics
711 A Street
Meridian, Miss. 39301

HOW DO THE "BIG GUNS" STACK UP?

MFRS. NAME / RECC. LOAD	POWER @ OUTPUT TRANSISTORS	COOLING SYSTEM	SPEAKER PROTECTION	CONSTRUCTION GENERAL	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 E	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 11/1/75

CIRCLE 89 ON READER SERVICE CARD

THE BEST VALUE IN A PROFESSIONAL TAPE RECORDER

When you compare a tape recorder, here are the most important areas to consider for value, quality, and sound.

PERFORMANCE:
Overall Signal-to-Noise: 66 dB unweighted at 520 nWb/m (30 Hz to 18 kHz audio filter).

Playback Signal-to-Noise (electronics): 72 dB unweighted (with audio filter).

Headroom: +24 dB. Maximum Output: +28 dBm.

Overall Frequency Response (15 ips): 30 Hz to 22 kHz ±2 dB.

Playback Frequency Response (MRL test tape): 31.5 Hz to 20 kHz ±2 dB.

RELIABILITY: An unmatched 4-year track record of on the job performance for the original compact professional recorder. Day in, night out. Just ask someone you trust.

ALIGNABILITY: Any tape recorder must be aligned to achieve maximum performance. With the MX-5050-B, all primary alignments including record bias and level are on the front panel. So is a 1-kHz test oscillator. Secondary alignments are inside the bottom panel. You or your maintenance people can align it fast and easy. This saves you time, money, and enhances your reputation.

INTERFACEABILITY: With a flick of the output switch you can plug-in to any system: +4 dBm 600 ohm or −10 dB high impedance. No line amps or pads to mess with. A perfect match everytime.

ADDITIONAL BENEFITS: Three speeds, dc servo ±7%, ¼ track reproduce, full edit including indexed splicing block, over-dubbing, noise free inserts, XLR connectors, NAB/CCIR switching, unique 3-position alignment level switch.

PRICE: Suggested retail price $1,945 (USA).

MX-5050-B: THE CHOICE IS OBVIOUS

OTARI®

Call Ruth Pruett on 415/593-1648 for the name of your nearest Otari professional dealer.
Otari Corporation, 981 Industrial Rd., San Carlos, CA 94070 TWX 910-376-4890
In Canada: BSR (Canada, Ltd.), P.O. 7003 Sta. B, Rexdale, Ontario M9V 4B3 416/675-2425

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.*

One for the Road

I am a professional musician working on the road playing bass with a rock/show group. I am interested in getting a direct box for the board mix since I do not like the sound I get when the amp is miked, and the preamp, at the back of the head (an Ampeg SUT), gives a rather distorted, boomy sound with the matching transformer setup. Any information (schematics, kits, availability) you can supply would be greatly appreciated.

—Marc Beland
Sudbury, Ontario, Canada

Since you indicated interest in the availability of kits and schematics for direct boxes, we can assure you that availability is no problem. In fact, we can tell you exactly where to find 'em. Published first in our April 1978 issue, "Building a Direct Box" by Peter Weiss was reprinted by popular demand in our 1979 Buyer's Guide. *Please note however, that one of the two transformers contained on that parts list is no longer available at this time. Instead, Peter suggests you get either a Stancor #A-4407 or #A-4350 or a Thordarson #20A07. (More information on both these firms was given in the Letters To The Editor column in the February 1979 issue; see page 18 for some helpful addenda.) We're quite sure that one of the two configurations for the direct box that are offered in the article will suit your needs.*

—Ed.

Clarifying Impedance Check

What does it mean when instructions for building speaker enclosures end with the words "impedance check?" What is it and how is it done? What equipment is necessary? Does it affect what one hears?

—Dave Howse
Lagrangeville, N.Y.

Since I have not seen the context in which the term "impedance check" was used, I can think of at least two possible meanings. The first type of impedance check refers to an amplifier's ability to deal with the impedance of a loudspeaker(s). The equipment necessary for checking a speaker's impedance is an impedance bridge, and is not readily available to most home loudspeaker system designers. Most speaker manufacturers will supply impedance data on their products, and it is important to note that nominal impedance is not as useful as minimum impedance in calculating amplifier load.

The second possible meaning is how the speaker system impedance applies to vent tuning. A system for measuring relative impedance vs. frequency can be assembled from readily available test equipment. All that is needed is a sweepable audio oscillator, an AC voltmeter, and a resistor (approximately 100 ohms). (See figure one below.)

The free air resonance of a loudspeaker driver can be measured by sweeping the oscillator until the voltmeter reads maximum value. The system resonance is tested with the driver in the enclosure and sweeping the oscillator slowly until two peaks are

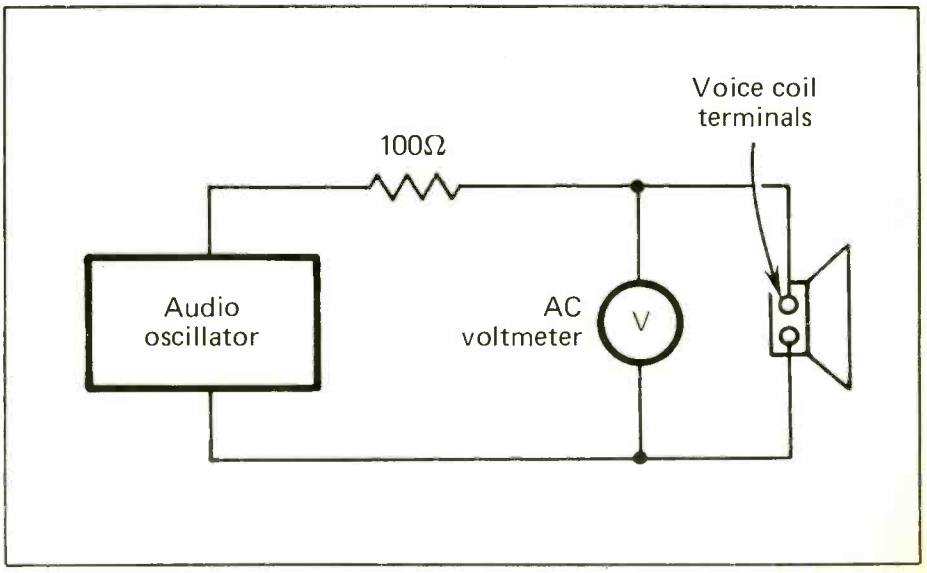


Figure 1. Set-up for determining relative impedance vs. frequency.

found. Some enclosure designs call for adjusting the port length or diameter so that both peaks are equal.

Due to the advances in loudspeaker technology over the last decade, lots of information is available on vented enclosure parameter relationships, which enables a much more scientific approach to vented enclosure design. This method allows testing the driver for many related parameters and applying this data to alignment equations for determining vent length and diameter. This method is more accurate than previous techniques.

To gain a better understanding of vented enclosure performance, the new anthology of papers on loudspeakers published by the Audio Engineering Society includes work by A.N. Thiele and Richard Small. Many loudspeaker manufacturers are now publishing Thiele data on their drivers which eliminates the need for testing. Most companies, however, require you to write for more specific details.

In addition, for those not wanting to contend with theory, some manufacturers will supply optimally vented enclosure designs (Eastern Acoustic Works and Electro-Voice among others). It is important to note that placing a speaker in an improperly tuned enclosure can create over-excursions and cause the driver to fail with suprisingly low power.

With the new vented enclosure system synthesis techniques, loudspeaker enclosure designing is no longer a black art. Unless you are prepared to do extensive research, your best bet would be to leave the designing to the manufacturer.

—Kenneth Berger
National Sales Manager
Eastern Acoustic Works, Inc.
South Framingham, Ma.

Creature Comforts

We are currently having a problem with a "live" miking technique and could use any advice you can offer.

The problem lies with our drummer's vocal mic. We are presently using a large, studio-type stand with a gooseneck attachment and a Shure SM 58 mic. The drum kit itself is large and subsequently the mic stand interferes with the drummer's playing. We have tried every possible position but nothing has worked so far. We then tried a new idea, a "headset" type of microphone, most commonly used for broadcasting purposes. The frequency

response was suitable, but the breath "pop" was severe and the headband became very uncomfortable when worn for long periods of time.

We would like to find a headset mic, hopefully with all the good characteristics of a "live" vocal mic. Does anyone manufacture or custom-build such a unit? Any guidance will be greatly appreciated.

—Dave MacKellor
Buzzard Music Co.
Thornhill, Ontario, Canada

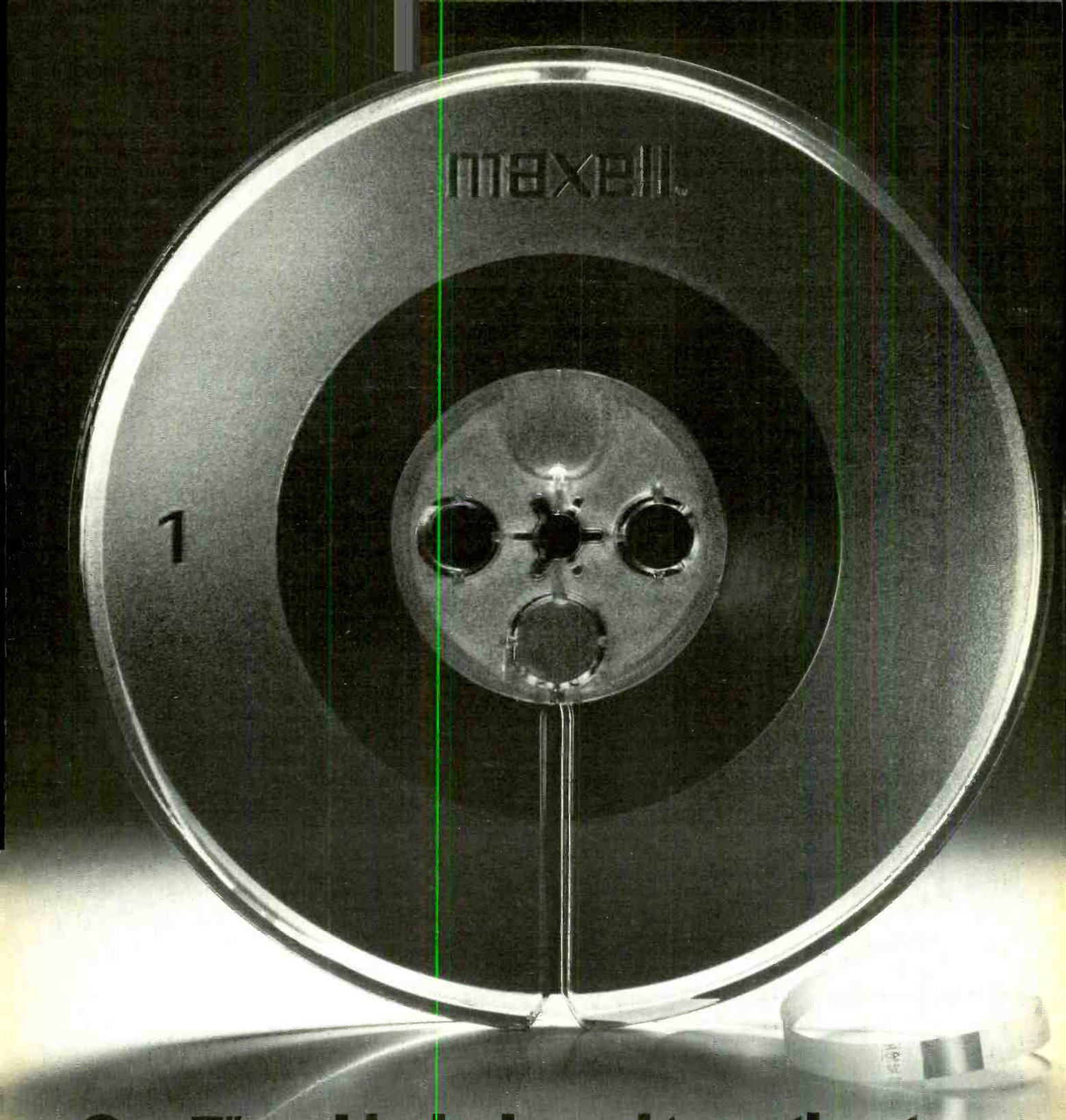
Conversation regarding your problem with recording engineer and author Don Ketteler presented us with such a simple solution that we're surprised you haven't stumbled across it yourself. Don suggests that you place you sturdy, studio-type mic stand behind *your drummer, arrange your boom over one of his shoulders (whichever seems less obtrusive) and connect your gooseneck to this. This allows the microphone to be placed directly in front of his face or off to one side, whatever position is more appropriate and will avoid that annoying breath "pop." This arrangement allows complete freedom of movement and will allow you to continue using the Shure mic that you like.*

Olsen's Odd Ohms

I wish you would publish an article on the matching of one piece of equipment to another. I have a devil of a time trying to get my inexpensive Olsen Electronics reverb amp to match to the back of my TEAC Model 2A mixer. I plug the "amp out" into the effects receive and the effects send to the input of the reverb. The effects send/receive on the board is rated at 10K and the input on the reverb is 5K and the output is 500K. How might I best match up this mess of darn ohms?

—Jonathan Frost
Ragged Mountain Studios
Andover, N.H.

In our equipment, the rule of thumb is that you bring a device with a low output impedance into one with a higher input impedance. Impedance may be thought of as resistance to a signal in a circuit. It also contributes to the efficiency of the circuit (how much signal it takes to get the job done properly). Impedance or resistance is measured in ohms which is symbolized by a "Z" (impedance) or "Ω" (ohms). The results of an impedance mismatch may include a loss of volume, changes in frequency response, or other forms of distortion.



Our 7" reel is designed to gather tape. Not dust.

Something as insignificant as a speck of dust can mess up a perfectly good recording.

So at Maxell, we've developed an ingenious device that keeps dust from collecting on our tape. Our take-up reel.

Instead of gaping holes that let dust in, our specially molded polystyrene design actually forces dust out.

So if your take-up reel is picking up more than it should, pick up ours.

You'll find it comes attached to something even more impressive.

Our tape.

maxell

CIRCLE 79 ON READER SERVICE CARD

Maxell Corporation of America, 60 Oxford Drive, Moonachie, N.J. 07074.

In your particular situation, we find it questionable that the output impedance of the Olsen device is as high as 500K ohms. We would be hard-pressed to find any device that would interface correctly with such a value. Generally, our input impedance has a nominal rating of 10K ohms and the expected output impedance of peripheral equipment would be somewhat lower than that. Please check to see if the figure you provided was correct. Try to plug the reverb into the Model 2A. If it sounds okay, use it.

An excellent discussion of impedance matching as well as the interfacing of audio devices is in our new publication, "The Multitrack Primer," available at your authorized TEAC Multitrack dealers. It gives many valuable hints and techniques, including home-type methods to acoustically treat your room. If there are any further questions, you are always welcome to contact me here at TEAC.

—Stuart Taira
Technical Correspondent
TEAC Corporation Of America
Montebello, Ca

Durable, But Not Indestructible

I am a musician and a home multi-track enthusiast who works simply for my own entertainment or to help out some of my musician friends from time to time. Being amateurs, we often have many out-takes before we complete a track with which we are satisfied. My question is, how many times can a high-quality tape be recorded and erased before it starts to affect the quality of the tape?

—Tom Wagner
Honolulu, Hawaii

To make sure that none of the fine points of high quality tape were overlooked, we contacted the two following manufacturers of professional recording tape for a response to Mr. Wagner's question. —Ed.

Magnetic tape does not lose its magnetic potency with age or use. Magnetic tape may be recorded, erased, and re-recorded an infinite number of times. Magnetic tape "wears out," or becomes useless, as a result of physical damage (stretching, creasing, folding, etc.) or through dirt and debris build-up which causes excessive signal dropouts. This debris build-up can be self-generated by the tape (oxide shed and/or clog) or from the ambient environment (dust, cigarette ashes, etc.).

To get maximum utilization from tape, one should keep the transport clean and properly adjusted. Also, transport environment should be as clean as possible. Magnetic recording tapes should be operated and stored in a controlled environment (70°F ± 20°; 50% RH ± 10%).

—George F. Armes
Manager, Product Management
Magnetic Tape Division
Ampex Corp.
Redwood City, Ca.

How long will recording tapes last? Expert evidence shows that with proper care, quality magnetic recording tape may outlast the user.

Magnetic tape did not become commercially available in the United States until the late 1940s, but engineers at 3M Company, manufacturers of both magnetic tape and tape recorders, have tested recording tape on special equipment to simulate one-hundred years of use. They found no appreciable change in the tape or its sound reproduction.

John T. Mullin, a magnetic recording pioneer who aided in the development of 3M's professional audio recorder, has tapes which are over twenty-five years

New ATM31 *Fixed-Charge* Condenser

For Vocalists Only

A great vocal microphone must do just two things:

1. Sound Fantastic. 2. Survive.

The New Audio-Technica ATM31 Vocal Microphone accomplishes both with considerable style. The sound is the direct result of new condenser technology from A-T. Our unique fixed-charge condenser element puts the electrical charge on the back plate rather than on the moving diaphragm. So the diaphragm can be made thinner better able to react precisely to every vocal nuance.

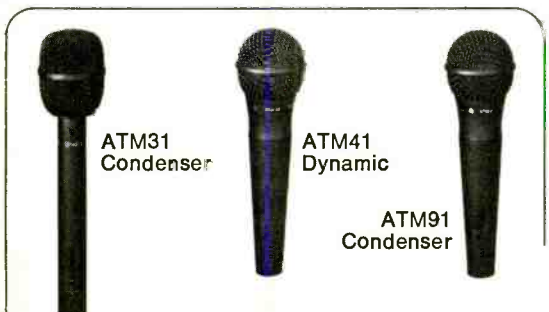
The result is honest, very musical sound. Vocals with punch and clarity—a direct result of our frequency-aligned response. The ATM31 curve takes into account every element in the chain...voice, amps, and speakers. It's the same kind of sound you hear on the finest recordings, but delivered on the road, day after day, in concerts and club dates alike.

As for survival, take a close look at one example of ATM31 "Road Tough" construction: the windscreen. Not simply woven wire, but *three* layers of screen. A heavy outer wire mesh, a finer inner mesh, and finally a fine brass screen. All soldered firmly in place (others use cheaper epoxy, but it can get brittle and fail at absolutely the worst times).

Every other detail of the ATM31 is as carefully engineered for performance and long life. This is one vocal microphone which will stay new-looking and new-sounding long after others are showing their distress.

Great sound in the real world. It's not too much to ask of Audio-Technica.

See the NEW "ROAD TOUGH" Artist Series Microphones now at your Audio-Technica Dealer.



FOR VOCALISTS

FOR INSTRUMENTALISTS

audio-technica

INNOVATION □ PRECISION □ INTEGRITY

CIRCLE 64 ON READER SERVICE CARD

AUDIO-TECHNICA U.S., INC., Dept. 49MR, 33 Shawassee Avenue, Fairlawn, Ohio 44313 • In Canada: Superior Electronics, Inc.

old. They have been stored in his home garages where temperatures ranged from 120°F in California to – 35° in Minnesota. These temperature extremes, however, are not recommended for your tapes. Mullin's tapes showed no signs of aging and sound reproduction remains excellent to this day.

There are factors, however, that will contribute to the deterioration of tapes and to the reduction of fidelity. For example, tapes which have been improperly wound, either too tightly or at irregular speeds, may have a ruffled edge. They will not pass properly over the recorder's heads, resulting in poor reproduction. Check the machine for this condition. Imperfections in a recorder's head or tape guides can also score a tape, thereby ruining it.

A strong previously recorded signal may not be completely erased by the machine's erase head when it is being re-recorded. Rather than discard the tape, use a bulk eraser (degausser) with a more intense magnetic field to completely wipe the signals from the tape.

Tapes which have become brittle under high heat and low humidity conditions can be restored by moving them to a more suitable environment, and leaving them out of the containers twenty-four hours or longer.

Performance also can be affected by a dirty tape surface. Rather than discarding the tape, rewind it, cleaning it with a soft, lint-free cloth.

Open reel tapes should be stored on edge in containers to protect them from dust and physical damage. Those which are stored for extended periods should be re-wound occasionally.

A word of caution to the buyer of tapes. Quality tapes are the best buy. The production of sound recording tapes is one of the most precise manufacturing processes known. Consequently, the "cheap" tapes are usually the discards of the process.

—Richard Ziff
Publicist
Magnetic Products Division
3M Company
New York, N.Y.

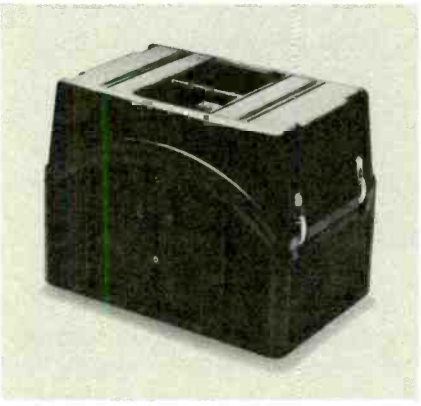
Lighten Your Load

I have been a subscriber to Modern Recording for the past year and I am fascinated by many of your articles even though some of them are too technical for me. I have been hesistant to write to you since my knowledge is

The Bose Model 802 Professional Loudspeaker System isn't for everyone. It's for those who really want to sound like themselves. Clear. Full. Natural. Voices sound like voices, guitars like guitars, and drums like real drums.

How does the Bose 802 avoid sounding like a speaker? By radiating sound broadly and evenly, just like humans and instruments do. By radiating all of its sound from the same area, just like humans and instruments do. By radiating its sound directly, without the use of horns, just as natural-sounding humans and instruments avoid the use of megaphones. And by not getting in the way of the music; providing smooth frequency response, low distortion, and a clarity and transparency that lets the real you come through.

If you want your audiences to hear you as you really are, check out the Bose 802 soon.



Visit your Bose Professional Products dealer and listen for yourself.

BOSE®

Bose Corporation, Dept. MR
The Mountain
Framingham, MA 01701

Please send me a copy of the Bose Professional Products Catalog and a complete dealer list.

Name_____

Street_____

City_____

State_____ Zip_____

Tel. ( )_____

(Patent rights issued and pending)

The Bose 802. The Sound of You.

extremely basic and I feared my question might appear amateurish.

I am a singer who performs on an almost nightly basis in small clubs and hotels. Sometimes, I have two different dates in one evening. The average audience is about three-hundred people and is made up of mostly middle aged or older people. My goal was to carry as little and as light sound equipment as possible. I purchased, therefore, a Shure SM 58 mic, a Tapco 6200B mixer, a Peavey CS 400 amp and a pair of Bose 800 speakers with the Bose active equalizer, mostly chosen from advertisements I read in MR. My question is how to patch in the following effects: the Bose 800 equalizer; a mono graphic equalizer, such as the MXR 10 graphic and an analogue delay, such as the Electro-Harmonix Music Man?

I am interested in these effects because of their portability, compactness and ease of setup. The ultimate solution for me would be to house them in one package, such as a rack or case, and be able to wheel them on stage, just connect the speakers to the amp without patching and be left with only the equalization and volume adjustments to make.

—Edward Klein
Miami Beach, Fl.

What you're describing is an interface problem and, happily, we can help you to get all hooked up just as quickly as you can turn from this page to part one of Larry Blakely's definitive article on the subject which appears in this issue. Larry will tell you the most effective way to set up your equipment to get the sound you desire and will probably answer some questions along the way that you haven't even thought of yet. While on the subject of asking questions, remember there are no stupid ones, and if you don't ask them you will appear amateurish—the pros ask (that's how they learn all those nifty things that make them professionals!).

—Ed.

Pacifying a Peevish Peavey Purchaser

I'm a pedal steel player who purchased a Peavey Session 400 amplifier because I'd read in many magazines that they made a great steel amp that was used by many session players.

Those guys must do some custom work to them because mine sounds like someone is frying bacon on a hot stove!

To get a superb performance, you need a precision machine.

To command a great performance, a cassette shell and cassette tape must be engineered to the most rigorous standards. Which explains why we get so finicky about details. Consider:

Precision Molded Cassette Shells—are made by continuously monitored injection molding that virtually assures a mirror-image parallel match. That's insurance against signal overlap or channel loss in record or playback from A to B sides. Further insurance: high impact styrene that resists temperature extremes and sudden stress.

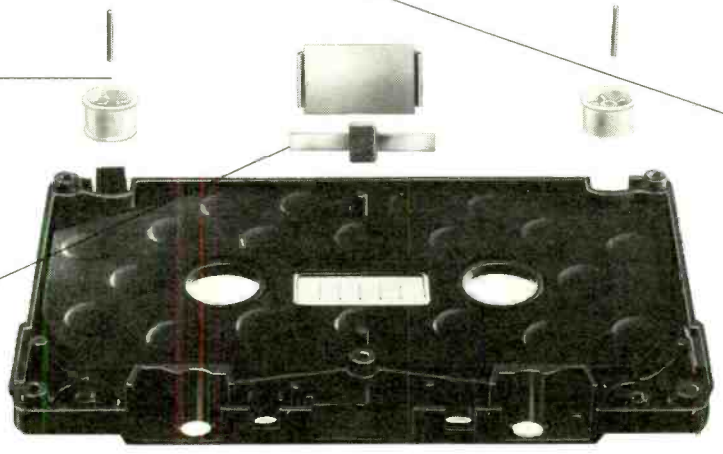
Five-Screw Assembly—for practically guaranteed warp-free mating of the cassette halves. Then nothing—no dust or tape snags—can come between the tape and a perfect performance.

An Ingenious Bubble Surface Liner Sheet—commands the tape to follow a consistent running angle with gentle, fingertip-embossed cushions. Costly lubricants forestall drag, shedding, friction, edgewear, and annoying squeal. Checks channel loss and dropouts.

Perfectly Circular Hubs and Double Clamp System—insures there is no deviation from circularity that could result in tape tension variation producing wow and flutter and dropouts. The clamp weds the tape to the hub with a curvature impeccably matched to the hub's perimeter.

Head Cleaning Leader Tape—knocks off foreign matter that might interfere with superior tape performance, and prepares the heads for...

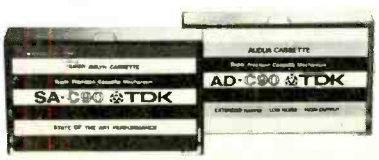
Tapered, Flanged Rollers—direct the tape from the hubs and program it against any up and down movement on its path towards the heads. Stainless steel pins minimize friction and avert wow and flutter, channel loss.



Our famous SA and AD Tape Performance—two of the finest tapes money can procure are securely housed inside our cassette shells. SA (Super Avilyn) is the tape most deck manufacturers use as their reference for the High (CrO_2) bias position. And the new Normal bias AD, the tape with a hot high end, is perfect for any type of music, in any deck. And that extra lift is perfect for noise reduction tracking.

Resilient Pressure Pad and Holding System—spring-mounted felt helps maintain tape contact at dead center on the head gap. Elegant interlocking pins moor the spring to the shell, and resist lateral slipping.

TDK Cassettes—despite all we put into them, we don't ask you to put out a lot for them. Visit your TDK dealer and discover how inexpensive it is to fight dropouts, level variation, channel loss, jamming, and other problems that interfere with musical enjoyment. Our full lifetime warranty* is your assurance that our machine is the machine for your machine. TDK Electronics Corp., Garden City, N.Y. 11530. Canada: Superior Electronics Ind., Ltd.



TDK®

The machine for your machine.

*In the unlikely event that any TDK cassette ever fails to perform due to a defect in materials or workmanship, simply return it to your local dealer or to TDK for a free replacement.

CIRCLE 67 ON READER SERVICE CARD

Not only is it noisy, but there is no AC outlet in the back for a volume pedal. Almost all the steel players I know of use a photo-electric volume pedal.

Two questions—could my volume and tone controls be dirty, hence the noise when I turn up the master gain? Is it advisable to have my local stereo shop install an AC plug for operating my volume pedal? If not, what alternatives can you suggest?

I like the sound of the amp but the noise and inconvenience of no AC outlet make it difficult to live with, both in the studio and on "live" dates.

—Angus M. Mackie
Cooperstown, N.Y.

Thanks very much for your purchase of the Peavey Session 400. The noise problem you have mentioned could easily be caused by a defective electronic component. However, some degree of "hiss" ill always be apparent when operating treble and presence at close to maximum settings. The noise or hiss that we just described may be greatly reduced by operating the master sensitivity control at "0." This master control is not the typical master volume that will allow distortion to occur at low settings, but is designed to reduce noise for studio operation. If more gain is needed for "live" performances, then a little additional hiss when volume is increased is usually not objectionable.

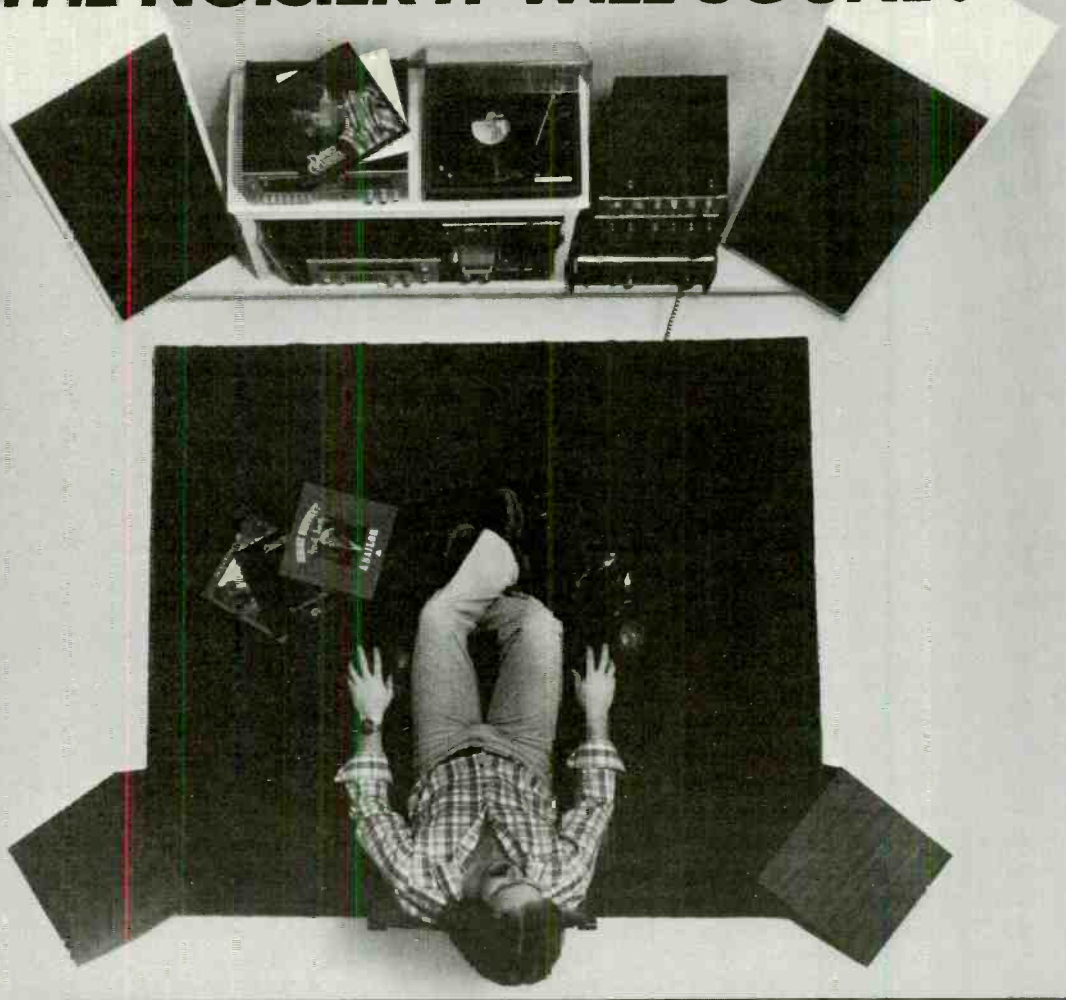
We have never provided an AC outlet on any of our models of guitar amps, bass amps, or powered public address systems. You are absolutely correct about the convenience of plugging accessories into the back of your amplifier, and the feature would certainly be added to our units if it were not so badly misused at times. For instance, we have seen entire groups plug every amplifier on stage through one convenience outlet on the back of a guitar amp. By this time, the voltage has dropped severely and everyone is wondering why the PA system is breaking up on three-part harmony. If you have ever heard an amplifier operated into 80 volts when it should have 120 volts, then you know what I'm talking about.

In most cases, your problem can be solved by purchasing a heavy-duty AC extension cord.

Thanks again and good luck with your system.

—Hollis T. Calvert
Director
Sales Promotion/Education
Peavey Electronics Corp.
Meridian, Miss.

THE BETTER YOUR HIGH FIDELITY SYSTEM, THE NOISIER IT WILL SOUND.



It's a strange, but true fact—the better your hi fi equipment, the more hiss, hum and rumble you will hear. Just as a quality high fidelity system provides richer music through its wide frequency response and greater dynamic range, it also has a better ability to reproduce irritating flaws contained in the source material. You can make a major improvement in your system by eliminating much of the hiss, hum and rumble that's inherent in the source material itself.

Many noise reduction systems have some success, but only one can silently remove 10dB of the hiss, hum and rumble that is contained in unencoded records, tapes and FM. That one system is the Phase 1000 Series Two.

As you reproduce recorded music, the 1000 Series Two analyzes the millions of incoming waveforms to find signals similar to a sine wave—a highly "correlated" waveform with periodic repetition. Like a guitar note. Or a piano note. Or a vocal note.

The 1000 Series Two electronically analyzes the signal to find fundamental musical tones, and their harmonics. Where these are missing, there is no music. The 1000 can then safely assume there is noise.

THE PHASE 1000 SERIES TWO

If the 1000 Series Two identifies a fundamental waveform, it instantly orders one of its silent bandpass gates to open. If no music is present, the gates remain shut. The 1000 removes a full 10dB of hiss, hum and rumble—without affecting music!

The 1000 Series Two overcomes another flaw—dynamic compression. Live music has great dynamic range, with as much as 100dB between the loudest and the quietest passages. But tape recorders have limited range, so studio engineers compress the dynamic range to less than 50dB. FM broadcasters compress the signal even more, in order to facilitate transmission. The 1000 is the only Noise Reduction System that can correct this compression on unencoded material. It expands dynamic range by a full 7.5dB, for a more open, lively sound.

The Phase 1000 Series Two may very well improve your sound more than any other single component you could add regardless of the quality or price of your hi fi system. The 1000 is an improved version of the Phase Linear Autocorrelator, now with second generation, low noise, high slew rate integrated circuitry for quiet, distortion-free performance. It's easy to utilize with any stereo receiver, integrated amp or preamp/amp, and is a valuable addition to Dolby* and dbx systems. (These systems are very effective in preventing noise from being added in the re-recording stage, but don't reduce noise in the original recording.) When you play conventional records through the 1000, you cut tape hiss. (Expensive direct-to-disc records are cut directly onto a master, primarily to avoid the taping stage with its inherent hiss.)

Ask your Phase dealer to play any record, tape or tuner through the 1000 Series Two. Then listen to the music. Not the noise.

Phase Linear®

THE POWERFUL DIFFERENCE

PHASE LINEAR CORPORATION, 20121 48TH AVENUE WEST, LYNNWOOD, WASHINGTON 98036
MADE IN USA. DISTRIBUTED IN CANADA BY H. ROY GRAY LTD. AND IN AUSTRALIA BY MEGASOUND PTY. LTD.
*A trademark of Dolby Laboratories, Inc.
CIRCLE 93 ON READER SERVICE CARD

THE PRODUCT SCENE

By Norman Eisenberg

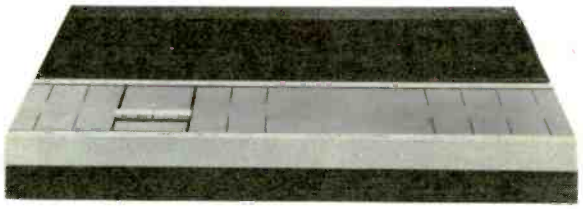
TEAC DEBUTS MASTERING DECK

New in Teac's Tascam series is the model 35-2, a mastering deck with optional dbx. Electronics include full logic with motion sensing, up-front bias and EQ controls and a separate quarter-track play head to complement the half-track record/play head. The transport system is said to be rugged and reliable, incorporates pitch control, punch-in recording, cueing and editing and a flip-up head cover.

The deck's monitor switch has three positions for source, calibration and output. Meters are VU, with LED peak indicators. Specifications at 15 ips speed include frequency response of 40 to 22,000 Hz; wow and flutter of 0.03 percent; S/N ratio of 100 dB with dbx; harmonic distortion of 0.6% at normal operating level. The 35-2 accepts 10½-inch and 7-inch reels. Price is $1,000.

CIRCLE 10 ON READER SERVICE CARD

B & O DEBUTS CASSETTE DECK



Boasting "sleek Danish-made design" and claimed to be very easy to operate (no dials or buttons, only "feather-touch" finger controls) is the new Beocord 5000. This new cassette recorder from Bang & Olufsen is a two-head model with electronic fade-in and fade-out; a transport designed to eliminate audible distortion; and a tape head that is automatically demagnetized. Announced price is about $595.

CIRCLE 11 ON READER SERVICE CARD

SONY RELEASES TAPE TRAINING SERIES

Sony has prepared a series of Betamax video tapes that contain complete operation and servicing information on its Betamax video recorders—consumer and industrial versions. The "watch and learn" programs are in full color and include major block diagrams, wave-forms, simplified schematics and explanations of circuit theory. Most importantly, all tapes contain physical demonstrations of how to replace and change parts, using simple repair procedures. The tapes come with supplementary printed and illustrated technical guides. The series is priced at $24 per tape ($7 more than the price of a blank Betamax cassette). A free catalog is available from Sony Corp., Training Tape Production, 700 West Artesia Blvd., Compton, Ca. 90220

CIRCLE 12 ON READER SERVICE CARD

DBX ANNOUNCES NEW PRO PRODUCTS

DBX, Inc. of Newton, Mass. has announced several new products for professional audio applications. The model 148 is a noise-reduction system for broadcast use. With eight decoders, the 148 is said to provide 30 dB of noise reduction and 10 dB of headroom improvement. It employs a tape play module and another for dbx-encoded discs. In the event of power failure, the system automatically switches to bypass mode. Price is $3000.

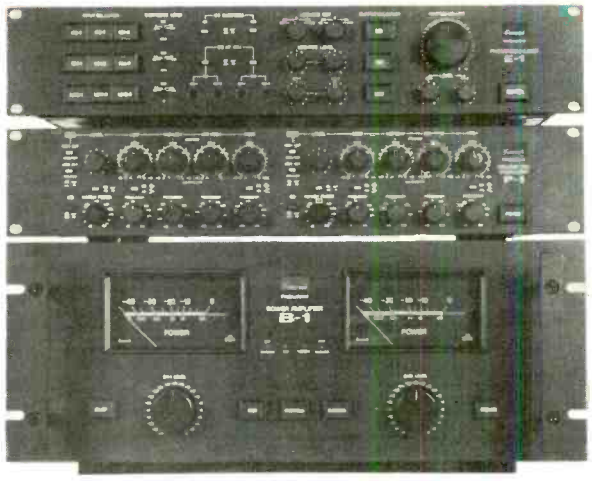
The RM-155 is an 8-track noise-reduction system capable of providing eight channels of switchable noise-reduction or four channels of simultaneous (encode and decode) functions. The unit is a mirror-image compressor/expander—halving the music's dynamic range at the input, then restoring an exact complementary expansion by a ratio of 1:2 at the output. Its price is $1100.

The model 208 is an 8-channel unit that features independent and simultaneous record and playback electronics. It eliminates audible tape hiss, thereby permitting multiple-track bouncing and mixing without noise buildup. Designed for use with professional multi-track tape recorders, this system costs $3300.

Other new dbx items include the model 163, a one-knob compressor/limiter priced at $189; the model 165, an advanced compressor/limiter at $550; and the model 3BX-R, a remote-control unit for use with the dbx 3BX three-band dynamic range expander which also assumes command of an entire music system. Its price is $149.

CIRCLE 13 ON READER SERVICE CARD

SANSUI SETS UP PRO AUDIO DIVISION



Sansui has formed a Professional Products Division to offer specialized and innovative audio components to broadcast, recording, sound-reinforcement and discotheque users. Distributed via a new setup entirely apart from their consumer products, the new line will include the model B-1 250-watt power amplifier; the model P-1 4-band stereo parametric equalizer; and the model E-1 phono playback EQ unit which can switch-select up to three moving-magnet or three moving-coil pickups, or three line-level sources. Prices for the three new units were not known at presstime.

CIRCLE 14 ON READER SERVICE CARD

PEAVEY OFFERS NEW MIXERS

A new line of mono mixing consoles, the Mark 1 series, has been announced by Peavey Electronics. Professional features include variable input gain, monitor send, 2-band EQ, effects send and level sliders on each channel. The master section has controls for high and low EQ, effects level, reverb return, reverb contour and effects return, along with main and monitor output sliders. The rear panel includes line out; high and low inputs for each channel; outputs for main, monitor and effects; auxiliary inputs for main, monitor and effects; and effects return.

CIRCLE 15 ON READER SERVICE CARD

ASHFORD SHOWS NEW HORNS

Designed for use as high-frequency sound projectors is a series of professional 90-degree fiberglass radial horns from Ashford Audio of Lindenhurst, N.Y. Hand laminated, the horns are claimed to produce "crisp sound reproduction using any superior driver." Material used is claimed to eliminate unwanted resonances and sound-coloration including the ringing tones often produced by metallic horns. Suggested uses include any "live" application (pro or working musical groups), discos and P.A. in general. The horns are lightweight and are supplied in a rugged road case shell. Standard colors are black or white; other colors are available on special order. Models include: 1-1490R (800+ Hz; for "live" or permanent in-house installation); 1-1890R (500+ Hz; for large sound coverage at high sound-pressure levels); 2-2290R (500 Hz+; top of the line for use where maximum SPLs are required; available with 1.4-inch or 2-inch diameter throat).

CIRCLE 16 ON READER SERVICE CARD

GRAPHIC EQUALIZER

Spectra Sound of Salt Lake City has announced its model 1000B graphic equalizer, said to incorporate the latest in Bi-Fet circuitry, wide bandwidth, low noise (−100 dBm), high slew rate (13 volts/microsecond), and low distortion (IM and THD less than 0.008 percent).

CIRCLE 17 ON READER SERVICE CARD

TAPE EDITING BOOKLET

Expert advice, presented in straightforward manner and liberally illustrated, on tape editing and splicing is offered in a booklet by Joel Tall entitled *Tape Editing*. Tall is a veteran pro recordist who, among other things, is credited with the invention of the tape-splicing block. The booklet is published by Elpa Marketing and is to be sold through retail outlets handling tape equipment. Price is $2.

CIRCLE 18 ON READER SERVICE CARD

BASF ANNOUNCES NEW TAPES AND NEW PACKAGING

From BASF comes word of new chrome video cassette tapes. In the Betamax format, there's the L-500 (1 to 2 hours playing time), and the L-750 (1½ to 3 hours). For the VHS format, there's the T-60 (1 to 2 hours), and the T-120 (2 to 4 hours).

BASF also has improved and repackaged its studio series of audio cassettes. Studio I takes normal bias; Studio II (chrome) takes high bias. Says BASF, these designations follow the general custom of numbering enhanced ferric tapes "I" and chrome (and chrome substitutes) as "II."

Production of the firm's Professional series tapes has been expanded. This series includes Professional I (ferric bias); II (chrome); and III (ferrichrome, developed specially for car stereo).

CIRCLE 19 ON READER SERVICE CARD

GARRARD USES NEW MOTOR IN TURNTABLES

Garrard's new direct-drive turntables employ what the company describes as an "ingenious motor that puts an end to the main drawback of most direct-drive turntables—cogging." The new motor is described as being brushless, coreless, and without slots, creating a magnetic force that is constant during the entire 360-degree rotation of the platter. Also incorporated in the new turntables are the time-integral velocity (TIV) speed-monitoring, and the Hall-Effect control circuitry to assure steady speed under all load conditions. Both models use Garrard's low-mass 12-gram tonearm/shell combination. The model DD131 turntable, $189.95, is a semi-automatic single-play model unit; the model DD132, list-priced "under $200," is a fully automatic single-play unit.

CIRCLE 20 ON READER SERVICE CARD

UNUSUAL SPEAKER KIT OFFERING

Selected models of high-quality speaker systems are available in kit or semi-kit form, requiring different degrees of effort on the buyer's part to assemble into a complete system that is guaranteed to perform as well as the factory-built version. Source of these items is a new firm, Sonikit, headquartered in Oakland, California. Included in its offerings are speakers and systems by Irving M. "Bud" Fried; JansZen; Dalesford; and Rogers. The Fried line contains monitors and subwoofers plus audio stands; a special feature here is an "updating program" whereby a kit builder can add to the system with improvements from time to time. The JansZen line includes electrostatics combined with dynamic woofers. Dalesford and Rogers are British firms known for their high-grade products.

CIRCLE 21 ON READER SERVICE CARD

NEW CROWN AMP AND PREAMP

New companion units from Crown International of Elkhart, Indiana are the Power Line One power amp, and the Straight Line One preamp, intended for high-quality playback systems. The power amp is rated at 50 watts per channel (RMS, both channels operating into 8-ohm loads, 20 Hz to 20 kHz). With a 4-ohm load, each channel increases its output to 80 watts. A rear-panel switch converts the amp to mono, for an output of 160 watts into 8 ohms. Included in the amp are separate indicators for evaluating performance. These include the Crown IOC distortion indicator and a peak-indicating output voltage display. Also built in is a speaker protection circuit that is sensitive to both overload and to DC.

In the new preamp, the signal goes through the circuit in an electronic "straight line" with all controls set flat. These controls are designed to be accessory to the main signal path, and the signal is diverted through them only when the controls are required. Crown indicates that this design results in significant reduction of distortion. Prices are $549 for the preamp and $479 for the power amp.

CIRCLE 22 ON READER SERVICE CARD

REPEAT COIL FOR BALANCED LINES

From Audisar of Bellevue, Washington, comes word of its model 9K-600-6 Repeat Coil, which allows for one balanced input and five balanced outputs on 600-ohm balanced lines. Rated response is 20 Hz to 50 kHz within ±0.5 dB, with +30 dB of headroom, and an insertion loss of only 0.75 dB. Furnished with standard lead lengths of 10 inches, and color-coded for phasing, the device weighs 11.5 ounces and is priced at $60. A data sheet is available on written request.

CIRCLE 23 ON READER SERVICE CARD

SONY OFFERS NEW TAPE

New from Sony is "EHF" tape which uses the recently developed cobalt-doped "ultra-gamma" magnetic material claimed by Sony to be superior to chromium-dioxide tape. Developed for cassette decks with high bias settings, EHF—says Sony—offers improved dynamic range and minimal print-through, "without the disadvantages traditionally associated with chrome tape." The new tape is fitted with Sony's SP mechanism, which is said to double cassette life by reducing friction, and eliminating irregular winding problems.

CIRCLE 24 ON READER SERVICE CARD

TANDBERG RECOMMENDS METAL TAPE STANDARDS

Based on its experience, Tandberg has released its recommendations for "the best combination of basic physical and magnetic properties for metal-particle cassette tapes."

According to Tandberg, the three most important specifications from the point of view of a recorder manufacturer are retentivity, coercivity and coating thickness. However, it is not practical simply to maximize each or all of these parameters independently. Instead, each must be considered in relationship with the other two.

In Tandberg's judgment, these are the optimum values for the three tape characteristics: Retentivity, 3300 gauss; coercivity, 1000 oersted; coating thickness, 3.5 to 4.0 micrometers.

These numbers, explains Tandberg, assume that metal particle tape will be used with the existing 70-microsecond playback EQ.

CIRCLE 25 ON READER SERVICE CARD

HEAD MOUNTING AID

Designed to reduce alignment time and to simplify tape-head maintenance is the Promix I introduced by Grandy, Inc. of Fairfield, N.J. A multitrack head mounting assembly, it incorporates various adjustments that give the user complete control over all aspects of head alignment. As a result, says Grandy, high-frequency and peak adjustments become smooth, simple and repeatable. A built-in head subplate enables a technician to remove an individual head to change its configuration, relap it or replace it without seriously affecting the alignment of the head. Designed to fit most studio recorders, the Promix I can be customized for special applications.

CIRCLE 26 ON READER SERVICE CARD

TECHNICS OFFERS NEW AMP

The new model SU-8099 by Technics is an integrated DC amplifier which, according to the company, was designed with the help of a new method for evaluating performance. Described as Input/Output Distortion Analysis, this method compares input and output waveforms of complex musical signals. The resultant "I/O" figure is said to be a true indication of the amplifier's transient-distortion characteristics. The amplifier uses straight DC circuitry throughout. High-level inputs bypass the usual preamp stages and are fed directly to the power amp section. Tone-control circuitry may be bypassed without any change in gain, inasmuch as the input sensitivity of the main amp has been raised to 200 mV (about five times more sensitive than most power amps). Rated power output is 115 watts per channel (continuous RMS, 8-ohm loads, both channels driven, 20 to 20 kHz, no more than 0.007 percent THD).

The unit's preamp and power amp sections, essentially independent within the overall design, may be used separately via switching on the rear panel.

CIRCLE 27 ON READER SERVICE CARD

AKAI SHOWS NEW OPEN-REEL DECK

Aimed at the serious enthusiast is the new GX-635D open-reel tape deck from Akai. A six-head model, it features automatic reverse and plays and records in both directions. Reels up to the 10½-inch size are handled, and controls are solenoid-operated for "feather touch" handling. Three motors are used: the one employed for the capstan is an AC servo direct-drive type motor.

A two-speed model (7½ and 3¾ ips), the GX-635D has a variable pitch control, a real-time counter; mic/line mixing; bias and EQ selector; 2½-inch illuminated VU meters; sound-on-sound. The same machine, with dual process Dolby, also is available as model GX-635DB.

CIRCLE 30 ON READER SERVICE CARD

HOW MANY MICS?

A problem faced by every recordist often becomes a sort of Catch-22 dilemma. It's the question of how many (and what kind of) microphones to use. There is a widespread belief in, and practice of, using multiple miking. There also is the opposite extreme of using a single microphone—"single" of course meaning a "unitized" stereo mic.

Aside from the possible variations in the number and placement of mics, the basic dilemma stems from the notion that the more, the better versus the complexity, phase problems, lines, amplification and distortion—all of which undeniably increase as microphones are added.

And so the serious recordist frequently asks: Do I go the simple route with only one mic on each of two stereo channels, or do I get fancy with several mics and hope for the best in terms of balance, correct phasing and minimum distortion—not to mention will I or someone be able to mix it all down for a satisfactory two-channel program?

If you try to get answers to this question, lots of luck. You probably will get as many different answers as the number of recording personnel whom you approach. What you will get in the main are the educated opinions of individual recordists. The advice may or may not solve your problems since even though it is sincere and backed by technical know-how, it is in great degree based on personal experiences and individual preferences.

Taking a pragmatic approach to this problem, wouldn't it be great if you could compare two takes of the same session, both recorded at the same time in the same place—but one using multiple miking and the other using single miking? As it happens, just such a comparison is possible thanks to the efforts of producer Lincoln Mayorga and the people at Town Hall Records of Santa Barbara, California. What they've done is to release two albums of the identical program called *The Art of Fuguing*. It's performed by a group of forty string, woodwind and percussion players with a final chorale sung by the California Boys' Choir. Album no. S-20 is the multiple mic version; album no. S-21 is the same stuff in single-mic version.

I have played both on side-by-side turntables, and taped interleaved segments from each. Several listeners have been A-B'ing the results on loudspeakers and headphones. Among this panel are professional musicians, a record producer and general music lovers of both sexes.

My listener-reaction tests are still inconclusive and I plan to continue this little project into the future. But to date, the results may surprise some of you. There seems, so far anyway, to be no clear-cut preference for one version over the other. Not only that, but there is barely any evidence that anyone has actually heard any differences in the two versions.

I realize that this information does not answer the dilemma posed earlier. But maybe it indicates that the dilemma is not a real one or at least hardly as important as many of us have thought it to be.

MUSICAL NEWSICALS

MUSICAL INSTRUMENTS

M. Hohner Inc. has announced new, updated versions of their Stringvox and Stringer keyboard instruments. Both models have received completely redesigned electronics which utilize some of the latest state-of-the-art, solid-state circuitry, plus a new physical package of hardwood with a metal top plate and protective wood lid. Both models feature a triple modulation system which is said to extend the color range in the string voicings while increasing the texture of ensemble effects. The Hohner Stringvox 3 is a sophisticated unit whose voicings include piano, harpsichord, violin, viola, cello and contra bass. It is a split keyboard design, allowing the musician to mix voicings separately in the bass and treble ranges. Other features of the Stringvox 3 include individual slide bar volume controls, a slide control for variable decay, footpedals for sustain and volume control and a detachable music rack. The Hohner Stringer XL, on the other hand, is a relatively simple device which is the smallest four-octave string synthesizer on the market today. The Stringer XL incorporates a full range of voicings including violin, viola, cello, and ensemble, and includes slide controls for volume and variable decay, and a volume foot pedal.

CIRCLE 28 ON READER SERVICE CARD

Ibanez has announced the availability of several new guitar models in their Artist Series and Studio Series. The Model 2630 is the latest addition to the Artist Series, and is a semi-acoustic, thinline electric model. This model is said to possess the look and feel of a more expensive guitar, yet it carries a reasonable price tag thanks to a straightforward package. The 2630 has an arched, curly maple body which is finished in Antique Violin. The hand-contoured maple neck supports a 22-fret ebony fingerboard with pearl/abalone/pearl position markers. The hardware used on the 2630 is top-notch as we have come to expect from Ibanez. The tuning head uses Velve-Tune double worm gear machines which now feature an exclusive thumbwheel adjustment for light or firm tuning action. The sound of the instrument is well balanced and bright thanks to the Half-and-Half brass and bone nut and the gold-plated Gibraltar locking bridge and slotted tailpiece which are both anchored to a maple sustain block running the length of the body. For pickups the 2630 uses one standard Super 80 in the bridge position and a Tri-Sound Super 80, which has a selector switch for single-coil, humbucking or reversed phase operation, in the neck position for excellent tonal variety. The other notable new model is the new top-of-the-line model in the Studio Series, the ST-300. This model has a contoured body designed for balance and playing comfort, featuring a deep cutaway for easy access to all 24 frets. The neck and center strip of the body are hard rock maple for maximum response and sustain. The side sections of the body are ash

with two lengthwise walnut strips as an accent. The ST-300 is a long-scale (25½") instrument and features abalone dot position markers. On the hardware side, the model uses the Half-and-Half nut, a gold-plated Gibraltar Locking Bridge, a Quik-Change Tailpiece which combines the solidity of a stud-type with the convenience of a slotted type, and Ibanez' new Sure-Grip Knobs which feature a special shape and a ribbed rubber insert for non-slip handling. Like the rest of the Studio Series, the ST-300 uses the latest Ibanez V-2 pickups. These pickups use a new design with more turns of wire in the coils to reinforce the upper midrange output while rolling off a slight amount of the low frequency output. This was done to optimize the pickup's characteristics at high volume levels when most pickups begin to sound somewhat muddy; the V-2, on the other hand, stays tight and punchy with no breaking up of chords at high levels. The Tri-Sound version of the V-2 is used in the ST-300 guitar for maximum tonal range. In addition, the ST-300 features the Ibanez EQ-2 Tone System, an on-board equalization circuit for excellent control of the mid and upper frequencies at the guitar.

CIRCLE 29 ON READER SERVICE CARD

SYNTHESIZER EQUIPMENT

Mediamix has announced its latest synthesizer accessory, a programmable low-frequency oscillator, known as the PLFO for short. The PLFO comprises three functional blocks in one unit: a voltage-controlled LFO is the heart of the unit, and features pulse or triangular waveforms and has voltage-controlled symmetry; an envelope generator is included which has controls for delay, attack and decay, an external trigger input, and its own output; the package is rounded out with a VCA section which may be controlled by the internal envelope signal or an external control device such as a foot-pedal or joystick. The PLFO is basically a low-frequency synthesizer whose output is used to modulate any voltage-controlled function in another synthesizer. By using a gate signal from the keyboard to trigger the envelope generator, the synthesist can have LFO modulation with a pre-programmed amplitude envelope on every note, or by using the delay function of the envelope generator the synthesist will have modulation only on notes which are sustained longer than the delay time. The PLFO has a self-contained AC power supply, and carries a list price of $189. Mediamix has also announced that a detailed product brochure is now available in addition to

the one page, short-form catalog they mail in response to reader service inquiries. The mailing cost for the brochure is $1, or for $5 you may order the brochure plus a 30-minute demo cassette featuring its full product line. Either cost is refundable with a $75 order from the company.

CIRCLE 31 ON READER SERVICE CARD

Two interesting pieces of information arrived recently from 360 Systems, the guitar synthesizer people. First is that they have moved from their previous Los Angeles address to a new location at 18730 Oxnard Street, No. 215, Tarzana, Ca. 91356. The second piece of information concerns the company's latest product, the Spectre guitar synthesizer. Unlike most of 360 Systems' previous models, the Spectre is a self-contained (except for the guitar) system. It comes packaged in a Tolex-covered road case which is designed to sit on top of most guitar amplifiers, and which has a lid and handles for safe handling. Electronically the Spectre comprises two oscillators, two envelope generators, a low pass filter plus three other filter types, two interval transposers which may be pre-set to give parallel harmonies at any desired intervals, hex-fuzz, string selector switches and a polyphonic effects processor for synthesizer effects when playing chords. In normal operation, the Spectre follows your lead line with its pitch-tracking circuitry, which converts each note's frequency to a control voltage and which will follow virtually any picking style as well as string-bending or vibrato. The unit is furnished with a special hex pick-up which can be mounted to most any solid-body guitar. For additional convenience, an optional programmer is available to plug into the Spectre with a single cord enabling the user to store up to 64 preset sounds for instant recall.

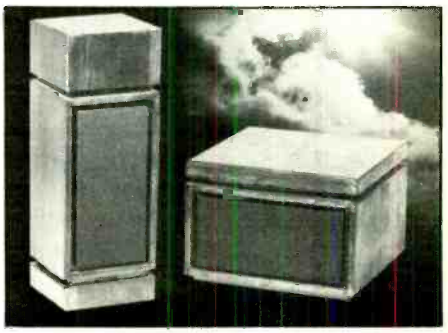
CIRCLE 32 ON READER SERVICE CARD

RolandCorp US has introduced yet another synthesizer to its line of performance-oriented models. The new unit is the RS-505 Paraphonic Ensemble Synthesizer, which is described as a lead-line unit which functions as a bass, string, polyphonic and paraphonic synthesizer. The unit is a sophisticated design with three complete and independent voices which may be selectively assigned to upper and lower halves of a split keyboard. The string voice has controls for separate eight-foot through four-foot mixes for upper and lower keyboards plus an envelope generator. The bass voice has two sixteen-foot and one eight-foot voice plus an envelope generator and is playable from the lower keyboard only. The synthesizer voice has eight-foot and four-foot tabs for each keyboard section, and features a VCF with ADSR or LFO control, ADSR envelope generator and a special bass voice. In addition the unit has manual pitch bend or automatic pitch sweep, delayed LFO and independent ensemble switches. Thanks to the independent envelope generators on each voice, and the sophistication of the controls and the output mixer, the RS-505 is said to sound like an ensemble rather than a single instrument.

CIRCLE 33 ON READER SERVICE CARD

MUSICAL INSTRUMENT AMPLIFIERS

Dynamic Dimensions, Inc. has announced a new line of keyboard sound systems known as the Avant Garde series. The unique feature of these new powered speaker systems is the digital simulation of the sound of a dual-rotor, mechanically rotating speaker system. The circuitry simulates two rotational speeds which can



be switched by the organ console or by micro-touch switches. The fast and slow speeds can be adjusted over a limited range by the user. In addition to the speed adjustments, controls are provided for volume and treble cut, plus dual connectors are provided to facilitate "daisy-chaining" or parallel connecting several speaker systems. Several versions of the system are available in one of two overall package sizes, and with total amplifier power ranging from 100 to 220 watts.

CIRCLE 34 ON READER SERVICE CARD

A new addition to the Lab Series amplifier line is among the news from Norlin Music. The new model is the Lab Series L3, and is designed as a compact no-frills amplifier for studio, club or practice use. The L3 features a 60-watt amplifier section driving a single 12-inch speaker which is capable

of remarkable amounts of sound output. In addition to input volume and tone controls, the L3 has a Master Volume to allow complete control of preamp distortion at any final volume level. Rugged construction, featuring fingerlocked corners and an extra speaker support round out the well-balanced package.

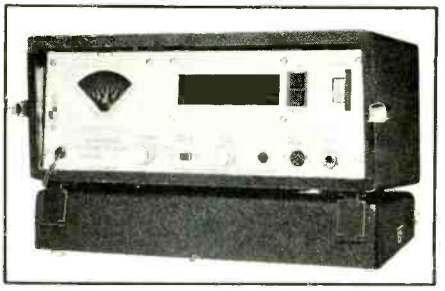
CIRCLE 35 ON READER SERVICE CARD

MUSICAL INSTRUMENT ACCESSORIES

A full line of solid brass bridges and replacement parts for electric guitars is offered by Mighty Mite Mfg. & Dist., who is best known as the maker of "Screamers" pickups. In addition to solid brass adjustable bridges specifically designed for Strats, Teles and Precision Basses, the Mighty Mite line includes a variety of brass hardware items for improving the sustain and/or appearance of any guitar. Among these items are strap buttons, knobs, neck plates, control mounting plates, brass nuts and string inserts and tension guides for bridges.

CIRCLE 36 ON READER SERVICE CARD

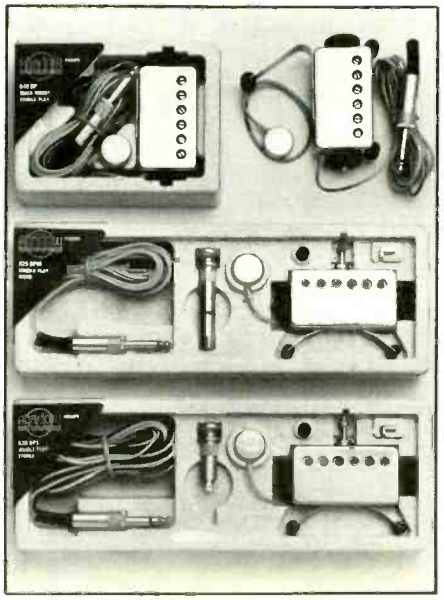
New from Peterson Electro-Musical Products is the Model 700 Scanning Strobe Tuner. This unit is designed to allow hands-free tuning since the note being tuned can be switched up or



down by pushing on the foot pedal supplied with the unit or by pushing the appropriate button on the front panel of the unit itself.A lighted display on the front of the unit indicates which pitch has been selected. In addition, the display also transposes for E-flat, B-flat, and F instruments as well as displaying C tuning.

CIRCLE 37 ON READER SERVICE CARD

A unique combination of a powerful magnetic pickup and a sensitive, wide-response transducer in a single housing is what distinquishes the Shadow Double Play System of guitar pickups now available from Shadow of America Electronics Co. The pickups, which are made in West Germany, attach easily to any guitar with non-marring adhesive, and come complete with all necessary hardware. Each pickup has



a volume control and a balance control to determine the blend of transducer and magnetic pickup outputs from a pure acoustic sound to a pure electric sound or anywhere in between. Three basic models are available: the 640DP is a removable monaural system, while the 625DPM is a permanent-mount monaural system; the 630DPS is a permanent-mount stereo system which allows even more possibilities for combinations of sounds.

CIRCLE 38 ON READER SERVICE CARD

News comes from International Sales Associates of the new Schecter Les Paul electronics assembly. This product is basically a complete replacement electronics kit designed to retrofit the electronics cavity in all Les Paul-type guitars. The heart of the kit is the pair of Schecter Z Plus humbucking pickups, which were designed by noted guitarist and guitar-builder Dan Armstrong. But in addition to the pickups is an innovative control panel using four of the newest Omni-Pots made by Allen-Bradley. These new pots incorporate a double-pole double-throw, push-pull switch along with the actual potentiometer in a single assembly. By using omni-pots, the Schecter kit is able to offer twenty-six different tone combinations without a clutter of miniature toggle or slide switches. The kit comes with four omni-pots on a brass shielding plate, and is pre-wired with a color-coded wiring harness for easy connection. the kit was carefully designed for hassle-free installation with no modifications or custom routing required.

CIRCLE 39 ON READER SERVICE CARD

Revolutionary!

Sound-shaping taping mike.

Never before — a single microphone that gives you the versatility of 16 microphones! Four tiny frequency filter switches built into the new Shure 516EQ E-Qualidyne Microphone let you tailor sound for studio effects in virtually any recording situation: flick a switch to add sizzle to vocals . . . flick another switch to highlight the sound of a bass drum. You can even compensate for the acoustic response of a room — *right from the microphone!* In all, the 516EQ creates 16 different response variations that can add a new, professional sound to every tape you make. Available singly or in pairs for stereo recording. Ask to hear a recorded demonstration at your participating Shure dealer.

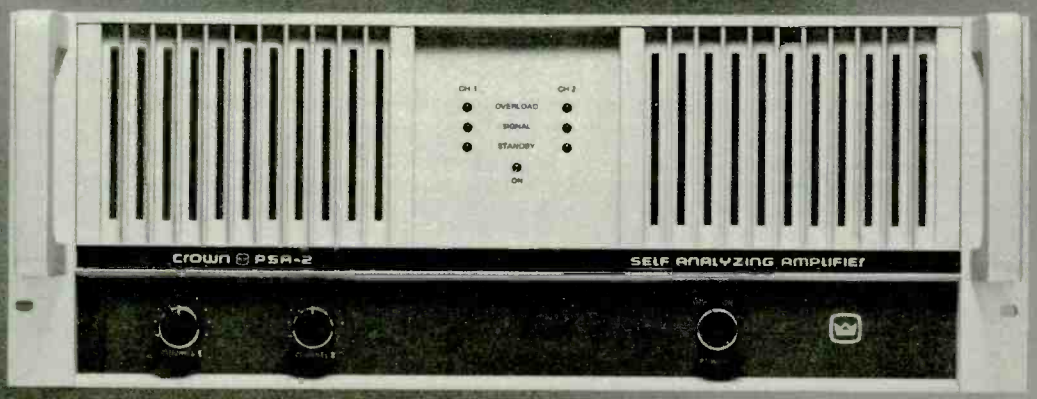
Shure Brothers Inc.
222 Hartrey Ave., Evanston, IL 60204
In Canada: A. C. Simmonds & Sons Limited

SHURE®

Manufacturers of high fidelity components, microphones, sound systems and related circuitry.

CIRCLE 69 ON READER SERVICE CARD

Five years from now,



The Crown PSA-2 Professional Power Amplifier*

220 watts per channel minimum RMS (both channels operating) into an 8 ohm load, 20Hz-20KHz at a rated RMS sum total harmonic distortion of 0.05% of the fundamental output voltage. (tested per FTC specifications)

250 watts ±1dB per channel, 20Hz to 20KHz into 8 ohms with no more than 1.0% THD (EIA Std. SE-101-A).

400 watts ±1dB per channel, 20Hz to 20KHz into 4 ohms with no more than 1.0% THD (EIA Std. SE-101-A).

685 watts ±1dB at 1K per channel into 2 ohms, with no more than 1.0% THD.

*Designed for installation and use in professional sound systems

the Crown PSA-2 amplifier will still be unique.

There is unique technology built into the new Crown PSA-2 amp that is not available to other amp manufacturers. Our competitors may try to copy the PSA-2, but only the Crown label guarantees you access to that technology.

You will experience that technology as reliable, long-term performance of the PSA-2. No other amplifier combines such power and dependability.

Here's why.

For over ten years, Crown has tested every output device manufactured for us. We built an electronic wizard — the SOAR III Transistor Analyzer — to determine for ourselves the safe operating area (SOA) of each type of output device. Designers have long understood that the SOA changes as operating conditions change, but until now there has been no way to define and compensate for these changes. The SOAR III has changed all that — exclusively for Crown.

As a result, we can include in the PSA-2 analog computers connected to sensing units which constantly monitor the operating circumstances of each output device. These self-analyzing circuits are programmed at the factory with Crown's data on the SOA. For the first time, the protection circuit actually follows the changes in transistor SOA resulting from operation of the amplifier. If an output transistor exceeds its SOA for any reason, the self-analyzing circuit limits the output, preventing its destruction. If the SOA is not exceeded the output devices are not limited in any way.

What good does that do you?

The Crown PSA-2 provides more usable power from each output device. There are no arbitrary voltage or current restrictions on the output.

You get reliable power for less money than you might expect. Output devices are expensive. Only Crown has learned how to use them at maximum efficiency.

In the PSA-2, you'll also find

- . . . . a two-speed fan and completely enclosed high-efficiency heat sinks
- . . . . balanced variable gain (XLR) inputs on a back panel plug-in module
- . . . . switchable high and low pass 3-pole Butterworth filters that are factory-set for 50Hz and 15KHz, with other roll-off points available
- . . . . a push-button test-tone generator
- . . . . an adjustable-threshold compressor to limit output at the user's discretion
- . . . . switch selectable low-frequency load protection
- . . . . switch selectable turn-on delay
- . . . . thermal-sensing power supply protection to eliminate premature fuse-blowing
- . . . . stackability (without a cabinet)

The Crown PSA-2 is a unique professional component. With the PSA-2, the amplification systems you are bidding today will still be state-of-the art years from now. Call us for spec or delivery information at 219/294-5571.

crown

1718 W. Mishawaka Road, Elkhart, Indiana 46514

American innovation and technology...since 1951.

CIRCLE 104 ON READER SERVICE CARD

UP THE BASEMENT

by James F. Rupert

Hello again! Since my last article appeared on the hallowed pages of *Modern Recording* ["Confessions of an Audio Addict," April 1978, pgs. 22-23.], I've been constantly pummelled by two questions: "When are you going to do another?" and "Is it going to be funny this time?"

The second query I've chosen to disregard, but the initial question has always forced me to answer, "As soon as I can think of something to write that I'm qualified to talk about." As stated in the previous article, I do not claim to be an expert in any stage of recording. Yet I've been working in it for the last seven years, so I must be doing something right. (Either that or in the words of Archie Bunker: "God looks out after dingbats.")

It then struck me that there are two almost impossible tasks on earth today—bringing about world peace and dealing with the public. Both these facts are direct causes of so many prematurely bald politicians, retail salesmen and basement recording studio owners. The public can be an elusive and unloving minx unless handled with a bit of diplomacy. It's

Situation Number One

A customer marches into your studio with a guitar amp the size of Alabama. Immediately upon turning it on you hear enough crackling, popping and humming to make Helen Keller sit up and take notice. The customer never really noticed the noise before at his "live" gigs, but it is all too noticeable now. He demands to know, "Why is my amplifier humming?"

Do you say . . . *(check one)*

☐ A) "It doesn't know the words."

☐ B) "Aaah, that amp isn't worth cow cookies. What were you planning on doing in here, arc welding?"

☐ C) "Sounds like you've got a ground problem. We can try reversing the ground, but it's going to be a lot safer going through a direct box, or a combination of a direct box and miking off a smaller amp." (To help him understand further, set him down with the April '78 issue of *Modern Recording* to read "Building a Direct Box" by Peter Weiss.)

Situation Number Two

A potential customer comes in, takes one look at your recording booth and doesn't see brands such as 3M, Studer, Rupert Neve, MCI or Ampex. He consequently thinks your set-up is all junk and wants to know, "Why don't you have any good stuff?"

Do you answer . . . *(check one)*

☐ A) "Well, gee, Paul and Linda loved it when they were here last week, but I guess there's no accounting for taste . . ."

☐ B) "Hey, eat it, you jerk!"

☐ C) "I'm sorry we don't have the brands of equipment you're looking for, but I didn't think you wanted to spend that kind of money. Let me just call up my friend over at Megabucks Studios and see if I can get you in there. It'll cost about five times as much, but if you're looking for the big brand gear his place really might suit you a lot better."

See how this works? I thought you would. Let's try another.

Situation Number Three

Your next customer is a fifteen year old who has never spent more than five dollars at once in his life. As he reads your price sheet his complexion progresses from lime to Kelly green to House of Usher white. Upon regaining his ability to breathe he asks, "How come you charge musicians so much to record?"

Do you say . . . *(check one)*

☐ A) "Well, Y'see Mom's been awful sick . . ."

☐ B) I don't know, the next time I see a real musician I'll ask him."

☐ C) "Two reasons, really. The first is that all this equipment costs money—to buy, to keep and to maintain. The second is that the purpose of this business is not to get rich overnight and, at the very least, not to lose money on the deal. I'm here to give you the best possible product at the best possible price. But I'm afraid that's a two-way street."

Situation Number Four

The same young customer from the previous question then wants to know, "How can I get this song recorded any cheaper?"

Do you say . . . *(check one)*

☐ A) "Well, I guess I could take a few dollars off . . ."

☐ B) "We won't use any tape, how does that grab you?"

☐ C) "The best way to save money in the studio is to have you and your fellow musicians ready *before* you walk in the door. Paying me studio rent for you to rehearse one last time can get awful expensive awful fast. If you have any questions or problems let's try to work them out before the clock starts running. That way we won't be wasting any of your money or any of my time.

Okay so far? Anything sound familiar? Anybody's thumbs green yet? Let's continue . . .

Scoring

A) If you consistently answered your situations with choices listed under the letter "A" you probably should not be in the basement recording studio business because of health reasons. Namely, you are suffering from a disease known as "Spinal Linguine." This disease affects people's ability to take any pride in their equipment, their procedures and their final product. People with this disease generally don't live long in the studio business because of the lack of a nutrient called confidence and the necessary and life-giving exercise known as a little homework into the art of recording itself. This condition can be reversed with some experience and some brushing up on studio techniques. Choice A answers score ½ point each.

B) If you are a basement studio owner who chose B answers you probably didn't really take this quiz because you are dead, having been murdered by your customers. Believe it or not, your clientele are all people too. Ignorance on their part can be a little aggravating, but certainly is not deserving of the belligerence displayed in answers in the B column. Turn yourself over to the local authorities and score yourself ½ point for each answer.

C) I think (I hope) it has been obvious which of the three choices was the most desirable right from the beginning. Yet in both beginner and

or A Quiz for The Would-Be Recordist

an unfortunate fact that knowing how to handle your equipment can end up doing you minimal good if you do not have any idea how to handle the people you are trying to serve. Too often I've seen a chance remark from a customer lead a novice recordist to either alibi his act or invite somebody outside for a lesson in manners. If you're the slightest bit unsure about your equipment or how to use it, the chances for success slim down even further.

So for all you basement wizards willing to admit you don't quite know everything about recording (both of you!), I've devised the following quiz to see how you'd react in certain situations. Given a certain set of circumstances, it'll be up to you to pick from one of three different reactions as to how you'd handle the situation. Score yourself upon finishing the quiz, but no fair looking at the answers first! Cheaters never prosper. (If you do cheat, specially-treated sections of this magazine will dye your thumbs green for the rest of your life. So there.) There is no time limit, so you can choose your answers carefully. Pencils ready? Let's try one.

Situation Number Five

You're about to record a young folksinger who has absolutely no distinctive style whatsoever, yet who is convinced he is the new voice of the younger generation. He eagerly asks, "I didn't like that last take; can you make me sound like Phil Ochs?"

Do you answer . . . *(check one)*

☐ A) "Only God can make a tree."

☐ B) "If you're sure you want to sound like you're singing with a double hernia."

☐ C) The tape doesn't lie. I can sweeten the sound a bit, make it sound a little fuller, even make it sound like there might be two of you singing. But unfortunately recording engineers aren't magicians. We can only try to make you sound like the best possible you. Shall we try it again?"

Situation Number Six

You're recording a rock group that insists on doing everything "live." To complicate the matter, the group's drummer can play at only two volumes—loud and past the threshold of pain. He's leaking over on to every mic in the studio and separation is out the window. You've tried (reluctantly) hemming him in with gobos but even those were ineffective. The band is getting angrier by the minute, but unfortunately the anger is directed toward you, not the drummer. You know you have to get this maniac to play softer, but you don't know how to phrase it. Finally you decide.

Do you say . . . *(check one)*

☐ A) "Uh, listen, Mom's awful sick upstairs . . ."

☐ B) "We can solve the problem with absorptive blankets. How about if I tie one 'round your drummer's head?"

☐ C) (To the drummer): "I think the way it is now I'm not going to be able to mix down your drum tracks the way they deserve. If we could muffle these drums or, better yet, get you to play a little softer I'm sure I can mix your drums with the snap and power you're trying to convey. Otherwise we're letting these other guys' tracks mess up your sound, and after all you're the backbone of this whole recording. Once more, okay?"

Situation Number Seven

A group has finally completed a multitrack recording in your studio. The lead singer has read one issue of *Modern Recording* and thinks he's Fred Catero. You become painfully aware of this when he tells you he wants to run the console and mix down their tape. He's so hot to mix he's shaking like the tootsies on a tap dancer. How do you discourage this unwise practice and keep this guy from ruining all your work so far?

Do you say . . . *(check one)*

☐ A) "Sure! But first let me find my pet boa constrictor that got away. I know he's under this console somewhere . . ."

☐ B) "Hey, eat it, you jerk!"

☐ C) "Mixing might be a little more complicated than you might believe. It requires the patience of a saint, the ear of a bat, the arms of an octopus, the timing of a juggler and the objectivity of a Supreme Court judge. These aren't things you walk into a studio and instantly develop. I strongly advise against you trying to mix down your own tape. Six months down the road is no time to discover you really don't like the job you did trying to finish the recording you're going to walk out of here with. Your advice I need, your suggestions are welcome, but you sitting here playing with the controls isn't going to do either one of us any good. Okay?"

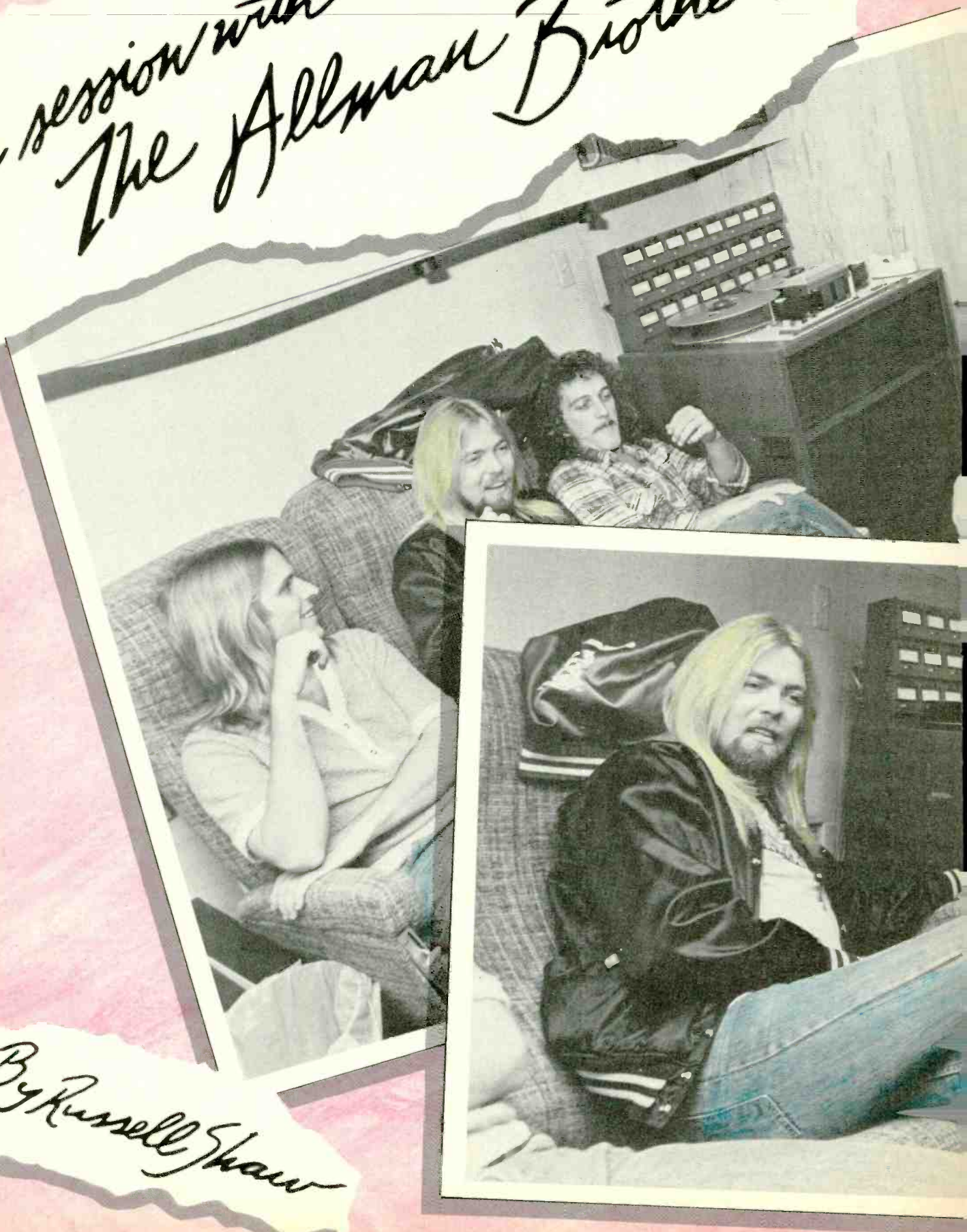
Time's up! Pencils down and add up your scores!

professional studios I've seen or been subject to answers to questions that bordered on the ultra-defensive or the super antagonistic. Don't fall into either trap. Answers in section C score 4½ points out of a perfect five. These are only alternatives taken from what has worked in my own personal applications. The perfect 5 point answers must depend on your situations and your personality.

So there we have it. I hope some of you have been able to glean even just a tad of insight from the quiz. The best way to keep your customers is to make them want to come back. Sounding like you know what you are talking about isn't half as good as truly knowing what you are talking about. With a little patience, effort and diplomacy that hobby-turned-business in your basement can turn out to be everything you want it to and more. Trust must be a mutual experience. For the customer you must grant it, and from him you must earn it. If it isn't a two-way street, it doesn't lead you anywhere.

So depending on your answers, either congratulations, or better luck next time. For those of you who have just discovered your thumbs are turning green, don't say I didn't warn you!

a session with The Allman Brothers



By Russell Shaw

For some, the years have passed gracefully, if not quickly. The social fabric of youth has woven many new tapestries since 1969, when the Allman Brothers Band was first born; political defiance, episodic experimentation with chemicals and, heck, just plain growing up, have significantly faded from the scene.

Ten years later, comparatively few musical chestnuts have survived. No more than perhaps half-a-dozen American rock groups have bridged the eras, and among those still surviving, a loss of dégagé pervades.

We're not here to recapture lost, past glories, but to create new ones. Admittedly, a swig from the Fountain of Youth wouldn't exactly hurt, especially in the view of some that upon a jaded, rather bitter dissolution in early 1976, the Allman Brothers were but a shell of their former selves. Robbed by the deaths of Duane Allman and bassist Berry Oakley; their immense creative skills beaten down into lifesize mediocrity by drug addiction, legal troubles, egos, too much time on the road, and all the other diseases familiar to the lexicons of armchair rock coroners. The three years adrift saw two lacklustre Gregg Allman solo efforts: a pair of promising, yet one-dimensional efforts from Betts and his new band, Great Southern; back troubles for drummer Jai Johanny Johanson ("Jaimoe"); sudden career anonymity for trapper Butch Trucks.

It would be both naïve and melodramatic, then, for one to say that the Brothers were drawn back together by a craving hunger to make more great music. Missives of the minstrel would have made great imagery, yet in truth, the prime purpose of this latest confederation actually was, and is, the balance sheet.

To this southern-bred writer, who first saw Allman Brothers' guitarist Richard Betts play copped psychedelic licks at a 1968 Dorm Council dance in a frat-dominated north Florida university, who perused the life of Gregg Allman's "Midnight Rider" through flirtation with sinister enterprises and who, upon the loss of a one-time female partner to another, played "Whipping Post" from *The Allman Brothers Band At Fillmore East* album for thirty-four drunken, sleepless hours, the ABB has truly encapsulated life.

Tunes to live by, sure, but up until one night in winter, 1979, it had been a process of admiration from the spectator's point of view. That is, until this warm winter Miami night, when ABB road manager Twiggs Lyndon and one Gregory Lenoir Allman come out to the airport to meet . . . *me*.

He [Gregg] wasn't recognized. Seems as if airport patrons have a singularity of purpose; after all, their minds are someplace else. The path through the myriad of terminals thus unblocked by the idolaters, we hit the causeways of metro Miami until we arrived at a haven of hits known as Criteria Studios. Breathes there a recording afficianado unaware of this sun-drenched citadel of musical hitdom? For goshsake, look at the *effing* walls: platinum albums from the likes of the Bee Gees; Firefall; Andy Gibb; Crosby, Stills and Nash; Eric Clapton; the Eagles; the Allman Brothers Band.

Enlightened Rogues, struck the brainstorm, and a title was born. The "99% perspiration" thus loomed, namely an album, featuring primary input from six musicians who hadn't played together in years.

Analyzing the Virus

What better man to trust with this ecumenical task than the great white father, producer Tom Dowd. His countenance, a forthright yet serene prism of affability and knowledge, shines upon the flock and brings it peace. He has worked with ABB before, so this is no introduction.

Never gruff, the quintessential open-minded soul, the white-bearded Dowd sits at *theat dadgummed console* with antennae-like ears, working on instant analysis, improvement and perfection, yet with an omnipresence so, well, gentle that you almost feel this guy could walk into the pit of an active volcano and tranquilize it.

As we arrive, "Crazy Love," is the first order of business. They've been working on the tune for two nights now, and they have it down, but not down enough. It seems to be flowing; Betts' slide bites like a starved, rabid bulldawg, all eighteen wheels are a-rollin', but everybody in the room holds back that elusive butterfly of satisfied adulation. There's something—indefinable to most—wrong.

Dowd has analyzed the virus. "We need more of a round sound." To Tom, producer of Rod Stewart, Lynyrd

Skynyrd and a hundred other acts, this means that bassist Dave Goldflies, a Great Southern vet, should slow down just a bit, and Dicky Betts should pace at a slightly faster tempo. The picker confesses that, "Last night, we had more fire in it." "We're only warming up," is Trucks' remark.

A few more takes, and Dowd shifts proceedings to another song, a complex instrumental entitled "Pegasus." This one has all the ethereal lilt of "In Memory of Elizabeth Reed," while recalling the jazz-fusion lope of "High Falls." The composition is indeed a most fickle mistress, allowing freedom while demanding unswerving fealty. Once again Betts, forever seeking to better himself, is persuaded by Dowd to "play a few more verses." "Must have lost my rhythm," Dicky states impishly.

In walks Gregg. The keyboardist-singer's initial greeting to the assemblage is a fairly loud proclamation predicting the Pittsburgh Steelers as winners of Super Bowl XIII. This prognostication signals, as if by design, a break in the proceedings. Gregg convenes the troops, and some rather racy war stories of old ABB road adventures are told, and mentally relived.

Putting Down the Parts

Next night.Gregg needs to put down a clavinet part on "Crazy Love." On time, Gregg pulls his motorcycle (his brother's instrument of death, but which Gregg drives very carefully) into the rain-soaked Criteria parking lot. Within ten minutes, Allman and Dowd are looking over a lead sheet.

"You come in after the first eight bars," instructs Tom. G.A., donning headphones, ambles over to the clavinet and spends a good fifteen minutes getting his fills down in his head. Now, we're ready for overdubbing—the others have already put their tracks down.

GA: That take faked me out. I have to find the right key.

Another take.

TD: That was mighty close on the back phrase, Gregg. Here we go again now . . . pray.

Another take. Gregg fluffs a note.

TD: No good.

GA: This is about to piss me off! F———!!!

Another take.

TD: You gotta get tighter with the guitar on the way down from that phrase, Gregg.

A couple of more go arounds, and Gregg finds the precise vamp and groove desired.

From Behind the Console

Another piece of the puzzle has been completed. Yet this is not just a venture between producer Tom Dowd and six veteran, skillful players; the men at the controls, engineer Steve Gursky and assistant engineer Kevin Ryan, are most assuredly on the front lines.

For Steve Gursky, age 25, this is a most coveted and noble assignment; his hand is on the trigger of one of the most hit-creating consoles in the entire world for the express purpose of sculpting a reunion for a rock legend steeped in gold, platinum and controversy. And who must prove to an army of fans and skeptics alike that even after an extended sabbatical, they still do "have it."

Modern Recording chatted with Gursky about the project, some of his ideas and himself.

MR: What are some of your previous album credits?

SG: I've worked on the *Main Course* album by the Bee Gees, the first record made by Andy Gibb, and I worked with Tom Dowd on Rod Stewart's *Atlantic Crossing*. There are others, but I'd have to dig out my resume.

MR: Could you give us a personal glimpse of how Dowd works in the studio? What are some of his attitudes and habits? What is he like?

SG: Tom's got a handle on it all. The way some people work is that all the basic tracks are cut, then all the backgrounds, then the lead. With Tom, it's not so disciplined. He leaves the pace of work wide open—to the inspiration of the artist. If all of a sudden a guitar player wants to put down a rhythm track, who are we to get in his way?

Tom's always got everything under control. He's not fishing, but rather searching. It's hard for a musician to come back into the control room and objectively listen to what he played. That's the good thing about Tom . . . he's the kind of guy you'll trust when he tells you "I've heard you play it better." It's always positive encouragement. He never comes at you with: "No, that's wrong."

MR: How does he approach interrelations with his engineers?

SG: Part of the control room job is looking for mistakes. He's open enough that if I have a strong feeling about something being wrong, he might say something like, "Yeah, I see what's bothering you." Tom is most accessible; he's not a close-minded sort of producer.

MR: Obviously, this is a super-seasoned studio band. The core of the group has been featured on nearly a dozen albums. How does their recording experience manifest itself in, if applicable, making your job easier?

SG: This band is proficient. It knows what it wants—what kind of feel, fire and frills. It knows the standards it has to live up to.

They have an established sound. Prior to undertaking this project, I listened to all the Allman Brothers Band's records, and thoroughly enjoyed them. Before, I listened to them for enjoyment, but now, I was looking for more technical information. No one is trying to create a new

(L. to R.) Kevin Ryan, Steve Gursky, Dicky Betts, Gregg Allman and Tom Dowd.

sound for this band; you have to give credit where due.

MR: *Eat a Peach* was recorded in these same studios seven or eight years ago. You didn't work on that platter, but being the engineer on *Enlightened Rogues* you'd probably be in a position fo compare and contrast the different records as affected by nearly a decade of improvements in recording technology.

SG: I have a picture of how it was done before, in the same studio, the same room, but the new album hasn't yet come out, so what you'd be comparing at this stage is finished product to tape. But of course there have been strides, in technique.

MR: What is Tom Dowd's attitude towards the much-publicized newer tools of the trade as they relate to this present project?

SG: From a sound standpoint, this is not a gimmicky record at all. We're keeping away from flash. I use [echo] chamber delays. I have acoustical delay—the best kind of delay, room sound. As far as noise reduction, Tom feels that it is o.k. in its proper place, especially if you have soft, delicate string lines. But as long as this music—southern-style-boogie-rock—is recorded well, you really won't need it nearly as much.

MR: Let's talk about mics. How about what you use on guitarists Dickey Betts and Dan Toler?

SG: I use Sennheiser 421s, two apiece on each guitar—one close mic and one distance mic. I'm going for an open sound, and these mics are very reliable; you don't have to worry about them in the least.

MR: What do you use on bassist Dave Goldflies?

SG:We went through the KM86 Neumann condenser mic, but the low-end response was almost flat down to D/C, no cycles at all. It's a pretty good mic, but there was a leakage problem from the guitars. So then we switched to a Neumann KM84. We had good luck with that, but there was still the proximity of the bass amp to the guitars. So we got a Sennheiser 441.

MR: Was leakage a major problem?

SG: The leakage vector was a livable situation. But what we were primarily concerned about was how to capture all the different bass sounds that Dave Goldflies gets. Each song is its own entity, so you can move from a Rickenbacker sound to a Fender sound just like that [*snaps fingers*]. That's fine with me. My assistant went out and scoured the studios (Criteria has four separate recording facilities under the same roof) to find the right equipment. The major thing is that the sound has to suit the song, and the musician needs to be totally satisfied. I have no ego about it. If something doesn't work, he's not doing a bad trip on us if he says it doesn't feel quite right or sound quite right to him.

(L. to R.) Producer Dowd, assistant engineer Kevin Ryan and engineer Steve Gursky.

MR: What is Gregg Allman's keyboard set-up, and how do you mic it?

SG: He's got a Hammond B-3 organ, a clavinet, Wurlitzer electric piano and Steinway 7'9" concert grand.

Now with the Hammond B-3, we've got Shure 546s on top for stereo displacement, and, for its directionality, Neumann U87s on the bottom. I face the mics at a 90-degree arc, rather than a 180°, to get a "staggered" effect.

We take the Wurlitzer direct, with a Sennheiser 546 on the oval top of the speaker, also with KM84 condenser mic. The clavinet is taped directly, running through an amplifier.

MR: What mics do you use on vocals? Are there any characteristics of the timbre you find it advantageous to take into consideration?

SG: There are mics that if a singer goes real loud into them, they fold up. What really happens is, the mic is putting out a lot of juice, so it loses head room and distorts.

Gregg is known for his super-loud singing style. There is a 20 dB difference between being three feet away from the mic or three inches, but he always knows where he is. He's got excellent technique. So you have a singer, and you need a mic that can "tell" tricky consonants, like S, T and P. Those sounds that are hard to recognize as you listen to someone over a telephone, for example.

The Shure SM7 gets Gregg right. You have to remember that the voice is one of the most dynamic, delicate, hard to record instruments; there are 45 dBs of dynamic range from a whisper to a shout. And in Gregg's case, he has all those qualities . . . sexy, gruff yet appealing. That instrument of his has emotion; you have to record the bleeper right. It's a direct path from the brain to the mouth.

Two Drummers

MR: As most people know, the Allman Brothers Band has two drummers. What are the unique characteristics of Jaimoe and Butch's drum sets, and how do you approach recording a group so equipped?

SG: First of all, there are some differences in their kits. Butch only has the normal bass drum, snare, high-hat, rack tom, floor tom and three major cymbals. His kit is very small and light, but grooves right along.

Jaimoe had four toms, but took one of them out. He's got four bass drums, and a double-headed bass drum that just about speaks on tape.

Then, they have different styles of drumming. Butch is an anchor; he plays moderate to hard, very steady. Jaimoe is more of a jazz type of drummer, like he'll tap the tom to get a little ring out of it. You can't really record him properly without a lot of pains, so as to insure that he can do what he wants, and it will be heard.

For both Butch and Jaimoe, I have Shure 546s on toms. We changed to

expensive condenser mics, but we came back to the 546. On snares and high-hat, the AKG 452, with the optional 10 dB pad. I mic Butch's toms closely but at an angle looking across the head. With Jaimoe, it's higher, but looking down. The way he plays, the mic has to "see" the instrument for best results.

MR: What are your views on placing drummers in a drum booth?

SG: I don't like it. I hear the box [booth]. When you put them in that box they relate to their headphones, not to the other cats in the room. They fall ahead, behind . . . they're not part of the band. They have trouble staying with the band's dynamics.

MR: Given the different sets of drum equipment, you must mic the two bass drums a little differently.

SG: Butch has an open-headed bass drum; we use the Schoeps CMT-55 condenser. Jai, with the double-headed one, gets a dynamic E-V RE-15. Of course, you don't shove the microphone right into the thing; who the hell wants to hear that? It sounds like a bass drum when you back it off a little.

Allman Brothers' producer Tom Dowd listening to a playback at Criteria Studios.

MR: There are also guest appearances on this album by a percussionist and a harmonica player.

SG: Jim Essery's a real bluesy harpist. He's got one of these crystal mics that they all use, but it distorts like a mother. We went to a Shure 56—something he could hold easily in his hand and blow into at the same time. We did some EQ, but as for the breathiness, we left it in, because that's part of the harp's sound.

Joe Lalla, the percussionist, has a two-sided tee-shirt. On one side, it says "Congas For Cash," on the other, "Bongos for Big Bucks." His basic set-up is congas and timbales, but he has shakers and a triangle readily available to him, as well.

We record the congas and timbales with a two-track stereo spread. We keep both instruments "live" in case he gets inspired. The timbales are recorded with two Shure 546s positioned in stereo pickup fashion, and the congas have two Beyer M88s, arranged in a stereo pickup pattern.

MR: What kind of headphones are the musicians hearing themselves on?

SG: Beyer DT 100s. They sound decent, loud, and the breakdown factor is real low.

MR: What about your monitor speaker set-up?

SG: In the control room we have custom-built cabinets. They were designed by Don Gehman who used to work for Clair Bros., but is now an engineer here at Criteria. He's got a degree in acoustical design and physics. Every once in a while, when you get a musician who wants it cranked up, these speakers will really part your hair. We also have Altec A7s for talkback purposes.

Mr. Gursky's Ax

MR: Your pride and joy—the console. Give us a guided tour.

SG: My ax! It's an MCI 532 console, presently the top of the line. It has automated mixdown; it can do whatever you want it to do. It spares you a lot of headaches because it's got enough patch points and echo sends. You don't have to patch the equalizers for echo return. The EQ section is pretty unique. The input side of the console has monitor faders layered on top of each other.

We've had the 500 series console for three years or so. When it first came in, it threw us a curve, so we had to explore it, always taking into account which of the four studios we were in.

I EQ a little, basically what you'd call survival EQ, but I save the rest for the mix. Why spend hours of recording time EQ'ing the bass drum, fussing and all that, when you have musicians who want to play.

Also, there are three separate cue-sends, and three cue mixes.

MR: Tell us about the mechanics of the taping system for this record.

SG: We've got MCI JH 114s for tape machines. They're top-of-the-line, and just fabulous. I've never had a problem with them, which is great, since in talking with other engineers, I've heard tales of woe about other machines being a bitch to edit with.

We feed it with Ampex Master 456 tape. I get off on Ampex because of the amazing consistency of the tape. Sometimes you might get the same kind of tape from a different batch, and although most people can't tell such a slight difference, people who record for a living can. That's not a problem here.

MR: What role has your assistant engineer, Kevin Ryan, had on this assignment?

SG: He's my righthand man, and sometimes my left as well. My thinking about this is that I'm trying to whittle down the space between engineer and assistant engineer. So we both set up mics, and if I'm fatigued from recording too much, I'll get off the stool and give it to him. Plus I'll ask him his opinion about things; I won't use him just to write labels. Someone broke me in and trained me this way; now I'm doing it for him. Kevin's right on the case.

MR: Do you have any pet philosophy of engineering?

SG: A lot of engineers come from the electronic point of view. I relate more to what used to make me buy records. You gotta remember you're making records for people, and you should always do that, not for other engineers.

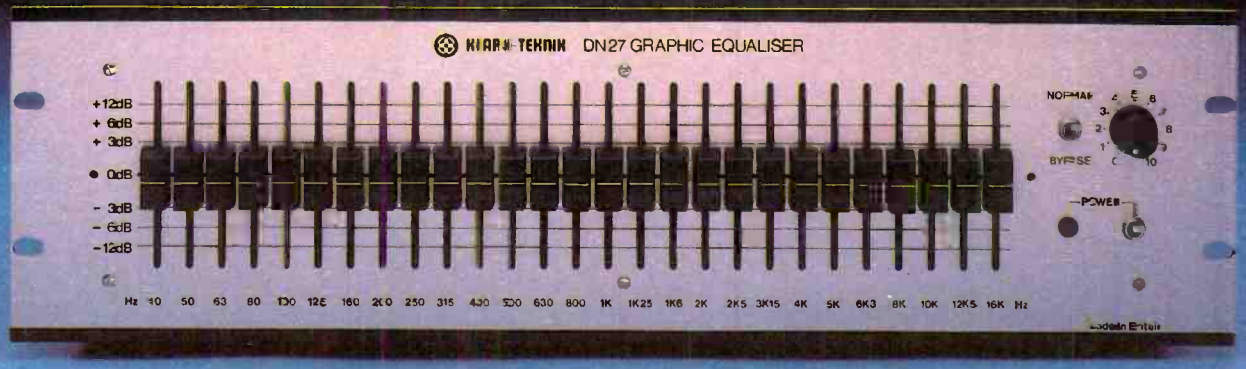
MR: Do you have aspirations of becoming a producer?

SG: Every engineer has such goals, but at this time I see no reason to become a producer. At least not until I complete this (engineering) trip. I'm still learning.

And "learning," we might add, in (and from) some rather distinguished company.

The DN27 and DN22 graphic equalisers.

In a class of their own.



Every now and then there comes on to the market a product whose quality is such that it becomes a generic in its own right.

This has been the case with the Klark Teknik equaliser.

All over the world our equalisers have proved themselves to be the ultimate in tone control for sound recording, reproduction and measurement systems.

Inevitably, they cost a great deal.

But we offer guaranteed performance which meets all your personal requirements.

In equalisers which have been assembled and checked by engineers rather than a production line.

And specifications which meet your own exacting demands in every way.

Shouldn't you be the owner of a Klark Teknik equaliser?

You'll never settle for second best again.

For further information about our equalisers, the new DN34 and DN36 analogue time processors and DN70 digital time processor, contact:

KLARK-TEKNIK

You know it's the best.

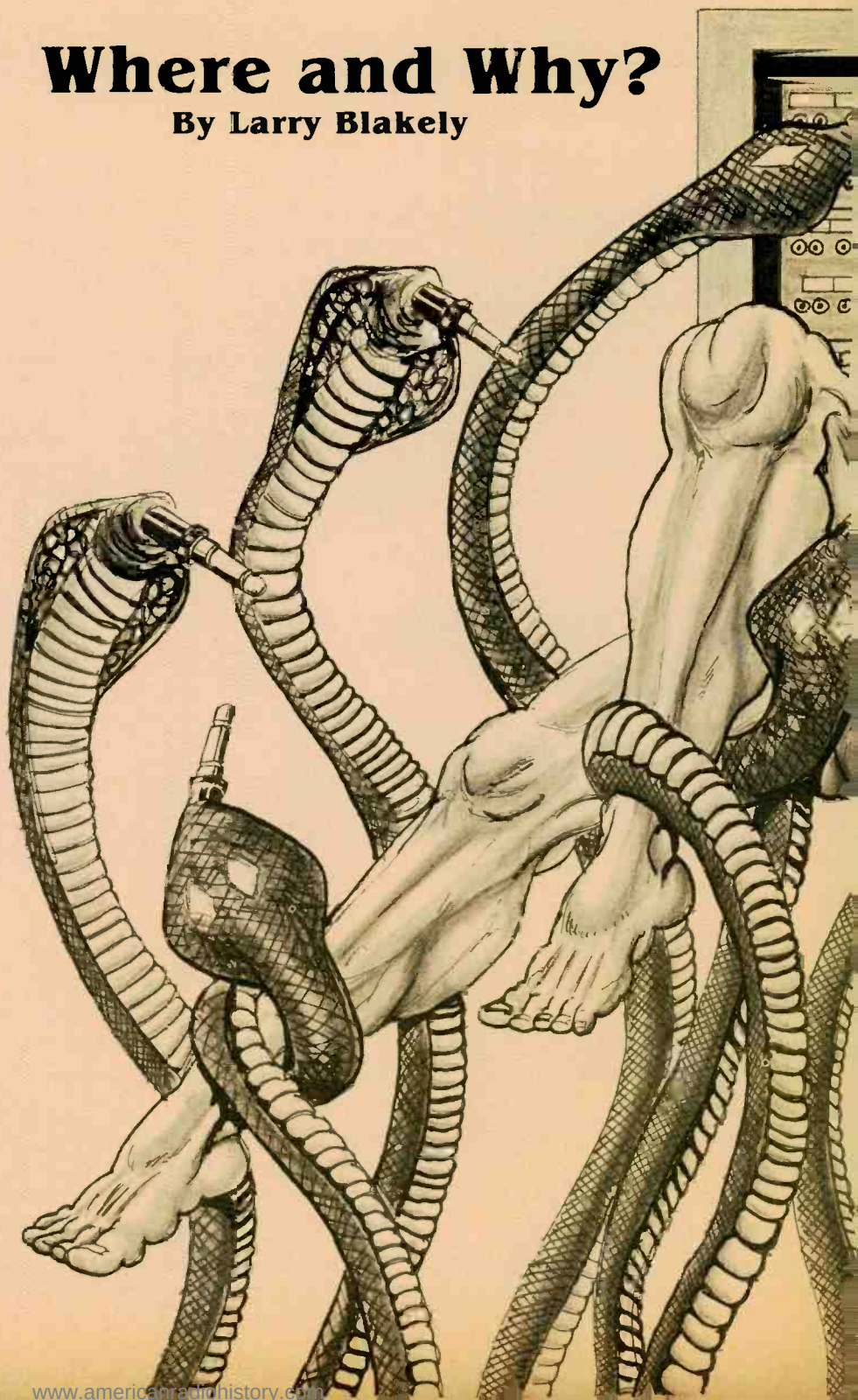
Hammond Industries Inc. 155 Michael Drive, Syosset, New York 11791 (516) 364-1900; West Coast Office (213) 846-0500; Canada (416) 677-0545

CIRCLE 96 ON READER SERVICE CARD

Interfacing Auxiliary Equipment:

Where and Why?

By Larry Blakely



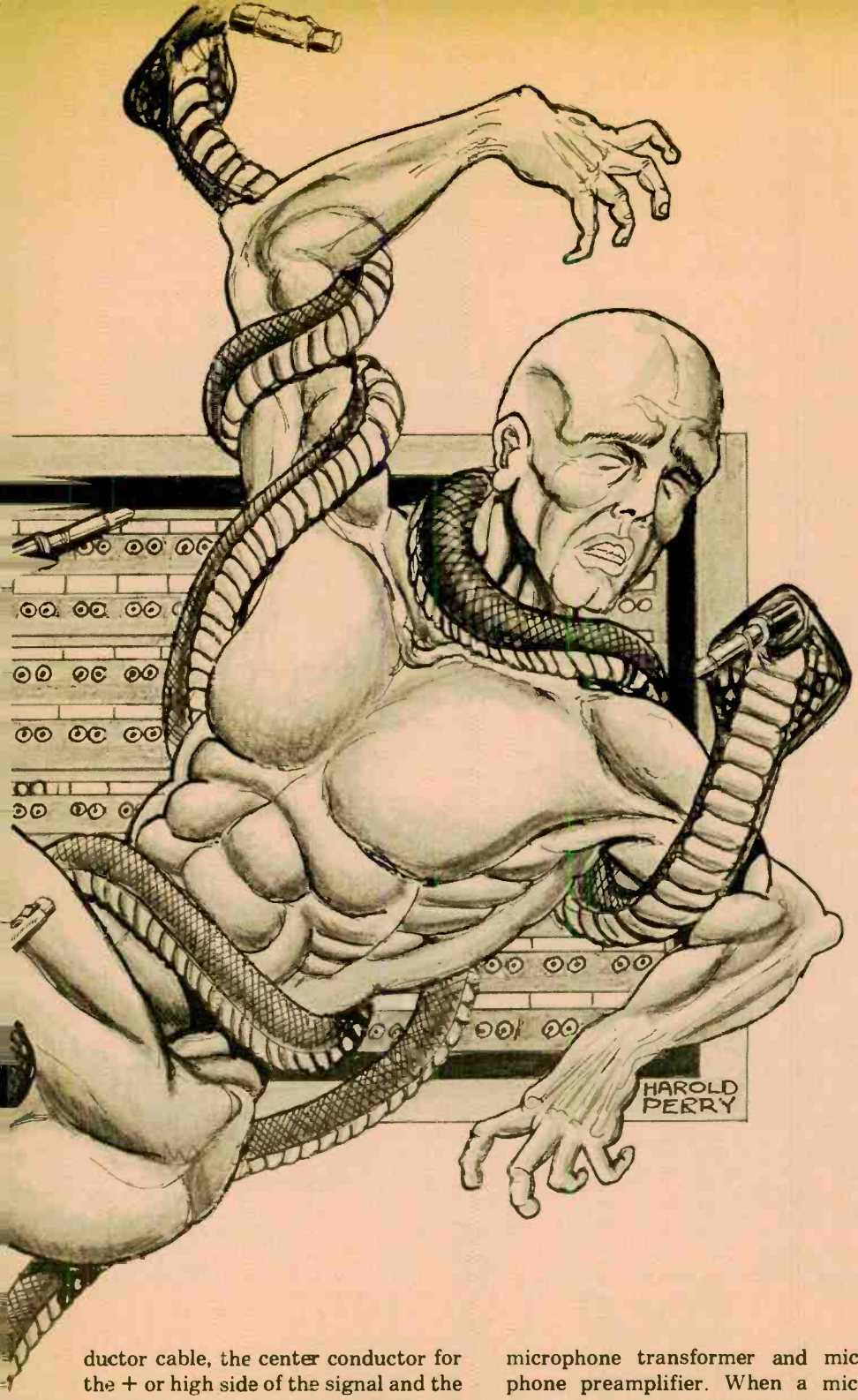
Frequently, owners or operators of small recording studios and people with multi-track recording equipment at home wish to add auxiliary equipment such as compressors, limiters, outboard equalizers, delay lines, echo devices, etc. After such a piece of auxiliary equipment is purchased, the question asked is, "Where do I connect this in my recording system and why?" The answer to this question is not a simple one because a piece of auxiliary equipment can be utilized (connected) at a number of different places in the recording system. Each of the signal points at which auxiliary equipment can be connected will provide the user with varied results for the numerous individual applications possible.

To get a clear picture of what should go where, it is necessary to understand the signal flow through the entire recording console. You may be saying, "Whoops, this is going to get heavy." But, don't get nervous, because for the purpose of this article, I have spent a great deal of time finding ways to explain signal flow—in a simplified and easy-to-comprehend manner. If you take the time to read the information covered in the balance of this article, I assure you that you will have gained one of the most important and *usable* pieces of information in your recording career. Using recording equipment without a knowledge of the signal flow is like traveling in an unknown land without a map. Knowledge of signal flow is absolutely mandatory for any competent engineer.

To see where the signal flows, we must have a type of road map. This road map is called a "block diagram." When reading a road map, there are a number of different symbols used to indicate or illustrate certain information. There are symbols for U.S. and state highways, indicators to show mileage, symbols for rivers, railroad tracks, airports, types of road surfaces, four-lane and two-lane highways, and so on. Likewise, a block diagram has symbols that provide information. When one knows the electronic symbols, he can read any block diagram and understand it, the same way in which one who understands map symbols can read and comprehend any map.

Block Diagram Symbols

Microphone Connector (Fig. 1). There are three common types of microphone connectors used. Fig. 1a shows the two circuit phone-type that uses a two-con-



ductor cable, the center conductor for the + or high side of the signal and the shield carries both the ground (⏚) and − side of the signal. Fig. 1b shows a three circuit phone-type connector. This connector uses three wires—one for the +, one for the −, and the shield is the ground (⏚). Fig. 1c shows the most common type connector, that of the XLR type. The XLR connector is also a three-circuit connector. Pin #1 is the shield or ground (⏚), Pin #2 is the −, and Pin #3 is the +.

Microphone Pad (Fig. 2). Such a pad is made of resistors to decrease the level of the microphone prior to the microphone transformer and microphone preamplifier. When a microphone is placed close to loud instruments, it has a higher output level (more voltage) which will often times overload the microphone input transformer or microphone preamplifier. A microphone pad will reduce the output level (voltage) of the microphone, and thereby prevent overload or distortion that may be caused by the microphone input transformer or preamplifier. Illustrated in Fig. 2 is a switch and two resistors. The switch is shown as an arm with an arrow (which indicates the switch contact), and three dots or circles to where the switch arm can move. When the switch is in the position shown in Fig. 2, the microphone signal goes through the switch arm to a straight wire (0 dB), which will provide no attenuation (reduction in level). When the switch arm is moved to the next position (−10 dB), the signal is sent through a resistor that will provide a 10 dB attenuation (reduction in level). When placed in the final position another resistor will provide 20 dB of attenuation.

Microphone Input Transformer (Fig. 3). A microphone input transformer is commonly used as a method to increase the gain (level) of the microphone prior to the microphone preamplifier. The microphone input transformer will also often prevent ground loops (hums and buzzes).

Microphone Preamplifier (Fig. 4). It is important to point out that the symbol for all amplifiers is the same. The symbol is a triangle. The signal here is shown entering the base of the triangle, while the tip or point indicates the output of the amplifier.

Gain Adjust for Microphone Preamplifier (Fig. 5). In as different microphones have a wide range of output levels, greater or lesser amounts of amplification may be required of the microphone preamplifier. By placing a gain adjust on the preamplifier, the amount of amplification can be increased or decreased at will by the operator.

Patch Points (Fig. 6). These provide a means of taking signals from or sending signals to different points in the recording system, while affording the operator a great deal of flexibility. The knowledgeable operator can make a recording console do many versatile operations with the use of auxiliary equipment and patch points. In a block diagram patch points may be illustrated several different ways. It is important to note that the direction of the arrow indicates where the patch point has access to the signal. If the arrow points to the left, the patch point has access to the signal to the left of the arrow. If the arrow points to the right, the patch point has access to the signal to the right of the arrow. While the direction of the arrow is *not* intended to show the direction of the signal flow, in some instances the arrow will point the direction of the signal flow, but not always.

Fader (Fig. 7). A fader is a volume control commonly used at each input position of a recording console. Be-

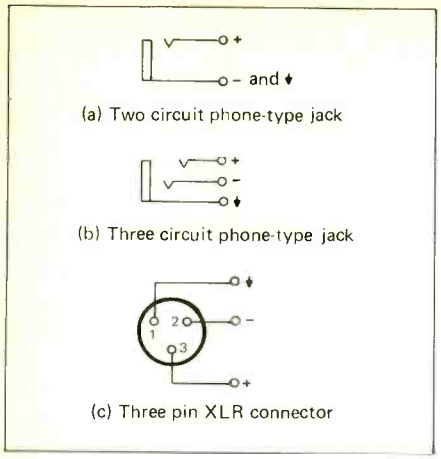


Fig. 1: Microphone connectors.

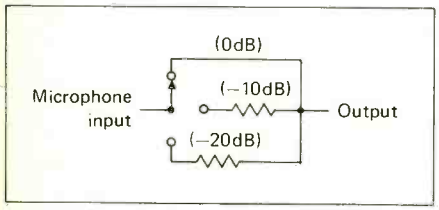


Fig. 2: Microphone pad.

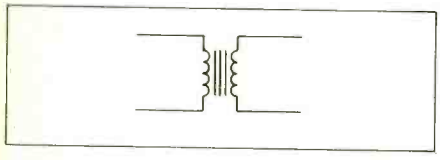


Fig. 3: Microphone input transformer.

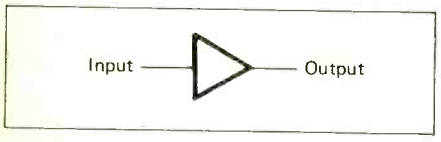


Fig. 4: Microphone preamp.

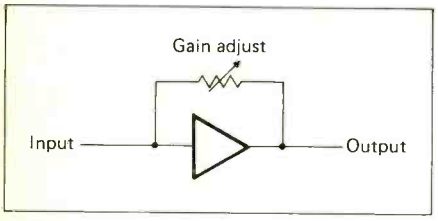


Fig. 5: Mic preamp with gain adjust.

cause a fader or volume control is an adjustable or variable resistor it is shown as a resistor with an arrow through it to indicate that it is adjustable or variable. The same symbol will be used for echo send level controls, phone or cue send level controls, etc. Echo receive or return level controls will also use the same symbol.

Pan Pot (Fig. 8). A control or pot that will place the signal from a console input position on the left channel, right channel, center, or varying degrees in between.

Echo Send Level Control (Fig. 9). Here again is a pot, or fader, and therefore it uses the same symbol as a fader shown in Fig. 7. The echo send signal can be obtained before the input fader (pre-fader) or after the input fader (post-fader). Consequently, a switch is often shown prior to the actual echo send level pot to indicate if the signal can be obtained from pre-fader or post-fader. If this pre- and post-fader feature is not on a particular recording console the switch will not be shown. Both pre and post, and post only type echo send level controls are shown in the Fig. 9 illustration.

Phone or Cue Send Level Controls. Would be shown in an identical method as shown in Fig. 9. Phone or cue send controls are available for pre and post and post-only operation.

Solo (Fig. 10). Here we have a switch normally (physically) located below or above the input fader which when activated allows you to hear that input "only." This switch can be activated to hear one or more input positions without pulling down the other input pots and destroying the mix obtained with the remaining input pots or faders. A solo switch is usually illustrated as a simple switch as is shown.

Equalizer (Fig. 11). Ordinarily shown as a simple box with the word "Equalizer" or "EQ" written inside. In as there are many types of equalizers available on different recording consoles this simple indication is all that is necessary.

Filter (Fig. 12). A filter is a feature on some recording consoles used to remove unwanted portions of the frequency spectrum. Such filters can be used to remove low frequency room rumble or air conditioner noise, for example.

Output Channel Selector Switches (Fig. 13). Each input of the recording console can be switched to one or more output channels. Four switches on a four output channel console, eight switches on an eight output channel console, etc. Shown here as simple switches to indicate signal routing.

Combining Amplifier (Fig. 14). A common procedure in which a number of signals is added or "combined" together for a particular output channel. This combining process is done through an amplifier normally called a combining or summing amplifier.

The combining amplifier can be illustrated in one or more ways. Shown are two of the most common symbols in Fig. 14. In Fig. 14a a simplified drawing is shown. In Fig. 14b the engineering symbols are illustrated. You will notice the use of a resistor in each of the input signal legs (1-8). These summing resistors are always used with a combining or summing amplifier. The summing resistors are not shown in the simplified drawing (Fig. 14a); however, they are still used even though they are not shown. If a recording console has 8 input positions each summing amplifier will have at least 8 inputs. Each summing amplifier can receive signals from all eight

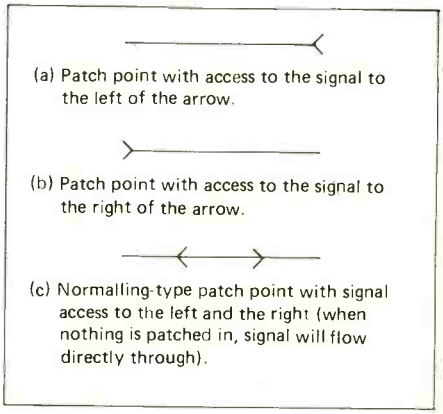


Fig. 6: Patch points.

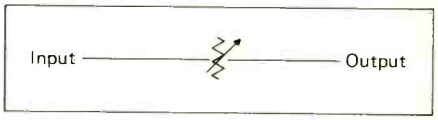


Fig. 7: Fader or level control.

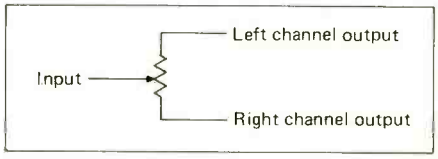


Fig. 8: Pan pot.

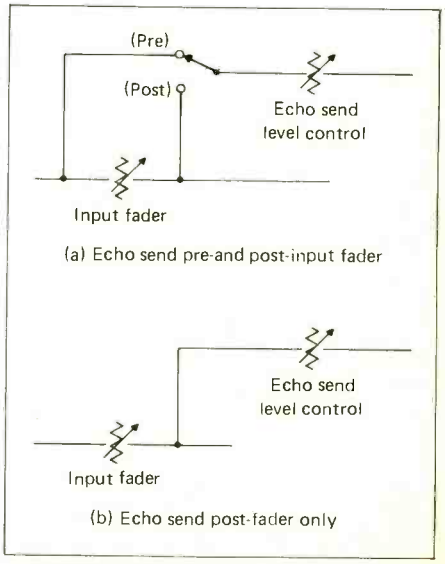


Fig. 9: Echo-send level control.

CARVIN
S1200 Stereo Board

- Effect Buss
- Stereo Panning
- Talkback System
- Monitor-CUE Sends
- Direct Channel Outputs
- Variable Input Alteration
- LED Peak Level Indicators
- Balanced Inputs & Outputs
- 2-10 Band Graphic Equalizers
- Built-in Hammond Reverb System
- Stereo Headphone Amps W CUE Switch
- 7 Core Plywood Cabinet with Hard Cover
- 2 Year Warranty

"For Road Use — For Studio Use"

Designed as both recording and road boards Carvin's new stereo mixers represent the "State of the Art", for both sound quality and construction. Carvin Boards are quiet and they don't add sound coloration or audiable d stortion.

All Carvin Boards are performance tested by (4) Quality Inspectors and Burnt-in for a min. of 8 hrs, to assure years of trouble free performance. "Yet!", Carvin Prices give you your best dollar value today because we Design, Manufacture, and sell Direct; eliminating distributors and dealer profit costs.

Plus, Handcrafted quality remains in our product because we eliminate mass production.

For more information, call TOLL FREE 800-854-2235 (California, 714-747-1710), Monday thru Friday or send for our FREE Technical Catalog, including listings of other professional components such as; Gauss, JBL, and Emilar, installed in Carvin Systems!

SPECIFICATIONS	
Horn & Noise	−125 dBV
S/N Ratio	72 dB
Bal Outputs	10 volts (+22 dBM)
Distortion	.05% THD
Freq. Response	15 to 25 KHz

S1200
$995

DIRECT PRICES		
S 600	6 Ch Stereo	$ 495.00
SP 600	W 150W Amp	625.00
S 1200	12 Ch Stereo	995.00
S 1800	18 Ch Stereo	1,295.00

Carvin

Dept. MR-20 1155 Industrial Ave., Escondido, Calif. 92025

Call TOLL-FREE 800-854-2235, (Calif. 714-747-1710) for more information.

CIRCLE 85 ON READER SERVICE CARD

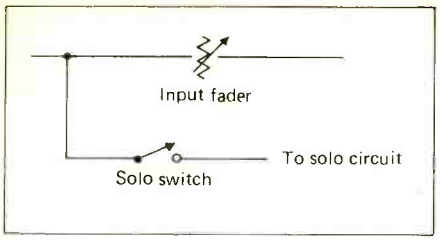


Fig. 10: Solo switch.

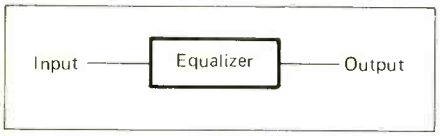


Fig. 11: Equalizer.

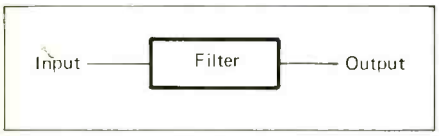


Fig. 12: Filter.

inputs (if appropriate output channel switches are depressed).

Output Amplifier (Fig. 15). This amplifier is used to provide the proper output level for a recording console. It will provide the proper output level and power necessary to feed the tape recorder inputs. Since an output amplifier is an amplifier, it is illustrated in much the same way as a microphone preamplifier.

Output Transformer (Fig. 16). Often used to provide a recording console output with a balanced output. A balanced output will prevent hums or ground loops. Special output transformers will also increase gain (level) beyond that of the output amplifier (when designed to do so). The symbol for the output transformer is the same as for the input transformer.

VU Meter (Fig. 17). Used to indicate the level of the output amplifier.

Peak Signal Indicator (Fig. 18). Typically, VU meters indicate the average signal level and do not normally respond to peak signal levels. A peak level indicator is a feature of many recording consoles to indicate the peak signal (maximum output) level. More expensive recording consoles do offer peak reading type VU meters.

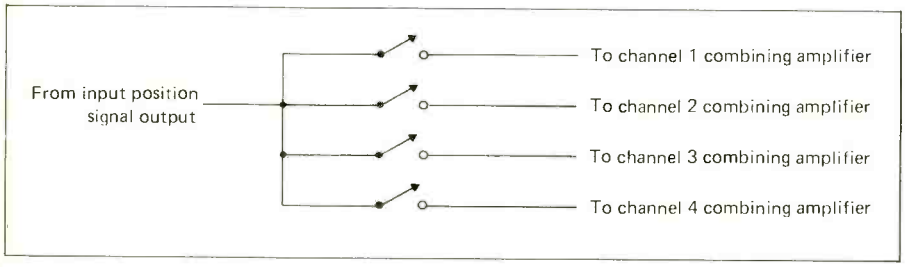


Fig. 13: Output channel selector switches.

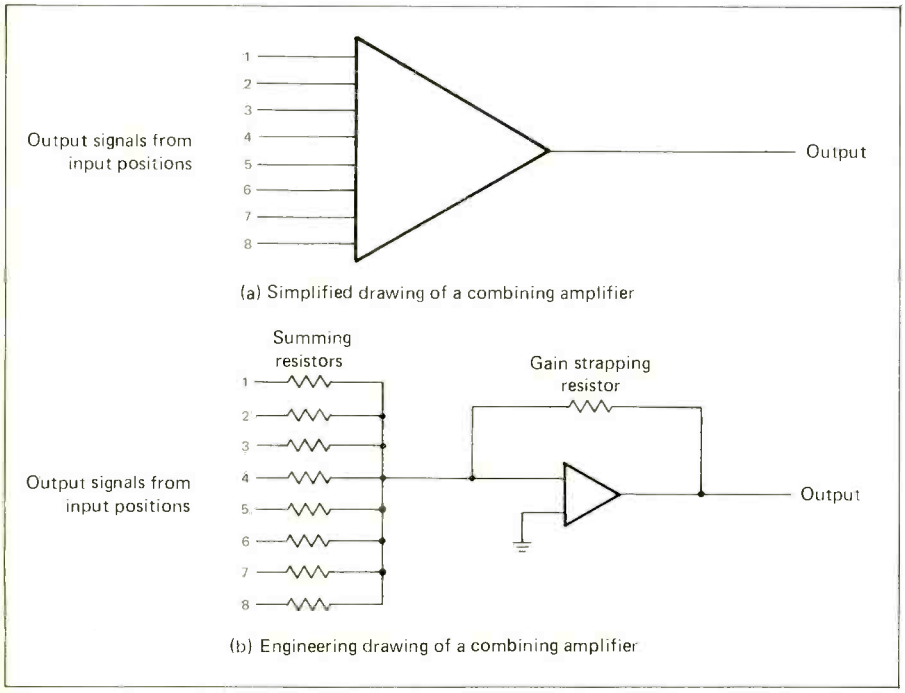


Fig. 14: Combining amplifier.

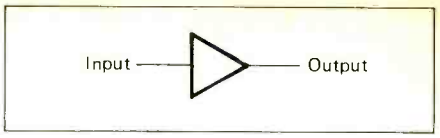


Fig. 15: Output amplifier.

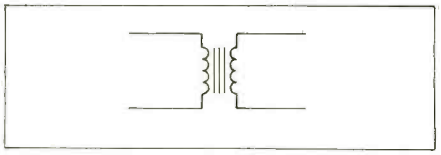


Fig. 16: Output transformer.

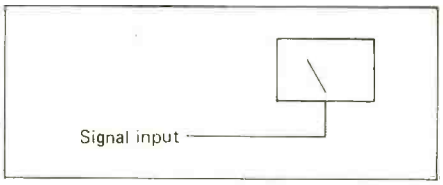


Fig. 17: VU meter.

Overload Indicator (Fig. 19). The overload indicator informs the recordist of excessive levels at the microphone preamplifier stage of a recording console. Note that it is an indicator and has the same symbol as the Peak Signal Indicator.

Echo Return Level Control (Fig. 20). Here again is a pot, or level control. The symbol is the same as for a fader. The echo return signal is normally routed through a pot or fader (to adjust level) and then to an input of the appropriate combining amplifier to add the echo return signal with the main signal.

Signal Flow

Before being able to reach an understanding of signal flow, first it is important to understand two additional terms:

Microphone Level: A very low-level signal from a microphone. Dynamic microphones typically may have an output of .001 volts while a condensor microphone typically may have an output of .003 volts.

Line Level: A high-level signal. This is a signal level used for routing signals inside the console and to or from the console (with exception of the microphones). Line levels typically will range from .316 volts to .775 volts de-

THE PROFESSIONALS

The entire line of Biamp audio equipment can be described in one word; Professional. From precise engineering and clean sound to a pleasing appearance and feel, our complete line is establishing itself as the industry's most consistent in reliability and performance.

We manufacture professional mixing consoles, graphic equalizers, a parametric equalizer, a stereo reverberation system, a 4-channel limiter, electronic crossovers and stereo power amplifiers; all perfectly interfaced and performing with an unprecedented tolerances.

But, not only do we make exceptional audio equipment, we also make it affordable. Ask anyone who uses Biamp equipment or write for free information and a list of dealers in your area. You'll discover why Biamp is the fastest growing company in our field.

biamp

BIAMP SYSTEMS, INC.
10950 S.W. 5TH AVE. BEAVERTON, OR 97005

CIRCLE 95 ON READER SERVICE CARD

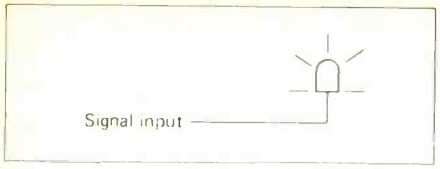


Fig. 18: Peak signal indicator.

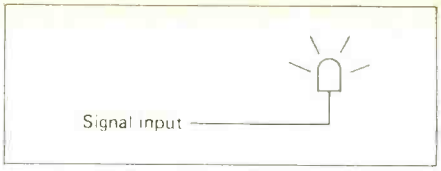


Fig. 19: Overload indicator.

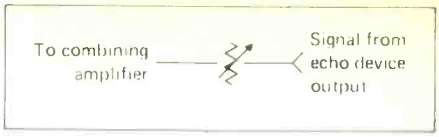


Fig. 20: Echo return level control.

pending on the type of recording equipment used.

From the two above definitions it can be easily seen that a line-level signal is much greater in volts than a microphone-level signal. The two types of levels utilized in a recording system (i.e., recording console, tape recorders, echo units, power amplifiers, etc.) are microphone level and line level. Line-level signals are high-level signals while microphone-level signals are extremely low-level signals. When doing "live" recording, the signal originates at the microphone. The microphone sends its low-level signal to the recording console microphone input. (Follow the signal path as shown in Fig. 21.) The microphone level first "sees" the microphone pad that can be switched for 0 dB, −10 dB or −20 dB level reduction as desired. The microphone-level signal then goes through the microphone transformer to the input of the microphone preamplifier. The amount of gain (amplification) is adjusted by the gain adjust control. The microphone preamplifier

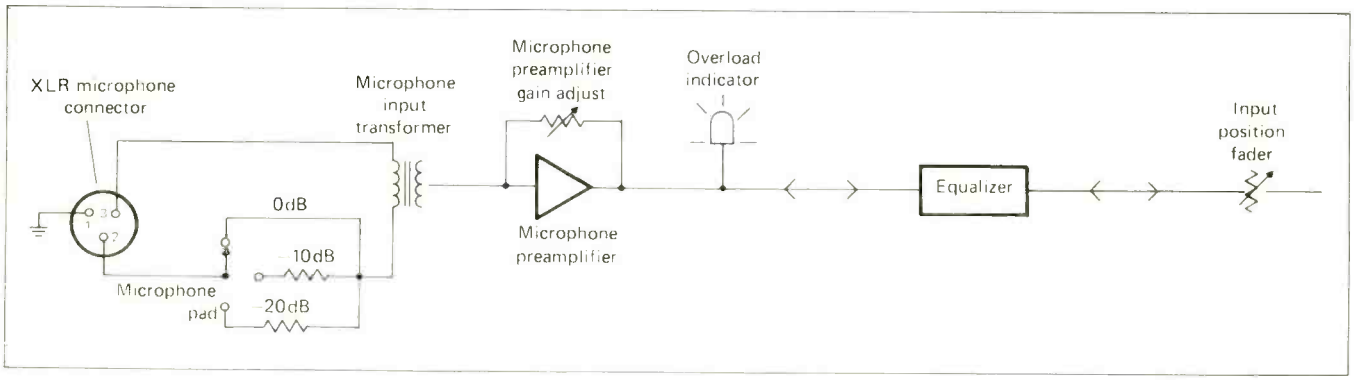


Fig. 21: Signal flow block diagram (#1).

increases the microphone-level signal to that of a line-level signal. (The purpose of a microphone pre-amplifier is to change microphone-level signals to line-level signals.)

If too much amplification is created, and the output level of the microphone preamplifier is near the point of distortion, the overload indicator will flash. You then can decrease the gain adjust control on the microphone preamplifier to reduce the amount of amplification. The microphone signal, *now a line-level signal*, flows to the equalizer input, through the equalizer to its output. Now the signal flows to the input position fader. Once the signal has passed the input position fader it is routed via switching to various parts of the recording console. The line-level signal then goes to four switches as shown in Fig. 22 on a four-output-channel console. Notice that the signal can be switched to one or more of the four combining amplifiers. Combining amplifiers are used for this purpose because any number of input positions can be switched to one output channel. The combining amplifier allows signals from the input positions to be added or combined.

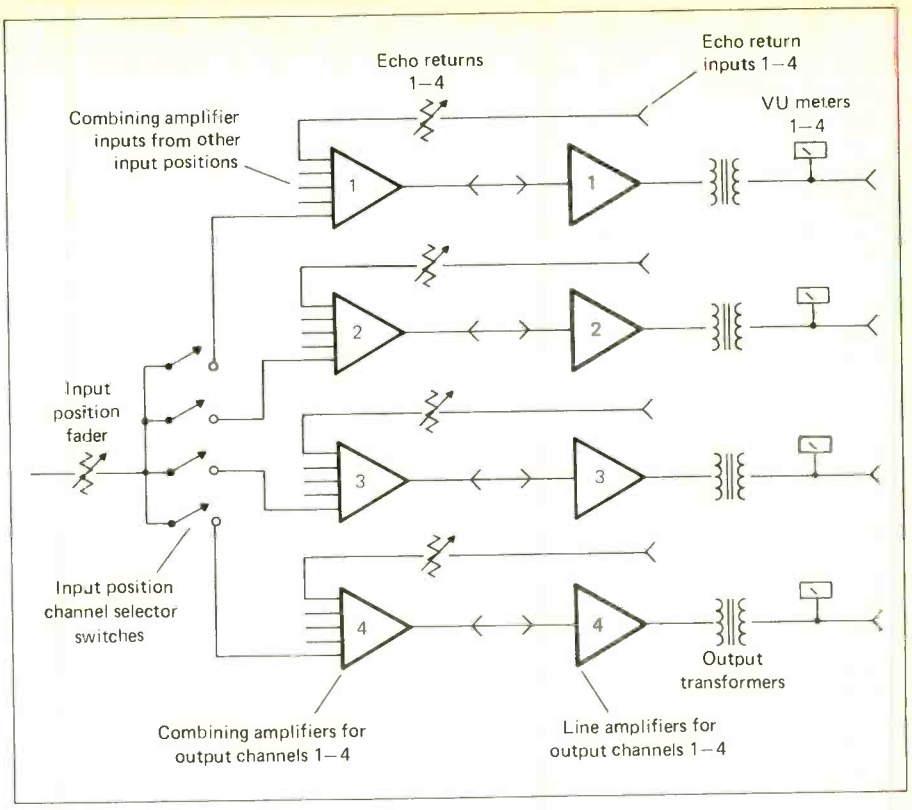


Fig. 22: Signal flow block diagram (#2).

Once the appropriate signals are combined with the summing amplifiers the signals flow to the line amplifier. The line amplifier is used to increase the level to that of the specified output level of the console. The output amplifier also provides the console cut-

put signal with ample power to drive the required recorder inputs. In Fig. 22, output transformers are shown following the line-amplifier outputs. These transformers will provide the console with a balanced output. However, many consoles today do not utilize output transformers.

The VU meter is shown as the last thing, this is so the VU meter can indicate the proper output level of the recording console. An echo return input is shown for each output channel. Notice that the returns go through a pot, or fader to adjust the level and then flow to the separate combining amplifier input.

Now that we have followed the basic signal flow through the recording console, we will look at the points in the signal path (flow) that are normally made accessible via patch points or jacks for the use of auxiliary equipment, such as outboard equalizers, compressors, limiters, delay lines, etc.

Patch Points

The first point at which patching is normally available is at the output of the microphone preamplifier, as shown in Fig. 23a. This is the first point at which the microphone signal is available as a line-level signal (because it has been amplified by the microphone preamplifier). Most all auxiliary equipment operates at line level and cannot be operated at microphone level.

The next commonly available patch point is that of the console equalizer input shown in Fig. 23b. In Fig. 23c the console equalizer output is shown. By having the console equalizer inputs and outputs available on patch points the equalizer can be lifted from the circuit and patched in another signal path somewhere else inside or outside of the console. In Fig. 23d the fader input (line input) patch point is shown. This is usually the last access point until after the signals have been routed through the combining amplifiers. After the signals have been routed through the combining amplifiers, usually the first available patch point would be the combining amplifier output shown in Fig. 24a. At this point, you can have access to a number of mixed or combined signals after they have been combined together by the summing amplifier. In Fig. 24b access to the line amplifier input is shown. Fig. 24c shows the console channel outputs. Fig. 24d shows the echo return inputs which usually are connected to the echo device outputs.

It is important to remember that a "normalling" patch point as shown in Fig. 23a and b, c and d and Fig. 24a and b will pass the signal as if the path points were not there *if nothing is patched in.* When something is patched in the circuit is broken and is routed to or from whatever device is patched in at that particular patch point. Single patch points as shown in Fig. 24c and d are points where signals are sent to or taken from the console.

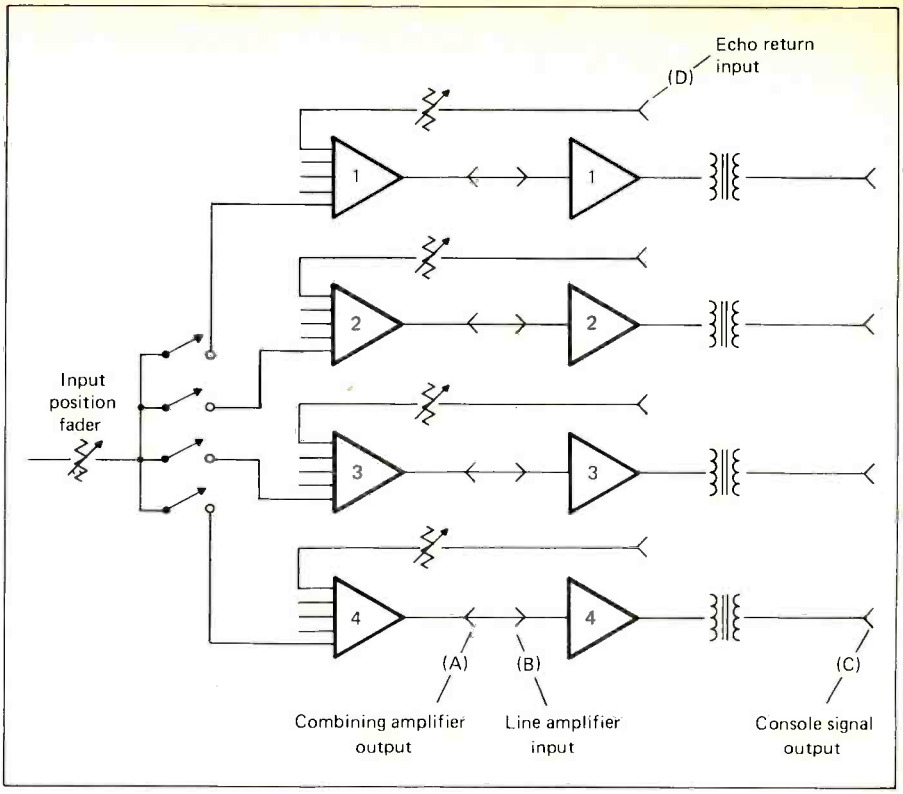


Fig. 24: Patch points block diagram (#2).

With the information that has been covered so far in this article—the first part of a two-part article—you should now be able to read a recording console block diagram and understand the signal flow, as well as identify the patch or access points at which auxiliary equipment can be patched in. This knowledge will be of great benefit to you now and throughout your entire career in recording. In my twenty years of professional recording I have never ceased to be amazed at the number of professional recording engineers that cannot read or understand recording console block diagrams. As stated earlier in this article, not having this knowledge is like going on a trip in a strange land without a road map, or the ability to read such a map even if you had one.

Come Back For Seconds

Because of the complexity of this subject of patching-in auxiliary equipment there remains much information that must be covered. The second part of this article will cover what types of auxiliary equipment are normally used at each of the access (patch) points, and for what purpose. The knowledgeable use of patch points will give the

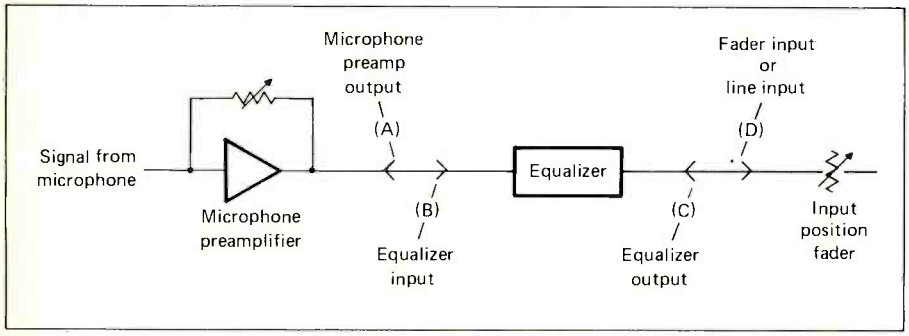


Fig. 23: Patch points block diagram (#1).

"good acoustics"

Imagine if all clubs were built for live music; that clubowners spent as much on sound systems as they do on decor; and all you had to do was set-up and play. Well, forget it. There is only one Hollywood Bowl and chances are it's not your next gig. More likely, the acoustics at your next room will be just as bad as the last, maybe worse. More likely, the next clubowner's "vocal smasher" is older than the last one, and as usual it will be you and your group that suffers. All too familiar? Well relax. Acoustic, with over a decade of live music experience, is introducing an exciting new line of Sound Re-enforcement products, designed for turning problems into opportunities. Quiet, versatile mixers with low distortion amps built-in for fast, easy set-ups. Features like dual-sensing overload indicators, 9-band graphic equalizers, built-in reverb and light bar output displays. Rack mountable power amps that boast fan cooling, and extensive circuit safeguards. Even the compact solid-plywood speaker systems include a driver protection circuit that will handle power overloads without program interruption. Acoustic has carefully matched these components to perform in the most adverse conditions, and continues to offer the exclusive Lifetime Protection Plan. So why suffer through another night of feedback and blown horns? Don't expect "good acoustics," take them with you.

nobody was ever sorry **acoustic** **...they bought the best.**

professional sound equipment

7949 WOODLEY AVENUE • VAN NUYS • CALIFORNIA 91406

CIRCLE 54 ON READER SERVICE CARD

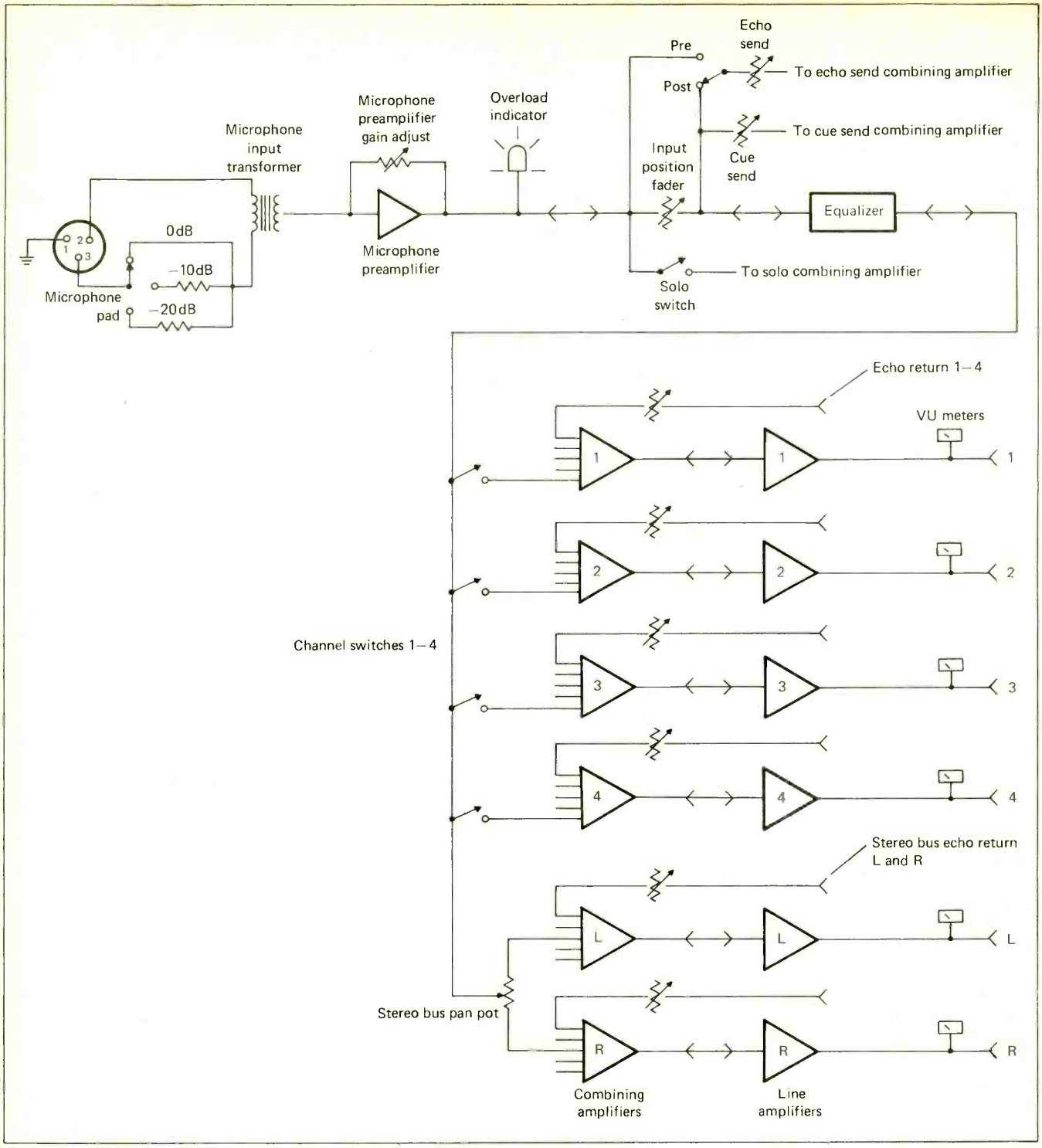


Fig. 25: Typical recording console block diagram.

engineer the capability of almost entirely rebuilding the recording console (changing the signal routing) on a temporary basis quickly and efficiently. Use of this knowledge also will give an engineer the ability to perform many functions not normally available on a particular recording console. You also will find yourself now able to create many tricks and effects that that you previously found impossible. A good basic working knowledge of what is going on behind the panel of a recording console (i.e., signal flow and routing) can only work to your benefit now and in the future.

With the new-found information contained in this first part of the article, I have drawn a block diagram of one input position of a four-channel-output recording console. You will find solo switches, echo send controls, cue or phone send controls, some with pre- and post-fader switches. Take some time and study the signal flow and routing on this recording console block diagram to further sharpen your "chops." This block diagram is illustrated in Fig. 25. Keep in mind that nearly all recording consoles are different, and this one has some different twists than what you have seen so far in this article.

Have fun and we'll pick it up from here in next month's issue of *Modern Recording* magazine.

The notes were always there.

The Electro-Voice S18-3 Stage Keyboard System now lets you hear them!

Unless they were willing to spend $2,000 or more for a sound system, most keyboard and synthesizer artists were never able to hear the full range of sound their instrument was producing.

Electro-Voice has changed this! The 40 Hz note a synthesizer puts out can now be heard. The upper harmonics that sounded muddy because they were squeezed through a lead guitar speaker sound muddy no longer. That "honky" sounding midrange won't sound "honky" anymore.

The S18-3 Stage Keyboard System sells for under $1,000 and was specifically designed for those applications that require an accurate sound over a wide frequency range – exactly the performance required by keyboards and synthesizers.

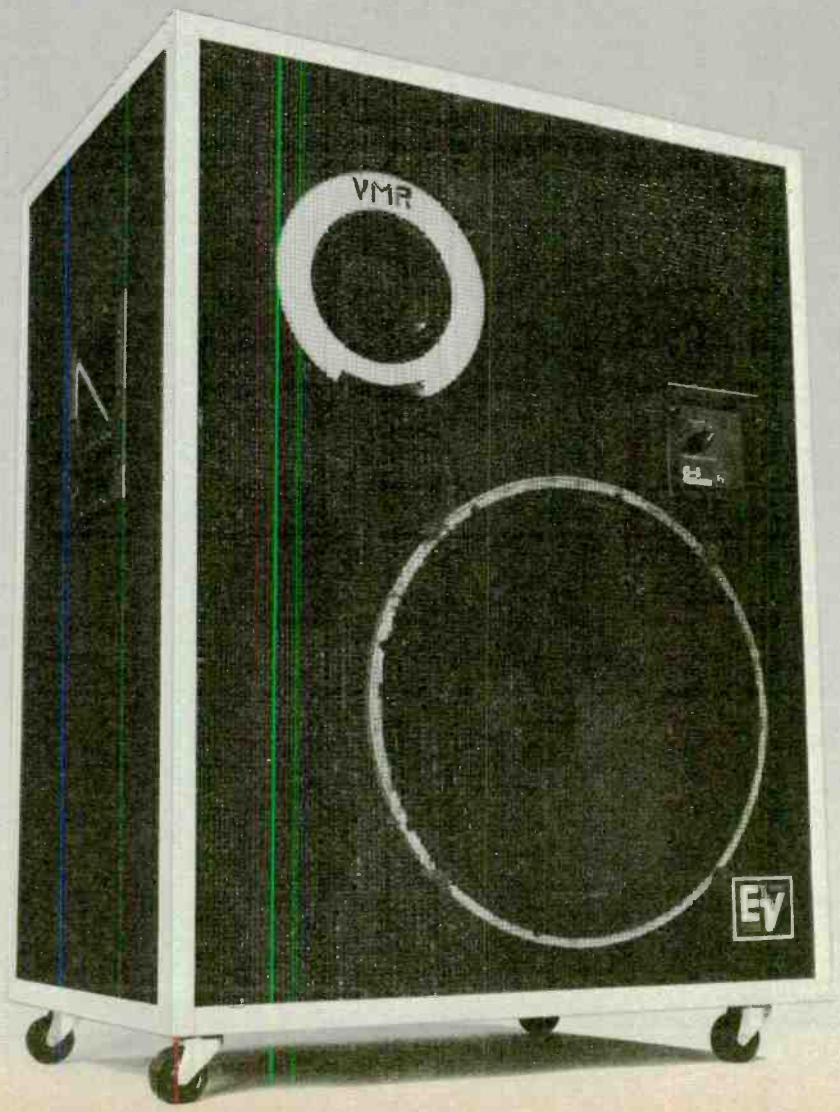
Electro-Voice uses the famous EVM-18B loudspeaker in an optimally vented enclosure to achieve frequency response and high acoustic output that is virtually flat to 40 Hz. The ST350A tweeter not only is flat to 16,000 Hz, but radiates its output over a solid 120° angle. Gone is the "beaminess" at high frequencies that restricts the audience's ability to hear the highs or the artist's ability to hear himself accurately. The VMR (vented cone midrange) couples a 6-inch cone driver to a 16 lb magnet structure in an integral vented enclosure. The result – the clarity of a cone driver without sacrificing the efficiency of a horn.

It's conceivable that many keyboard artists don't even know how good their instrument can sound. If you are one of these artists, prepare yourself for an emotional experience. Audition the Electro-Voice S18-3.

Electro-Voice®
a gulton company

600 Cecil Street, Buchanan, Michigan 49107

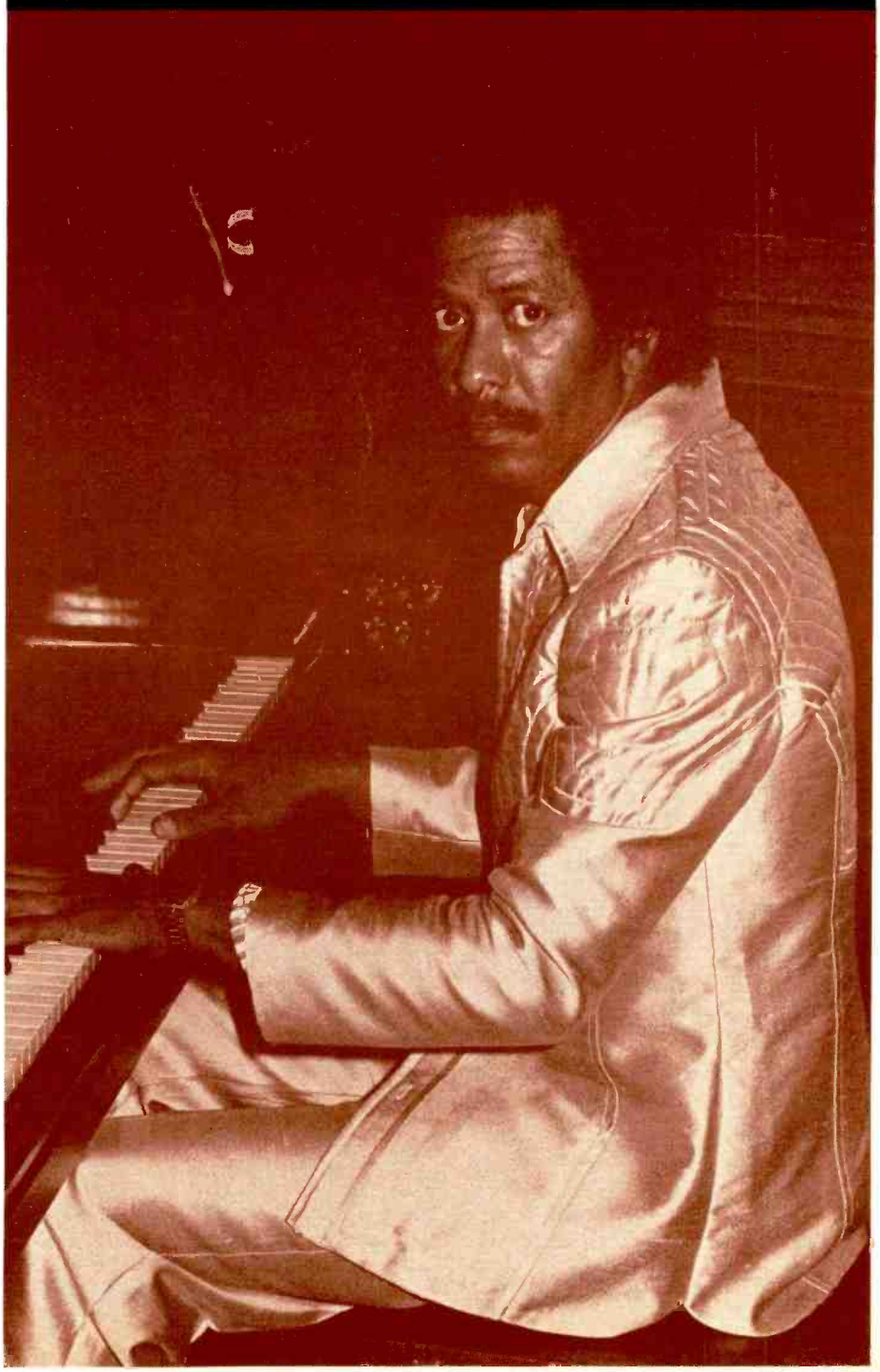
CIRCLE 82 ON READER SERVICE CARD



profile:

Producer/Artist

ALLEN TOUSSAINT



New Orleans is perhaps known best for what it is remembered for—the good old days, when one could walk a three block stretch of Bourbon Street and without so much as entering its time-honored halls, hear the sounds of the jazz masters waft through opened doors and be hypnotically drawn away from his original purpose. A time when Mardi Gras meant more than painted decadence, when horse-drawn carriages were the fashion instead of the novelty.

The making of new memories has not been easy for the grand old lady. Where jazz had once been common only to the French Quarter, it has become a chief cultural export, one which has fueled other cities into rivaling Louisiana's prominence.

More recently, any musical claim-to-fame owing to a native of New Orleans will more than likely belong to Allen Toussaint. Unless the reader gains his education from liner notes and album labels, chances are his knowledge of the long list of accomplishments by this distinguished artist is incomplete.

Although his songs have been sung from everyone's lips for more than twenty years, Toussaint's successes have come largely from the recordings of his work by other artists. Therefore, it is not the likeness of Toussaint that smiles down from the postered walls of a million homes, but those of his disciples—Boz Scaggs, Robert Palmer, Ringo Starr, Dr. John, Joe Cocker, The Rolling Stones and The Band.

Ironic. What Toussaint cannot do for himself he does so well for others. When he described "Southern Nights" in song it was Glen Campbell who delivered the message. When he asked the musical question: "What Do You Want The Girl To Do?" it was Boz Scaggs who provided the answer. He is the gifted producer who created the unequalled but often imitated ambience of Cocker's "Luxury You Can Afford" and Labelle's "Lady Marmalade" yet failed to weave the same magic spell over the relative few who bought his Life, Love And Faith.

Louisiana Is Home

Sea-Saint Studios, of which Toussaint is co-owner and resident inspiration, is reeling and rocking on this particular afternoon. In the front offices with co-owner Marshall Sehorn is Brian Hyland, the blast-from-the-past who is remembered for "The Joker Went Wild." Passing through on related business is John Fred whose

Playboy Band had sold 2.5 million copies of "Judy In Disguise" at last count. Isaac Hayes is booked for the afternoon. At 6 p.m. "Shaft" must make way for the evening shift when Toussaint brings Vicki Sue Robinson in to continue work on her next album for which he will be writing several of the numbers.

The burning question was put to Toussaint: While the rest of the music world congregates in New York and L.A., why remain detached in Louisiana?

Toussaint: When an artist or record label decides to come to Sea-Saint to record an album with me it is because of reasons that cannot be found anywhere else. We are not slick, but then there are plenty of studios north of the Mason-Dixon for that. New Orleans has its own sound, its own color. The pace is completely different and we employ local session men to insure that the feeling is not lost once the studio doors are closed. From time to time it has been necessary to travel to the coast, but it is rarely my choice to do so . . . and I always return home.

MR: The first of your involvements that can be traced was your stint as pianist for Shirley and Lee and your studio work on the Fats Domino cut "I Want You To Know" in the early 1950s. Fill in from the beginning.

AT: I cannot remember when I wasn't a musician. My earliest recollections are of the Second Line street funerals and Professor Longhair. [For those interested, Professor Longhair's latest release is: *Live on the Queen Mary*; Harvest, SW-11790.] My father was a trumpeter and my brother plays guitar, so music runs in the family. I began as a professional writer and pianist in 1955 and three years later I began the slow process of recording material for my first album which was released in 1960 as *The Wild Sounds Of New Orleans* on RCA.

It was during this time that Ernie K-Doe recorded "Mother-In-Law" which was one of my first big hit songs to be recorded by another artist. I then went to work for the Instant and Minit labels as staff arranger, songwriter, producer and pianist, and worked with a number of artists including Lee Dorsey, for example.

MR: Marshall, during these same years, where were you and how did you and Allen eventually meet?

Marshall Sehorn: In 1957, I moved from North Carolina to New York to work promotion for the Fire and Fury labels. We were handling Bobby Robinson, Elmore James, Arthur "Big Boy" Cruddup and Wilbur Harrison, who had a big hit with "Kansas City." In 1960, I was traveling the South on promo tours and I met Allen while we were recording Bobby Marshan's "Booty Green." Lee Dorsey was signed to the Fury label and Allen and I crossed paths several times when "Ya-Ya" was in the works.

When Allen went into the army in '62, I went to London with EMI to work on the Beatles' first tour of the U.S. London and I didn't get along too well together so I returned to New Orleans in '65 where Allen was directing Lee Dorsey's band and "Ride Your Pony" was released. At that time we formed Sansu Enterprises.

What do I do? Dash errands, negotiate contracts, wash dishes and handle Allen's personal affairs. I attend to the details, so I suppose you might call me the executive producer.

MR: Where tour of duty usually interrupts most careers, your army days were most productive. What was happening while you were in the service?

AT: We had formed a group called The Stokes and wrote "Java"which was picked up by Al Hirt. Following that was "Whipped Cream" which Herb Alpert did very well with.

Coming out of the service, I went back to work with Lee Dorsey. Aaron Neville, whom I had worked with several years earlier, brought his brothers Cyril and Art along into what became The Meters in 1967. Aaron dropped out, Art played keyboards and Cyril played percussion. Leo Nocentelli joined to play guitar, Zig Modeliste on drums and George Porter, Jr. on bass. The Meters have become regular session men at Sea-Saint and have worked on my records as well as recording a list of their own.

Lee Dorsey had a comeback in 1970 with three singles that I had written which have been covered by others—"Yes We Can Can," "Sneaking Sally Through The Alley" and "Occapella."

MR: In 1973, The Meters and you were tagging along with Dr. John on his European tour, but it seems that in recent times you have kept a very low public performance profile. Why have you not extensively displayed your music before the public in an effort to boost the sales of your albums?

AT: I do not think of myself as a great performing artist. I have not spent the time to become one. My energies have been spent on writing and producing because I believe in the hit record first, performance second; the hit song is the front-runner to a tour. I have not felt justified in touring. I would rather play piano in the studio than go out on the road.

MR: In searching your discography, there was a debut LP in 1960 and a nine year gap until *Toussaint* was released on Scepter Records. It seems that throughout the first half of the 1960s you were inactive, which I suppose was due to the service, but during that period I also see the name Naomi Neville pop up frequently as a writer. Who is she?

AT: Naomi Neville is my mother's maiden name. I used it as a pen name in the earlier years because of a legal hassle that I had with a publishing company I had signed with as a minor. When Ernie K-Doe's "Mother-In-Law" was released, I had written it for another company and someone took notice. The question arose as to where my material was supposed to be going, and because I did not want it to go to the first company, I wrote under the name Naomi Neville for the other publishing company.

Expects More from an Artist

MR: Your original versions of the songs that you write [seem to] have more warmth and emotion than their more successful commercial renditions. It seems that in your case, the public prefers your songs sung by other artists. Glen Campbell's version of "Southern Nights" far and away outsold your original, yet in many opinions your delivery is superior. How do you react when one of your songs becomes a colossal hit for another artist when it failed to do so for you personally?

AT: I smile quietly . . . to myself. It is not a public smile, but I am pleased. They are good artists and they have the right to do something different with my material that perhaps I would not choose to do. They are professionals and entitled to their opinions. In the case of Glen Campbell and Boz Scaggs, they each took a song that I had written for the mood and lyrical

importance and placed the emphasis on the beat and changed them into dance tunes. Perhaps the public would rather have something to dance to than listen to.

When I have produced my own work, I have expected to capture that free spirit, a spontaneous event. But I am always surprised to find that it's not there when I sit back and look at myself. I am not free. I create concoctions which are deliberate statements. I expect more from another artist that I produce than I can get from myself.

MR: Contrast the manner in which you work with another artist as their producer and the way in which Jerry Wexler produced your new album.

AT: When I produce an album I am in total control over my environment. I select the material, musicians, tempos, beats; I am involved in its totality. In most cases I contribute to the writing and arranging. The artist must place himself in my hands and trust my feelings and allow me to make the final decisions. Sometimes I find myself having to defend myself, but when an artist chooses a producer, the artist must be able to rely on him completely. Other groups may get to the point where they do not need a producer or where the artist and producer form a partnership, but in some cases the artist cannot be objective. The artist who produces himself may not be able to step back and look at himself constructively.

Basically, the primary problem that I have in working with many artists is their high level of energy. They must be harnessed to prevent them from being swept away by their enthusiasm. When I make a song, it is a musical statement. It may only be experienced through one sense—hearing. The listener cannot see your expression or the theatrics, so he must be able to clearly understand the emotions through the phrasing and style of the song.

Energy can cause an artist to shift from one emotion to another within the same song incorrectly. The meaning can become lost or confused. The work is like a painting. Colors must be applied with careful strokes of the brush in order to transmit the intended meaning. High energy causes palpitations which will cause a violent change. The artist might interject power where there should be passion or hate where there should be hurt. The painter becomes a monkey flinging colors at the canvas in splashes. Application must be cautious. There must be consistency of character.

When I approach a song I think of it in an equation: The song plus me equals what? In contrast, the song minus me equals what? Is it different? I know what to expect from a song and I know how to get it from the artist I am producing.

I did not choose Jerry Wexler to produce *Motion*. But had I been given the choice and his name presented to me, I would have said yes. It was Warner Bros. that suggested another producer, and they chose Jerry. He was in charge, he selected the songs and the musicians. He gave me the freedom that I would not have given myself had I been in his position. I am not sure whether it is because he respects my history as a writer and producer or because he thinks that he knows what I can deliver and do it without his help, but he gave me a wide range to work in.

MR: Did Jerry Wexler get from you what you wanted to hear?

AT: I don't know. At this time I just don't know. He chose certain songs which lack the warmth and emotion I prefer. I do not like to record old songs, but he wanted "Just A Kiss Away" which John Mayall did several years ago and an old tune that I wrote as Naomi Neville entitled "Lover Of Love," which Lee Dorsey did in 1960.

The production was slick, maybe too slick for my material. But I was removed from my element, without the people I have always relied on. The album was done in Hollywood with California-based musicians.

The next effort will be back to basics. I want to be able to please Warner Bros. and the public without losing my identity. We will do the next one here with my people. We will record twice as much material and allow the label to take its choice. On *Motion* I was willing to give myself to Jerry, but I may actually have given too much away.

MR: On the *Life, Love And Faith* album in 1972 you introduced a vocal style on "Out Of The City" which you used again very effectively on "Southern Nights." What did you do in order to achieve that ethereal effect?

AT: The vocals were channelled through Leslie speakers.

Old Planets—New Talents

MR: One of the most significant events to occur at Sea-Saint was the recording of Paul McCartney's *Venus And Mars* LP. How did McCartney reach the decision to come to New Orleans to record?

AT: It wasn't the first time he had been here. The Beatles' tour stopped in New Orleans in 1965 and they spent several days at the Roosevelt Hotel. McCartney has often said that Fats Domino was a primary inspiration for his becoming a musician. When the Beatles came to town, all they wanted was Fats Domino and a baby grand piano sent up to their room. I understand they jammed all night.

McCartney had always [wanted] to return for Mardi Gras, and decided to take a working vacation here during that time. He walked in the door and everything was just right. He is such an amazing artist, so much talent. We had no problem, just a great time.

MR: Among your new productions are the new release by Joe Cocker and one by Chocolate Milk. You are credited as Chocolate Milk's mentor —their pianist, arranger, producer and writer. For a Toussaint product, the lyrics are rather simple and repetitious. What is it that you try to accomplish with a fledgling act on their first time out?

AT: We just wanted to say, "Hello." The lyrics are intentionally simplistic for two reasons: one, so that they would not overshadow the band's instrumental excellence, and two, to make songs that are easy to remember so that the public catches on quickly.

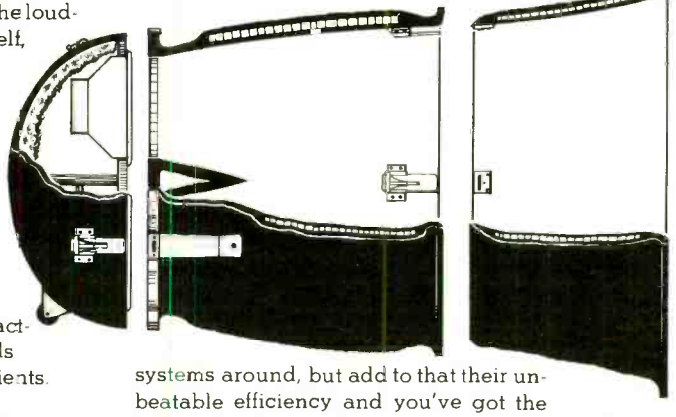
MR: On the other hand, what are the differences in working with a seasoned pro such as Joe Cocker? How does your position change?

AT: Actually, my position doesn't. I produced, arranged, played keyboards and wrote one of the songs for Cocker. With an established artist such as Cocker, he will play a part in establishing the direction of the work. We will discuss the tempos, keys and selection of material and musicians.

We chose to record in Miami instead of New Orleans because it was a good central location for all of the people involved. Several people came from other parts of the world. We also wanted to pick a neutral site away from my home base and Cocker's home base. The strings, horns, percussion,

LEVIATHAN BASS HORN

This is the legendary Leviathan, our fiberglass bass horn for two 15" loudspeakers. It comes in three sections as pictured below: the back pod which houses the loudspeakers, the 48 Hz flare horn itself, and the optional extension for increased frequency range, projection and efficiency.



Not shown are our other bass horns: the FRC/B, designed to provide true horn performance in the smallest possible package, and the aptly named BLT, or Bass Long Throw, which does exactly that over several hundred yards with the closest attention to transients.

Like everything else that we make, our Levi, FRC/B and BLT are rock solid, portable, and built to last. That's reason enough to make Community bass horns the foundation of some of the best touring systems around, but add to that their unbeatable efficiency and you've got the bottom line for a full spectrum of professional applications.

What does efficiency mean? Because of our design criteria any Community bass horn's output is typically 4-6 dB above its wooden competitor's. To you, the professional sound person, this means that you need fewer bass horns to fulfill your requirements and, consequently, less drivers and electronics to power them. In addition, our bass horns weigh thirty to forty percent less than the old wooden horns meaning an additional savings in reduced installation and freight charges.

Need a couple of bass horns? See your Community dealer. You might only need one.

SPECIFICATIONS	EXTENDED LEVIATHAN	BLT	FRC/B
Flare Rate	48 Hz	52 Hz	66 Hz
Operating Range	from 50 Hz	from 60 Hz	from 75 Hz
Driver	Two 15"	One 15"	One 15"
Size (HEIGHT/WIDTH/DEPTH)	43¼"/69¼"/64"	44"/44"/56"	30½"/40"/44"
Weight (less drivers)	175 LB	90 LB	65 LB

Community

COMMUNITY LIGHT & SOUND, INCORPORATED ▫ 5701 GRAYS AVENUE, PHILA, PA 19143 ▫ (215) 727-0900

CIRCLE 81 ON READER SERVICE CARD

ALLEN TOUSSAINT DISCOGRAPHY

Albums by Toussaint:

The Wild Sounds Of New Orleans	1960
Toussaint	1969
Life, Love And Faith	1972
Southern Nights	1975
Motion	1978

Singles by Toussaint:

"Night People"
"Optimism Blues"

Compilations:

New Orleans Jazz And Heritage Festival 1976

Singles by Toussaint as writer and/or performer

Title	Artist
"Country Fool"	Shirley and Lee
"I Want You To Know"	Fats Domino
"Ooh Poo Pah Doo"	Jesse Hill
"Mother-In-Law" "Hello My Lover"	Ernie K-Doe
"Tell It Like It Is" "Over You"	Aaron Neville
"You Always Hurt The One You Love"	Clarence "Frogman" Henry
"Ya-Ya" "Holy Cow" "Working In A Coal Mine" "Ride Your Pony" "Get Out Of My Life Woman" "Everything I Do Gonna Be Funky" "Yes We Can Can" "Sneakin' Sally Through The Alley" "Occapella"	Lee Dorsey
"Ruler Of My Heart" "It's Raining"	Irma Thomas
"Pain In My Heart"	Otis Redding
"Basic Lady" "Country John"	Mylon Lefevre
"Southern Nights"	Glen Campbell
"What Do You Want The Girl To Do?"	Boz Scaggs
"Land Of 1000 Dances" "Something You Got" "I Like It Like That"	Chris Kenner
"Java"	Al Hirt Chet Atkins Floyd Cramer
"Whipped Cream"	Herb Alpert
"It Will Stand"	Showmen
"Lipstick Traces" "Fortune Teller"	Benny Spellman
" 'Frisco Here I Come"	Lou Johnson
"Yes We Can Can"	Pointer Sisters
"Sneakin' Sally Through The Alley"	Robert Palmer
"Occapella"	Ringo Starr
"Fortune Teller"	Rolling Stones
"On Your Way Down"	Little Feat
"What Do You Want The Boy To Do?" "What Is Success?"	Bonnie Raitt
"Brickyard Blues"	Three Dog Night Maria Muldaur
"Shoorah"	Betty Wright
"Life Is A Carnival"	The Band

As producer, writer and/or performer

The Meters *New Directions* *Trick Bag* *Cabbage Alley* *Rejuvenation* *Fire On The Bayou*	Albums by The Meters
"Tell It Like It Is" "Sophisticated Cissy" "Cissy Strut" "Be My Lady" "Look Ka Py Py" "Chicken Strut"	Singles
In The Right Place (LP)	Dr. John
Nightbirds (LP) "Lady Marmalade" (45)	Labelle
Venus And Mars (LP)	Paul McCartney and Wings
Jess Roden (LP)	Jess Roden
Notice To Appear (LP)	John Mayall
High Life (LP)	Frankie Miller
We're All In This Together (LP)	Chocolate Milk
Luxury You Can Afford (LP)	Joe Cocker

my keyboards and some of the vocals were done at Sea-Saint.

MR: In producing Cocker's album, the mixing occurred at Muscle Shoals, the mastering at Elektra Sound and recording at Criteria and Sea-Saint. Four studios, three producers, and a convention of musicians seems too much. Was it all necessary?

AT: No, probably not. And these complications caused some problems. We would record a basic track at Criteria and it might be sent to Muscle Shoals for overdubbing, and when I would hear it the next time, someone would have added or subtracted something that I knew nothing about. Strings might be added where they weren't supposed to be and it became quite aggravating at times.

MR: What projects are scheduled at Sea-Saint currently?

AT: We are finishing up on Albert King and are in the middle with Vicki Sue Robinson. Etta James will be coming in soon and dates are also scheduled for Maize and 7th Wonder.

KELSEY®

PROFESSIONAL 4 / 2 SERIES MIXERS

We've Got A Mixer For You

The first Professional Sound Reinforcement Mixers at affordable prices.

Our new range of Kelsey 4/2 Series Mixers incorporate all the features necessary for fully Professional Sound Reinforcement mixing, including 4 submasters with direct outs and stereo patch points, talkback, 2 monitor sends, 2 independent effects channels, plus many other facilities.

And our modular concept is unbeatable—get 16 channels in a 24 channel main frame, 24 channels in a 32 channel main frame—in fact, any variation from 8 through 32. Buy what you need now and add what you'll want later!

Combine our:

- Modular Panel Design
- Roadability
- Serviceability
- Simplicity of Operation

and you have the finest available sound reinforcement mixer.

Lots of money? No way—our 24 channel is just $4,600.00 list and that includes separate power supply and road case. We've combined features, quality and roadability at unbelievable prices.

Write or call:

Dallas Music Industries
150 Florence Avenue
Hawthorne, N.J. 07506
201-423-1300

DMI

- SMF DIRECT BOXES
- SMF STEREO 150 POWER AMPS
- KELSEY SNAKES
- SMF ROAD CASES

CIRCLE 88 ON READER SERVICE CARD

SEND $5.00 FOR YOUR KELSEY / SMF T-SHIRTS

Ambient Sound

BY LEN FELDMAN

If The Pros Have It— Why Can't You?

It's become something of a cliche to describe the difference between a good professional reel-to-reel tape deck and a hi-fi open-reel machine in terms of the added ruggedness and reliability of the studio machines. Indeed, that is true and ought to be, since studio machines are expected to perform day-in, day-out, often for fifteen to eighteen hours (or more) at a time. But to dismiss the subject of pro-versus-home machines with that single comparison is to overlook a host of seldom discussed operating and convenience features which somehow find their way into professional decks but only rarely show up on even the most expensive home-type open-reel machines. Now I know that some manufacturer is going to read this column and write to tell me that his machine has this feature or that feature or even some other feature that I don't mention. The point is that while some home machines have some of the things I'd like to talk about, I know of no single machine that has them all. So, let's take a few of these features and dissect them, one by one.

Variable Speed Control

Very few home reel-to-reel decks I know of have variable speed or variable pitch controls. When I asked one manufacturer about this, his reply was that it would serve no useful purpose since his company had gone to great lengths to make sure that extremely good speed accuracy was maintained at 7½ and 15 ips. The machine he was referring to, by the way, was a 4-track unit with sel-sync (or multi-sync) so it was obviously intended for the serious musician-recordist who wants to get involved in multi-track or track-by-track recording. In doing multi-track work professionally, it often happens that one of the tracks (or more) may have been recorded on another machine and at another time and now wants to be added to the "live" instrumental tracks being mastered on the machine in question. If that first machine was off speed, or if the musician's instrument was slightly off key, what are you supposed to do, detune everyone else's instrument? Having a variable speed machine (±4 or 6 percent is probably more than enough) provides an easy solution; you can then bring the pre-recorded track onto perfect pitch relative to the tracks now being recorded.

When it comes to bias adjustment facilities, some of the open-reel makers could take a lesson from some recently introduced stereo cassette machines. Many of these high-end cassette units not only have accessible bias and EQ adjustments, but there are now one or two that even adjust bias and EQ automatically, by recording a few test-tones, analyzing the playback results by means of a microprocessor and then electronically adjusting these two most important parameters for optimum results with the tape being used. Professional machines always provide a means for bias adjustment and EQ calibration and, while many of them require an external audio oscillator with which to perform these adjustments, that's usually not a big problem in a studio where at least one such oscillator is usually on hand.

Those open-reel deck makers who produce better products for home use that *do* offer accessible bias and EQ controls (and there are a few) but fail to provide the necessary built-in tone generators to go with the adjustment are really missing the boat since not too many home recordists (that I know) own variable-frequency audio oscillators.

VU Meter Ballistics

I've seen record level meters that are labeled "VU" even on $200 stereo cassette decks. As any professional recordist knows, that labeling is fraudulent; a true VU meter is a fairly expensive instrument that has very specific ballistics and a very specific impedance network shunting it so that it can be properly connected to a 600-ohm balanced line output. Specifically, the standard VU meter (two of which could cost as much as the entire cassette deck with the phony

meters) will reach approximately 100% of true reading in 0.3 seconds and will have negligible overshoot. The professional recordist has learned to read a real VU meter properly and to allow for peaks of from 8 to 10 dB above the actual reading so as not to over-record. The uninitiated home recordist could be taught to do the same thing if he or she were, in fact, really using true VU meters. But the meters that are normally supplied on home decks can have widely varying ballistics, generally are not calibrated to any real reference level that's standard and are vastly different in their action from one machine to the next, depending upon whose machine you are talking about.

That's probably why so many home deck makers are now resorting to peak LED indicators to augment their so-called VU meters.

For The Would-Be Tape Editor

The professional recordist spends at least as much if not more time editing tapes as he or she does making actual recordings. And so, the professional deck often offers features which make that job a lot easier than it is with home reel-to-reel machines. For example, almost any pro machine can be hand rocked, in a free-wheeling reel mode while you listen for the exact syllable or note on the tape at which a cut is to be made. Very few machines used at home have this free-wheeling capability, and, with their usual fast forward and fast rewind high speeds, it makes locating a precise point on a tape even more difficult.

Another thing you can often do with pro machines is allow the tape to spill forward off the tape reel when you want to discard or cut out a long section of tape. In professional practice, this is often done with the reels positioned in a horizontal plane (or the deck on its back), but very few home reel-to-reel machines can operate properly in that position.

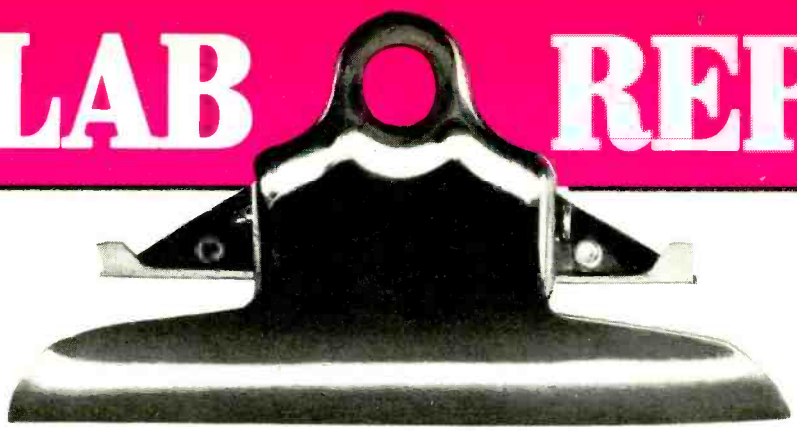
While some home machines have a so-called "cueing" position which enables you to listen to recorded material in the fast forward or fast rewind mode, very few of these machines provide any automatic means of attenuation of the higher-frequency playback that results at such high speeds. I wonder how many tweeters have been burned out by amateur recordists who forgot to turn down the volume control on their monitoring amplifiers when using the fast-wind cueing mode to reach a desired point in a previously recorded tape for editing purposes. A nice, simple refinement would be to have a built-in attenuator come into play every time this cueing mode is used, and some machines have actually incorporated this idea.

Another nice feature you will find on some professional (and a very few home-type) open-reel tape decks is a real-time tape counter. Instead of the usual 4-digit numerical counters, the real-time counter must be referenced to the tape drive capstan and not to the takeup reel, because takeup reel speed necessarily varies depending upon the amount of tape on it at any given moment. Many professionals prefer to use external timers even when operating decks that are equipped with real-time indicators, but very few home recordists would go to the trouble of buying and hooking up such accessory devices. It would therefore be very nice if more hi-fi reel-to-reel machines came equipped with built-in tape timers. Here again, a lesson could be learned from some of the more advanced stereo cassette machines which actually incorporate digital read-out LED tape timers.

On The Other Hand...

There are, of course, some features which are found on home-style reel-to-reel machines which may not show up [or need to be utilized] on studio decks. For example, most studio engineers will be feeding their signals to a tape deck via a console or mixing board, so there is little need for microphone/line mixing facilities on pro machines. Yet many hi-fi decks offer separate mic and line inputs with on-the-deck separate record level controls for each input, providing the home user with at least the rudiments of mixing capability. There are also a few home machines that offer fixed degrees of microphone attenuation so that mics having widely different sensitivities can be accommodated. There are even a couple of machines that incorporate low-frequency roll-off in their microphone input lines. Normally, in professional applications, these functions would also be performed on the master console rather than on the deck's controls. Output level controls are generally provided on home-style decks whereas they are not required in pro machines, where fixed-level outputs can be attenuated by means of monitor amplifier or console controls on the mixing board. Finally home machines are generally equipped with unbalanced line and microphone inputs whereas professional decks will either have both unbalanced and balanced 600-ohm input and output impedances or only the latter. In general, the 600-ohm balanced impedance approach simplifies the impedance matching problem between the deck and other signal-handling components in the studio and also provides a theoretically better signal-to-noise ratio for the system, especially where remote positioning of the deck relative to the mixing console necessitates fairly long cable runs.

I think you will agree now that just because a home reel-to-reel recorder can handle 10½-inch tape reels and can operate at 15 ips doesn't automatically make it eligible as a "professional" tape deck—all manufacturer advertising claims notwithstanding!



NORMAN EISENBERG AND LEN FELDMAN

Teac Model C-1 Cassette Recorder

General Description: The model C-1 is Teac's recent top-of-the-line cassette recorder. Like other models in this high-end area, it offers very high performance, has some unusual features and is a relatively high priced piece of equipment.

The C-1 is a three-head machine; the record and play heads are electrically discrete but are contained in one physical housing. The transport system—said to be the same as that sold to computer manufacturers—is a three-motor unit employing a closed-loop, dual-capstan arrangement. The capstan motor itself is DC servo-controlled. Transport buttons are "feather-touch" and permit complete fast-buttoning to and from all modes, including run-in recording from play as well as from fast-forward and rewind. An added fillip is a pitch control for optional use during playback.

Probably the most novel feature of the Teac C-1 is its use of optional plug-in circuit boards (supplied)—one for CrO_2 tapes, and the other for cobalt-treated tapes. These boards are employed in addition to the usual switch controls for bias and for EQ.

A front-loader, the C-1 is attractively styled and may be installed in standard 19-inch rack mounts. Alternately it may be shelf-placed, and a metal brace under the unit may be engaged to tilt the unit upward if required or so desired.

The cassette compartment is protected by a see-through hinged door. For access to the heads and tape path (for cleaning or degaussing), the cover of the door may be removed. To the left of the cassette compartment are the AC power off/on switch, a timer switch for use with an external timing device, the pitch control and a stereo headphone output jack. This output is controlled by the unit's main output control which also handles the line output. Other than the headphone jack, there are no signal jacks on the front panel—all other signal terminals, including microphone inputs, are on the rear panel.

To the right of the cassette compartment is the transport control array, topped by the tape-index counter and its re-set button. Operating buttons include those for record, record mute, pause, rewind, fast-forward, normal forward and stop. The cassette-eject button, which opens the hinged door over the cassette well, is at the bottom of this group.

The signal meters are peak-reading types calibrated from −40 to +5 dB. Below them are individual controls for left- and right-channel record level, and a single control for output level on both channels simultaneously. The input controls are internally geared to permit simultaneous adjustment of each channel by rotating only one control. However, if individual input level control is desired, one control may be held while the other is rotated.

Below these controls is the slot for insertion of the bias and EQ plug-in card. The card itself is permanently installed within a housing that slides into the front-panel slot so that the circuit-board terminals

engage the appropriate circuit connections inside the chassis. The housing then may be securely fastened to the panel by tightening two holding screws at either end. Once in place, the plug-in board may be adjusted by recessed trimmers for bias, left- and right-channel record level, and left- and right-channel EQ. These adjustments become operative only when the separate bias and EQ switches are set to the marked "CrO_2/option" positions.

The final group of switches at the extreme right of the front panel include, from the top: a monitor selector (source, tape calibrate, tape output); the noise-reduction selector (Dolby in, Dolby out, external dbx); the input signal selector (mic attenuated, mic normal, line); the automatic rewind (stop, off, play); and the already mentioned separate EQ and bias selectors with positions for normal, FeCr and "option" which permits further trimming of the unit for CrO_2 and cobalt tapes by means of the plug-in boards. *Note:* When the monitor selector is in "tape cal" position, the meters show the actual signal levels recorded on a tape being played; in the "output" position, the meters show the playback signal level as chosen by the output level control. The noise-reduction switch, in its "dbx ext" position, permits connecting the C-1 to Teac's model RX-8, a dbx encoder/decoder available as an optional accessory. The "auto rewind" switch is the same as a memory-rewind switch and may be used here to either stop the tape, or to start playback, when the three-digit counter reaches 999.

The mic attenuator, if used, reduces mic-input signals by 20 dB before feeding the signals to the recording circuitry.

The rear panel of the C-1 is "busier" than usual for a cassette deck. To begin with, there are the inputs for microphone (standard ¼-inch jacks). Next are the regular line-in and line-out jacks. Also found here is the connecting panel for the optional RX-8 unit, with eight signal jacks (stereo receive and send for hookup to decoder and encoder) plus a multi-pin socket for the RX-8's control signal. Additionally, the rear panel contains another multi-pin socket for use with an optional remote-control accessory (the Teac RC-90). Finally, the rear panel of the deck houses the AC power cord and a grounding terminal.

For rack-mounting, the front panel has suitable screw-slots at either end; access to these may be had by removing plastic insets in the handles, behind which are holes for inserting a screwdriver shaft.

Test Results: In *MR's* tests, published specs for the Teac C-1 were confirmed or exceeded. Best overall response was obtained using CrO_2 or "CrO_2-equivalent" tape, although even with ordinary ferric-oxide tape the unit produced commendable response. S/N figures for CrO_2 tape also were better, by a small margin, than for standard tape, although the latter tape did produce slightly lower distortion. Recording headroom was the same for both tapes—at +4.5 dB it was deemed ample enough. Transport action was excellent, with very low wow and flutter, extremely smooth and gentle handling of the tape, and alacrity of response in all operating modes. The C-1, in short, very obviously shapes up as among the best cassette recorders we have tested to date.

During the lab measurements of this unit, some question came up as to the practical necessity of the plug-in boards and their calibration adjustments (see "Individual Comments," below), since the procedure involved is fairly complex and any significant improvement over the "as is" condition of the deck's bias and EQ settings could not be completely documented.

General Info: Dimensions are 19 inches wide; 6½ inches high; 13⅞ inches deep. Weight is 32 pounds. Price is $1300.

Individual Comment by L.F.: Perhaps I'm getting a bit jaded when it comes to high-end stereo cassette decks, but it seems to me that some of the lengths to which Teac has gone in the execution of its top-of-the-line C-1 cassette deck are a bit of over-kill. After all, the whole idea of a cassette deck is convenience and simplicity of operation. To have to change modules when you go from chromium dioxide tape to cobalt-treated ferric tape seems to me a bit much—especially since I was taught to believe that the bias and EQ requirements for both of these tapes are practically (I didn't say *exactly*) identical.

I'm all for optimizing bias and EQ settings on any tape deck for the tape with which it is going to be used,

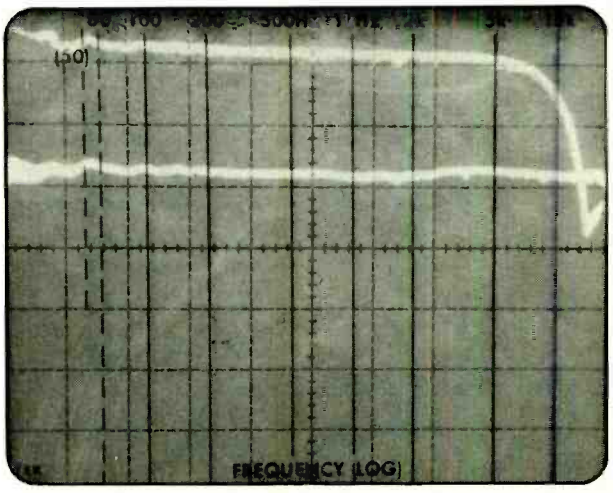


Fig. 1: Teac C-1: Record/play response at 0 dB and −20 dB record level using TDK-SA C-90 cassette tape (CrO_2 equivalent).

but it seems to me that the easiest way to do so is to offer vernier adjustment centered about the nominal ferric, ferric-chrome and chrome bias and EQ values. Furthermore, if, indeed, tweaking up the bias and EQ is so important as you switch from tape to tape, how come Teac provides *fixed* settings for "normal" and FeCr tapes and only offers those optional "plug in" cards for CrO_2 and cobalt-treated tapes? Then, to top things off, the owner's manual tells you that the cards (which are supplied) have been factory calibrated to "the specific tape being used in each category." What tape is that? The chart of recommended tapes on Page 7 of the manual lists four cobalt types and four CrO_2 types, but it doesn't specify which one was used in each case for the "factory calibration."

Fearful that perhaps we were *not* using the tape to which our sample had been "factory calibrated," we decided to touch up the two plug-in cards, one for the TDK-SA tape which we would use as our CrO_2 equivalent in all our tests, the other for actual CrO_2 tape. To do this job, you need an audio generator, as per instructions. We own one, but how many users of a stereo cassette deck do? Anyway, the procedure is quite complex and, frankly, I'm still not absolutely certain why there are EQ adjustments on the plug-in card, since the only reference to them that I could find in the calibration instructions had to do with adjusting the record EQ trimmer of the left channel only. Never in the instructions were we told to adjust the right channel record EQ trimmer.

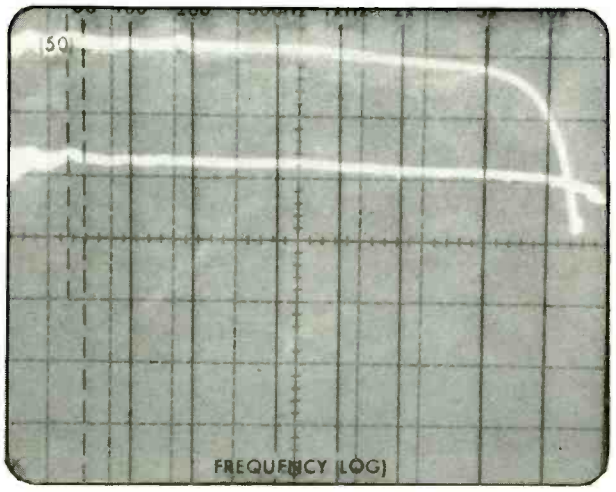


Fig. 2: Teac C-1: Record/play response at 0 dB and −20 dB record level using TDK-AD C-90 cassette tape (ferric oxide).

For all this refinement, the C-1 does *not* offer microphone and line mixing. It does have a double-Dolby system (since it is a true three-head machine) but to incorporate dbx you have to purchase an outboard accessory unit, Teac's Model RX-8.

Once you get past all of this calibration complexity, card insertion, etc., the machine performs very well indeed. Teac has been preaching the importance of the inter-relationship between signal-to-noise, dynamic headroom, distortion and frequency response in tape recording for years, and I fully agree with everything they say in this regard. I was happy to settle for an 18-kHz top end, using TDK-SA tape (see Fig. 1) when that meant a low 1.2% THD at 0 dB record level and an outstanding S/N of 60.5 dB *without* Dolby. Overall record/play response using the TDK-AD sample tape was also nicely balanced (see "Vital Statistics" and Fig. 2) against S/N and THD and available headroom. Professional recordists will understand why it's better to accept a 16 kHz −3 dB roll-off point with this tape instead of under-biasing it to produce "flat" response out to 20 kHz without my having to belabor the point.

The logic-control operated transport system is flawlessly smooth in its operation, and the double capstan closed-loop drive system works well to reduce wow-and-flutter to the inaudible 0.04% level. The clutch-action separate-but-coupled record level controls are practical and fun to watch (as you rotate one the other one follows along, unless you off-set it manually). The mic attenuator switch introduces some 20 dB of input attenuation for use with high-output microphones. The memory-rewind and auto-play functions are nice conveniences.

I think the C-1 is well designed in terms of its recording performance. But I can't help wondering how much has been added to the cost of the machine by the designers' attempts to out-do the competition by adding "refinements" of questionable importance to even the sophisticated cassette deck user.

Individual Comment by N.E.: Among high-priced cassette recorders these days, it's becoming a question of: What will this new model have that competing models do not? This question inevitably concerns "features" (e.g., metering, tape selection adjustments, various convenience touches, and so on) rather than basic audio performance, since in terms of actual performance (response, distortion, S/N, etc.) they all seem to have attained a very high degree of competency that was, a few years ago, hard to imagine could be achieved by the petite cassette format.

In the case of the Teac C-1, the obvious new design flourish is the plug-in bias-and-EQ board approach. Whether this system offers better performance than others (in which bias and EQ are selected by the familiar switches, with possibly a single knob for tweaking the bias) is a question we cannot answer with any certainty. For this reason, it may represent "design overkill," but we have to admit if that is so, it has been carried out here most elegantly. In this sense, then, the C-1 can be said to have a product appeal to a particular class of buyer; this feeling is further underscored by the inclusion of a special facility for connecting the optional Teac RX-8, a unit that you either will go for or not, depending on whether or not you "believe in" the dbx noise-reduction system as offering anything substantially better than Dolby-B for the cassette format. There is, of course, some pro and con on this, and ap-

parently Teac feels more inclined toward it than not.

So, "you pays your money and takes your choice." The lack of a built-in mic/line mixing facility could, of course, be rationalized on the grounds that for really serious (pro or semi-pro) use, an external mixer would be used anyway.

While all of this remains debatable, especially in the context of the unit's price, what is more certain is the C-1's superior performance, mechanically and electrically. It also is apparent that the unit is more than usually well-built; it has a solid substantial "feel" about it. Also commendable is the owner's manual for this cassette deck, in which the material seems better presented than in some others we've seen.

TEAC C-1 CASSETTE RECORDER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Frequency response		
CrO_2/FeCr tape	± 3 dB, 30 Hz to 18 kHz	± 3 dB, 25 Hz to 18 kHz
Ferric oxide tape	± 3 dB, 30 Hz to 16 kHz	± 3 dB, 25 Hz to 16 kHz
Signal-to-noise ("A" weighted), Dolby off		
FeCr tape	60 dB	NA
CrO_2 tape	NA	60.5 dB
Ferric oxide tape	NA	58.5 dB
Signal-to-noise ("A" weighted), Dolby on		
FeCr	Improves by up to 5 dB at 1 kHz, and 10 dB over 5 kHz.	NA
CrO_2	NA	69 dB
Ferric oxide	NA	68 dB
THD at 0 dB record level		
CrO_2 (or equiv.)	NA	1.2%
Ferric-oxide	NA	0.9%
Record level for 3% THD		
CrO_2/std	NA/NA	+ 4.5 dB/ + 4.5 dB
Wow and flutter (WRMS)	0.04%	0.04%
Mic input sensitivity (for 0 dB)	0.25 mV	0.26 mV
Line input sensitivity (for 0 dB)	60 mV	87 mV
Line output level	0.3 volts	0.45 volts
Headphone output level	1.0 mW/8 ohms	1.1 mW/8 ohms
Fast-wind time, C-60	70 seconds	55 seconds
Power consumption	39 watts	46 watts

CIRCLE 7 ON READER SERVICE CARD

Setton Model BS-5500 Stereo Power Amplifier

General Description: Ostensibly a stereo (two-channel) power or basic amplifier, the Setton BS-5500 actually consists of two independent mono amplifiers sharing a common chassis and wraparound, and a common AC line cord. In all other respects, the unit is actually two separate amplifiers, with each one independently switchable and usable. For stereo service, each channel can deliver well in excess of its rated 100 watts, and because of the unit's design this power remains the same from each side in mono use (either as a single mono amplifier with one side shut down, or as two utterly independent mono amplifiers driving their own respective speaker systems).

As a power amp, the BS-5500 is of course intended

for use with a line-level source before it, such as a preamp. However, since each side has its own level control, the input to either could also be from any line-level source such as a tape deck or preamplified mixer, console board, etc.

Regarding this aspect of the device, by the way, each signal input (at the rear) is paralleled to its own "output" jack which actually can serve as a feed-through connection so that the input source may be hooked up directly to another power amp (or line-level input device) without the need to employ additional hardware such as Y-connectors.

The front panel of the BS-5500 is a logical reflection of the amplifier's basic design, consisting of two discrete groups of controls and meters, each of which is a mirror-image of the other. The security panel contains a meter and three illuminated indicators. Each meter is calibrated in two scales: one reads watts from 0.001 to 200; the other runs in decibels from −40 to a bit above +3. The unusually large indicators come on for "heat," "clipping" and "protection." If any of these warning lights is ignored for too long, the amplifier will shut itself down due to built-in protection relays.

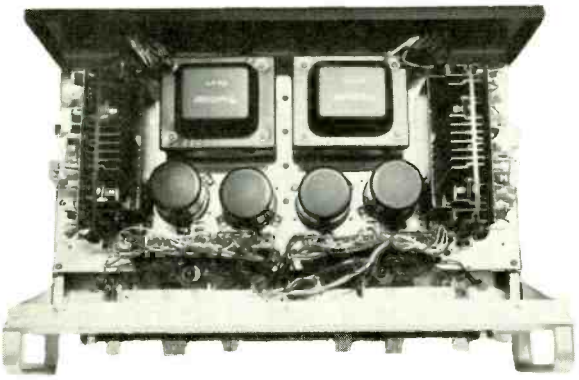


Fig. 1: Setton BS-5500: Internal view clearly shows completely separate left and right channel amplifier construction.

Below each meter are the power off/on switch and its associated indicator light; the individual channel level control; and the individual channel speaker selector. The last knob has six positions for speaker A, B or C alone, as well as for combinations of any two (B+C, A+C and A+B). Three additional indicators next to the selector light up to show which speaker or speakers have been selected. To emphasize the point here: The control and use of each channel—from input to output—is completely independent of the other.

The rear panel contains—independently for each channel—the signal jacks mentioned above; speaker connectors; an operating voltage selector (240, 110, 220 and 130 volts AC); and a fuse-holder. Speaker connectors are color-coded press-to-connect types. There are three pairs labeled A, B and C, and an accompanying chart showing recommended working impedances for the six possible hookups. The AC power cord is a 3-conductor (grounding) type that must be plugged into the chassis.

Test Results: Most of the published specs for the Setton BS-5500 were either met or exceeded in *MR's* lab tests. Some examples: we obtained 136 watts per channel; Setton claims 100. Our measured THD was less than half of the specified THD. In frequency response, for the rigorous −1 dB tolerance, we went better than an octave below the rated low-end, and hit out to 70 kHz (as compared to the published 80 kHz) at the high end. For a −3 dB tolerance, response went clear from 3 Hz to 160 kHz. Hum and noise were 111 dB below rated output by the "A" weighting, and 92 dB down by the new IHF standard. Needless to say, either measurement is excellent. The rated IM figure of 0.05 percent was not confirmed for full output, but it did drop to 0.04 percent at slightly less than full output (85 watts per channel).

Fig. 2 is a plot of distortion versus power output at 20 Hz, 1 kHz and 20 kHz. Also included in this graph is IM distortion versus equivalent power output. Figure 3 shows distortion versus frequency for the rated 100-watts per channel output into 8-ohm loads. In each of these figures, the "worst case" channel results are shown, but actually the measured results were virtually identical for both channels.

General Info: Dimensions are: chassis width, 19 inches; front panel width, 19¾ inches; chassis depth behind front panel, 11⅞ inches; depth, including panel and handles, 13¼ inches; height, 6½ inches. Weight: 47 pounds. Price: $799.95.

Individual Comment by N.E.: The brand-name of Setton is relatively new on the audio scene. I first saw some of Setton's extensive line at the 1977 Chicago C.E.S., and I have been itching to get my hands on these units since then. Our tests confirm the initial impression of high-grade audio equipment that offers superior performance combined with useful and well-planned operating features.

It is interesting to note how certain design approaches intended to make for a better amplifier in general begin to overlap from what has been up to now regarded as the "home stereo enthusiast" type of product into the realm of the semi-pro or professional user. As we have remarked on previous occasions, when reporting on other top-quality amplifiers, the old dividing line between the two classes of product all but vanishes for some models. That is to say, you can have an amplifier that straddles, and manages to fill the needs of, both worlds.

In the case of the Setton BS-5500 we have—as the legend printed across the top of the front panel states—"two entirely separate amplifiers." It is, literally, as if you took two independent power amps and placed them side by side, albeit on the same chassis

and inside a common housing and sharing the same AC power cord. This approach sidesteps a lot of problems—some admittedly "esoteric" but some more tangible. For instance, a defect that crops up in the power supply will not disable both channels. In application terms, the BS-5500's design lends new versatility to a power amp since it may be used as a regular stereo amp or as two mono amps for use in two unrelated systems.

The BS-5500 also is the first power amp I have seen that provides for direct connection of up to three different speaker systems on each channel with front-panel switching to select any one or any combination of two. Different speakers, and combinations, may of course be chosen for each channel—simultaneously or in sequence (as in A-B testing).

With its clean, tight sound and operational versatility, the Setton BS-5500 bears serious consideration by anyone looking for a basic amp in this power class.

Individual Comment by L.F.: When does a high-powered stereo amplifier qualify as a professional monitoring amp and when is it limited to home hi-fi applications? Over the past few years, the demarcation between the above two types has become ever finer, and I'm not sure I can tell the difference any longer. If you agree that an amplifier intended for pro sound work and monitoring should be rugged, reliable and capable of operating for long periods day-in and day-out, then the Setton BS-5500 (which is obviously part of that company's hi-fi line) surely qualifies as an amplifier of interest to pro users.

The company emphasizes that the BS-5500 is actually two amplifiers. Indeed it is—right down to its two power switches that enable you to turn on power to one channel at a time. I have read all about problems of cross-modulation between channels, and how you don't want the supply voltage fluctuations caused by a sudden bass note in one channel to affect the tones being amplified in the other channel at that instant. This seems like a good theory; I confess, however, that I have yet to hear this form of inter-channel degradation in a music-listening situation. I suspect that it is due to the fairly nondirectional nature of bass sound, which means that when you have a high-energy bass tone being reproduced in one channel, it will be pretty much there at equal amplitude in the other channel at the same time.

Be that as it many, I certainly cannot fault Setton for going to all this trouble of actually isolating the circuitry of the two channels in the BS-5500. I suppose that one mammoth power transformer wouldn't be all that much cheaper than two smaller ones. And the use of completely separate supplies does make for a rather nice and symmetrical parts layout, as you can see from the internal view of the amplifier. If anything, the facility for using each amplifier as a separate entity may have more practical applications in professional use than in home hi-fi.

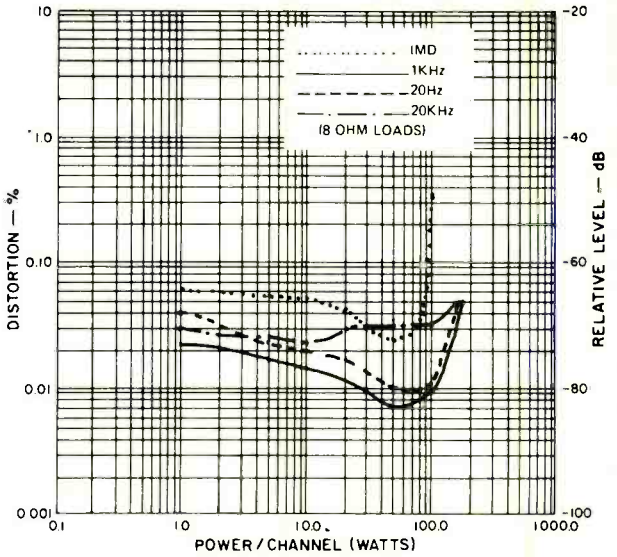


Fig. 2: Setton BS-5500: Distortion vs. power output.

I was impressed by the two security panels and the very accurate power meters of the BS-5500. Another nice feature (that cost Setton practically nothing to include but which could be very useful) is the so-called output jacks (actually paralleled feed-through input jacks) alongside each input jack. The speaker selector controls are completely separate on each channel which means, for example, you could have speaker A turned on for the left channel, while speaker B was energized for the right channel. Conceivably there may be situations when this kind of unorthodox speaker selection might be useful.

As for the sound quality of the BS-5500, I found it to be excellent with tight, unmuddied bass that seemed well-damped and controlled. There's enough power here to drive even low-efficiency speakers to high SPL levels, and the signal-to-noise level is more than ade-

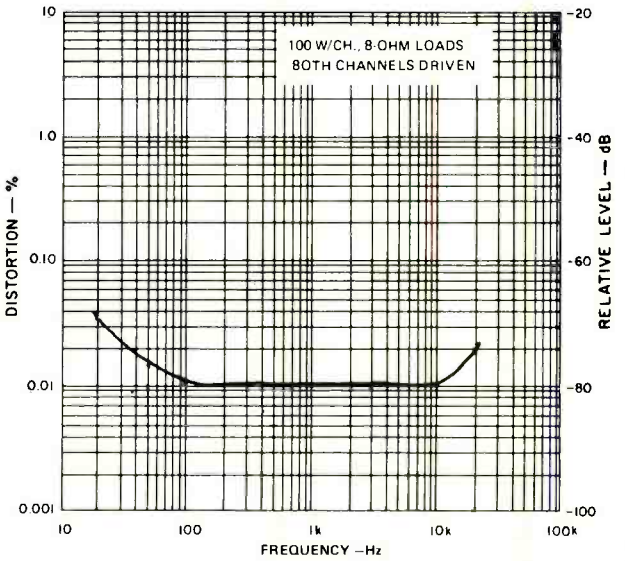


Fig. 3: Setton BS-5500: Distortion vs. frequency.

quate, so there's no audible hum or noise during quiet musical passages, or even when no signal is applied.

I do wish that Setton had provided a place to connect a chassis-grounding lead which I found was needed for achieving the best S/N ratio with the particular preamp I used when auditioning the BS-5500. Of course, you always can loosen one of the structural screws and wrap a grounding wire under it, if you find this procedure is helpful.

I suspect that the total "separateness" of the two amplifiers of the BS-5500 contributes something to its suggested retail price of $800. At that, the price does not seem out of line with that of competitive amplifiers that test out and sound as good.

SETTON BS-5500 POWER AMPLIFIER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Power output	100 watts per channel, 8 ohms, 20 Hz to 20 kHz	136 watts per channel, 8 ohms, 20 Hz to 20 kHz
Rated THD	0.05%	0.022% (at 20 kHz)
IM distortion	0.05%	0.35% at rated output; 0.04% at 85 watts/channel
Frequency response	−1 dB, 10 Hz to 80 kHz	−1 dB, 3.5 Hz to 70 kHz −3 dB, 3 Hz to 160 kHz
Input sensitivity	1.0 V	0.95 V
Power bandwidth	5 Hz to 40 kHz	5 Hz to 38 kHz
Damping factor (1 kHz)	40 (8 ohms)	53 (50 Hz, 8 ohms)
Hum and noise "A" wtd	110 dB below rated output	111 dB (92 dB, new IHF standard)
Power consumption, max.	600 watts (4 ohms)	620 watts

CIRCLE 8 ON READER SERVICE CARD

Furman Sound Model PQ6 Parametric Equalizer

General Description: The PQ6 from Furman Sound provides parametric equalization on two (stereo) channels, each handled in three portions of the total frequency spectrum: from 25 to 500 Hz (bass); from 150 Hz to 2500 Hz (midrange); and from 600 Hz to 10 kHz (treble). Each portion has a frequency adjustment knob that covers its range; a bandwidth adjustment knob (from narrow to broad); and a boost/cut knob (from "minus infinity" to plus 20 dB). In addition, each channel has its own EQ in/defeat switch (with a pilot LED indicator indicating "in"); and a master level control. All controls (except the in/bypass switches) are continuously variable. However, they have specific markings. The first frequency range knob has markings for 25, 50, 100, 200, 400 and 500 Hz. The second frequency range knob has markings for 150, 200, 400, 800, 1000, 2000 and 2500 Hz. The third frequency range knob has markings for 600, 1000, 2000, 4000, 8000 and 10,000 Hz. The bandwidth knobs are marked only "narrow" at one extreme, and "broad" at the other extreme, of rotation. The boost/cut knobs are marked in dB from minus "infinity" through "flat" and up to +18 in steps of 3 dB, with the uppermost position marked for +20 dB. The level knobs are marked in steps of one from zero to 10.

The twenty knobs (colored red) and the two switches occupy just about the entire front panel which is of rack-mount width with suitable mounting holes.

The rear panel contains eight 1/4-inch phone jacks for signals in and out. Each channel has low and high level inputs, and low and high level outputs. The unit's AC power cord is fitted with a three-prong (grounding) plug. The PQ6 has no power off/on switch of its own. The reason for this omission, explains the manufacturer, is that he has observed that most rack-mount gear is turned on with one master switch for the whole rack (often on a Waber-type electrical outlet strip), and so an individual off/on switch seemed unnecessary in the design of this particular device.

The PQ6 does not have balanced inputs and outputs. Again, explains Furman, their omission is based on his feeling that only a handful of potential users would need this feature, considering that the PQ6 and most other modern audio equipment have very low output impedances, and the PQ6 processes line-level signals.

The philosophy behind providing three EQ bands is based on the designer's own experience as a recording engineer. He states that when a parametric is patched into a troublesome track, usually one or sometimes two bands are used. Only occasionally would three bands be used all at once, and in this sense a fourth band becomes largely superfluous.

The reason for providing two inputs and outputs on each channel (either the high or the low should be used, but not both simultaneously) has to do with the PQ6's possible applications. The low-level inputs are to be used when the PQ6 serves as a preamplifier in addition to providing EQ. Total available gain through the low-level inputs is 26 dB. Examples of sources requiring the use of the low-level inputs are an electric guitar, or a microphone.

Gain through the high-level inputs is considerably less, up to 6 dB with EQ set flat or bypassed. These inputs are to be used when the additional gain is not required, as in most recording studio applications, broadcast work and sound-reinforcement—where a line-level signal is available.

The equalization curves produced by the PQ6 are non-reciprocal. That is to say, they are deliberately designed to produce a relatively broad boost characteristic, but a very narrow or steep notch effect ("infinitely deep"). According to the manufacturer, this approach allows for a more musically useful spread of bandwidths than is afforded by reciprocal curves (which provide only as much cut as they do boost). Explains Furman: very narrow boosts are fairly useless musically since they sound peaky, while very narrow notches do have great value in eliminating single-frequency sounds such as hum or feedback, and they do so with minimal effect on tone coloration.

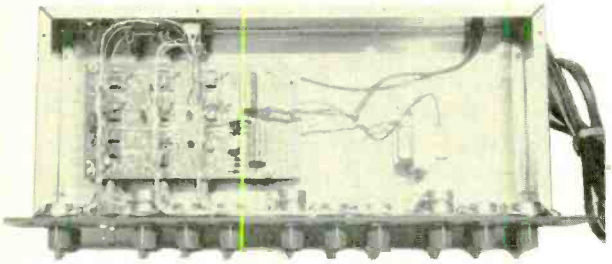
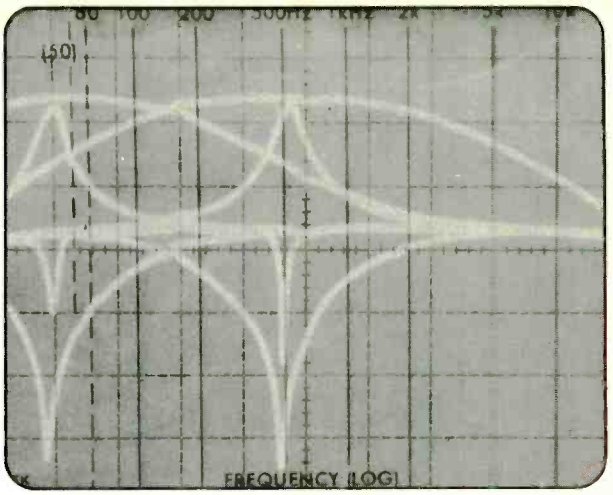


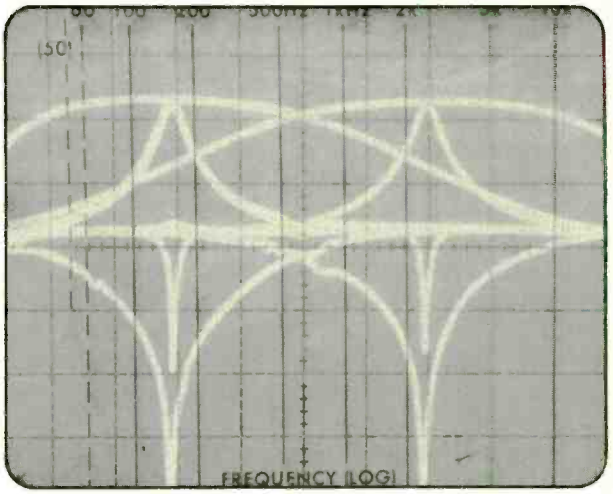
Fig. 1: Furman Sound PQ6: Internal view of unit.

Test Results: Most of the PQ6's published specs were confirmed within normal tolerances, and the really important ones were right on the nose (such as frequency band control) or better than claimed (such as the extremely low distortion we measured).

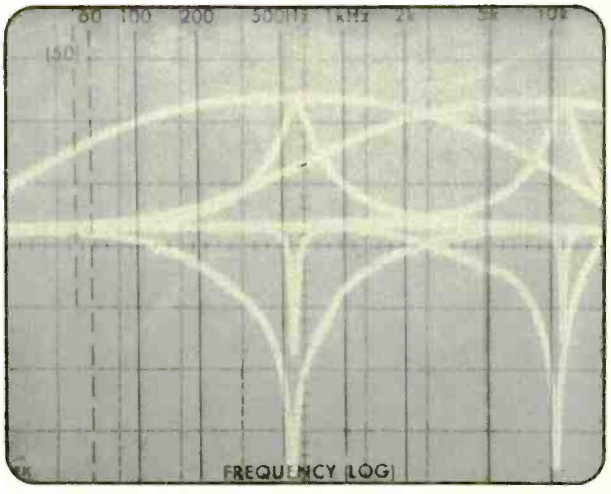
To study in detail what is probably the most significant difference between this parametric equalizer and others we have tested (its non-reciprocal response curves), we made a series of 'scope photos of the unit's response. Figure 2 shows the curves obtained at the extreme settings of the boost/cut, frequency and bandwidth controls for each band. It should be noted that when controls are set for maximum boost, the band-



(a)



(b)



(c)

Fig. 2: Furman Sound PQ6: Composite frequency sweeps show non-symmetrical nature of boost and cut action of (a) 25-500 Hz band; (b) 150 Hz-2.5 kHz band; and (c) 600 Hz-10 kHz band. (See text.)

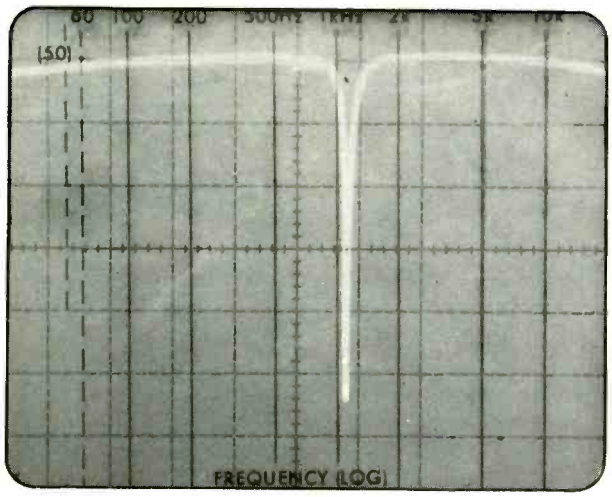


Fig. 3: Furman Sound PQ6: By overlapping two sets of EQ controls, extremely steep rejection notch at 1 kHz is achieved.

width can be varied from less than 1/3 octave to about four full octaves. (The 4-octave extreme is wider than we have encountered on most other parametrics set to their extreme or maximum bandwidth positions.) Available boost is about 20 dB maximum.

The picture changes, of course, when we apply "cut" to a given band. Now the bandwidth range varies from around one octave to extremely narrow notch-filtering that is only a few Hz wide. We thus confirmed the designer's avowed intent in producing this equalizer the way he has. We further agree that its applications (as explained in the "General Description" section above) make sense musically in terms of avoiding extreme peaks in the sound while also affording a means of eliminating the single-frequency annoyances of acoustic feedback or hum (or the latter's "harmonic buzz") while having little or no audible effect on the actual sound quality of the program.

In point of fact, the notches obtainable on the PQ6 are even sharper and deeper than they appear to be in our Figure 2a, b and c. Had we been able to slow down the speed of our frequency-sweep, you would have seen notches (in the narrow-band extreme) in excess of 40 dB (the vertical scale in the accompanying 'scope photos is 10 dB per division).

Since each EQ band's frequency range overlaps that of its adjacent band, we tuned the mid- and high-frequency bands for exactly 1 kHz to obtain an even sharper and deeper notch at that frequency, as shown in Fig. 3. We could just as easily have obtained a deep rejection notch down to 150 Hz or up to 2.5 kHz, the extremes of common frequency range between the midband controls and the low- and high-band controls.

Signal-to-noise characteristics of the PQ6 are excellent. The device's distortion—even at high output levels—is about as low as that of our test generator. And the PQ6 has enough headroom to meet just about any recording system requirement.

General Info: Dimensions are 19 inches wide; 3½ inches high; 8 inches deep. Weight is 7 pounds. Price is $495.

Joint Comment by L.F. and N.E.: Admittedly, the PQ6 lacks some of the features found on other EQ devices. What it does have, however, is very carefully planned and executed to add up to a no-frills parametric. Its design and performance reflect a very realistic approach to practical program and application needs. Its performance is superb, if somewhat "different," and its cost—all things considered—is relatively modest.

FURMAN PQ6 STEREO PARAMETRIC EQUALIZER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Frequency ranges	25 to 500; 150 to 2500; 600 to 10,000 Hz	Confirmed
Equalization range	20 dB boost; "infinite" cut	See text
Maximum input, low level	430 mV	410 mV
high level	4.9 V	4.8 V
Maximum output	8.3 V (+21 dBm)	7.8 V (+20.5 dBm)
Total available gain		
low level	26 dB	25.5 dB
high level	6 dB	5.0 dB
Frequency response, controls flat	± 0.5 dB, 20 Hz to 20 kHz	± 0.5 dB, 10 Hz to 45 kHz
Signal-to-noise		
Bypassed	109 dB	110 dB (re: max out; 92 dB IHF)
EQ in	99 dB	99 dB (re: max out; 84.5 dB IHF)
THD at 1 kHz, +20 dBm		
Bypassed	0.015%	0.0035% (0.006/0.02% at 20 Hz and 20 kHz
EQ in	0.025%	0.0035% (0.006/0.035% at 20 Hz and 20 kHz)
Power consumption	8 watts	8 watts

CIRCLE 9 ON READER SERVICE CARD

Now Ashly offers a new dimension in audio control. It's a complete package of the most up-to-date signal processing equipment around. And its capabilities will amaze you.

Like building blocks it can be assembled one part at a time and used in any combination to suit your audio needs. It's as versatile as you are.

Rack mounted and designed for the most rigorous use, the 16-gauge steel units (feel the weight yourself) hold up on the road, on the stage, or in the studio.

From brilliant highs to rich lows, the units remove unwanted noises, sustain guitar, monitor audio gain, improve the efficiency of your speaker system, and can even help you find new sounds.

Test them out at your nearest dealer. Better yet, talk to a sound man or guitar player who's used them. He'll tell you that ASHLY MAKES THE BEST SIGNAL PROCESSING EQUIPMENT AROUND!

Put some in your rack!

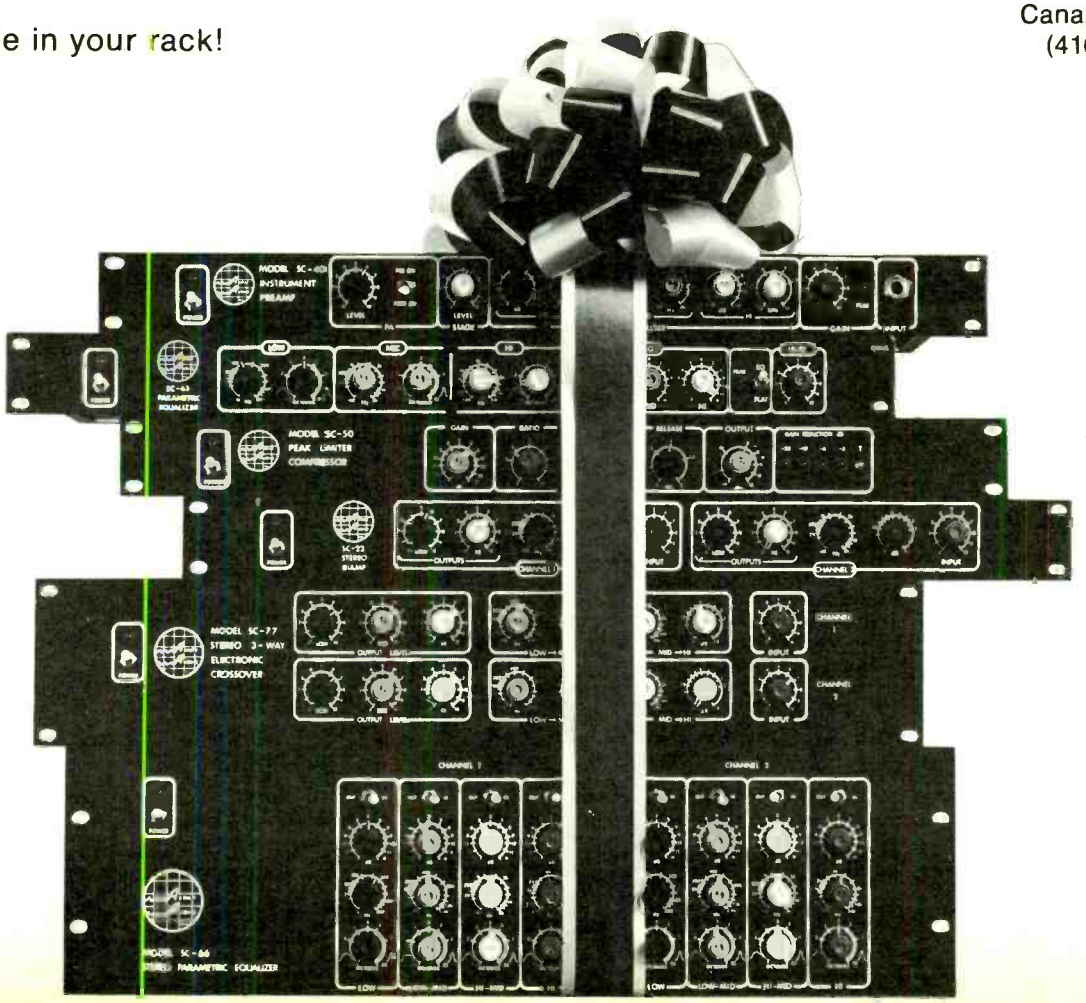
The Ashly Package

SC-40 Instrument Preamp. $349
SC-50 Peak Limiter Compressor. $299
New SC-63 Mono Parametric Equalizer. $369
New SC-22 Stereo 2-Way Crossover. $290
SC-77 Stereo 3-Way Crossover. $429
SC-66 Stereo Parametric Equalizer. $599

NOTE: The full Ashly line also includes the SC-60 Professional Parametric Equalizer; SC-55 Stereo Peak Limiter Compressor; the SC-70 3-Way Electronic Crossover; and the SC-80 4-Way Electronic Crossover.

Ashly Audio, Inc.
1099 Jay St.
Rochester, N.Y. 14611
(716) 328-9560

Exclusive distribution in Canada:
Gerr Electro-Acoustics
365 Adelaide St. East
Toronto, Ontario
Canada M5A1N3
(416) 868-0528



CIRCLE 84 ON READER SERVICE CARD

Uni-Sync Trouper 1 Monitor Mixer

By Jim Ford and John Murphy

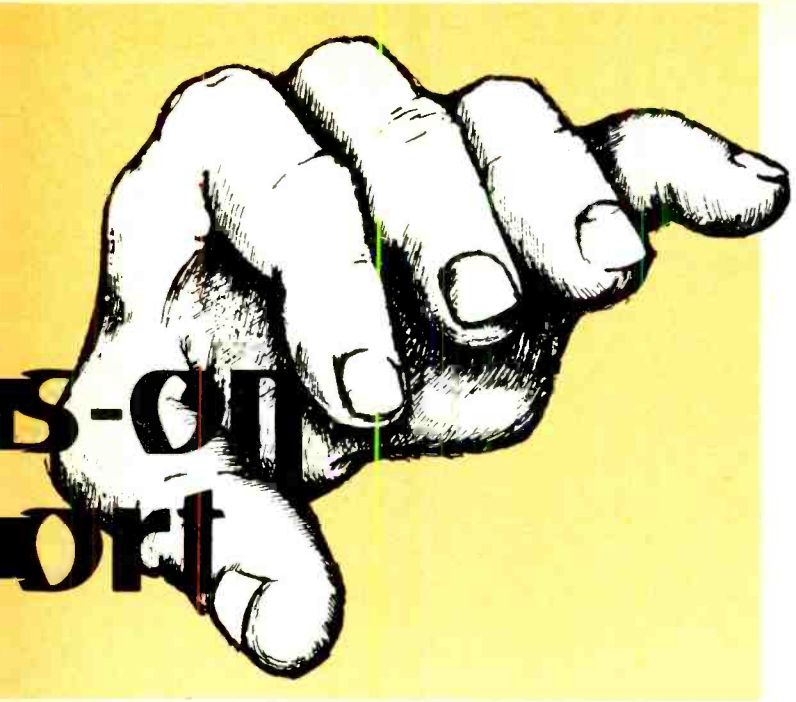
A monitor mixer is a specialized microphone mixer that is designed to meet the specific requirements of on-stage monitoring. The Trouper I Monitor Mixer provides four independent monitor mixes from eight mic inputs and an additional twelve inputs can be added with an expander module if more are needed. The unit features three-band equalization on each channel, balanced mic inputs and complete soloing facilities. The price is less than $800.

Stage Monitoring

Consider a typical concert stage and P.A. layout. The stage is likely to be about 40 feet wide with the P.A. speaker systems to the side and in front of the stage. To make matters worse (for the musicians, that is) the P.A. speakers are pointed away from the stage and set up to deliver the best sound out in the audience (hopefully!). So the musician on stage is faced with a situation where he is behind the main P.A. speakers and maybe as much as thirty-five to fifty feet away from them. To compound the situation even further, some performers (guitarists for example) will probably have powerful amps right behind them on stage. Maybe now you can begin to see the problem from, say, the lead singers point of view. His voice is being reproduced by a P.A. which is in front of him and pointed away from him, and the guitar player's amp is behind him and more or less pointed toward him.

There are several distinct problems that result from the arrangement just described. First, the musicians hear little if any direct sound from the main P.A. Instead, they hear mainly reflected and reverberant sound. The direct sound that the musicians do hear from the P.A. will have a significant time delay just because of the distance between their ears and the speakers. Remember, sound only travels at a rate of roughly one foot per millisecond (msec.), so if the musician is 50 ft. from the P.A. speakers the sound he hears is delayed about 50 msec. from when it was produced (there are no significant delays in the cable and the electronics since the electrical signals travel at the speed of light). In order for musicians to play in time it is necessary to keep time delays less than about 35 msec. Considering this, it's best if they don't hear the main system very well since the time delay could throw off their rhythm.

Another problem with our typical stage and P.A. layout is that the vocalists will hear lots of guitar (and any other instruments with amps on stage) and not much of the vocals. For the best performance the per-



formers need to hear *themselves* clearly as well as each other. That is, they need to hear a clear and balanced mix, with no one musician dominating the mix.

On-stage monitoring provides the solution to both of the problems with our typical setup. By placing monitors around the stage and/or giving each performer his own monitor loudspeaker, time delays can be held to a minimum. (say 10 msec. if everyone is no more than ten feet from a monitor) and balanced mixes can be provided by a monitor mixer separate from the main house mix. The monitor mixer should be capable of providing several different mixes in order to suit the different requirements of different musicians. (Vocalists typically want to hear mostly vocals, whereas the drummer may want a more average mix, etc.)

General Description: The left-most two-thirds of the unit contains the eight inputs. Closest to the operator are eight groups of four faders each. Input one for example, can be sent to any of the four monitor mixes at any level desired. Thus, there are four level controls per input. Above each group of four faders is the solo switch for that channel. This assigns the input of that channel (pre fader) to the solo bus for the monitor operator to hear. Above the solo switches are three linear EQ controls for that channel. These provide high- and low-frequency shelving at 8 kHz and 150 Hz, respectively. The midrange EQ is a peaking type with a center frequency of 2 kHz. The controls provide about 10 dB of boost or cut. There are two switchable input attenuators at the top of each input section. One provides 10 dB of attenuation and the other 20 dB of attenuation. When both are switched in they provide 30 dB of input attenuation. To the right and closest to the operator are four master monitor level controls. They provide master level control of the four monitor mixes. At the top left and right of each of these faders are slide switches for activating low- and high-cut filters, respectively. These filters affect only the output of the monitor master they are associated with. Above the filter switches are solo switches (post fader) for each of the monitor channels. Further from the operator is an eight segment LED-type VU meter for monitoring signals on the solo bus. Any soloed input or monitor mix will show up at the meter as well as at the solo headphone jack above the meter. Headphone levels are controlled by a fader to the left of the jack. Above the phone level control is the power switch and line fuse holder. The back of the unit has eight XLR connectors for mic inputs and four 1/4-inch two-conductor phone jacks for monitor outputs. There is also a connector for the expander module on the back as well as a solo output. The solo output is controlled by the headphone level control and can be used simultaneously with the headphone jack. The unit is housed in a heavy steel chassis and may be mounted in a standard 19-inch rack.

Mic Output Levels: When we started this review and we were trying to determine the input signal levels that the mixer would actually see, we realized that we didn't really have any good data on mic output levels. Oh sure, the manufacturers specify mic output levels (typically referenced to one milliwatt output at a sound pressure level of ten dynes/cm^2, but how do these relate to a truly inspired rock 'n' roll scream?! We decided to find out. We took a sampling of popular mics (four dynamic and one electret condenser type), loaded the output with a real mic preamp and observed the output on our storage oscilloscope. This allowed us to readily observe and save the peak output voltages of the mic. A loud shout directly into each of the mics resulted in peak outputs ranging from 0.1 volt to 0.3 volts for the lowest and highest output mics respectively. Our best rock 'n' roll scream gave us 0.6 volts output. This is a line-level signal! No wonder mic preamp overload is such a common source of distortion in P.A. systems! The same rock 'n' roll scream into the mic of our sound level meter gave an SPL reading of 142 dB SPL. However, we suspect that a highly-frenzied rock 'n' roller might even get a few dB higher SPL at his mic.

Checkout and Listening Test: We ran a mic into the unit to check out the signal levels and control functions and found everything to be in order. We wanted to see if it introduced any audible colorations or distortions so we ran some recorded music from our reference system through it and just listened for a bit. By alternately bypassing the unit and then switching it in we were able to detect a slight masking of the vocals with the unit in. However, this is a small compromise when you consider the monitoring flexibility this unit provides. The slight masking we noted may be related to the low measured slew rate.

Even though the input faders are quite closely spaced (faders spanning about 11 inches across) we had little trouble making fine adjustments. It occurred to us that the input attenuator rocker switches were somewhat vulnerable with respect to accidental switching. (Accidentally switching out a 20 dB mic attenuator during a "live" performance could be very embarrassing to say the least.) Using recessed slide switches (such as on the high- and low-cut filters) would be an improvement. All in all we were quite pleased with all the flexibility and control that the monitor mixer provided.

Lab Test: A summary of the "Lab Test" results is given in the accompanying table. The noise levels at the mixer outputs are strongly dependent on input and master fader level settings. This is generally true of all mixers. We noticed that the noise consisted mainly of white noise (hiss) and had only a small 60 Hz (hum) component. This may be due to the fact that the power supply transformer is externally located within the massive line cord plug rather than inside the chassis with the electronic circuitry.

We were surprised to find the slew rate limited to 0.2 v/μsec. The integrated circuits used in this mixer are capable of higher speeds. (In case you're not familiar with slew rate, it is the rate of change of a signal voltage. You can think of it as the "speed" of the signal. The maximum slew rate of an electronics device sets an upper limit for the "speed" of voltage change of a signal that can pass through the device without generating distortion. That is, the signal through a device can't go faster than the "speed limit" of the device without becoming distorted.)

When we took the cover off to check out the mixer's construction we were quite pleased. Nearly all the active devices are mounted in sockets for easy servicing should it ever be required. Most of the connections to the board are made by way of plug-in connectors which, again, makes for easy, quick servicing. The construction and workmanship were such that we would expect a high level of reliability. The sturdy chassis and scratch-resistant paint finish and lettering are extraordinary and excellent.

Conclusion: The new Trouper I Monitor Mixer by Uni-Sync is a highly functional product. It was designed specifically for doing on-stage monitor mixing and has just the features to do the job. Although we would like to see a higher maximum slew rate and goof-proof input attenuator switches, we were very favorably impressed by its ability to perform as intended. We don't hesitate to recommend the unit for its intended application as a stage monitor mixer.

Lab Test Summary

Unweighted Noise

(Note: All levels are referenced to 0 VU which for this unit is + 4 dBm or 1.23 volts)

One input fader at −15 dB and the monitor fader at −15 dB:	−65 dB
One input fader at maximum and the monitor fader at −15 dB:	−52 dB
All faders at −15 dB:	−60.5 dB
All faders at maximum:	−24 dB
All faders at minimum:	−94.5 dB

Harmonic Distortion
(measured at 0 VU)

100 Hz	.046%
1 kHz	.047%
10 kHz	.043%

Intermodulation Distortion
(SMPTE method)

0 VU	.019%
−10 VU	.058%

Frequency Response
(measured at 0 VU with EQ set flat)
±1 dB from 8 Hz to 15 kHz

Bandwidth
(−3 dB points)
3.8 Hz to 25.5 kHz

Maximum Slew Rate
0.2 volts per microsecond

Crosstalk
(measured at the output of Master 2 with a .015 V input to channel 1 and 0 V output level on Master 1)

	1 kHz	10 kHz
Master 2 fader at −15 dB	−54.5 dB	−34 dB
Master 2 fader at −10 dB	−48 dB	−28 dB
Master 2 fader at maximum	−38 dB	−17.5 dB

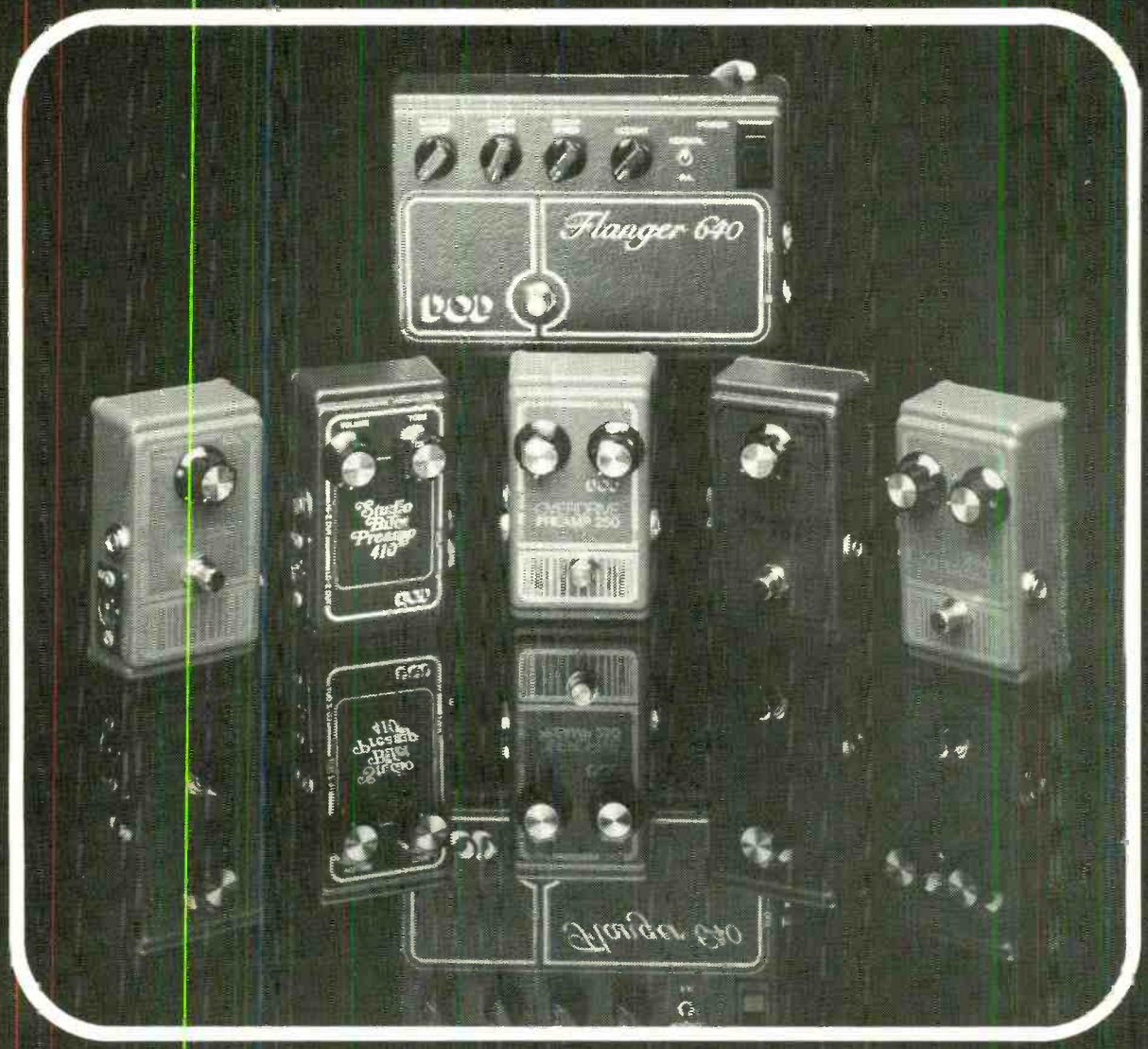
Maximum Input Level
(before clipping the input)
2.0 volts rms (+8.2 dBv ref. .775V)

Maximum Output Level
(before clipping)
10.0 volts rms (+22.2 dBv ref. .775V)

Microphone Input Impedance
(at 1 kHz)
3.4 K ohms

Take Your Pick

Whichever DOD product you choose you'll find consistent high quality design and materials.



When we design a product we keep the musician in mind all the way. We demand a product that is functionally superior and to ensure that it will stay that way we use rugged name-brand components such as CTS, Carling Switch, National Semiconductor, Texas Instrument, Switchcraft etc. We also feature solid Die-cast Zinc and Aluminum cases and FR-4, G-10 Glass epoxy circuit board. All our products are hand assembled and individually tested by qualified technicians and have a full one-year warranty on parts and labor.

For further information write or call:

DOD Electronics Company, 2895 South West Temple
Salt Lake City Utah 84115, (801) 485-8534

CIRCLE 73 ON READER SERVICE CARD

GROOVE VIEWS

Reviewed By:
ROBERT HENSCHEN
NAT HENTOFF
JOE KLEE
ALLAN KOZINN
JEFF TAMARKIN

POPULAR

THE DOOBIE BROTHERS: *Minute By Minute.* [Ted Templeman, producer; Donn Landee, engineer; recorded at Warner Bros. Studios, North Hollywood, Ca.) Warner Brothers BSK 3193.

Performance: **Lazy—must've been smokin' too many doobies**
Recording: **Clean but unimaginative**

The Doobie Brothers have always had the same problem. On any given recording, there will be a few gems and the rest will be lifeless, repetitious filler. That, perhaps, is what makes *Best Of The Doobies* such a solid album: all of the essential Doobies material is packed into one LP. But *Minute By Minute* is no best of—instead, it continues in the Doobies tradition of a few hot stand-out cuts surrounded by the usual, forgettable Bay Area funk 'n' roll.

At this point, a couple of weeks after the LP was released, it evades me which cut Warners will choose as the single from *Minute By Minute.* But I wouldn't be surprised by anything they choose, because almost any of the songs here have "hit" imbedded within their structure. The Doobie Brothers have reached the point where they can calculate their impact by remaining within the boundaries they've worked at developing throughout the 70s. And so they can guarantee themselves hits. Unfortunately, they've learned that the easiest way to do this is to sacrifice originality and experimentation for predictability. It's making them one of the success stories of the decade, but it's costing them their reputation as innovative, talented musicians.

THE DOOBIE BROTHERS: Prefabricated soulfulness

The Doobies have become, in effect, two separate bands: one led by longtime guitarist/vocalist Pat Simmons, who's responsible for the vocals on many early Doobies hits. The other Doobie Brothers band is led by more recent addition Michael McDonald, the keyboardist and vocalist on such songs as "Takin' It To The Streets" and "It Keeps You Runnin'." McDonald owns a smooth, soulful voice, but on this new record he's nonchalant and dry, which is the reason why most of *Minute By Minute* is a tiring collection of music.

Another reason is the syncopated drumming and percussion work of John Hartman and Keith Knudsen. The Doobies grew out of a Bay Area funk tradition, and here they've co-opted it and served it up as prefabricated soulfulness. This is most apparent on the title cut, but consistently makes itself felt throughout.

There are a few highlights though, which ought to qualify for the second volume of Doobies' greatest hits. "Dependin' On You" (ever notice that these guys sure like to drop their 'g's?) is an upbeat, light rocker which combines a South American-type beat with gospel vocalizing and nicely-integrated horn riffs. Nicolette Larson adds an ap-

Go For The Best

Go For The 100B, 250D & 750B/C

They're the BGW amps. The Industry Leaders. Four different models with only one philosophy: The Best. The best engineered and designed; the best and most sophisticated electronic test equipment available to test the dreams of an audio engineer's imagination; the best support for an engineer that money can buy – from complex computer modeling to the back-up personnel who refine and distill the inventor's visions.

In every BGW product there is a lot you can relate to. Like the quality of every component part. Every one meticulously selected for uncompromised reliability – a simple resistor or a complex semiconductor. Hand-wired teflon harnesses and precision soldered modular assemblies are built to exacting standards. From our imitated front panels to our imitated back panels, you'll find a heavy steel chassis and massive heatsink modules.

These are things you'd expect from a company that has built an enviable reputation as being the best money can buy. Recording engineers and artists alike have recognized that the BGW name **is** performance and **is** innovation. The best specs and the most versatile and reliable amp you can buy. Absolutely. A BGW is equally at home on a grueling road tour or in the demanding environs of a studio control room. Super-high power to super-low noise and distortion, a BGW works with any high quality speaker or mixer. Year-in and Year-out a BGW delivers the kind of incredible sound that has made the careers of many an artist and engineer. Check-out the new 100B and 250D. Both are the result of continuing evolution based upon experience. These two new amps are worthy partners of our industry standard 750 series.

A BGW may be priced a bit more initially, but you need the best. So, when you're ready, Go For The Best.

Go For a BGW

BGW SYSTEMS

BGW Systems, Inc.
13130 South Yukon Avenue,
Hawthorne, California 90250
In Canada: Omnimedia Corp.,
9653 Cote de Liesse
Dorval, Quebec H9P 1A3

CIRCLE 72 ON READER SERVICE CARD

propriate female touch to the vocal, and Jeff Baxter borrows a Santana riff or two for some brief, enlightened soloing. Also notable is Simmons' bluegrass instrumental, "Steamer Lake Breakdown," which is really no great revelation in the world of bluegrass, but a breath of fresh air on an otherwise bland white soul album from California.

The Doobies are by no means a band that's had it, but they are getting used to the idea of the easy life, and it shows. Their talent as instrumentalists is unquestionable, and both McDonald and Simmons are fine vocalists. The problem is in the application of their talents, and there's no obvious reason that a band with such a wealth of studio know-how should be recording an LP as disappointing as *Minute By Minute*. J.T.

BOB MARLEY & THE WAILERS: *Babylon By Bus.* [Bob Marley & The Wailers, Chris Blackwell, and Jack Nuber, producers; Jack Nuber, engineer; recorded "live" by Island Mobile Studio in Paris, Copenhagen, London, and Amsterdam, 1978.] Island ISLD 11.

Performance: **Rough highs, polished lows**
Recording: **Hockey rink acoustics**

The internationally acclaimed excitement of reggae's greatest concert act is documented on this two-record set, a 1978 collection including some of Bob Marley's better tunes. But aside from the crowd's vocal urgings after nearly every song, and a sing-along to "Punky Reggae Party" (London, no doubt), no recording could quite capture the visual eeriness or socio-political immediacy of The Wailers' revolutionary music. Despite its definite viability as a record of The Wailers at one point in time, *Babylon By Bus* is unable to deliver the whole picture. This is one of those concerts you have to *see* as well as hear.

BOB MARLEY: At his primal best

Hockey rink acoustics and the inevitable taping problems may hurt this disc slightly, but The Wailers are meant to sound rough, and some of their best studio works have nearly revelled in imperfections (*Burnin'*). Muddy sound mixes are a fact, but not necessarily a factor. Some of these tunes, like "Is This Love" and "Stir It Up," actually sound a little *too* spiffy. Although reggae has from the beginning distilled many sophisticated Americanisms from R&B, combining soul melodies with more basic rhythm influences from the islands and beyond, Marley's arrangements have been getting more and more commercial. Prolonged exposure to European and American urban culture may be having its effect on the songwriter—to the point where "Exodus" was making

A JBL MONITOR KNOWS ITS PLACE.

A studio monitor is only a tool. It is not supposed to enhance, add to, subtract from, or in any way modify sound.

That's your job.

What a studio monitor is supposed to do is tell you precisely what's on tape. Because you have to know everything that's there. And everything that isn't. Before it's too late.

That's why JBL monitors are in thousands of recording and broadcast studios around the world. In fact, according to a national survey by Billboard Magazine, JBL's are in more recording studios than any other brand.

A JBL monitor plays what it's told. Nothing more. Nothing less. If that sounds good to you, contact your nearest JBL Professional Products Studio Equipment Supplier.

And put a JBL monitor in your place.

The 4301: Our newest 2-way monitor. Compact and efficient, for small broadcast control rooms and home studios.

The 4311: The most popular monitor going. A compact, full-range 3-way.

The 4315: An ultra-shallow 4-way, for maximum sound in minimum space.

JBL studio monitors come in three other models, too. All fully compatible for accurate cross referencing.

JBL

GET IT ALL.

James B Lansing Sound, Inc. / Professional Division, 8500 Balboa Boulevard, Northridge, Calif[illegible]329

CIRCLE 102 ON READER SERVICE CARD

disco playlists and *Kaya*, the group's most recent studio undertaking, has a refined pop attitude.

The "live" version of "Exodus" from *Babylon* is less danceable, but the album shows additional tendencies toward conventional lead guitar soloing (by Junior Marvin and Al Anderson) and polished choral work by the I Threes. Such guitar breaks help establish a connection with Anglo rock, and the backup singers have a soulful appeal, but both depart slightly from the essence of reggae where, instrumentally speaking, best is less. At the rhythmic core of *Babylon*, however, the beat goes on irresistably simple and funky, given added color by even the slightest polymeter or counter beat. At their primal best, The Wailers provide an incredibly tight, intense vehicle for Marley's oft-fiery poetry.

Highlights include the singer's spoken invocation to "Positive Vibration," a call-and-response version of "Lively Up Yourself," and lesser known message pieces such as "Rat Race" and "Heathen." You can count on *Babylon* to do a slow burn throughout, some of the longer, drawn-out cuts sinking into a low-keyed, hypnotic groove. If the excitement seems inconsistent, try some of the earlier studio efforts like *Natty Dread* and *Burnin'*, or a previous performance caught on *Bob Marley & The Wailers Live!* R.H.

SANTANA: The lure of success is the curse of recording

SANTANA: *Inner Secrets.* [Dennis Lambert, Brian Potter, producers; Matt Hyde, engineer; recorded at Western Recorders, Los Angeles, Ca.] Columbia FC 35600.

Performance: **Depressingly uninspired**
Recording: **Nothing special**

After ten years of making records of a consistently illuminatory nature, Santana has recorded the first royal bomb

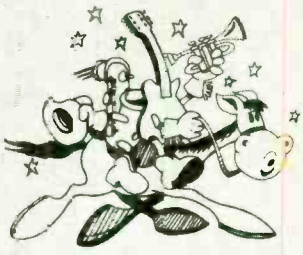
Everything You Need to be a Star.

And How to Put it All Together.

Nowadays you gotta be an engineer to master all the tricks of Electronic Circuitry, like our six salespeople, each of whom have a degree in music and also know the inputs and the outputs of your art!

Sure, some store *may* match our selection (but we doubt that), some store may match our price, (ditto), but no store can match our advice (and we'll guarantee that!)

Luck, talent, and Hanich Music . . . Give us a call.



Hanich Music

WE SHIP EVERYWHERE!

235 North Azusa Avenue, West Covina, CA 91791 213/966-1781

CIRCLE 74 ON READER SERVICE CARD

of its career. Not that Carlos hasn't had his weak moments before, but never has this great innovator had such trouble coming up with at least a few tracks worthy of his reputation on any given recording.

It would be simple to attribute my dissatisfaction with this album to my high expectations, but I have come to appreciate the various stylistic changes that Santana has undergone throughout the years, and to grow with them. I've watched Devadip veer steadily from his trademark Latin-influenced sound toward a mainstream soul approach, and cheered him on because he continued to break ground wherever he entered. But *Inner Secrets* is the mark of a one-time champ groping for strength in the final rounds. There is little here to grasp onto, and Santana has, with this recording, become one of rock's followers rather than one of its most revered leaders.

It is obvious from the opening track, Traffic's "Dealer," that Santana is not going to be working very hard at forging a new direction with this LP. The arrangement comes as close to mimicking Traffic's as is possible using Santana's instrumentation, and save for a token percussion binge, there is nothing here to identify this track as a Santana recording.

Some of the problem can be directly traced to the loss of long-time Santana keyboard whiz Tom Coster. It was apparent throughout his association with Santana that Coster possessed much of the brains behind the outfit, if Carlos Santana possessed the chops. But it was not obvious until now that Coster was also much of the spirit of Santana, a spirit which Carlos himself is almost exclusively given credit for. This record is devoid of that spirit, which previously seemed to come to guitarist Santana from some divine source.

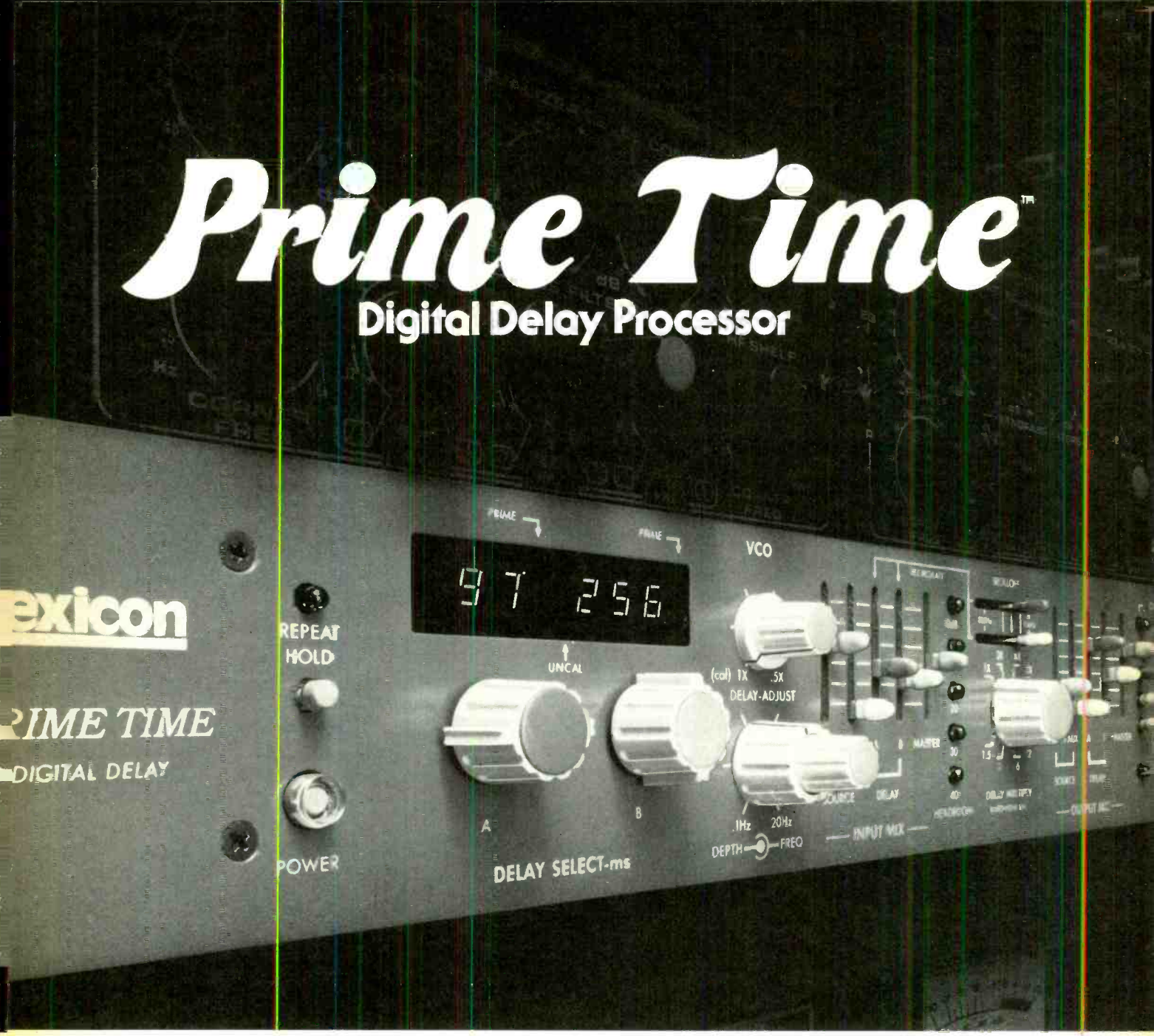
Another problem is vocalist Greg Walker. Although Walker has been with Santana for a while now, his strict soul vocalizing has never really meshed with the group's Salsa-based ensemble sound. Walker is a fine vocalist, but he's in the wrong band. And now that fact is plainly affecting the credibility of this band as a pacesetting unit. Walker's dominance tends to mute Santana's seering leads, rendering them flat and dull. Where he used to ring sweetness from his guitar, Santana is now pushing a harsh and abrasive tone from it, and to justify this, he is mixing himself down to a point where his work becomes rote and anonymous, no different than that of the hundreds of guitarists who worship at his fingers.

Walker's voice is technically as good as the next guy's, but in this band, one should be able to add a note of dimension, not just fill in a part. On both "Move On" and "The Facts Of Love," he is doing just that, singing because the material demands a singer. But what is more disturbing is that the album also shows that this outfit might function best as one without any vocalist at all. On the two instrumentals on the second side, "Life Is A Lady/Holiday," and "Wham," Santana himself comes alive, playing as imaginatively as he's done in the past. In fact, Santana gives the impression that he wouldn't mind so much if he could knock off the whole R&B racket and stick to what he does best—making love to his guitar, and leading a group of talented musicians through *his* dreams, rather than those of a hit-minded producer.

In fact, that lure of success might just be the curse of the record. Riding on the heels of a successful single, a remake of the Zombies' "She's Not There," Santana's recent taste of Top 40 notoriety, we find not only the

Prime Time™

Digital Delay Processor



professional quality delay plus special effects

Lexicon's new Model 93 "Prime Time" digital delay processor gives recording studios and entertainers an easy-to-use professional quality time delay with special effects and convenient mixing all at a price you can afford. It combines a degree of flexibility and versatility never before offered in equipment of full professional quality.

- Two delay outputs independently adjustable from 0 to 256 ms
- Complete mixing for delay and reverb processing, freeing up main console channels and tape tracks
- Integral VCO for special effects like vibrato, doppler pitch shift, flanging and automatic double and triple tracking
- Long delay special effects — up to 2 seconds
- All dynamic functions can be footswitch controlled
- 90 dB dynamic range, total distortion below 0.08% at all delay settings

Lexicon Lexicon, Inc., 60 Turner Street
Waltham, MA 02154 (617) 891-6790

Export: Gotham Export Corporation, New York, New York

CIRCLE 68 ON READER SERVICE CARD

"Dealer" cover here, but two more chart-bound goodies—Buddy Holly's "Well All Right," and the Classics Four's sixties smash, "Stormy." Neither song is altered here, leaving a distinct feeling Santana is again looking for the hits. "Well All Right" is a total plagiarization of Blind Faith's late-60's version, and "Stormy," which adheres strictly to the original arrangement, is simply lacking any characteristics which might transform it into a Santana song. Maybe they'll have their hits now, and Santana is as deserving of them as anyone, but it's unfortunate that Santana has to lose its true soul in its effort to conform to its accountant's concept of soul. J.T.

JAZZ

RETURN TO FOREVER: *Live — The Complete Concert.* [Chick Corea, producer; Dave Palmer, engineer; recorded May 20-21, 1977 at the Palladium Theatre, New York, N.Y. by Fedco Remote Recording Facility.] Columbia C4X 35350.

Performance: **Snazzy**
Recording: **Classy**

My-my, fusion music *has* come a long way, baby . . . to boxed, four-record sets no less. And the prestigious packaging of this *Complete Concert* is suitable attire for the snazzy sounds to be found inside—eight sides and 2:45 worth of extremely varied jazz and fusion music. If you witnessed any one of the sixty-eight concerts played by this "big band" version of RTF, you'll know exactly what to expect from this exquisitely recorded set— right down to Stanley Clarke's seemingly choreographed crowd rebuff prior to "Serenade."

On tour shortly after the release of *Musicmagic* in the spring of '77, Corea & Clarke were fronting an aggregation of ten musicians, including a six-man horn section (multi-reed whiz Joe Farrell unharnessed at last) and Chick's steady girl, former Mahavishnu Orchestra keyboardist-singer Gayle Moran. Listeners then (and now) were at first shocked by the tight and brassy pizzazz of Corea's arranging for horns. The entire performance was glossy and rehearsed, almost a technical overindulgence had it not been done so flawlessly well. Opening with a twenty-

seven and a half minute rendition of "The Endless Night," Return To Forever proved stunningly schooled and almost too ambitious in its attempt to touch all musical bases. Those who identified RTF with powerhouse jazz-rock were at first dismayed by the sophisticated metamorphosis.

But although they were forced to sit through Ms. Moran's soulless "Come Rain Or Come Shine," and her equally mediocre vocal duets with an unimpressive (vocally) Clarke on "Musicmagic" and elsewhere, every music fan got what he or she wanted from RTF. Farrell can be heard nabbing several fine soprano and tenor sax solos, the horns snap right into place in all the critical spots, Gerry Brown simmers nicely on traps, and the music ranges far and wide. Even within the context of extended charts to "So Long Mickey Mouse" or "The Endless Night" there is an enormous amount of creative ground very well covered.

But the four featured performers all take substantial solo spots, Moran's so-so vocal standard followed by Farrell's sensitive tenor on a blues-to-bop "Serenade," and then Clarke's miraculous acoustic bass improvisation, taking up all of side six, on "The Moorish Warrior And Spanish Princess." Known primarily for the inroads made with his twang, lightning-quick electric bass play, Stanley really shows some grit on the upright as well.

RETURN TO FOREVER: Prestigious packaging of snazzy sounds

Corea's solo piano spotlight comes last, leading right into the complete "Spanish Fantasy" from *My Spanish Heart* (Polydor). Of course, Chick is just awesome as a multi-keyboardist (surpassed only by Joe Zawinul these days), but his acoustic playing has again come to the fore on his all-piano tour with Herbie Hancock (hopefully another "live" recording) and on the straight

jazz LP *Friends* (Polydor). His soloing here goes from fluid mood setting to classical austerity and then foot-stomping gypsy campfire music. And after the electrifying "Spanish Fantasy" concludes the concert, Chick encores with Stanley on an acoustic exploration of "Green Dolphin Street." You couldn't really ask for much more than RTF *Live*, unless it's Corea's brand new jazz-Latin "Suite For A Hot Band" as recorded by the Woody Herman Band on *Chick, Donald, Walter & Woodrow* (Century CR-1110)—equally tasty sounds. R.H.

LARRY CORYELL: *European Impressions.* [Michael Cuscuna, producer; recorded July 23, 1978 at the Montreux Jazz Festival, Montreux, Switzerland, by Mountain Studio, Dave Richards, engineer; and at Soundmixers, New York City, August 17, 1978, William Wittman, engineer.] Arista Novus AN 3005.

Performance: **Impressive to the core**
Recording: **Too close for comfort but they do get the big sound**

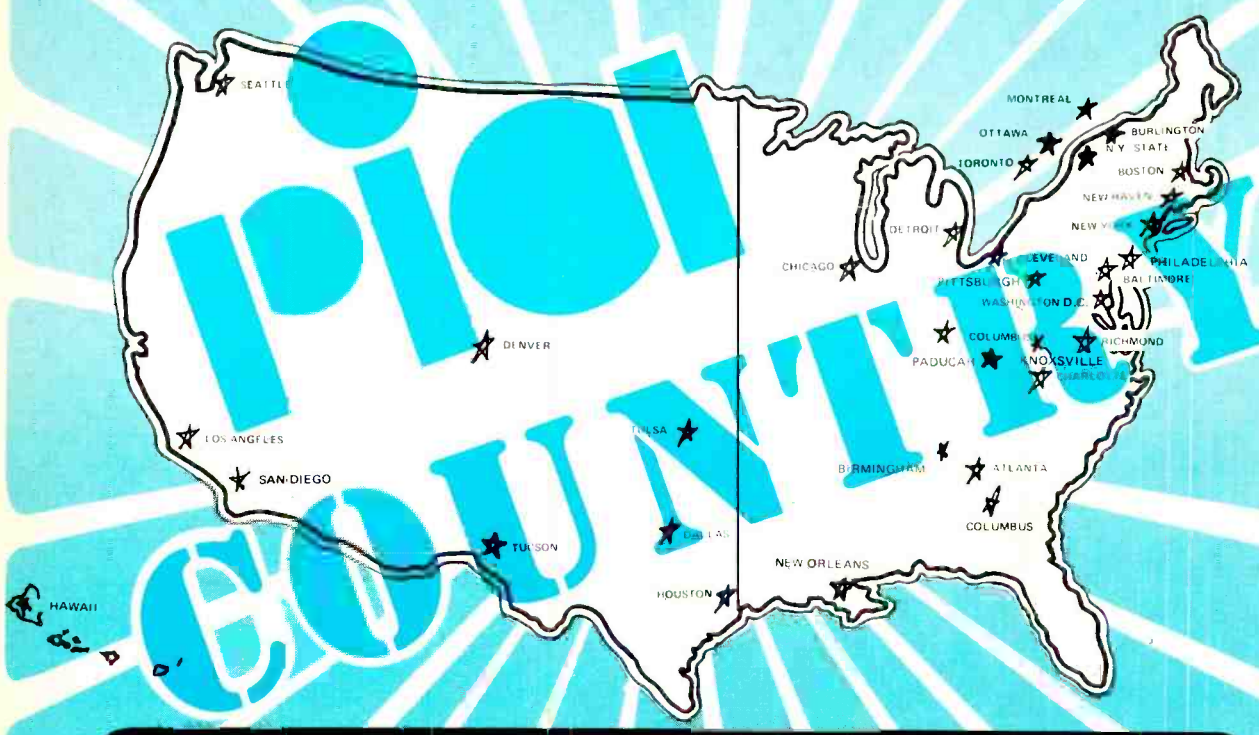
When it comes to technique there are few contemporary guitarists who can come close to Larry Coryell on the instrument. The problem with technique is the temptation to play for technique's sake and cover up the music. Yet if the listener wants to be impressed with fancy guitar playing, this is the place to come. Sooner or later it becomes a display of "look what I can do and how fast I can do it" rather than letting the music rest on its own merit.

The music presented here does have considerable merit to rest on. Like Duke Ellington, Charles Mingus and probably Franz Liszt before him, Larry Coryell is in transition from a musician who writes tunes now and then to a composer whose main goal in performing is to expose the latest pieces he has written. Larry Coryell has written some good ones and he exposes them here. His impressions are of cities ("Toronto Under The Sign Of Capricorn"), Belgian-born guitarists ("For Philip and Django") and composers of classical ("Rodrigo Reflections") and jazz (a Horace Silver medley including "Song For My Father" and "Sister Sadie").

LARRY CORYELL: Impressive soloing

Larry does get a magnificently full rich sound...my attempts to discover just what make of guitar he plays on these performances have led only to frustration. Once again, as I've pointed out with acoustic guitar recordings in the past, the microphone is so close to the strings of the guitar that every bit of string noise is picked up. Some guitarists like this, they say it makes

RECORDING INSTITUTE OF AMERICA, INC.



When today's music conscious society made recording the new art of self-expression, the RIA created the nationally acclaimed ten week course, entitled Modern Recording Techniques, in the art of multi-track recording. All classes are conducted on location at 16 and 24 track recording facilities. Under the guidance of professional recording engineers as instructors, the students see, hear, and apply the techniques of recording utilizing modern state of the art equipment. The course includes: mono, stereo, multi-track (4, 8, 16 track) magnetic tape recorders-theory and operation: microphones-basic theory and operation; control console-function and operation; overdubbing principles, echo techniques, equalization and limiting principles, multi-track "mixdown" principles (16 track to 2 track stereo); and tape editing techniques. The course concludes with live recording sessions so that the student may apply the techniques learned. The RIA is the largest and most respected network of studios offering musicians and creative audio enthusiasts the chance to experience the new world of creative recording.

FOR INFORMATION ON RIA'S MODERN RECORDING TECHNIQUES COURSE, CALL OUR LOCAL REPRESENTATIVE IN THE FOLLOWING CITIES:

AMES, IOWA
A & R Recording Studio
(515) 232-2991

ATLANTA, GA
Apogee Recording Studios
(404) 522-8460

BALTIMORE, MD
Sheffield Rec's Ltd., Inc.
(301) 628-7260

BIRMINGHAM, AL
Solid Rock Sound
(205) 854 4160

BURLINGTON, VT.
Starbuck/Ashley Recording
(802) 658-4616

CHARLOTTE, NC
Reflection Studio
(704) 377-4596

CHICAGO, ILL.
Universal Recording Studios
(312) 642-6465

CLEVELAND, OHIO
Agency Recording
(216) 621-0810

COLUMBUS, OHIO
Mus - T - Col Rec'g
(614) 267-3133

COLUMBUS, GA.
HNR Studios
(404) 327-9431

DALLAS, TEXAS
Sound One
(214) 742-2341

DENVER, COLO.
Applewood Studios
(303) 279-2500

DETROIT, Mich.
Recording Institute
(313) 779-1380

HONOLULU, Hawaii
Audissey Sound
(808) 521-6791

HOUSTON, TEXAS
Wells Sound Studios
(713) 688-8067

KNOXVILLE, TN
Thunderhead Sound
(615) 546-8006

L.A./ORANGE COUNTY, CA
United Audio
(714) 547-5466

NEW HAVEN, CT
Trod Nossel Productions
(203) 269-4465

NEW ORLEANS, LA
Knight Recording
(504) 834-5711

NEW YORK, N.Y.
RIA
(212) 582-0400

NORTHERN N.Y. STATE
Michele Audio
(315) 769-2448

PADUCAH, KY
Audio Creations
(502) 898-6746

PHILADELPHIA, PA
Starr Recordings
(215) 925-5265

PHOENIX & TUCSON, ARIZ
Lee Furr Studios
(602) 792-3470

PITTSBURGH, PA
Audio Innovators
(412) 391-6220

RICHMOND, VA
Alpha Audio
(804) 358-3852

SANTEE/SAN DIEGO, CA
Natural Sound
(714) 448-6000

SEATTLE, WASH
Holden, Hamilton
& Roberts Recording
(206) 632-8300

TULSA & OKLA CITY, OKLA
Ford Audio and Acoustics
(405) 525-3343

CANADIAN REPRESENTATIVES

MONTREAL, QUE.
RIA
(212) 582-0400

OTTAWA, ONT
MARC Productions
(613) 741-9851

TORONTO, ONT.
Phase One Recroding Studio
(416) 291-9553

CIRCLE 65 ON READER SERVICE CARD

Classic Modern Jazz/Philly Joe, Sonny, McCoy and Colleagues

By Nat Hentoff

Talking about his respect for the drummer Philly Joe Jones, Miles Davis once told me: "Jazz has got to have *that thing.* You can't learn it, you can't buy it. You have it or you don't. And no critic can put it into any words. It speaks in the music. It speaks for itself. And Philly Joe, he's got it."

And yet, accurate as that assessment was, this fiery yet subtle drummer had been off the main jazz scene for some time before re-emerging last year on tour with Bill Evans. And there had not been an American album under Philly Joe's name for fifteen years until the curent Galaxy set, *Philly Mignon.* The explosiveness of Philly Joe's work with Miles in the late 1950s has been sublimated here into highly disciplined but infectiously relaxing drumming in a session of authoritatively classic modern jazz blowing—the kind of performances that outlast changing fashions.

Alternating on tenor are Dexter Gordon and Ira Sullivan—both strong-voiced, supple masters of jazz time. The perennially underrated Nat Adderley plays cornet on several tracks; Ron Carter is characteristically large of tone and feeling; and George Cables plays with a secure inventiveness that marks the playing of everyone else as well. Nobody's straining to be hip here. The music is a distillation of where they've all been in modern jazz history and how much, based on those roots, they still have to say. Which is a lot.

The sound is crisp, precisely balanced, with a natural presence most befitting the natural force of these players.

Another set of classic (for the ages) improvising is the two-volume *Milestone Jazz Stars in Concert,* recorded on the road during the 1978 fall tour of the "Milestone Jazz Stars" (Sonny Rollins, McCoy Tyner, Ron Carter, and drummer Al Foster). There are only four players, but the range and diversity of imagination excel what often happens at one of those lengthy jazz festival evenings with what seems like a cast of too many thousands.

Moreover, producer Orrin Keepnews has judiciously selected his tapes to provide a provocative variety of settings: quartets; duets between Tyner and Carter and then between Rollins and Tyner; solo performances by Carter and by Tyner; and a trio track with Rollins, Carter and Foster. It's hardly that startling a concept, but monochromatic programmers could learn from Keepnews.

The playing is full of surprises, many of them from Rollins who is at the height of his thrustingly lyrical powers, bending melodic lines into ever new contours—and all the while making everything he does fuse with his sweeping rollercoasterish command of time. Tyner, the most percussive of modern pianists, is less dense and more high-spirited here than on many of his own dates. Carter, of course, is formidably flawless; and this tour has certainly revealed the impressive extent of Al Foster's skills.

Although recorded in three different locations, the quality of sound is consistently superior and indeed, ranks with that of the best of "live" jazz sessions—particularly with regard to the fullness of the individual and collective presence of these great and magisterial improvisers.

PHILLY JOE JONES: ***Philly Mignon.*** [Ed Michel, producer; Baker Bigsby, engineer.] Galaxy GXY-5112.

SONNY ROLLINS, McCOY TYNER, RON CARTER: ***Milestone Jazz Stars in Concert.*** [Orrin Keepnews, producer; Jim Stern, engineer.] Milestone M5-55006.

the record sound more authentic. I personally find string slide and pick noise, when it appears on a record, distracting and annoying. Yet it seems the only way to get a full range recording of an acoustic guitar leaving as alternatives either electric amplification (God forbid) or the fuzzily focussed sound of a distant pickup. Side two which was recorded at Soundmixers studio in New York has somewhat better sound than side one which was recorded live at Montreux but in a studio sound can be managed. At a concert all you can do is set up the best you can and hope for the best (prayer and a rabbit's foot sometimes helps).

Actually it's a good record. I'd rather hear Coryell unaccompanied since his bands always tend to shatter the decibel level. It's part of the current jazz/rock/fusion syndrome that musicians playing together feel the need to play louder to hear themselves. Alone they can deal with music at listenable levels but add a bass and drum and keyboard and it seems to be an automatic invitation to enter the threshold of pain. I'm glad that Larry Coryell is recording by himself—I only hope it gets to be a habit. J.K.

SHOWS and SOUNDTRACKS

FRED ASTAIRE: *The Astaire Story.* [Norman Granz, producer; Lowell Frank, engineer; recorded in December 1952 at Radio Recorders, Los Angeles, Ca.] DRG Archive DARC 3 1102.

Performance: **Astairey-eyed magnificence**
Recording: **Better than the originals, as I remember them**

What made Fred Astaire the king of movie song and dance men was as much his cinematic charisma as it was his dancing talent or his singing ability. That's why Fred Astaire never did work as well on records as he did in film; the nimble body, the plastically changeable expressive face (he was a master of the double take), couldn't come across on wax. People bought the records for several reasons. One is that they represented a take-home-and-playable memory of a film they enjoyed (all Fred's films were enjoyable fluff). Another is the fact that Fred was (and I guess, still is) an enjoyable, engaging, fun-type singer even if he didn't have the voice of Crosby or Sinatra. Another is the wonderful tunes that the best songwriters of the day wrote for him.

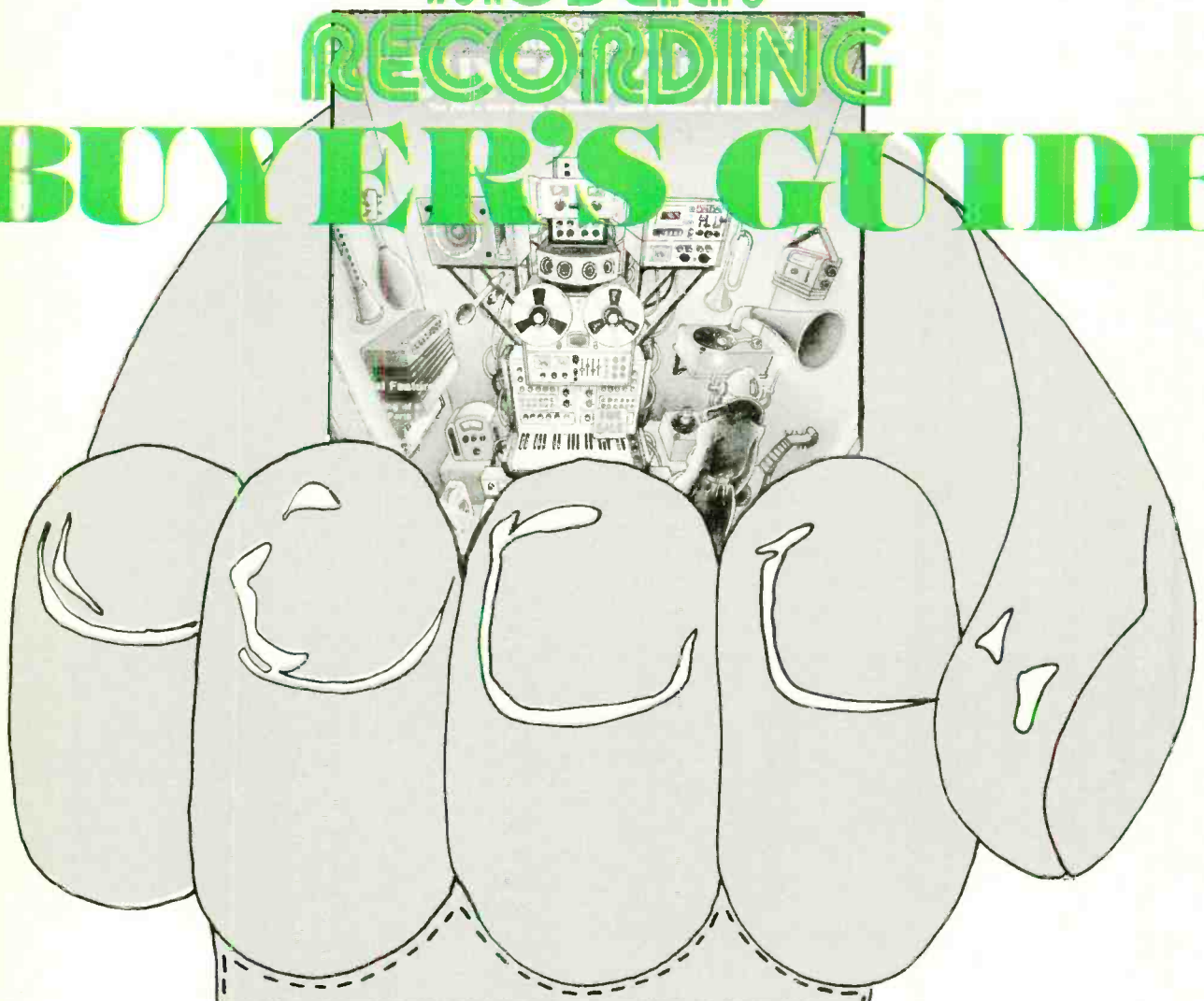
So it's no wonder that the idea of a Fred Astaire project appealed to Norman Granz in December of 1952. By that time most of Fred Astaire's musical film career was behind him, although he was still to star in the film remake of *The Band Wagon*, *Daddy Long Legs*, *Funny Face* and *Silk Stockings* before he launched his career as an actor in non-musicals with *On The Beach*. The Astaire films that fans most cherish came between 1934, *The Gay Divorcee*, and 1940, *Second Chorus*—most of them costarring Fred with Ginger Rogers. His earlier films, such as *Flying Down To Rio*, are considered Astaire trivia even by those nostalgia buffs who worship Fred. The later films, including those teaming him with Bing Crosby, were a completely different type of film and a completely different side of Fred Astaire. It's most interesting to hear Fred Astaire at age 53 singing songs he had made popular be

tween twelve and eighteen years earlier. Some of the songs in this three-record set of Astaire backed by the cream of Norman Granz's Jazz At the Philharmonic unit are more recent than the golden age of Astaire, some are older, but it's the tunes from *Top Hat* and *Shall We Dance* and *Damsel In Distress* that we'll always remember when the name Fred Astaire is dropped. And, oh what songs they are! Who doesn't have fond memories of tunes like "Cheek to Cheek," "A Foggy Day," "A Fine Romance"and so many others? There's even some that Granz and Astaire omitted that I wish they hadn't been forced to by the limits of time and space. They left out "Let's Face The Music And Dance" and "Pick Yourself Up" but there are more than thirty songs from Astaire films and Broadway shows plus several tap dance jams with the All Stars (Charlie Shavers, Flip Phillips, Oscar Peterson, Barney Kessell, Ray Brown, Al Stoeller) and some jams by the All Stars without tap dancing. There's also a book of photos by Gjon Mili and drawings by David Stone Martin.

If you want to compare these versions by Fred Astaire in 1952 with the classic late '30s Astaire, many of his old Brunswick 78s have been reissued by Columbia in an album called *Starring Fred Astaire.* The first difference you'll notice is that Fred Astaire at 53 seems to prefer slower tempos than he did in his late thirties or early forties. Is he getting tired? *No.* First of all, the Brunswicks were accompanied by the society-type bands of Leo Reisman, Johnny Green and Ray Noble. On these records Fred has the help of the top jazz artists available to Norman Granz in 1952. The society bands were used to quick-step tempos for the dancers at the Coconut Grove. The jazzmen were allowed more flexibility. Another factor is that the 78 RPM Brunswicks could handle a bit more than three minutes playing time at the most. With an LP, Astaire could take as much time as he wanted on any tune—and doesn't "Cheek to Cheek" work wonderfully at the 1952 tempo? Another advantage of Astaire with Granz's jazzmen is the kind of inspiration that giants like Peterson and Phillips can give a singer like Astaire. Listen to Shavers and Fred interacting on "No Strings," a nearly forgotten Irving Berlin song from *Top Hat.* There are also two songs composed by Fred Astaire one of which, "Not My Girl," includes the only known recorded example of Astaire's

1979

MODERN RECORDING BUYER'S GUIDE



14 VANDERVENTER AVE., PORT WASHINGTON, N.Y. 11050

SUBSCRIBER OFFER:

I am a current subscriber to MODERN RECORDING MAGAZINE. Enclosed please find $ for copy(s) of MODERN RECORDING's "Buyer's Guide" ($1.75 each - subscriber's price)

NON-SUBSCRIBERS'S OFFER:

I am enclosing $ for copy(s) of MODERN RECORDING's "Buyer's Guide at $2.75 each.

check ☐ / money order ☐ / enclosed for the amount of $_____

Please Print

Name _____

Address _____

City / / State Zip

Date

904C

twenties-style piano, followed by an amusing Oscar Peterson takeoff which hits both Erroll Garner and Fats Waller.

The original issue was on four Clef LPs. With the new mastering techniques that have been developed since 1952, they all get on three LPs with enough room left over for a couple of unissued items and alternate takes. As I remember the Clef LPs (I traded them off awhile back to an Astaire collector who just *had* to have them), they had a lot more echo chamber than these reissues. The sound here is incredibly clean, especially considering that DRG was working with latter generation tapes rather than virgin material. A large order of thanks is due Hugh Fordin and his DRG archives for making their initial jazz issue something this worthwhile. J.K.

CLASSICAL

MIASKOVSKY: *Cello Sonata No. 1 in D, Op.12; Cello Sonata No. 2 in A minor, Op. 81.* Yehuda Hanani, violoncello; Daphne Spottiswoode, piano. [Ilhan Mimaroglu, producer; Ray Hall, engineer; recorded at RCA Studio A, New York, N.Y.] Finnadar SR 9022.

Performance: **Beautiful**
Recording: **Excellent**

There seems finally to be a realization that the piano and the violin are not the only instruments worthy of great soloists and great solo repertories. Where there used to be 200 pianists for each major trumpet player, flutist, clarinetist or cellist, there now seems to be a proliferation of virtuoso soloists playing "orchestral" instruments. Many of these are finding, however, that the literatures for their instruments are rather limited, leaving them basically three options: playing the same works everyone else plays, transcribing works written for other instruments, or spending some time in the library digging up scores that have been collecting dust for years because there was no one to play them.

Happily, cellist Yehuda Hanani is the kind of musician who has done his share of all three. And equally fortunate is that he is working with a producer (Ilhan Mimaroglu, himself a noted com-

poser) who takes the time to assist in the process of finding out-of-the-way repertoire. These two cello sonatas, in fact, were "discovered" by Mimaroglu in the New York Public Library.

In the late 1940s, Miaskovsky was considered to be one of the "big four" Russian composers, along with Prokofiev, Khachaturian and Shostakovich. Like the others, he was attacked in the Stalin years for that great sin of bourgeois composition, "formalism." The *Second Cello Sonata* is the piece he wrote to have himself forgiven, and so, obviously, is a throwback to the sound of an earlier era. The *First Sonata* is also a conservative sounding work, and according to the wonderfully comprehensive sleeve notes by Richard Taruskin, even Miaskovsky found it to be "sugar water with sighs out of Rachmaninoff and Tchaikovsky."

Well, whether or not these two works, written in 1911 and 1949 both sound as if they were written in the 1880's, the fact remains that they are elegant and emotionally quite moving. Yes, there are echoes of the *Franck Sonata* in the *First* and a sometimes too lugubrious quality to the *Second*, but all that suits the cello quite well, and Mr. Hanani invests them with such beautiful dynamic and timbral shading that you can't help but be taken in.

The recording here is really exquisite: the cello dominates on the right, the piano on the left, the separations being rather subtle and giving the impression that all comes from the center rather than being artificially separated. The pressing is flawless and quiet. Finnadar is a small neglected division of Atlantic Records that has, in the past three years or so, been putting out a great variety of music which, like these pretty Sonatas, has gone unheard for no good reason. Company founder Mimaroglu deserves special mention for his endeavors not only in connection with this disc, but for Finnadar itself.

Yehuda Hanani, who was born in Jerusalem and who now lives in New York, plays a 1761 Gagliano cello, from which he elicits a smooth, streamlined sound. Now in his early thirties, he seems on the evidence of this disc and his concert and radio performances to be developing into a worthy successor to the Casals/Rostropovich line of cello virtuosity. Miss Spottiswoode is a sympathetic accompanist, whose performance here blends beautifully with that of the cellist, although the music affords her comparatively little opportunity to impress on her own. A.K.

Advertiser's Index

CLASSIFIED ADS

FREE INFO! "Unique" piano, guitar and music recording methods. SELF-TAUGHT . . . hours. Guaranteed. Music Magic Co., Box 656, Dept. MR, Ellicott Sta., Buffalo, N.Y. 14205.

A 140-page comprehensive directory listing names, addresses, and phone numbers of every major record company, publishers, booking agents, managers and independent record producers. Also, sample contract forms for each. All for $4.95. R.I.A., 15 Columbus Circle, New York, N.Y. 10023.

If you have an 8 or 16 track studio, and are interested in becoming a licensed representative for R.I.A.'s Modern Recording Techniques courses, call or write: Mr. P. Gallo, R.I.A., 15 Columbus Circle, New York, N.Y. 10023 (212) 582-3680. A Large profit potential with low operating costs.

THE DISCO CO. Installation and portable disco's available from one of the most experienced sound companies in this field. Also, professional P.A. and recording systems. For information write to: Tim Azzaria, 1510 Cypress Ave., Burlingame, Ca. 94010.

FREE information on home recording studios. Send stamped envelope to Trackmasters, Box 585, Bremerton, Washington 98310.

Send for our catalog of studio, musical and stereo equipment: Tascam, EV, Technics, BiAmp, BGW, C-V, dbx, Kelsey, SFW, Tangent, more. Recording Sound Co., 1871 Seminole Trail, Charlottesville, Va. 22901. (804) 973-1110.

TASCAM 80-8 eight track recorder. Rack mount. Totally recalibrated. No dbx. $2000.00 (305) 422-0790.

Soundcraft Series I Mixer, 16 × 2, 2 years old. Real clean. $1875.00. Heyday Sound, Toledo, Ohio 419-476-3835.

Best price on Teac, Tascam, Ampex, Sennheiser, Allison, Eventide, Sound Workshop, UREI, BGW, Electro-Voice, JBL and more. Paul Kadair's Home and Commercial Audio, Baton Rouge, La. (504) 924-1006.

INDEX INDEX INDEX. Modern Recording Magazine. Keyword, for entire magazine. Jan-June 1978 $3.00; Jly-Dec. 1978 $3.00. Each 350 + keywords, 650 + entries. NJ add 5% tax. Foreign $2.75 plus 3 oz. postage. SASE for sample page. RF Products, P.O. Box 270, Lyons, N.J. 07939.

Mixing console, Stevenson Interface 16 × 4, excellent condition, many extras, must sell! Best offer. CSE Studios, P.O. Box 33, Hilton, N.Y. 11468.

WANTED: Recording equipment of all ages and varieties. Microphones, outboard gear, consoles, tape decks, etc. Dan Alexander, 6026 Bernhard, Richmond, Ca. 94805. (415) 232-7933 or (415) 232-7818.

Use MODERN RECORDING's Classified Ads- They Get Results!

Complete sound system packages. Touring P.A. or permanent installations. Crown, JBL, Community, Yamaha, Canary, Shure, EV, Sennheiser, Eventide, Tapco, Soundcraft & many more. Contact: Steve Simmons (405) 525-3343.

FOR SALE 3 yr. old Ampex AG-440B, mono rec-stereo repro, 19" rack mountable, GC. 2 yr. old Ampex AG-440C, 8 tr. in console, GC. 1 yr. old Tascam 80-8 w/dbx-8, VGC. Mint cond. dbx 187, 4 chan. bal. in/out. Contact: Steve Simmons (405) 525-3343.

FOR SALE MCI 24 track with 16 track heads. Well maintained workhorse, reasonable. M. Guthrie (212) 581-6505.

MODERN RECORDING

BUY • SELL • TRADE
- PRODUCTS
- EQUIPMENT
- SERVICES

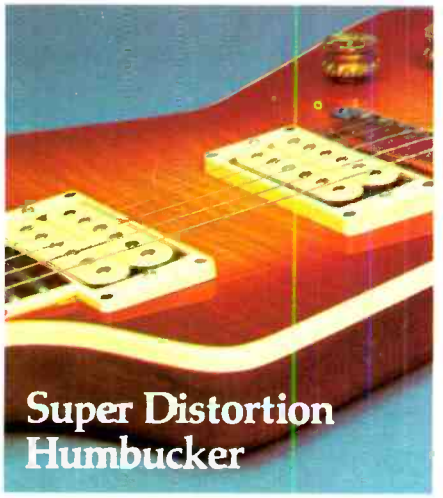
Classified Rates
75c per word

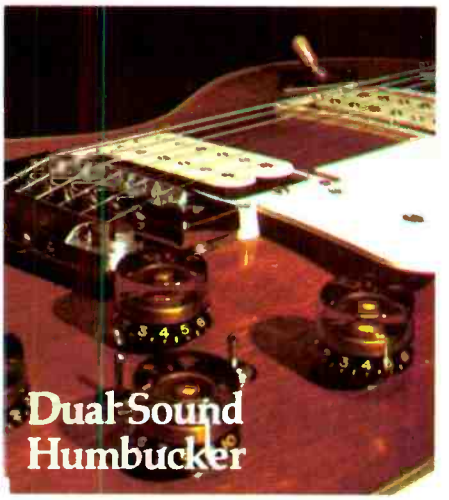
Minimum 10 words. Copy must be received at Modern Recording, 14 Vanderventer Avenue, Port Washington, N.Y. 11050 by the 1st day of the 2nd month prior to cover date (for example, the April issue closes February 1st). Payment must accompany order. Phone numbers count as 1 word. Zip codes are free.

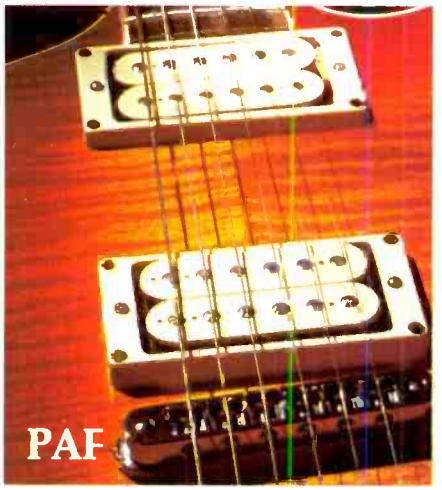
DISPLAY ADVERTISING
$100.00 per column inch

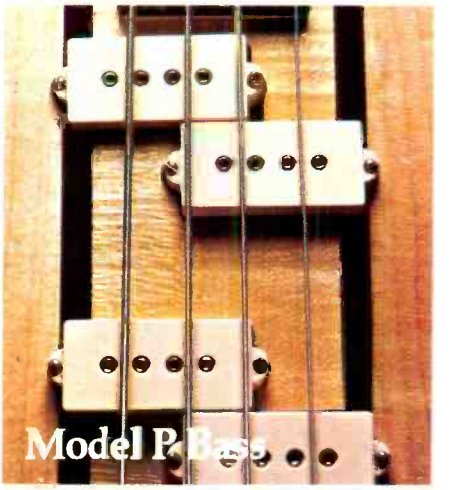
CLASSIFIED

Don't choose one of these for our sound. Choose one for yours.









For a full color catalog on all our fine pickups, send 75¢. Also, if you'd like a poster of this ad, send $1.00 to cover postage and handling.

DiMarzio
Musical Instrument Pickups, Inc.

2388 Richmond Terrace
Staten Island, N.Y. 10310
(212) 981-9286

CIRCLE 107 ON READER SERVICE CARD

Years ago this was a flanger.

Incredible, isn't it? But when flanging was first used, it was done like this. Rumor has it that the first time flanging was achieved, it happened by accident. An engineer mistakenly leaned on the flange of a moving reel altering its speed relative to another simultaneously moving machine. The sweeping sound that resulted was one of an enhanced tonality, similar to a phase shift but also having characteristics of its own. This phenomenon became the hottest new sound in the recording industry overnight, but there were problems. In order to duplicate the flanging sound one had to obtain three recording machines, one experienced engineer, and a lot of time.

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 itself, and regeneration of the flanged signal for more intensity.

But it doesn't stop there. The MXR flanger's long time delay capabilities make it one of the most versatile effects on the market. By varying the delay range, colorations from subtle to bizarre are easily available, as well as really thick twelve-string simulation. We think it's incredible, and we believe you will too.

MXR Innovations, Inc., 247 N. Goodman Street, Rochester, New York 14607, (716) 442-5320

MXR Professional Products Group

CIRCLE 94 ON READER SERVICE CARD