SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

$2.00

VOL. 3 NO. 3
APRIL 1980

CONFRONTATION: JOUSTING WITH THE CUSTOMER

RETAILERS ON PRO SOUND
INSIDE A PRODUCTION COMPANY
SOUND AND THE SUBWOOFER

Expression through equalization.

The MXR Dual-Fifteen Band and Thirty-One Band equalizers are cost effective electronic signal processors designed to meet the most exacting equalization requirements in a wide range of professional applications.

The MXR Dual-Fifteen Band equalizer can be used to tailor the frequency response of two sides of a stereo system, or it can act as two separate mono equalizers. In performance one channel can equalize the house system, while the other is used independently in the stage monitor line adjusting frequency response and minimizing the possibility of feedback. In the studio the Dual-Fifteen Band equalizer can be used to compensate for control room acoustics.

The MXR Thirty-One Band equalizer provides maximum detail in the most demanding equalization applications. It can be used in pairs for ultimate stereo control, or in live performance interfaced with PA systems and other instruments. The Thirty-One Band equalizer is also the perfect tool for conditioning film or video sound tracks, and in mastering applications.

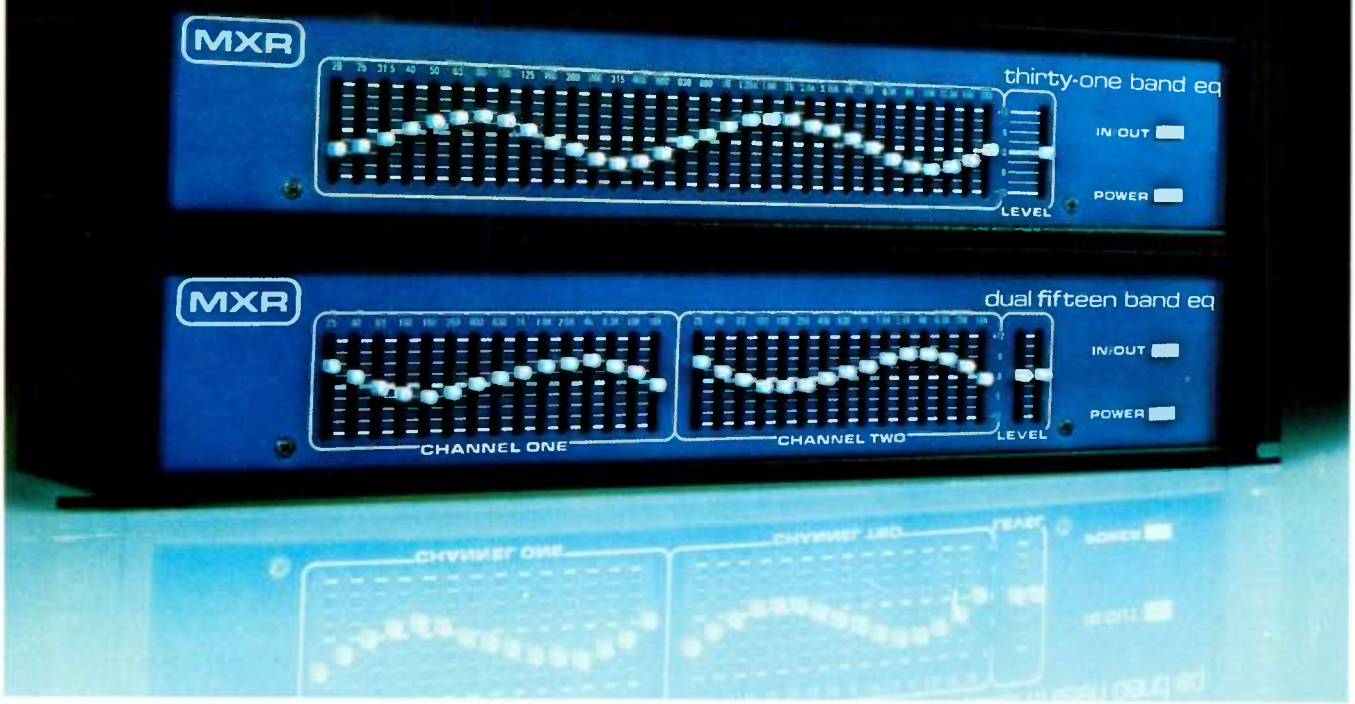
The spacing of frequency bands on ISO centers (2/3 octave in the Dual-Fifteen Band; 1/3 octave in the Thirty-One Band) and a flexible system of controls offer superior accuracy in frequency equalization. Each band can be boosted or cut over a range of ±12 dB. Clear, readable markings alongside each level control allow for quick and accurate checks of equalization settings, and aid in resetting the sliders to predetermined positions. The tight mechanical action of the sliders prevents slips during indelicate handling.

The MXR Pro Group equalizers afford maximum control of frequencies while maintaining the highest level of sonic integrity. The Dual-Fifteen and Thirty-One Band equalizers both have a dynamic range exceeding 110 dB and, as all MXR Pro Group products, will drive low impedance lines. Audio signal, including transients, is reproduced faithfully due to a high slew rate and a wide bandwidth.

The MXR Dual-Fifteen and Thirty-One Band equalizers are designed to withstand the demands of a professional road and studio schedule. Their superior design and superb craftmanship reflect MXR's continuing commitment to the manufacture of the highest quality electronic signal processors for today's creative artists.

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

MXR Professional Products Group



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT No. 392, PORT WASHINGTON,N.Y.

POSTAGE WILL BE PAID BY

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL
14 VANDERVENTER AVENUE
PORT WASHINGTON, N.Y. 11050

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT No. 392, PORT WASHINGTON,N.Y.

POSTAGE WILL BE PAID BY

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL
14 VANDERVENTER AVENUE
PORT WASHINGTON, N.Y. 11050

CONGRATULATIONS!

You're a part of the only growing market of the 80's!

A market of exciting new creative audio, sound re-inforcement and electronic musical instrument products.

TO RECEIVE INFORMATION ABOUT PRODUCTS ADVERTISED OR MENTIONED IN

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

CIRCLE THE CORRESPONDING NUMBER(S) ON THIS CARD AND MAIL TODAY

NAME

STORE NAME

ADDRESS

CITY STATE ZIP

PHONE

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

TO RECEIVE INFORMATION ABOUT PRODUCTS ADVERTISED OR MENTIONED IN

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

CIRCLE THE CORRESPONDING NUMBER(S) ON THIS CARD AND MAIL TODAY

NAME

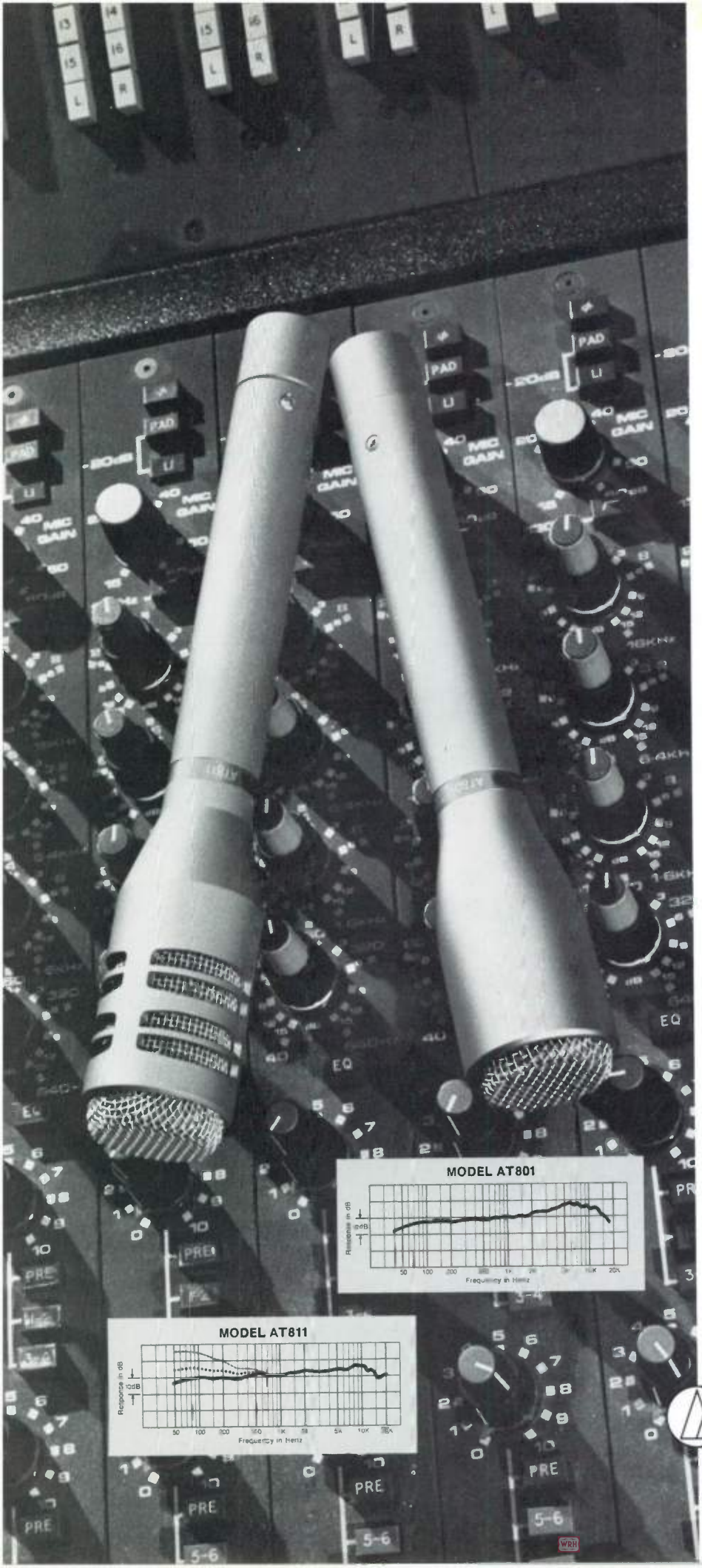
STORE NAME

ADDRESS

CITY STATE ZIP

PHONE

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
WRH 91	92	93	94	95	96	97	98	99	100



The Audio-Technica philosophy:

EQ should be used to improve the sound... not to fix the mike!

Introducing affordable smooth sound. The remarkable AT801 and AT811 Electret Condensers. With curves so smooth it would take a bundle to match them anywhere else.

Response like this has a number of benefits. First, mixer EQ is used only to touch up the sound, not to correct built-in errors of the microphone. Which leaves more leeway to control the overall sound.

And without unwanted peaks there's more usable headroom. That's vital when working near the dynamic limit of a preamp or line amp. Sound stays clean and sharp. Compressors or limiters sound less forced, because they are controlling peaks in the *sound,* not peaks in the *mike!*

But perhaps the biggest advantage is the versatility of these A-T condensers. Because they have just the right amount of presence for today's recordings, they're not limited to just one kind of instrument...just one type of voice. Put them *anywhere* in the mix: brass, reeds, percussion, chorus, or strings. Then listen. What you hear in the studio you'll hear at the console. Which is a great place to start in miking any session.

At their highly affordable prices, these are two of the best bargains you can offer your customers. Reliable, clean-sounding, and the most predictable microphones they can use. Your Audio-Technica rep has all the details. Call or write today.

Model AT801 Omnidirectional Electret Condenser

Model AT811 Unidirectional Electret Condenser

Great sound, right from the start!

audio-technica

INNOVATION □ PRECISION □ INTEGRITY

AUDIO-TECHNICA U.S., INC., Dept. 40SA
33 Shiawassee Avenue, Fairlawn, Ohio 44313
216/836-0246

VMR™... the most talked about new component in years!

"Unbelievable!" "Demo it, and it sells!" "We cranked it up, and smiles were everywhere!" "I never heard high SPL's sound so clean!"

No wonder dealers telling the VMR story have made the Electro-Voice S15-3 one of the best selling single-enclosure PA systems in the country. Instrumentalists, vocalists and sound men all have learned that a VMR in their system means incredibly clean midrange reproduction. Dealers displaying the bold VMR baffle are getting attention – and plenty of it.

The massive 16-lb magnet structure found in the VMR reproduces unmuddied midrange frequencies with the efficiency you would only expect to find with a horn. Plus the integral Thiele-aligned VMR enclosure rids systems of the "honky" sound typical of small horns. Maybe that's why companies like ARP, Oberheim, Moog and Crumar have used the S18-3 stage keyboard

system to demonstrate their synthesizer products.

The VMR is the speaker that has made the B215-M and B115-M bass guitar systems *the* bass systems to own. No wonder companies like Gibson and Kramer have used these systems to demonstrate their basses at trade shows and seminars.

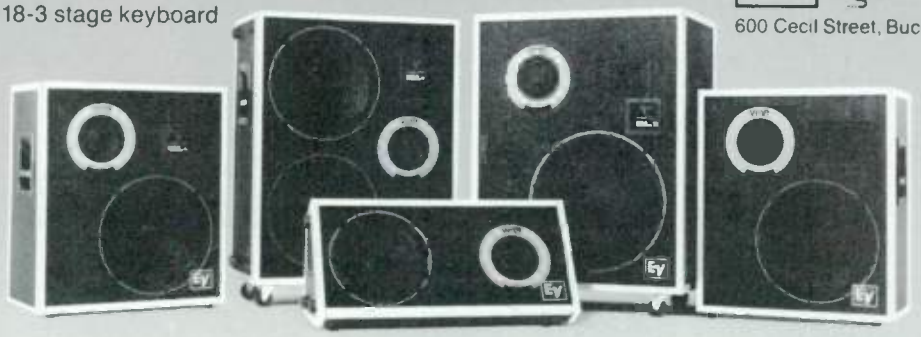
The VMR's basic accuracy is the reason you see the FM12-3 floor monitor so often on television musical broadcasts. When artists hear themselves accurately, they perform better. That's why FM12-3's sell.

If you're one of our dealers who has made VMR-based enclosures sell so well, give yourself a well deserved pat on the back. You've earned it. If you're one of our dealers who is not fully benefiting from this great opportunity, you should learn more about the VMR story. You're missing some great opportunities.

If you're not currently selling Electro-Voice VMR-based speakers, maybe you should be. They're the hottest selling systems around.

For further information about getting on the VMR bandwagon contact Chuck Gring, Music Products Sales Manager at Electro-Voice.

Electro-Voice
a gulton company
600 Cecil Street, Buchanan, Michigan 49107



CIRCLE 90 ON READER SERVICE CARD

VOL. 3 NO. 3

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

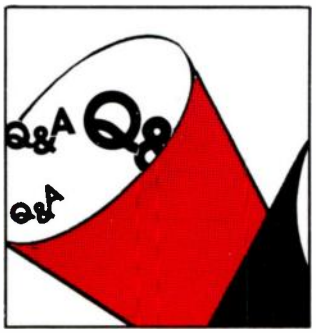
SOUND ARTS

MERCHANDISING JOURNAL

APRIL 1980

CONTENTS

THE FEATURES



THE STAPLES

COMING NEXT ISSUE!

Hot to Get and Maintain Credit
Basics of Reverberation
More on Sales Theory

Cover photograph by Doug Hanewinckel

Sound Arts Merchandising Journal (USPS 410-410) is published monthly by Sound Arts Merchandising, Inc., 15 Columbus Circle, Suite 316, New York, N.Y. 10023. Controlled circulation postage paid at Hanover, New Hampshire 03755. Subscription rates: $18.00 for 12 issues; $26.00 for 24 issues. Add $7.00 per year for subscriptions outside of U.S. Subscriptions must be paid in American currency. Postmaster: Send Form 3579 to Sound Arts Merchandising Journal, 15 Columbus Circle, Suite 316, New York, N.Y. 10023.

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL

JUDITH MORRISON LIPTON
Editor/Associate Publisher

CRAIG ANDERTON
LARRY BLAKELY
DOUG CARAWAY
STEVE CARAWAY
MEGAN FERRELL
WAYNE HOWE
CHARLIE LAWING
BARRY McKINNON
GLEN E. MEYER
HARTLEY PEAVEY
Contributors

ALLISON DRASNER
Layout and Design

MICHELLE WALBRIDGE
Production Manager

BARRY SIMON
Artist

SHERYL STERN
Artist

FRAN VITRANO
Artist

MICHAEL WALDMAN
Artist

DOUG HANEWINCKEL
Photographer

MELANIE DEUTSCH
Assistant to the Publisher

VINCENT P. TESTA
Publisher

Editorial and Executive Offices
Sound Arts Merchandising Journal
15 Columbus Circle
Suite 316
New York, N.Y. 10023
212-582-3680

Editorial contributions should be addressed to The Editor, Sound Arts, 15 Columbus Circle, Suite 316, New York, N.Y. 10023. Unsolicited manuscripts will be treated with care and must be accompanied by return postage.

A LETTER FROM THE EDITOR

Someone asked me recently which general interest magazines I thought SOUND ARTS readers read in their limited leisure time. We bandied about some familiar newstand names, but one periodical that we never considered was *House Beautiful*. Assuming I am correct in my assumption that few of you read *House Beautiful*, I will pass along an item that piqued my interest in the April issue (actually, the whole issue piqued my interest, since it is directed, believe it or not, towards men).

James Spina, in an article called "Coming to Terms with Your Stereo" advises House Beautiful readers to be sure their systems can handle two tape decks—a cassette and a reel-to-reel. The advantage, Spina tells his audience, is that "taping facilities are *the* most creative part of your system. . . . Tape . . . lets you play with sound . . . even some of your home-crafted music." Hardly a revolutionary idea, as I'm sure Mr. Spina would agree. However, the venue for the statement was new. And I am envisioning hordes of *House Beautiful* readers translating their sleeping lofts and clever little dining alcoves into home studios. Is this a hint of things to come? How many interior decorators have been in your store today?

Reading through the transcript of the Cameo seminar on Selling Pro Sound in this issue, we find more of the good-guys-bad-guys attitude on the part of retailers toward manufacturers' representatives. One dealer talks of how his reps have helped him see "the big picture" in retailing. Another bemoans the low "calibre" of reps coming into his store. Explanations of the contradiction would I guess range from the fact that there are of course both good reps and bad reps and that a certain measure of simpatico must exist between the buyer and the seller. I'd like to hear more from retailers on specific experiences where reps have helped out on problems.

The issue of relationships between buyer and seller is carried through in Hartley Peavey's article on Adversarial Selling. We're dealing here not so much with good guys and bad guys as with taking subtle control of what is at root a confrontation. And Hartley addresses that confrontation.

In "So You Want to Know" this month, Craig Anderton gives some personal thoughts on what he feels is or should be important in mixers, and deals with what he considers a misconception in the trade. Read on for enlightenment.

Regards,

Judith Morrison Lipton

The Sunn Professional Guitarists Sound Check

1. Can you select either or both channels without disturbing preset controls?
2. Are you sure of the same response at all volume levels?
3. Does your footswitch have L.E.D. and memory?
4. Do you have individual channel volume controls and master volume control?
5. Does your amp have C-MOS drive control?
6. Are you effectively patching in effects and/or other amps?
7. Can you achieve the tonal coloration you want?
8. Do your tone controls wash out at high levels?
9. Can you combine the best of tube and solid state sound?
10. Is your amp really portable?
11. Can you control channel interaction so that when you turn treble up, midrange and bass are not affected?
12. Can you use reverb without interference from your tone controls?

If you can't do all this and more with your present amplifier then you're limiting your potential performance ability.

The Sunn Beta Series can do it for you. See your Sunn Dealer and make a sound investment in your performance.

The Beta Series

sunn

Sunn Musical Equipment Company • A Hartzell Corporation Company • Amburn Industrial Park • Tualatin, Oregon 97062

CIRCLE 77 ON READER SERVICE CARD

FORUM

When reading SOUND ARTS this month, I was pleased to see Larry Jaffe's article, "Pricing In The Marketplace" [December 1979]. It is an important subject, and a ticklish one, too. It took a lot of guts to face the situation, and I'm glad someone finally came out and talked about it. But, I did want to bring up a point about Mr. Jaffe's figures. If I'm not mistaken, there is another very important figure that was left out of your discussion. This is the Gross Profit, or: Selling Price —Dealer Cost=G.P. To express it as a percentage: G.P.÷Selling Price=G.P.%. Here's an example: Let's say we have an item that lists for $100 and costs the dealer $50. Then the dealer sells it for $75. The mark-up is 50% in this case. The gross profit is 33%. When you say that dealers must make a 35% mark-up to stay alive, this translates to 26% gross profit, which is not enough to buy donuts for your employees, let alone advertise, have working capital, etc. I have found that most music store owners do not know the distinction among all these figures, and how they inter-relate. The books say, and I have found from experience, that 33% gross profit is healthy; this translates to 50% mark-up. If music store owners could understand this, they would stop discounting heavily. I think this industry suffers from a case of, "I don't want to know about it"—the way most musicians are about tech info. (There is a parable in their somewhere; might make a good article for *Psychology Today?*)

Sincerely
Gary Gand
Gary Gand Music
Highland Park, Il

Correction: *Our thanks to Martin Rabe of Flag Systems for catching a typographical error in Wayne Howe's Terms column in our October 1979 issue. The corrected sentence is: "In playing an amplified instrument on stage, a certain amount of residual noise is caused by electronics; a certain amount of 60 Hz hum is picked up by unbalanced cables and pickups; and sometimes high frequency radio signals can leak into the circuitry." The gremlins had dropped the un from unbalanced. Mr. Howe's original copy was, of course, correct.—Editor*

After reading Mike Beigel's article, "A Walk through the Waldorf ... [December 1979], I was made aware of significant advances being made in the field of digital synthesis. This is an area in which I am extremely interested and wish to become involved. I have been playing professionally as a keyboardist/synthesist for over ten years. My questions concern starting points. Who would I talk to regarding learning more about Crumar's computerized General Development System? Is it possible to purchase a system like this? Is it possible to work in conjunction with product development to pioneer this new era in electronic music synthesis? Your help in answering these questions will be of benefit to me both musically and technologically.

Sincerely,
Duane Decker
Lois Lane
West Chicago, Il

Mike Beigel replies: *For learning more about the General Development System, contact Tom Piggott at Crumar, 105 Fifth Avenue, Garden City Park, N.Y. 11040. (The system is not available for purchase.) If you want to work in product development, your best bet is to contact manufacturers individually to see if they are interested.*

I find your journal quite rewarding. There is not one article that I haven't read in the issues I've obtained. Articles such as "Terms," "Troubleshooters' Bulletin," and your info on new products and things such as synthesizer circuits and digital technology keep me waiting for each issue to arrive, so I can see where the electronic industry is headed. "Do's and Don'ts of EQ" was very timely, and much needed in this world of over-EQ.

On the other hand, "The Worst Sound Problem I Ever Had" [June 1979] was the worst article I ever read. The problems most people have are misuse and lack of consumer knowledge. Most boards *are* isolated—even if they are not modular, and often one IC "kills" one or two inputs. The article is talking about boards of the past, so it is not much use to those of us using today's technology, and I believe that is most of us. Modular or bread board assembly—if one IC is out—it's out. Most failures could be repaired if manufacturers installed IC sockets, and if consumers carried spare ICs. I found the article misplaced in a journal of this high quality. Keep up the good work.

Gary Luke
Midwestern Audio
Sioux City, Iowa

Thank you—I think. We win some and we lose some. The article in question was not meant to be specifically a how-to piece. It was meant as an explication of the grace under pressure—or necessity-and-invention combination—that is so necessary in this business.—Editor.

I would very much appreciate receiving your magazine. I found your articles on sound reinforcement quite helpful in selling new products to live sound and recording enthusiasts in the musical field.

Ron Richard
Sound Images
Wichita, Kansas

Sound Arts is available to qualified readers. Please fill out the subscription card that you will find in this magazine.

PORTABLE PRO POWER

The Peavey International Series offers you many of the features of the best of the big sound reinforcement systems, without putting a strain on your backbone.

The 112, 115, and 118 International all utilize a premium Peavey Black Widow® speaker in a ported, direct radiating, low end enclosure, with a Peavey Model 22A Driver coupled to a Peavey CH series horn for the high end. This adds up to high efficiency, superb response, and a walloping 300 Watts of power handling capability. Impressive.

Traditionally, smaller sound systems have been characterized by narrow bandwidth and low efficiency, requiring lots of headroom-robbing equalization for passable response. But we're changing all of that. Because we want you to sound your very best...while we're sounding our very best.

THE PRO SOUND SERIES

PEAVEY

PEAVEY ELECTRONICS CORP.
711 A Street/Meridian, MS. 39301

CIRCLE 81 ON READER SERVICE CARD

Today's hottest recording group.

Latest sales figures show that Maxell is the fastest-growing brand of recording tape in the country today.

It's not surprising.

Maxell cassettes are used by more people who own the finest tape equipment than any other brand.

Our open-reel and eight-track tapes have been accumulating some great performance records of their own.

Call your Maxell representative for an audition.

You'll find he, like our tape, is really worth listening to.

maxell

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

WRH

CIRCLE 99 ON READER SERVICE CARD

TEAR HERE

TERMS:

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Larry Blakely

Direct Drive Capstan: A capstan for a tape recorder that is actually the motor shaft from the capstan drive motor. On many tape recorders, the capstan is a metal shaft that is driven via a belt or rubber tire linkage, which is usually more susceptible to unwanted speed variations—especially when the belts or tires become dirty or worn. A good direct drive motor can maintain accurate speed as long as the motor is in good repair.

Pause Control: A feature that is found on many tape recorders today that will allow the tape motion to be stopped and started without disabling the record electronics. This will allow one to make a tape copy of something, stop the tape easily and prepare the next thing to be copied, then simply start the tape moving again.

Gap: The distance between the two pole pieces of a tape head. It is necessary for the gap of a playback head to be narrow, as the narrower the gap the better high frequency response the playback head will have. However, for a record head the gap is usually wider. If the gap of a record head is too narrow it will require more bias signal to record the audio signal and will often cause the record head to become very warm which could cause damage to the head. (See figure 1.)

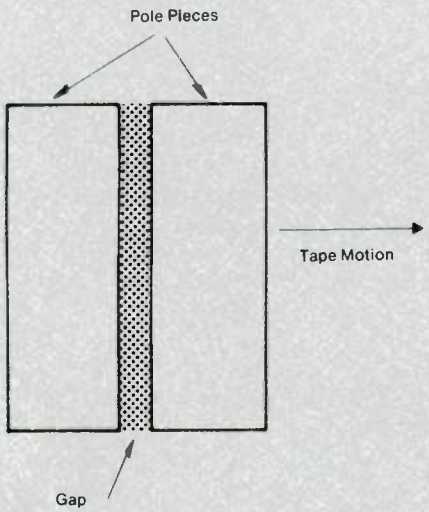


Figure 1 Tape Head and Gap

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Wayne Howe

Waveform: Any electrical or acoustical event represented as a function of time.

Periodic Waveform: A periodic waveform is any electrical or acoustical event that is repeated over time. A periodic waveform is usually used to refer to a pattern of a certain frequency which repeats itself over and over again. Each repetition is referred to as a *cycle.* Each cycle starts at zero; has a positive excursion; goes through zero to a negative excursion; and then returns to zero to begin a new cycle. The number of times that the cycle is repeated in one second determines the frequency or pitch of the fundamental note of the waveform being played.

$$\text{Frequency} = \frac{\text{Cycles}}{\text{Time}}$$

The unit measurement of frequency is referred to as Hertz (Hz). The older frequency measurement unit was cycles-per-second. This unit was invariably abbreviated to "cycles," a term whose usage was sometimes confusing and usually technically incorrect. The fundamental waveform in the spectrum analysis drawings of the waveforms below is labeled f_1 and is the tone which is perceived by the ear as pitch. The other frequencies, f_2, f_3 . . . are harmonics.

Sine Wave: This periodic waveform is the purest waveform, *i.e.*, it theoretically has no harmonics, but is composed totally of the fundamental frequency f_1. Figure 1 shows a sine (or sin) wave on an amplitude vs. time graph.

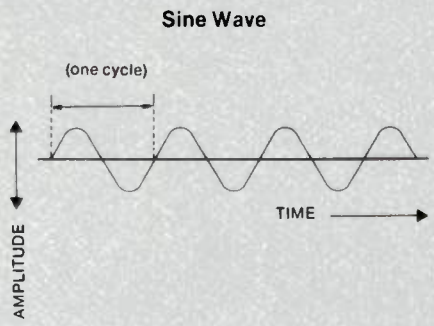


Figure 1

SOUND REINFORCEMENT

By Glen E. Meyer

Such a design generally resulted in little bass response below 50 or 60 Hz and demonstrated the characteristic bump above these frequencies in the mid-bass range. For this reason, the systems were sometimes called "boom-box."

In 1961, A. N. Thiele of Australia presented a paper that clearly defined for the first time the proper ways to design a vented system. This method related speaker system performance to the performance of an electrical high-pass circuit. Thiele's work, however, went largely unnoticed until it appeared in *The Journal of the Audio Engineering Society* in 1971.

His work clearly outlines that the design of vented systems is not a matter of cut and try. As is the case for sealed systems, the three variables of low-frequency limit, efficiency, and box volume are directly related. These Thiele parameters not only gave one the mathematical tools to optimize a given speaker, but offered the tools to properly design the woofer itself.

When a conventional sealed system with a given low frequency response, efficiency, and size is changed to an optimized vented system—which means not only adding an appropriate vent but also properly changing the speaker itself—the user could have a new system with one of the following three performance improvements, or an appropriate mixture of all three: (1) One-half octave more bass. That's like moving from 40 Hz to 32 Hz. Or, (2) 4.2 dB more efficiency. That's like multiplying your amplifier power by a bit more than 2.5 times. Or, (3) Reduce the enclosure to almost one-third the original size.

Distortion in Vented Enclosures: Low-frequency distortion is typically less in a vented system than in a sealed system. In a general way, low-frequency distortion is related to speaker cone excursion. Non-linearities in the cone suspension and voice coil motion combine to give higher distortion levels as excursion increases.

In sealed systems, excursion rises

TERMS: (CONTINUED)

A CONTINUING INDUSTRY GLOSSARY

RECORDING

Tape Head Alignment: Made up of a number of adjustments to insure that the tape heads are in the proper position, as well as to provide optimum frequency response and maximum head wear. These various necessary adjustments are described and illustrated in the following paragraphs.

Height Adjustment: The height must be adjusted in order for all the heads to occupy the same track (channel) space on the tape. If the record head were located properly and the playback head were too high it would be picking up only a portion of the recorded signal of the track. The track location for both heads should be at exactly the same level from the transport surface. This adjustment should only be made by a qualified service technician.

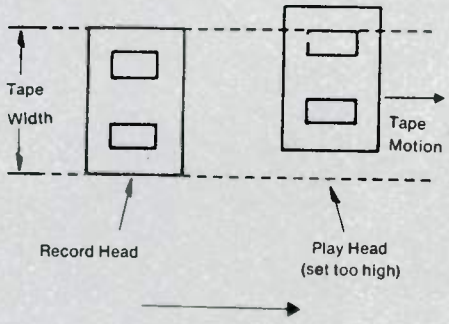


FIGURE 2.

Height Adjustment

Zenith Adjustment: The tape heads must be adjusted to be perpendicular to the movement of the tape. This adjustment is necessary for good tape-to-head contact on both the bottom and top of the tape head. The heads should be perpendicular to the tape path and transport surface. If the head is at a slight angle, it will result in uneven wear on the tape head after many hours of use and the tape will often cut a ridge into the head. This is called the "zenith" adjustment. This adjustment should only be made by a qualified service technician.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

Figure 2 shows the same sine wave on an amplitude vs. frequency graph. Notice that it has no harmonics, as shown on the graph.

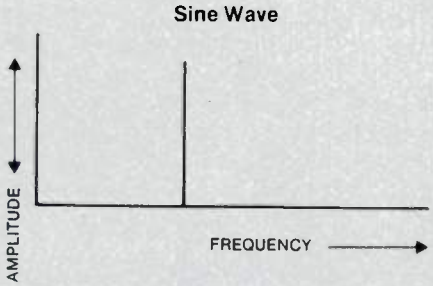


Figure 2

Sawtooth (Ramp) Wave: A sawtooth wave has a waveform shape that looks like its name. (See figure 3.) Also called a ramp wave, it can be thought of as a waveform rich in both even and odd harmonics. The amplitude of any of the harmonic components is the amplitude of the fundamental f_1 divided by the number of the harmonic. (See figure 4.)

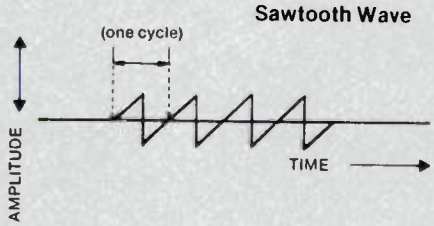


Figure 3

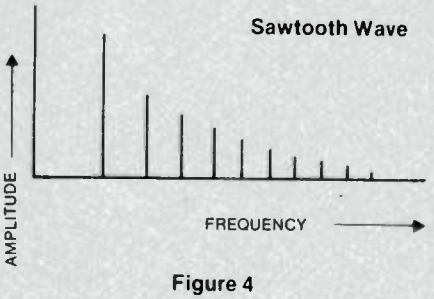


Figure 4

For instance, the amplitude of the third harmonic f_3 is ⅓ of the amplitude of the fundamental frequency f_1. The sawtooth waveform is also very similar to the waveform produced by the human vocal folds.

SOUND REINFORCEMENT

dramatically as the system's low-frequency limit is approached. In vented systems woofer excursion actually drops to a minimum at the low frequency limit of the system. This is possible because at the low frequency limit virtually all of the radiated acoustic power is coming from the vent, with the woofer cone barely moving. Properly designed vented systems will produce total harmonic distortion on the order of one to two percent at their low frequency limit, with full electrical power in, while five to ten percent is rather typical in a sealed system.

Thiele/Small Driver Parameters: In addition to A.N. Thiele, R.H. Small and others (for example see A.N. Thiele, "Loudspeakers in Vented Boxes," *Journal of Audio Engineering Society* Part 1, Vol. 19, May 1971, Pages 382-391; Part II, Vol. 19, June 1971, Pages 471-483) were influential in developing the definitive analysis of vented speaker enclosures. These parameters, which have become known as the Thiele/Small driver parameters, used in vented box design include: f_s, Q_{es}, Q_{ms}, Q_{ts}, V_{as}, N_o, V_d, S_d, X_{max}, P_e, and R_e. Knowing f_s, Q_s, and V_{as} will generally provide one with enough information to design basic low-signal vented systems. The other parameters are useful in arriving at these three basic parameters or are used in analyzing the capability of a high powered system.

Resonant Frequency: The phenomenon demonstrated by a vibrating system which responds with maximum amplitude under the action of a harmonic force; this occurs when the frequency of the applied force is the same as the natural frequency of the vibrating body.

f_s: The resonance frequency of a driver (woofer) in free air (in other words, not mounted in an enclosure). It is the frequency at which point the mass that is moving (the cone and voice coil) and the suspension system (surround and spider) that is holding the mass is at resonance.

(To be continued next month)

Fender SRA 200 Stereo Power Amp. When you work, it works.

With power amps, the bottom line is dependability. You must have a rugged, dependable power amp. One that's as reliable on the road, under any conditions, as it is in the studio.

That's why Fender engineers designed the new SRA 200 Stereo Power Amp. 200 watts of tough, fail-safe power in a compact design. Incorporating more advanced features than you've ever seen in a power amp at this price.

Precise controls. The Fender SRA 200 features dual 22-step calibrated attenuators up front. You get accurate and repeatable control on both left and right channels. And you maintain control even to the point of clipping. Fast attack LED indicators show exactly when clipping occurs.

Blessed silence. Thanks to an FET-controlled muting circuit, the SRA 200 operates silently. No more annoying and potentially damaging "thump" ON and "pop" OFF. The unit works so quietly, so reliably, you could use it as your home stereo amplifier.

Sound numbers. Most 200 watt power amps in this price range pale in comparison with the SRA 200. Look at the numbers. .007% THD. .008% IM distortion. They add up to clean high frequency response and a high slew rate. The total package is an affordable, compact and rugged power amp.

Reliable everywhere. Fender players field-tested this new power amp for hundreds of hours under the hottest performance conditions. Wherever they worked, it worked — because the SRA 200 is built to dissipate heat. You know a unit this rugged and dependable will work for you.

Try the new Fender SRA 200 soon at your authorized Fender dealer. Let it become your old reliable power amp.

The new 200 Watt Stereo Power Amp from Fender®

MADE IN U.S.A.

Professional Sound Products
1300 E. Valencia Drive
Fullerton, CA 92631

CIRCLE 80 ON READER SERVICE CARD

TROUBLESHOOTERS' BULLETIN

(1)

Troubleshooters' Bulletin is designed as an aid to the dealer. Manufacturers, retailers and service personnel are invited to contribute. Share the wealth of your knowledge. Items refer to repair of equipment, preventive maintenance, and the correction of customer misconceptions. Send your contributions to SOUND ARTS MERCHANDISING JOURNAL, 15 Columbus Circle, Suite 316, New York, New York 10023.

(2)

CHANGING TUBES

When changing power output tubes in a musical instrument amplifier, always check the grid bias voltage. This voltage limits the amount of current that the tube conducts in the plate circuit and is usually in the order of negative 45-55 volts in amplifiers using 6L6 or 6CA7 type tubes.

(3)

If this voltage is low or missing, it will allow an excessive amount of current to flow in the tube, the primary of the output transformer, and in the power transformer and rectifier circuits, with the possibility of damage occurring to any or all of them.

In fixed bias type circuits, this negative voltage is usually developed

separately in the rectifier of the power supply circuit.

In self biasing circuits there is usually a capacitor-resistor combination between the output tube cathode and ground.

Occasionally, a capacitor will short circuit. The amplifier will still

run, but at a nigher plate current, which results in overheating the transformer, etc. In fixed bias supplies there is often an internally mounted potentiometer for adjustment of the bias to an optimum level allowing minimum distortion and current limiting.

As an added note always check the fuses of the main circuit of any piece

of equipment that you service. Often when a fuse fails, the owner will grab the nearest thing he can find to get his equipment running.

I've found more 20 amp fuses in circuits where there ought to be a 3 amp fuse - often with expensive repair bills as a result.

MARK ROGERS
DADDY'S JUNKY MUSIC
STORES

What is the meaning of words such as RAM and ROM which are beginning to appear in audio equipment and what are some other computer terms I should know?

ROM means Read Only Memory. Data is permanently put into a ROM and can be read and sent to other circuits. The data in the ROM can not be changed or altered—they can only be transferred to other circuits. Usually the data are permanently entered into the circuit of the ROM by the manufacturer.

PROM is a Programmable Read Only Memory in which the data that are permanently held in the ROM may be programmed (entered) into the device's circuit by the user. Once the information is put into the circuit, it acts the same as a ROM.

EPROM is an Erasable Programmable Read Only Memory. The data put into an EPROM by the user (the same as with a PROM) can also be erased by the user. After the old data are erased, new data can be entered into the device by the user. Erasing usually is accomplished by a special procedure, such as exposing the device to ultraviolet light. Data entered into the device are considered permanent unless they are removed by the erasing procedure.

Shift register is a device which holds data for a short time and then sends them out to the next circuit. Data move through the shift register in an orderly, sequential fashion. The first datum into the device will be the first to leave. It will then be followed by the second and third and so on. A similar device, often used to produce echo effects by utilizing the time it takes the signal to move through this device, is called a bucket brigade device.

RAM stands for Random Access Memory in which the data can be entered into and retrieved from the device in any order desired. With a RAM we can put data into or out of any location in the RAM circuit, without regard for the order. The first item into a RAM does not have to be the first item out of the RAM.

A microprocessor is a small computer circuit, located entirely on a single integrated circuit. This integrated circuit has the capability of handling and directing information through its own and other circuits.

Address is the location of a particular bit of data or information in the computer's memory or storage. To address an item is to either assign it to a particular location or to direct it to that location.

ACSII stands for American Standard Code for Information Interchange. This is a standard which defines certain codes and symbols used by various pieces of computer equipment. It is a standard which allows equipment from different manufacturers to operate together, if they all use this same code.

Baud is a term that describes the signaling speed or how fast a circuit handles and moves data. When connecting various pieces of computer equipment, it is important to make sure that one piece does not operate too fast for the other equipment, or information can be lost or altered.

Byte is a group of binary bits of data, which are handled as a group when moved through the computer. Compiler converts one (computer) language to another or changes the form of the language. An example might be to convert the word "Start" into binary units of data, which can be handled and processed by the computer.

Memory and storage are places which hold information for later use. The information may be held on magnetic tape, magnetic disc, or electronically in an integrated circuit. Some devices will only hold the information for a short time and others hold it until it is removed.

Neil Lewbel
Technical Writer
Kew Gardens, NY

What does the "long-throw" mean?

Narrow dispersion devices are sometimes referred to as "long-throw." The term "throw" is loosely used to describe how far sound will be clearly projected by the loudspeaker. This is directly related to dispersion.

To describe this principle, think of a garden hose with a variable sprayer on the end. The water in the hose is being delivered to the sprayer with a constant pressure (the speaker or driver). The sprayer determines where the water will go (the horn). If you spray a wide pattern, it won't spray very far; but if you clamp down on the sprayer, it will spray a narrow stream and it will spray (throw, project, etc.) a heck of a lot farther. This is exactly what takes place in sound.

Most direct-radiating speaker systems are classed as medium-to-wide coverage because they have coverage zones of approximately 90% or wider. However, special devices are needed to generate high SPL and uniform, narrow coverage angles. These devices are usually horns. It is possible to have horn woofers, horn midranges or horn tweeters. For example, a midrange driver can be coupled to a wide-angle horn for short-to-medium throw, or it could be coupled to a narrow-angle horn for long throw.

By their principle of operation, long-throw devices take care of the reverberation problems of medium-to-large size rooms. By raising the sound pressure level of the direct sound at the rear of the room, program material will become more intelligible. The long-throw device is not only used to create higher sound pressure levels away from the stage but also to aim or concentrate the sound on the listeners at a distance away. The direct sound will be kept high relative to the reverberant sound and you'll be saying, "Can you believe we actually understand the words way back here?"

Jeff White
Author
Electro-Voice PA Bible

When Stevie Wonder speaks for TDK, it works.

The story is simple but powerful. Stevie begins with, "Natural sounds go into my music and they sound natural on TDK." He ends with, "It delivers the best sound, for its size, I've ever heard."

Suddenly, across the country, millions of new customers know that TDK delivers music like no other cassette. Brand awareness as reflected in sales is at the highest level ever. The high impact television commercial is supported by a series of radio spots in which Stevie talks about his experiences with TDK. Each spot uses original music from his new album, Journey Through the Secret Life of Plants.

This is the first time Stevie has endorsed an audio product. It's the first time anyone of Stevie's stature has allowed the use of original music to be used in commercials simultaneously with the release of a new album. Most importantly, this is the first time TDK has invested so much in an advertising campaign.

Newspaper ads are spreading the TDK story even further. There's a free-with-purchase Stevie Wonder poster to bring them into your store. Counter cards. A forthcoming consumer magazine campaign. Nationwide publicity. Nothing has been overlooked that could stop this from being the most successful year in TDK's history. If you're already part of it, you've seen the results in your sales. If you're not, tune in Stevie and listen to the story. It's hard to resist.

Supplier to the U.S. Olympic Team

By Craig Anderton

Last month, in our continuing series on audio for musicians, we discussed several misconceptions about the recording process. One misconception, however, is so widespread (it affects every aspect of the recording business from manufacturer to end user) that I felt it deserved a separate column of its own. The misconception, simply stated, is as follows:

"Running a recording studio mixer is the same as running a PA mixer."

What makes this seem like a logical statement is that there are indeed many similarities between the process of mixing down live sound and the process of mixing down recorded tapes. That illusion of similarity is given futher credibility by the fact that mixing consoles for both applications often resemble each other to a remarkable degree. Yet, the person who understands that mixing down tapes is *very* different from mixing down live sound will be much more successful in both fields. And the first manufacturer who realizes that mixing boards need to be designed for the ground up to be diferent from PA boards . . . well, we'll get into that later on in this column.

PA VS. RECORDING MIXDOWN

In PA work, a mixer needs to have scads of inputs for all the various microphones, transducers, direct boxes, and what have you associated with a live performance. As a result, a PA mixer places a premium on speed and ease of use. How fast can you cut channels in and out? How easily can you monitor various channels? How many mics can you accommodate? How accurately can you move a fader into position in a fraction of a second? How can you tune the system to match the room you're playing in, which can change every night?

In the recording studio, though, you have a different set of ground rules (especially in home studios, which are the focus of this series). For one thing, the odds of having 20 to 30 microphones feeding a home studio mixer are very remote. Most recording these days is done on a "cut and paste" basis, where more and more emphasis is placed on overdubbing and selective erasing. (Of course, overdubbing never even enters into PA work, since you get one chance for a correct mix, and that's it; in the studio, you not only have many chances to get the right mix, you also have many chances to capture the right performance.) Also, due to leakage problems, it's very difficult to simultaneously record all the members of a band, along with the singers, horns, strings, and other instruments. The logistics are just too frightening, and besides, how many studios even have a room large enough to handle all those people? Yet, companies continue to turn out mixers designed for studio use that have lots of inputs, each with its own balanced line transformer and mic preamps to accommodate multiple mics (never mind that more and more signals are taken direct), and so on. While all this may be impressive *looking* for a commercial studio, I seriously question the need for this degree of complexity and expense for home studios.

Another difference between PA and tape mixing involves the actual settings of the channel faders. In live PA work, the master volume control tends to be kept rather high, while the individual channel faders are kept low. This makes good sense, since a channel fader that's up too high can give distortion—something that the audience is definitely not paying to hear. In studio mixing, on the other hand, the channel faders are usually kept as high as possible with the master control set as low as possible to optimize the signal-to-noise ratio. In the studio, noise is far more critical than in PA applications; if the recording engineer sets a channel fader too high and accidentally introduces some distortion, then you simply go back and remix or recut that part. The PA operator does not have the luxury of going back and fixing anything, so the controls have to be operated more conservatively. As a result, if a good PA operator sits down at the recording console and sets the controls in the same way he or she would for PA, the mix will be noisier. While this might not be noticeable in a live context, it is definitely noticeable in the ultra-clinical confines of the studio.

PATCHING

Another part of studio operation that simply does not enter into live performance is patching. In PA work, you don't have the time for anything but the most rudimentary forms of patching. In the recording studio, it may be necessary to shift patch cords around just to get from record mode to playback mode. I wish manufacturers

would realize that in the home studio, time is not as critical and patching should be utilized more often. For example, I was talking about the fact that you don't really need 20 or 30 mic inputs in a home studio . . . it would probably be much more cost-effective to have 4 to 8 mic preamps that could be patched into the signal path if needed, and left out if not needed. A PA mixer operator expects everything needed for mixing to be directly at his or her fingertips for real-time use. The recording studio mixer, however, has the option of repatching to obtain different sounds and effects.

"BELLS AND WHISTLES"

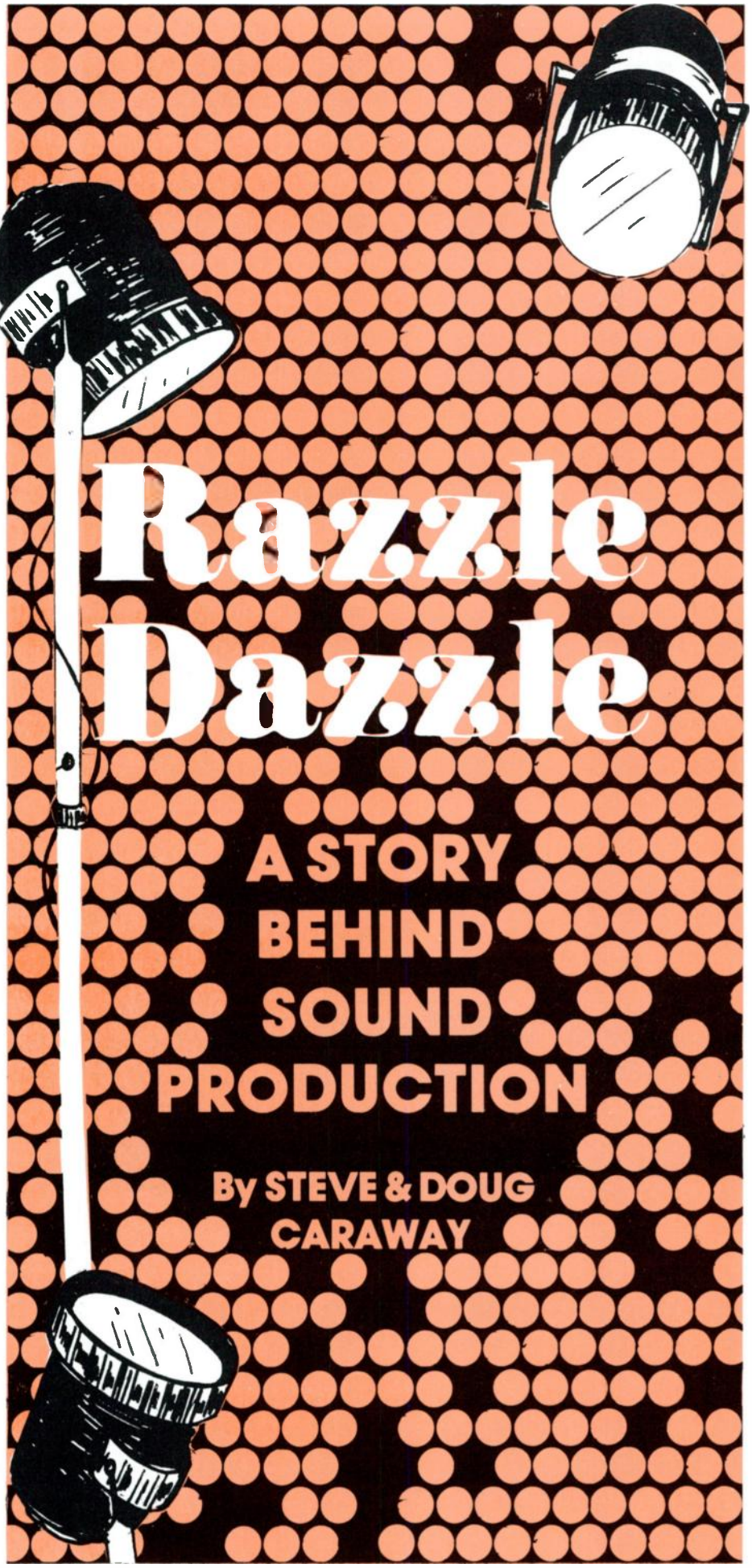
PA mixers require a great deal of complexity, because you never know what instrument or mic is going to go into any given channel. Therefore, each channel must have the capability to add equalization, preamping, noise gating, etc. Cue and reverb channels must be separate, since they both get used at the same time. Again, we're talking about convenience; how fast and how easily can you get the sound you want?

In the studio, however, we again encounter a different set of conditions. First, we must remember that adding preamps, equalizers, and such where they aren't really needed increases the cost of a mixer as well as degrading the noise figures and dynamic range of the unit. While this is an acceptable tradeoff in PA work for ease and speed of use, it is a tradeoff that need not be made for the home studio. In fact, I think that we'd probably be better off if home studio mixers were designed to be as stripped down and basic as possible, without sophisticated EQ and preamps for each channel. Instead, an accessory box containing these devices, as well as compressors, limiters, noise gates, and the like—with all appropriate patch points—could sit off to the side of the mixer. Then, as a particular unit is needed, it can be patched into the mixer signal flow where appropriate. In the meantime, channels that don't need to be messed with can have their signals flow directly from input to tape machine, without being degraded by the process of passing through numerous active electronic stages. By placing the emphasis on patch points instead of convenience, not only would the quality of sound be enhanced, but the cost would be dramatically reduced. And isn't that what home recording is all about?

CONCLUSION

Lest you think that the above is idle speculation, let me explain a little about my own home recording setup. Like most musicians, I had to meet a very tight budget, and the idea of purchasing a full feature mixer was simply out of the question. So, I put together a very basic, clean and simple mixer that only introduces one active stage between the tape machine and output during mixdown. Busses that are dedicated to cueing during recording become reverb busses during mixdown (something that would be impossible to use for PA work), and outboard units must be patched into the mixer. The sound is good, the cost is low, and the lack of convenience is more than offset by the overall quality of sound . . . and lack of dent in my budget!

To wrap things up, I would suggest that anyone who knows how to run a PA should approach the recording studio mixer as a completely different entity, with different ground rules and recommended techniques. And manufacturers, now is the time to realize that recording studio mixers should be designed from the ground up for that purpose . . . don't rely on what's been learned in the past from the production of PA mixers. Remember, home recording is really less than a decade old, so it's natural for people to try and superimpose techniques learned in the past on to an entirely new field of endeavor. But this does not necessarily yield the best results. It reminds me of the early sixties, when electronic engineers started making the transition from vacuum tube design to transistor design: those who tried to treat transistors like a new kind of tube had far less design success than those engineers who simply "forgot" most of what they had learned and treated the transistor as a new and different animal. Well, home recording and PA mixers are not the same animals either, and the sooner the music industry—and the end users of home recording equipment—recognize that fact, I think we'll start to see "phase II" of the home recording boom.



Full production organizations require careful interfacing of all the elements of a concert, not to mention a sophisticated knowledge of audio technology. And a talk with Steve Neal, Director of Audio for FM Productions, elicits valuable insights into the technical and logistical elements.

San Francisco's FM Productions was germinated in the early seventies out of Bill Graham's Fillmores (East and West), and is now one of the top full production organizations in the world. Steve Neal, with a degree in physics, originally signed on at FM Productions as an electrician/rigger and found himself on the road in charge of setting up and tearing down the lighting system as well as rigging and overseeing the electrical end of things. SOUND ARTS journeyed to San Francisco to talk with Steve about production capabilities and audio theories in general.

Can you provide accounts with anything they need in terms of staging, lighting and sound?

Neal: Yes. Staging, sets, sound, lighting, special effects. The only things that we are not into are lasers and pyrotechniques.

What happens when an account calls you and needs your assistance? How does the ball start rolling?

Neal: We need to take a look at the proposed tour in terms of the size of the venues to be played, the number of shows per week, crew requirements, crew transportation; we also have to figure if we'll be working with top line promoters or sleazy promoters. There are tours that require you to work with promoters who don't take care of business efficiently. But from our end, I'll propose a set of equipment, and make crew selections based on that. We'll then look at what we have and what we can set up in terms of an operating system to make the equipment flow as easily as possible.

Can you give a description of the facilities here at FM?

Neal: In terms of production capability, we have full heli-arc and welding facilities, full carpentry, scenic painting that ranges up to the sets for the large stadiums as well as sets and productions for large conventions. Some of our clients are Shakley, Anheuser-Busch, Pepsi Cola, Datsun, Macy's; we have a very large variety of clients. This is in addition to building sets and stage equipment for touring rock and roll bands and our own sound and lighting systems. We now have

FOR THE SMALL STUDIO OWNER WITH BIG IDEAS.

If you're a small studio owner, you may have a problem: your ideas are far beyond your present equipment.

Maybe you're an engineer, dreaming of an automated 24-track studio. Maybe you're a producer, searching for "the next big thing." Maybe you're an artist, trying to land a record contract. What you need is something that will get you from where you are to where you'd like to be.

Sound impossible? Not to us. At dbx, we're committed to make professional recording technology available to anyone with the determination to make use of it. We make a line of rack-mountable signal-processing devices designed and priced especially for the small studio.

Our tape noise reduction systems, the 155 (4-channel, switchable), the RM-155 (8-channel, switchable) and the 158 (8-channel, simultaneous), all offer the same 30 dB noise reduction and 10 dB headroom improvement as our state-of-the-art units and are fully compatible with them. They enable you to make master quality tapes, instead of demos, on your present equipment.

Our 161 and 163 compressor/limiters feature true RMS signal detection, which closely resembles the response of the human ear, and feed forward gain reduction, which allow for infinite compression capability. The 163 employs "Over Easy" compression, the most natural-sounding you've ever heard, and its "one knob" operation is the simplest around.

We can't guarantee our products will make you a star. But if you've got the talent, they'll take you as far as you want to go. dbx, Incorporated, 71 Chapel Street, Newton, MA 02195 617-964-3210.

dbx

Making Good Sound Better

dbx is a registered trademark of dbx®, Inc.

CIRCLE 92 ON READER SERVICE CARD

about 50 to 60 people working here.

Who are some of your rock and roll clients?

Neal: Heart is our strongest act right now. We've done Santana, the Grateful Dead, Jefferson Starship, Dave Mason, Graham Central Station, The Jam, and the Commodores.

How far in advance does the client contact you about a proposed tour?

Neal: Well Heart, for instance, contacted us in January. We have an ongoing relationship with Heart and we put together a system for them about a year and a half ago. The system looked fairly strange, but I have yet to find a system that I prefer or that out performs it. We flew a pair of stereo speaker boxes facing forward, instead of a whole bunch of identical boxes. It is actually a five-way speaker facing forward—one per side.

How do you decide the various components in designing a system?

Neal: You go with what you've got for starters. You've got to use what you can get your hands on. Use breeds familiarity and you learn how to deal with all your various components and get around any shortcomings they might have.

In the case of this Heart system, the physical configuration of this touring section meant that we had to radically change our structure. What this all did was to create the opportunity to perform what could be termed a "Grand Experiment." The system we put together for Heart was a stack that Dan Healy had me put up for the Grateful Dead at Red Rocks in Colorado. I liked that system a whole bunch; so all I did was to figure out how to take two fifteen foot stacks of speakers and hoist them up *and* point them down towards the audience. We found that this would optimize the reverberation problem. This tour encompasses venues up to 18,000 seaters and probably down to 5,000. It's your hockey arenas, your normal horrible halls! The old Heart system had incredible advantages in that it was an ultra-high-Q system and utilized the fact that the audience is the most absorptive stuff you've got in the building; if you direct most of your energy down into that audience, there is less energy bouncing around and contributing to the reverberation. The real trick here has to do with signal-to-noise. The analogy I like is that you're driving on the freeway and you're listening to the radio with your window rolled down. You come off the freeway to a stop sign and you reach for the volume dial because the sound is ready to take your ear off! Signal-to-noise, apparent loudness, and masking contribute to an incredibly powerful effect. In some of today's systems, with the full power that you need and at 5 to 10 percent distortion, it corresponds to a lot of noise. That line of reasoning leads you to the reason that on certain nights the system can be running very low-level in power but be very powerful sounding, when on other nights you can be pushing it up against the wall and it doesn't seem to be very powerful at all. If you bring that noise up, then that apparent loudness has dropped.

Flying systems have become a very popular way to approach large scale sound reinforcement; what kind of problems arise from flying systems?

Neal: Number one . . . *safety.* We have no *"OOPS"* around here; you just don't drop a system. I have never heard of a system coming down. Lighting trusses are fairly renowned for falling, but I've never heard of a sound system falling. We pray! We operate on a 5 to 1 ratio. For every 5 pounds of load capacity you have, you use one pound. The advantage to flying a system is that you've gained—and this is of tremendous value to the promoter—sight-lines to more seats on either side of the stage. They're not blocked out by a big PA. Flying a system also allows you greater control over the reverberation factor in most halls. A large number of companies don't take advantage of that fact. One of the only drawbacks is that the bass frequencies suffer if you fly the system. You get a lot of additional bottom end strength when you're coupling to the floor. With the Heart systems we've done we work with subwoofers on the floor for that additional bottom end. The subs we're using now are designed by John Meyers.

You mentioned tilting the system; how do you go about that?

Neal: Basically the high end goes where you point it. With the low frequencies, all we did was pick it up, then run a "come-along" down to the bottom point on the configuration, and lift *that* so it just fell forward and I could establish any angle I wanted. It's an extemely high source, with its energy carefully directed in a narrow-forward angle to maintain and maximize the sound pressure level at the back of the hall and to cut down on the reverberant energy in the room. We've been able to balance it out so that we get smooth coverage in a hall; some of the older bulkier "basket" systems or a deck aimed system could actually get you a little bit smoother coverage in the upper regions of an arena, but the reverberant field goes way up, stacking time goes way up, and you block a lot of sight lines. Also with your multiple source you get path length problems. If that path length difference is equal to half a wavelength of a specific frequency and they are equal in amplitude, it'll go away. So you put a lot of speakers side by side, you tend to get all these different path lengths and they "smear" the sound; so you go to columns and the sound becomes more localized and that problem is reduced.

How do you move all this gear on the road?

Neal: We normally would hire a trucking company. It is an absolute necessity to use air ride trailers because the shock values in a regular trailer just tear the equipment apart. This new Heart tour will be about a four-semi tour, and that's the whole production. We'll have a truck and two-thirds of truss for a big lighting system they have. Sound will fill one semi and the rest will be stage equipment and all. Heart is a unique case in that they have their own rigger and he supplies all the cablings, so all we're supplying are the winches and the structure under the winches.

How do you decide who and how many go out with a system?

Neal: How many is fairly obvious based on the amount of equipment you have to move. On the crew assignments, you're looking for a crew that can work well as a unit; you need a lead engineer who is always looking to make it better. This engineer can't be looking to get himself off immediately, he must be into it for the finer esthetics of it. You need crewmen who are dedicated and love the art.

Do you specify certain components in the systems you put together?

Neal: We use a lot of Beyer microphones; we're fond of the Beyer M69 sound. Yet there are times when the sharper edge of a Shure will cut it. The problem here is low and mid range intelligibility; in fact that is one of the problems with PA's in general. We try to match our power to our application. We are also involved with a new theory of operation of power. The fundamental reality, we suspect, is that cones are pretty vastly under-powered. To be doing a system right you need to

hit the cones with 400 to 800 watts each, depending on what they can handle. The real indicator in this fact is that we calibrate our power amplifiers to clip on sine wave at +12 dB. We then, for the show, change our meter calibration to 0 equals +4, and we find pretty much universally on all bands except ultra-high, when you reach 0 VU (where 0 now equals +4), you are peak clipping with the amplifiers. Now since the meters are basically RMS responding devices, what you have here is an implicit 8 dB peak-to-RMS ratio. If you have an amplifier that can drive the speakers at relatively severe clipping, and the speakers do not die, then you could have an amplifier that could hit the speaker with four times the power and you'd have 6 dB of increased overhead, which you would then have to prevent from excessive clipping by some technique or another.

You say you're going to put 400 watts into a cone; I don't know of any stock cones that could take that power!

Neal: The key question here is . . . for what duration? Remember that peak-to-RMS ratio; we don't like to push the system into anything more than peak clipping. When you clip, your distortion products go way up and that's noise. If you have the capability of providing each cone with 800 watts, and then instead of using the 8 dB peak-to-RMS ratio you use a 6 dB peak-to-RMS ratio, then you are in fact running the cone at 200 watts; but in order to get up to that 200 watts you have to have 800 watts of peak capability. Obviously, you have to determine whether or not the failure modes for the transducers are RMS related or thermal related or peak and excursion related or force related in terms of the peak force applied to the voice coil. But as long as you keep the RMS content down, then you should be able to handle the peak power.

Sound has really become a science, as well as an art, in the last 10 to 12 years.

Neal: In a way. I think there is some pretty fine engineering going on these days. Northwest comes to mind as having some pretty good engineering going on. John Meyers, of Meyers Sound Labs, is addressing the problem of speaker distortion and linearity. He designed the very successful JM3, JM5, JM10, SM3 and SM4 systems for McCune Sound which they used for *Beatlemania*. All those are real nice compromise oriented systems that are "locked down." We find that with a lot of our stuff we can out perform him, but we have to tune the system to the program it's carrying. When the program changes, you have to retune the system, which requires a very talented operator. Five years ago when Meyers designed these systems he attained a reasonable compromise, as it worked well in just about every situation. So we're going partially in that direction. Meyers produced full integrated systems; he spent five years in Switzerland designing an $18,000 studio reference monitor system which runs peaks at about 125 dB at less than 1% distortion. A very clean, phase-corrected, amplitude-corrected system. He almost gets impulse response out of it. In the Heart "System 80," we're using his cones in the central cluster, his horn array, his correction networks, and we're using his sub-woof on the bass. We're producing a bi-radially curved surface of 60 cones and we're dumping peaks in excess of 500 watts per cone.

When you are on the road with a system, how do you work your load in and set up times for all the different staging and lights that have to go up along with your sound?

Neal: That touches on a point that I feel is a critical aspect of touring that is too often neglected. A position that I would call stage manager. What he has to do is to make sure the hall is ready and meets the show requirements. From raw power, to stage size and stage height, to truck access. Steve Kahn is one of the top line stage managers as far as I am concerned. He is with Bill Graham Presents now, but he goes way back with Primo, the old Santana. He has a sheet for stage managing that he put together, and it opens up to be three or four feet long. On the sheet he has about 40 columns that deal with distances, times of travel, hotels, contacts, promoters, forklift information, power, food accommodations, stage heights, special conditions, necessary rigging information—everything one has to know to run a date efficiently. A good stage manager has to deal with all the aspects of the tour, not just sound and lights and staging. He even has to interface with the unions and help put together the necessary union people to work the dates. The difference between a good stage manager and a poor stage manager is the difference between doing a good tour and doing a tour that is sheer agony! Because when you are out there and it's wrong it can be eternal.

Can you give me any classic problems that have come up while on tour?

Neal: Well, the problem of touring 3,000 to 18,000 seat venues is that sometimes you have to squeeze that show into a real small place. That sometimes necessitates changing the load-in sequence, telling the electrics department to hold off while sound gets past them with a certain amount of equipment. If you are touring with a set, you have to decide on what elements of the set to keep and what not to use in a smaller venue. You've got to know when to yell at the promoter and how loud to yell, and you have to know what you can reasonably get from a promoter. It requires a certain sense to oversee the entire production.

How do you prepare for down time on the road, in terms of gear?

Neal: We carry spare speakers for replacing any cones that might go out. If something falls off the stage and gets damaged, you blew it! You want to keep a better eye on the equipment than that. The gear has to be built to military specifications, for all intents and purposes. It has to be virtually indestructable. You lose an amplifier and you have spare halves in the racks, and if you lose too many, you have to have the devices to repair them. I can think of many times I've gone back to my hotel room with a volt ohm meter and an iron and some transistors and repaired some gear. Part of the talent that you are looking for here is the capability of getting around anything that happens. When something goes down in show conditions, you have to find it fast and get around it fast. The reason the show exists is for the audience. If the show doesn't happen for the audience, it doesn't happen. That is one of the critical points in rock and roll today; too many musicians are on stage busy getting *their* rocks off and forgetting the purpose of their being on stage. The key is for the musician to listen to his master soundman and be aware of the difficulties. The musician has to realize that the soundman is not trying to tell him how to play his music, but the soundman may be saying that some specific aspects of the way the musician's playing the music are making it impossible to get the feeling that is being generated on stage out into the audience. Rock and roll is a feeling and if that feeling doesn't happen it's all useless.

Panasonic adds a new division:

The Professional Audio Division

Professional audio isn't new to us. In fact, we're old hands at it. Take Technics direct-drive turntables. As a recent survey shows, 73 of the top 100 radio stations that use turntables use Technics direct drive.

Now the Panasonic Professional Audio Division introduces two lines of components for the recording and broadcast industry: Ramsa, a new name in sound reinforcement. And Technics R&B Series, a specialized line of products from a name you already know.

RAMSA When it comes to sound reinforcement equipment, Ramsa has a lot to talk about. Our super tweeter and all compression drivers have a titanium diaphragm with a rhombic edge and ferrofluid in the voice coil gap to minimize temperature rise. The compression drivers feature a 1.4" throat. While the super tweeter has a compression driver and radial horn. Our twin radial horn offers wide dispersion (80° x 40°) and a flat frequency response.

There are also four Ramsa line array speakers. The WS-135 includes four 10" woofers and a horn tweeter. While the WS-165 adds a built-in power amp. The WS-130 combines two 10" woofers and a horn tweeter. The WS-160 also adds a built-in power amp.

The versatile Ramsa WR-130 8 x 2 portable mixer accommodates two turntables, eight mikes, headphone monitoring and more. The WA-140 mixer-amplifier includes 4-balanced-mike, 4-line, 2-phono inputs and a 5-band equalizer. While the WP-9210 power amplifier offers 200 watts RMS per channel from 20Hz to 20kHz into 8 ohms with no more than 0.05% THD.

Three Ramsa microphones are hand-calibrated to meet high performance standards. For instrument miking there's the back electret condenser WM-8150. The WM-8000 and WM-8050, designed for vocal use, include floating microphone capsules and triple wind screens.

Technics R&B Series Now records can be cut as accurately as Technics turntables play them, with the new SP-02 driving unit. It has the world's best torque (28kg/cm). Wow and flutter is a mere 0.0034%. And the SP-02 is easily attachable to Neumann mastering lathes.

Next there's Technics R&B Series SL-1015 quartz-synthesized direct-drive turntable system with a heavy rubber antiresonant base and EPA-500 tonearm system. The EPA-500, which can also be purchased separately, has a titanium nitride arm unit (EPA-501H) with dynamic damping for high compliance cartridges. A tonearm base (EPA-B500) with four-point gimbal suspension. And a stylus pressure gauge (SH-50P1), fully electronic and accurate to the tenth of a gram. To match the mass and compliance of any cartridge, there are four other titanium nitride arm units with dynamic damping.

For your nearest Panasonic P.A.D. representative and more information, call toll-free 800-447-4700. In Illinois, 800-322-4400.

Panasonic
PROFESSIONAL AUDIO DIVISION

See us at AES, Los Angeles Hilton, Rooms 615 & 621.

By Hartley Peavey

Right Knight Fight

In the first part of this series ["Anatomy of a Buyer," October 1979], we attempted to sensitize salespeople to the simple but generally predictable games people play before they decide to buy something. From this sensitizing process we now go on to approach the *theory of adversarial selling.*

We previously discussed the general reasoning and *stages of anticipation* a person goes through before he or she finalizes the so-called "buying decision." It has long been my contention that most successful salesmen often don't truly realize the reasons for their success. It has been almost universally observed that the outstanding salesperson has mastered the art of *projection, i.e.,* the ability to put himself in the buyer's shoes and base his sales approach on this premise.

Once a prospective buyer has made the decision to "look," he has probably already made up his mind that he would enjoy *ownership* of a particular item or one of that general class of items. As previously stated, some degree of anxiety usually accompanies this ownership urge and manifests itself in feelings of guilt over self-indulgence/selfishness, uncertainty over the wisdom of this particular investment, and/or a general and mixed aura of anticipation and lack of confidence in this decision, self, product and choice of vendor (supplier). This pre-purchase anxiety generally increases in direct proportion to either the purchase price or the complexity of the item that is to be acquired.

I have submitted the preceding for your consideration in order to develop the concept that buying is often a somewhat bittersweet, even traumatic, experience that is fraught with feelings of anxiety and uncertainty on the part of the buyer.

The initial meeting of a prospective buyer and the salesperson is a vital indication of the outcome of any sale. Both the buyer and the salesperson immediately try to make a favorable (and superior) impression on the other and instantaneously begin to try to classify the other in several important categories. The buyer desperately wants self-assurance that the product (manufacturer/design) is good, the purchase price is reasonable and fair, and that the dealer/manufacturer will stand behind the product and offer whatever post-sale aid might be required. The salesperson, simultaneously, is evaluating the prospect to decide if he is acutally able to consummate the purchase and what approach would convince the customer to buy. This encounter of the first kind is a vital and significant milestone, since complex sociological and psychological factors such as "body English," eye contact, voice timbre and level, and many other conscious and subconscious cues are exchanged between buyer and seller.

The foregoing indicates that, in actuality, an *adversarial relationship* exists at the time of initial contact between buyer and seller. The qualification process can take many forms, but it is generally predictable. It is an interesting and revealing exercise to observe this initial sales encounter at a distance. I'm sure each of us has, at some time, witnessed the mating dances of various wildfowl and the often elaborate contortions, wing flapping, and other undulations that convey the proper signals to the other individual. Interestingly, the initial sales encounter often will somewhat resemble the stylized mating dance of these birds and often includes some of the territorial bluff and push tactics observable among animals.

When observing the initial sales encounter, it is interesting to note the position of the hands, the amount of foot shuffling, the ratio of direct eye contact to the time each participant spends looking elsewhere, the time interval between blinks of the eyes of each participant. Also, two very important and often overlooked signals . . . swallow rate and the amount of lip wetting. Anxiety (or the lack of it) can very often be determined by the frequency and intensity of the above signals. A subtle but often dead giveaway for someone who is bluffing, lying (or otherwise overplaying his hand—for you poker players) is the simple act of swallowing. For complex psychological reasons, peaks of anxiety of various kinds such as lying, etc., are almost universally *immediately* followed by an unconscious and sometimes involuntary swallow. This is not to say that every swallow indi-

Meeting the Customer Head On

cates a lie, but a swallow almost always immediately follows a statement or act about which the person is highly anxious.

It is not the intent of this article to describe in detail the various factors of "body English" or the other obvious and generally ignored psychological cues, but rather to alert you to these in order that you may begin to observe and study for your own benefit. I have found that third party observation of the sales encounter will certainly enable each of us to polish up our sales techniques (and can, when properly understood and controlled, add considerably to your poker winnings!). When observing a successful prospect/salesperson encounter, you can often sense the exact moment when the prospect makes the final decision, since his overall anxiety level will diminish substantially—as will be evidenced by the markedly decreased rapidity and frequency of the various signals outlined above. At that moment, the salesperson should push for a close, since the customer has crossed over and further sales efforts will often result in the salesperson figuratively buying back the product. Don't *oversell* either!

So far, we have touched on the subtle aspects of the buyer/seller interface during the qualification process. We must now address direct or surface issues in order to complete the package and, hopefully, the sale.

By now, we have reached the assumption that an adversarial relationship does, in fact, exist between buyer and seller upon initial contact. The depth and intensity of this adversarial feeling is extremely variable and we should not lose sight of the fact that *if* the prospect is talking to you, he is interested—and you are certainly interested in selling to him. Any confrontation between opposing individuals amounts to a conflict of sorts and may, in a very general sense, be compared to warfare.

A standard military tactic in warfare is to gain as much intelligence as possible about the adversary in order to try to gain a decisive advantage, and so it should be in the sales encounter. For the past few paragraphs, we have been discussing the reactions of the customer. We must appreciate that he is keenly interested in *our* reactions to him and his "tactics." Military strategists have long utilized techniques and situations wherein they try to imagine how the enemy will think and react to various situations. In fact, "presumption/projection" is essential to various tactical exercises and war games. In sales, we call it "role playing." How do our potential customers get their "intelligence" about the various products, dealers, etc? Quite often, our prospect gets his information (or misinformation) from his own peer group or from reading various publications and magazines, as well as watching what the "establishment" is using. In any case, a standard qualification tactic is to try to place the salesperson on the defensive, then judge his convictions and reactions. A basic and essential rule of selling is: *Never let the customer gain control of the conversation!* If the prospect does catch you off guard and succeeds in putting you on the defensive, the situation almost invariably degenerates and the salesperson often becomes so intent on re-establishing his personal credibility that all efforts relating to product and closing the sale are diminished substantially. If the customer does gain the upper hand, your chances of making a profitable sale are greatly reduced, and you have created the potential for loss of credibility not only with the potential customer but with his entire peer group. The moral to this story is: Utilize the same sources of information your prospect uses and develop a flexible response to what he is likely to confront you with!

The customer usually expects the salesperson to know more than he himself does about the item of interest and if this knowledge is not apparent, he is turned off quick! Nothing is more disconcerting to a prospect than to watch a salesman groping for credibility.

There can be little communication if both parties are not speaking the same language. A disappointingly high proportion of audio salesmen are faking it and consequently they get caught off guard by subjective terms and vague half-truths with which they are unable to cope. I strongly recommend that all salesmen *read* all trade and related consumer publications as well as attend every available audio seminar

or training session. Audio is constantly and rapidly changing and the real pros spend a great deal of time just keeping up. Please realize that in this field we *never* have all the answers. It has been said that ignorance is bliss and lots of would-be sound salesmen are certainly blissful. If you are smart, you will learn all about your products as well as those of your competition, since you not only have to convice the customer to buy your product . . . he must buy it from your company if *you* are to benefit.

Most people will tell you that they would like to rise to the top of their chosen field of endeavor. I would like to remind you that if you want to become and remain a member of "The Winners Club," you are going to have to keep your dues paid up . . . that is, to keep up with this rapidly changing market and know it *better* than your competition!

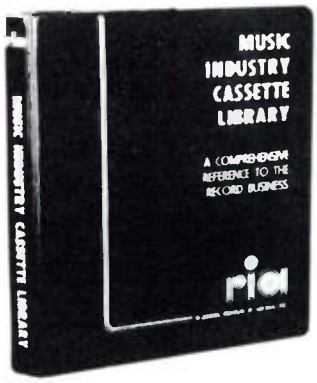
One final word of advice. Never begin your initial sales encounter by asking anything that the prospect can answer with a simple "no" or "just looking." To get the customer to commit himself, you must get him talking, and *no* is easy to say. There is no guaranteed opening line, but if you allow the prospect to say an easy no, its *your* fault. As in any conflict, you must get your adversary committed to the action before you can win.

As has been stated previously, *confidence* is the key word in selling. It is vital that you have self-confidence in order to project this to the prospect. This self-assurance comes only with faith in yourself, your product, and the company you represent. Prospects can easily pick up the negative vibes from the salesperson lacking this essential commodity.

Present economic conditions and increasing competition make it absolutely necessary that you and your company present potential customers with the right products and service at the right prices, combined with the best sales techniques. Value, performance and service are even more important today than ever before. Maintaining a leading position in a competitive marketplace will necessitate constant updating and improvement. The fundmental purpose of this article is to encourage you to think and grow through self-evaluation and improvement. If nothing else, I would encourage you to *think* before you try to *sell!*

ATTENTION RETAILERS:
Make 100% Profit . . . or *MORE*

A COMPREHENSIVE GUIDE TO THE MUSIC/RECORD BUSINESS



Compiled from Recording Institute of America's interviews with key executives and "hit-makers", plus Reference Directory and Dialogue's Viewpoints of industry "stars"

Listen to the industry "pros" describe the workings of the Music Business. Hear the most respected attorneys of the entertainment field define and discuss the legal terminology of Recording Contracts, Songwriter Contracts, Professional Management Contracts. Over 3½ hours of professional reference . . . could be the most important 200 minutes of your life!

Plus . . . RIA Reference Directory, including sample songwriter affiliation forms, sample artist contracts, writer contracts, etc., in addition to a Directory of Record Manufacturers, Music Publishers, Personal Managers, Producers and Booking Agents. Also **Record World's "Dialogues"** with over 50 candid interviews from **Record World** magazine, and a cross-section of "star" personality interviews.

You get all the above (retails nationally for $39.95) for as little as $18.00 (including library mailing carton).

A MUST FOR YOUR CUSTOMERS

ORDER FORM — MAIL TODAY!

For Quantities of 1-9 units . . . . . $20.00 per unit
WE PAY SHIPPING

For Quantities of 10 or more . . . . . $18.00 per unit
WE PAY SHIPPING

☐ PLEASE SEND _____ UNITS AT _____ EACH TO:

_____

_____

For large quantities or credit terms, write or call:
RIA, 15 Columbus Circle, New York, New York (212) 582-0400

Since a well known movie's special effects first rattled the teeth of moviegoers everywhere, there has been an increasing interest in the application of subwoofers in sound reinforcement and music reproduction systems. With large sound systems becoming more common, the ability to produce copious amounts of low frequency energy with low distortion has become increasingly important. The technology to do so has become more readily available in the form of high power speakers and dozens of low frequency enclosures. It is equally applicable to concert sound systems and bar and cabaret bands as well as to huge discos and small clubs. In this article we will look at several of the factors involved in utilizing subwoofers in both new and existing systems.

The subwoofer itself is simply a speaker system capable of generating high levels of low frequency energy with a minimum of distortion and a maximum of reliability. However, this is not all that easy. As it is almost impossible to include maximums of performance in all areas in one speaker system, a compromise is necessary. It is difficult to choose one area that is *less* important, as the customer will notice deficiencies in any of them. For this reason it is important to know what will work best for your customer's application. There are several types of popular subwoofers, including straight and folded horns; large cone direct radiators (both reflex and infinite baffle); Karlson couplers; and even trans lines and labyrinths. For simplicity's sake, we will discuss straight and folded horns and large cone direct radiators.

We must look at what the advantages and disadvantages are for both of those general types. In order for the dealer to make the best choice for the customer in terms of application and value-for-the-dollar, it is a good idea to see where the weak points and strong points lie.

There are indeed differences, and in brief and general terms, the horn is more effective for a given cabinet volume and price when high output and *not* extended low frequency response is a requirement. The direct radiator is more effective in terms of cost and size when extended low frequency response and *not* very high output is a requirement. But as anyone older than six months knows, there are no hard and fast rules in this world. So keep an open mind when you look at any project, as there always seem to be extenuating circumstances that may reverse that general guideline.

I won't go into detail about what differences may exist between straight and folded horns or the differences between reflex and infinite baffle systems. Many dealers will be limited in the items available in their product lines, and while there may be small differences in the performance of straight and folded horns, the end result will be more dependent upon the dealer's knowledge of his available lines and their use in specific situations.

The interface of the subwoofer with either an existing system or a new system is very important. It is necessary to decide upon the net effect to be achieved by the addition of a subwoofer. In live music, you can probably sacrifice the octave between 20 Hz and 40 Hz in exchange for 6 dB higher sensitivity, and use a horn. In a disco, that bottom octave may be very important and the lower sensitivity may not be a problem.

The advantages of a subwoofer can be nullified by improper application. Any type of subwoofer sytem should have its long axis parallel to the floor for maximum effectiveness. By doing this, you reduce the space it radiates into, thereby getting free gains in sensitivity. In the case of a horn, this also provides an apparent increase in the mouth size, which lowers the effective mouth cutoff of the horn.

The mid bass is not greatly affected, as most bass horns have adequately large mouths to control directivity in the midbass region. Direct radiators, on the other hand, exhibit a broad rise below the frequency where the speaker ceases to act like a piston in a baffle—usually around 250-350 Hz. Placement of the direct radiator subwoofer can have a dramatic effect on the overall system's sound.

It is also important to choose appropriate crossover frequencies between the subwoofer and the mid bass system. A sharp filter (18 dB/octave) is best, as it reduces overlap and modulation distortion. The frequencies are best chosen by using a variable frequency crossover in the complete system, with its usual program con-

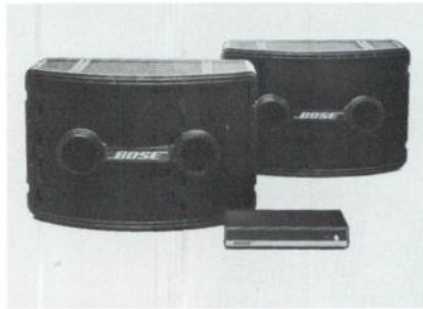
"The Bose® 802 helped me double my business."

Once again, rather than blowing our own "horn"—we've decided to let another of our enthusiastic, satisfied contractors do the talking:

"For me, the basic advantages of the Bose 802 over any other type of speaker system are sound and size. Most of my customers want speakers that sound good and blend into the decor of a room.

"I am very conscious of sound . . . I was a professional musician before I became a dealer. As a performer and a listener, as well as an installer, I would never sacrifice good sound for size. If I felt a speaker had to be big to give a big sound, I would choose it over a smaller one. But Bose 802s are amazing speakers. Bose provides intimate, living-room, high-fidelity sound on a dance floor—never the offensive, listener-fatiguing sound that you often get from a horn-loaded sound system.

"Another fantastic thing about Bose is that I never worry about the 802 blowing up. That's quite a contrast to some of the compression drivers I have used. In this business, the operators often don't understand how much the systems can take and they get abusive. Bose 802s can take just about anything those guys hand out.



"Several years ago, when I decided to go into the business of selling and installing sound and lights, I wanted to take on a line I really believed in—one that really did what it was supposed to. With Bose, I've done that. I handle very few products, and that is one of the reasons I have been successful.

"In the last two years, I've done about a dozen good-size installations, using the Bose 802 for dance music and sound reinforcement. Besides my installation business, I have the mobile Kenny Gordon Sound and Light Show, which can be rented in configurations from 4 to 12 Bose Model 802 speakers. Between these two areas, the Bose 802 has helped me double my total business income."

We can't promise you'll double your business when you carry Bose. But we can promise your customers will thank you for the sound, the appearance, and the size by repeat business and by recommending you to others. That way, you'll be building on your own success.

BOSE®

Better sound through research.

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

☐ Please send me the complete Bose Professional Products catalog.

☐ Please have your representative contact me.

Name:_____

Firm:_____

Street:_____

City:_____ State:_____ Zip:____

Tel. ( )_____

tent and level, and adjusting the crossover until the most subjectively pleasing sound is heard. It is possible to use the wrong bandwidth with any subwoofer. If too wide a bandwidth is chosen, modulation distortion will be produced by the subwoofer on demanding bass passages. If too narrow a bandwidth is chosen, the mid bass system may produce excessive modulation distortion as a result of being operated too low, too loud. For most subwoofers and mid bass systems, the optimum crossover point will be between 100 Hz and 250 Hz.

HORNS

Advantages	Disadvantages
High sensitivity	Very large for very low frequency response
High reliability	More complex and expensive construction
Low modulation distortion	
High dynamic range	
High SPL/cu. ft.	
High output/$	

DIRECT RADIATORS

Advantages	Disadvantages
Lower cutoff for a smaller cubic	Higher modulation distortion
Possible to have smoother response	Requires large excursion for high output
Simple and economical construction	Lower sensitivity than horn
	Lower SPL/cu. ft. than horn
	Lower output/$ than horn

Another very important point to be considered is amplifier power. A subwoofer with high dynamic range does not indicate that you can skimp on the amplifier's dynamic range. In adding a subwoofer to a system, you may reduce the power needed for the mid bass by 6-10 dB, but you still need a lot of power for the subwoofer. In a system using a 15″ bass speaker per side being driven by 200 watts, the addition of a subwoofer reduces that to 20-50 watts. However, the folded horn subwoofer requires an average of 100 watts and regularly peaks at 200 watts. This may seem contradictory, since we are talking about a speaker system much more efficient in producing low frequency energy, but what seems to happen is that the system operator will run a generally higher bass level (especially if there is dancing involved) without realizing it. The increased dynamic range and low distortion is subjectively translated into *better* bass. This effect can be entertaining; some customers may even complain that the additional subwoofer has not accomplished anything. It is very easy to prove just what it *is* doing by patching around the subwoofer add-on and letting them hear the original system. This is also the best method of selling subwoofer add-ons to existing systems or demoing new systems with subwoofers.

It is definitely worth the expense to have an amp rack and a couple of subwoofers around specifically for demo, especially if the filter system is wired in such a way that the customer can switch between his normal system and the subwoofered one. This has often proved to be the only sales pitch needed; it converts a skeptical customer into a paying one.

There are many product lines on the market which are suitable for producing subwoofers; peruse the line you handle and consider a subwoofer package. And don't limit yourself to just disco and sound reinforcement. It works just as well for instrument systems too. Try it, you'll like it.

More profit pictures from ARP.

At ARP, we believe the more musicians learn about synthesizers, the more they'll want to own synthesizers.

That's why ARP sponsors concerts and in-store clinics for ARP dealers. It's a chance for customers and salespeople to see and hear synthesizers played and explained by experts.

If you've ever had an ARP concert or clinic, you know about the sales, the excitement, and the long-term benefits of an ARP promotion.

If you haven't, call Hal Boyer, National Sales Manager, at (617) 861-6000. Find out how you can get into the ARP profit picture.

ARP Instruments, Inc.
45 Hartwell Avenue
Lexington, MA 02173

CIRCLE 72 ON READER SERVICE CARD

Retailers SPEAK OUT On Selling Pro Sound

At January's NAMM Winter Market, Cameo again sponsored a well-received series of seminars. One of these seminars, Selling Pro Sound, *consisted of case histories and advice from three retailers—J.D. Sharp of Bananas at Large, Fred Bramante of Daddy's Junky Music Stores, and Ray Hartman of California Music. The moderator was Larry Blakely, President of Cameo. We present here an edited transcript of that seminar.—Editor.*

J.D. Sharp: Bananas at Large was initially a music store specializing in rock and roll equipment which branched into creative audio and pro sound. In its current format we started in business in May 1974. We now occupy 3,300 square feet, of which there are essentially two adjacent 1,100 foot store fronts. We're in San Raphael, which is twelve miles north of the Golden Gate Bridge. We deal with the entire Bay area music market, which at times—depending on how much somebody wants to spend driving around and what they feel is at stake—can stretch all the way from San Jose to Santa Rosa and more, so it can be a large geographic area.

We also have a service department although it is not actually owned by us. We have an agreement; they're two blocks away. We felt that we weren't able to offer enough floor space and get in on the ground floor—which becomes a real factor in dealing with, let's say, tape machines which may weigh 80 pounds, 100 pounds or more.

We added pro sound in 1976, in the fall. At that time our business occupied 1,100 square feet and a store became available next door to us. We took the space and moved in at first with very little equipment. We were selling a few boards, small P.A. systems, columns, and stuff, just on the musical side. We moved that in there and we negotiated with Teac and Tascam. I'd say that that was the first key franchise for us in establishing something other than a music store. Shortly thereafter we also became a dealer for JBL, not only for music speakers but for their professional line.

We really started in that area with a very small investment and let it grow from there. In fact, Bananas at Large as a music store started very small and it was through almost continuous reinvestment, taking no salary to speak of for a couple of years, that we were able to build it up. We had success from the outset, partially because of real low overhead at that time; partially because of the growing demand (1976 was a good time to enter that market). We had a lot of growth right away and began a process of picking up franchises.

There's a question here of what I would change if I were doing it all over again. Well, I would change a lot of things. I wouldn't attempt to get into the business now the way I did then. I don't think it would be possible. If you're in a geographic area perhaps which is devoid of dealers and yet has an active professional segment, then maybe you'd be able to start out with a couple of items and build up from there. More likely though, if you've never been in the market, you're going to enter into a field where at least some of the guidelines have been established and maybe some dealers already have some equipment.

If I were doing it over again, I would pick and choose my lines very carefully. I would go for fewer lines than I went for initially and I would put the emphasis on systems right from the outset—which we didn't do. We built up systems; in fact we were very good at building systems. We would assemble professional systems, and we knew how to connect everything and what went with what. But we never made an effort to really display systems or to market systems.

Overall, the pro sound market has been very good to us and it definitely has enhanced our business and given us a standing in our market area that we would not have had otherwise. The profitability has gone up and down. For us right now it's up. It's up because of the strong effort on our part to weed out lines and to weed out the products that don't turn and to try and make decisions, hard decisions, that end up putting us in a good marketing position with a good product and selling it for what we want.

It's taken years of education from the market itself; from common sense and experience; and really from rep organizations. Our reps have been really helpful to me (I don't know what the other dealers would say) in getting me to think about the bottom line and to look at the big picture, to look at the way all the different dealers interlock and how to make money.

When I started into this I was a rock and roll musician and I'd never owned or operated a store of any kind. At this point things are profitable. They're profitable because I've become educated and I stress very strongly to our sales people what I consider to be tolerable in selling. All deals come back and are examined, and there are minimum operating standards.

Another thing we learned is to just walk people. It's been one of the most agonizing experiences, after you're used to trying to nail every sale that comes through the door, to change your philosophy and say, "Wait a minute, I'm in control of this situation if I want to be. This is the way I'm going to do business. If this doesn't work, fine." The corollary to that is to not be afraid to open your mouth and tell your rep what you're feeling and what you're encountering. Reps are used to hearing you cry a lot—maybe sometimes unnecessarily—but I found that if I take things in a calm manner, let them know what's going on with my market place and what I'm encountering, again there could be feedback between dealers without affecting competition at all. I think fundamentally there's an understanding that nobody really is going to make any money unless everybody's going to make some money.

Looking at our business and how it's been affected by the turn in economy, areas of our business have gone down. The market for creative audio products periodically goes through periods of saturation; that is, until new people realize the need for the equipment there is some of that saturation. However, our actual volume has been up and not down and that has been from the broadening of our market base into other fields, some of which are not related to the music field, like broadcast. Sales definitely have not stopped and the manufacturers have counteracted by new product introductions. A lot of new products have been fine tuned to where the market sits right now.

Now I'll give you my two bits on advice. I would say the requirement to enter this market are to become in one way or another knowledgeable enough to make decisions that will make you right as a dealer, rather than just buying a product out of convenience. Obviously floor space is a requirement, but that has to be tempered completely to the demand in your own marketplace.

The main thing is in relating to personnel. Let's say if you yourself do not have direct experience in the recording field or in the reinforcement field, then you're going to have to hire and rely on somebody who is knowledgeable. But I would contend that unless you one way or another get involved, you are going to be unable to supervise the person giving you advice and are not really able to weigh that advice. Now, you can sort of go on the hit or miss principle; if he gives you advice and it works out—great. You're a star. But your best insurance is to become knowledgeable about the subject, and there are different ways to do that. One thing is to use any number of publications. There's the Cameo glossary which is extremely helpful. I would get my hands on every piece of literature. Read *Modern Recording*. Definitely relate to SOUND ARTS to see what's going on. Where you can really start to unravel some of the technical end of things and make it make sense, then you can approach the point where you can probably make worthwhile decisions.

As far as inventory goes, I come back to the idea of systems. For a long time we succeeded in selling on a piece work basis—almost like a hardware store. We'd have a piece of equipment and that was it. But now I would concentrate on systems. Just having this piece or that piece may be good, and you may have a high selling line. That's fine. But overall, you're going to sell more crossovers and more equalizers and you have to have them displayed in systems and, if you can, show how functionally they work together. So your inventory at least should be sufficient to package intelligently and, again depending on your marketplace, it should be sufficient so that you can establish at least a couple of levels within that marketplace.

As far as profits to be expected and gross to be expected: that is a real variable. The profitability is really dependent on a couple of things. Coming from selling guitars or selling accessories, one notices that a lot of professional equipment carries shorter markups right off the top. You're not going to see the A discount very often. And if you do, great. But for the most part, you start to think of a B market as being good and it goes down from there—very often you're faced with an item and it might have 28% margin. So again, you have to look at products, to figure it all out. Let's say you take a piece of equipment that has a 28% margin but is highly in demand and that can be sold at list. That's a good product. But if you take that product and five other stores in the area have it and everybody thinks that they have to make the sale to make the sale—that's not going to be profitable. Anticipation of profit is going to depend on how selective you are in selecting lines and how well you can market the systems—and also on your competition.

Really the first thing is to analyze your marketplace and then figure out whether it's being served adequately now. We have a situation where pro sound is profitable for us now. We have identifiably a half dozen dealers in our area who are one way or another involved in pro sound. There are two more dealers entering our marketplace this year. We may have a situation where six dealers can survive but eight dealers are going to find it difficult. Now, maybe the strong will win out over the weak and that process will run its course, but on the other hand, maybe you are in the position not to get into pro sound just to be into pro sound. Get into pro sound because you can make money with it. And make money with it by analyzing your market setup both in terms of what lines you're going to carry and in terms of not trying to slice it too thin.

Another thing which I would put at the top of the list: specifications. The hi-fi industry went through a process a while ago where the federal government had to intervene and establish some kind of universal standard for quoting specifications on equipment. No such standards exist in our industry. And it is rare if ever to find two amplifiers or two crossovers or two anythings quoted with the same specifications. Let's say you look at frequency response: it says twenty to twenty thousand. That's great, but that could be an entirely meaningless specification depending on at what level, at what percent distortion, etc. With any specification, read the whole specification, because all specifications are relative.

Fred Bramante: If any of you happen to be sitting here with a hundred thousand, a hundred fifty thousand dollars in your pocket and you'd like to get into the pro sound end of the music business to make a lot of money fast, you're in the wrong semi-

nar. Because it is not going to be fast and it's not going to be easy. I'd like to approach the subject much from the viewpoint of a dealer who started pretty much with nothing. I had six hundred dollars when I opened my first store. And we grew quite substantially in a nonprofessional, very limited market in New Hampshire.

First I'll make a little plug for the Chamber of Commerce and tell you the state of New Hampshire is the only state in the United States with no sales tax and no state income tax. The population of the whole state is only one million people.

We have three stores in southern New Hampshire. One of them is on the Massachusetts border about 35 miles north of Boston and one of them is on the Maine border. We sell guitars, amplifiers and pro sound. Our stores vary in size from 2,000 square feet to aobut 7,000 square feet. Our largest store is in Salem, New Hampshire and that's one that we own and we built a year and a half ago. We have a full-time service department, with our technicians there all day long doing their thing. We started this business in 1972 selling used instruments; not just vintage guitars. We were selling used amplifiers, used drum sets and used sound systems. We were so committed to used instruments and believed so much in used instruments that it wasn't until 1977 that we took on our first new P.A. related line—and that was Shure microphones, which isn't exactly a giant leap in to the sound business. After doing this for a while, we realized that there was a problem, and the problem was that used Vocal Masters and Bogens just weren't making it any more and we were going to have to do something about it. Electronics was just advancing so fast that these things were becoming obsolete, and although it was nice to have my old Stratocaster hanging on the wall, I was having more and more trouble trying to sell used P.A.

The time had come to make a change. So very carefully we looked at what was available and very cautiosly we made our decisions. We followed a three-step plan guided by our own 10 commandments: One, thou shalt make a strong commitment to understanding sound systems, for this is essential if thou art to understand thy customer's needs. Two, thou shalt always keep current on what products are available. Number three, thou shalt make a fair profit, for thou art not church affiliated. Four, thou shalt not tie up many lines but rather (five) promote a chosen few. Six, thou shalt know and believe in thy products and thy suppliers and should expect the same in return. Seven, thou shalt know thy competition, for it is difficult to keep abreast if one does not know what abreast is. Eight, thou shalt not bootleg for thou will do more harm to thyself than good. Nine, thou shalt have the foresight to lay a good foundation on which to build a future, and ten, thou shalt be patient and persistent, for even Rome was not built in a day.

We used these ten commandments to guide us in our three-step plan in safely becoming a successful pro sound dealer in a small market with limited funds available. Step one is our training ground and we started with small package P.A.s, columns, small cabinets, microphones. Relatively inexpensive to get into and even to sell. You will have your local bands come and buy these and they will turn over and you will make a profit. Step two is getting into the larger amps, separate power amps, mixers, more expensive cabinets, equalizers, crossovers, a good speaker line, low impedance microphones. You're now into some heavy bucks. If you've done your homework properly it should be profitable, but the key in this situation is to know what you're doing. If you try to come out of step one into step two and you do not know sound systems, you are making a mistake and a very expensive one. When you have those items sitting on your floor, your customer expects that you know what they're all about. Step three is getting into accessories—digital delays, speaker components, snakes, limiters, etc. It can be very expensive. If you have done step two well, then step three should be a nice transition. All in all, the pro sound market is very exciting but it's also very expensive and how you do it will determine whether it's a good business to be in.

It has been said that 1980 is going to be an even tougher year than 1979. Personally, I'm looking forward to 1980. I am excited about my business, and I see good things in the future for us. Past performance says that in hard times, the music industry has done all right, one of the reasons being that music is an escape and is a way to get away from other problems. My advice is if you're going to do it, be cautious, be prepared, and go get it.

Ray Hartman: I have two businesses, and my first and primary business was started up in Seattle, Washington approximately 10 years ago. We are very heavily involved in pro sound in that area, and we were from the start very successful in the pro sound business. We were the original dealer to Tapco.

In 1975, when our business was destroyed by fire, we had been going great guns and doubling in size and volume consistently. At the time of the fire, I had an opportunity to sit back and think about the business that I was in and I realized that I wasn't in the music business at all. I actually was in the dollar business. This gave me an opportunity to approach this from a little different angle. And that angle is keeping a very close track of your inventory concerning your dollars. It was a lot easier for me after reassessing the situation. You know, I had thought that I was very smart and I had a lot of answers and I knew my pro sound business and my music business. But I really made better strides and more advancement when I realized how stupid I had been and started back at ground zero.

I assume that everyone here is in the retail music business in one form or another, whether it be band instruments or guitars and amplifiers. There is a considerable difference between them, I have found. In Seattle, we deal primarily with combo, pro sound instruments. We don't deal with band instruments or pianos and organs. That has a characteristic markup for us too and that's the standard markup of 50%. Now down in California, I acquired a company called California Musical Instruments. They are very heavy into the band instruments and discount point of view and that is a very valid approach in that field. But it's not a valid approach in the pro sound field. There's a little bit more margin to play with there and I find that the suppliers and manufactures condone the discount. In pro sound, however, you're dealing with a much shorter markup and that markup is very very critical, because if you discount to be competitive or to make a sale, it's very easy to discount yourself out of business. A number of people do it and we see new stores folding every year and I believe that the primary reason for this is a lack of commitment to effort—commitment to making money and getting paid for the time that you put in for it. I'm sure every-

one here puts in ten to fifteen hours per workday on the average basis and it's time to get paid for that.

The best way I've found to pay myself for my time spent is to demand my profit on every sale that we make. It's very easy to fall into a discount situation and approach all sales from a discount point of view, because the average customer walking in is very, very educatd on the lines that he's interested in. He's got all the issues of *Modern Recording* and he can out-spec you. We specialize them by department. Our salesmen are responsible for various areas of sales. We have twelve sections of sales, and we can look at the profitability of each section. It's the individual's responsibility to keep the profitability up at the various section assigned. I find that this works very well for us.

The short margins make us very careful about qualifying our customers and taking trade-ins. Trade-ins can be very deadly in dealing with pro sound merchandise because of the short margin. Many stores and I, myself, a long time approached this with a keystone or a full markup trade-in policy that does not work. I don't know what everyone's policies are. I find that those equations simply don't work. The reality is you wind up with a pile of used outdated merchandise. And that's very important, because I have a hard time paying my bills with merchandise.

People need and want to know all about the product they're purchasing. If you can give them every answer that they want or that they demand, they will come back and do business with you, and we have found that by adding a knowledgeable staff people will spend more money on the product: Since they can call us and get an answer to a question, they're more than willing to pay for it.

In-house or on-premise service facilities are very important also. We try to service everything we sell: we find it helps us out very much in the return on investment. In many areas you have to send your customer down the street and that's the last time you see him.

I find also that minimizing lines, maximizing product is more profitable. It's very easy to succumb to the customers that come in and ask for whatever and to go and to try to have all these items on the floor. You'll find this ties up all your money and gives you very little return. List price also is sometimes purely fictitious, and the only thing that counts is how many points up you can sell the item for; how much money it's going to make you.

I think that the establishment of minimum selling prices is important. In our case we use something called the landing cost, which is an arbitrary figure added on to invoice value. It also doubles as a commission figure on goods sold over landing cost. I refuse to lose money on any sale. The invoice cost is just a small portion of what your goods cost you. What we found successful is to take operating expenses for the first quarter or any given time period—90 days seems to work well. Operating expenses in my terminology are those expenses that we will have to pay for and accrue whether we sell any item or not. That's your rent, your light bill, your phone bill, heat. All those items that will happen whether anything goes out the door or not. If you add those up and come up with a percentage of a quarter's annual income, you'll come up with a rough landing cost, because that is your break even point. Your break even point is not invoice cost on goods.

We add those operating costs to, in this case, pro sound 33⅓% markup items and we come up with a net landing cost of let's say about 19% of invoice, 20% of invoice. Well, already we're out of the discount field. Because the salesmen can't discount into oblivion, so we have to figure out another way to sell with product knowledge and sale technique. We minimize our lines and maximize our product knowledge, because there are a lot of products out there. And if you sit down and really think about it I'm sure you can come up with solid and effective arguments to everyone elses products.

Another problem is the average caliber of representative that walks into my office and calls on me. I find that in many cases any one of my sales staff has more product knowledge than whoever walks in with that product. This of course isn't true in all cases, but it is true in enough cases that I believe it's a viable problem. A lot of these folks are used to the old music business which was selling lots of guitars and making money selling guitars and having to discount 20%. Well, you can't discount 20% when it's only a 30% markup. It just doesn't work.

The SOUND SH

After years of careful observation, I am convinced that there is no stranger breed of musician that the pedal steel guitar player. Why? Because no two of them play alike, tune their pedals the same way, or use the same kind of amp. That was a fact of life, until a few years ago, when **Peavey** introduced their Session 400 amplifier. Suddenly there was *something* that steel guitarists could agree on: the kind of amp for a pedal steel. A milestone had been reached.

One would think that after such a coup, Peavey wouldn't want to tamper with success, but such is not the Peavey way. They went back to the laboratory with hopes of improving upon what had quickly became a standard amp among steel players. The result: the Peavey Session 500, a monster amp if ever one drew current.

Consider these features: 250 watts RMS. Your choice, 15″ or 18″ Black Widow speaker. Pre and Post gain. Active equalization. Built-in phase shifter. Built-in "string effect" with dynamic expansion circuit. Built-in variable electronic crossover. Just about the only thing that isn't built in is the steel guitar!

There is also a built-in volume pedal circuit that allows a direct input into the amp, thereby eliminating unwanted noise. On-board compression is another feature of the Session 500. Then there's reverb, preamp output/return, and even a little ol' headphone jack, so the player can practice without disturbing anybody.

This amp has got everything but bucket seats and a moon roof, and although it was designed for the steel guitarist, I'll bet there are guitarists and keyboard players who will want to try the Session 500 just to see what kinds of new sounds they can pull out of this most impressive unit.

CIRCLE 4 ON READER SERVICE CARD

After designing, refining, and fine tuning, the invention of Kevin Godley and Lol Creme (musicians of *10cc* fame) has arrived in the form of the new Bass **Gizmotron**, an electric bowing device that attaches over the bridge of most any electric bass. The Bass Gizmotron renders the effect of bowing the electric bass, singly or all four strings at a time.

Beyond having the capability to bow any or all of the strings, the Gizmotron is capable of infinite sustain as well. Thus the player can hold the key (or keys) down on the device and fret the appropriate string(s) with the left hand. The sound is simply a pure string sound, not something electronic or farfetched. Bass players should immediately recognize its usefulness, and will be anxious to try the Gizmotron.

One of the nice things about this device is that it can be attached to the instrument via a special bridge plate that does *not* alter the bass itself or require that any holes be drilled in the body of the instrument. Furthermore, it opens up some new possibilities on the electric bass. (In my view, anything that can take us past "funky" string-popping is a blessing in itself.)

CIRCLE 1 ON READER SERVICE CARD

OPPE

By Charlie Lawing

Musicians working in those tight places (or working tight in loose places, as the case may be) will be interested to know about a new miniature monitoring system from **Mirage Audio**. It's called the "Short Stack," and it is a tiny cabinet that houses two small 4½" high-efficiency drivers that are capable of delivering 100 watts of directional power. The little critter only weighs 7 lbs., and the manufacturer also offers a custom mounting bracket that will mount two of the speakers on a mic or cymbal stand. The "Short Stack" has two parallel input jacks which provide easy connection to power amps or other monitor systems.

CIRCLE 2 ON READER SERVICE CARD

The latest in a long line of good quality products from **Tapco** is the Catalina series C-8E expander. This mixer expander adds eight more inputs to the C-12 master console. Each input has a mic-line switch, overload LED, 3 sends, three-band equalization, four mix busses with panning, a solo button and a 100 millimeter slide fader.

The C-8E contains mixing amplifiers and a self-contained power supply for necessary operating voltages, as well as Phantom power. All of the patching capabilities of the C-12 are retained, and the C-8E can be used as a bus expander, an input expander or a submixer, simply by the appropriate choice of patching.

CIRCLE 3 ON READER SERVICE CARD

One of the most popular effects to come along in a while is the **Roland** Boss CE-1 Chorus Ensemble. The CE-1 is a floor unit that has a chorus and a vibrato effect, with variable depth and speed controls provided for both functions. As the sound of phase shifters and even flangers (of *all* makes) has become a little tired, simply through overuse in the studio and in concerts, the lush sound of the chorus effect was welcomed by guitarists who wanted something new. However, while the chorus sound is new, the vibrato certainly is not, so the other half of the CE-1 was going unused, comparatively speaking.

Perhaps that is why Roland decided to offer the chorus sound in a smaller unit, the CE-2, which is simply a chorus ensemble and nothing more—no vibrato, fuzz, wah, or pounding surf sounds—just a good little chorus box.

The CE-2 has a variable Rate and Depth control, and its signal-to-noise ratio (90 dB)

makes it equally useful in the studio or on the stage. The CE-2 is not limited to use by guitar players, but can be effectively used to enhance vocals, keyboards, brass and wind instruments. FET switching circuitry keeps the unit from emitting any "popping" sound when the on/off switch is engaged, and access to the battery compartment, which is isolated from the rest of the circuitry, is attained with the twist of a coin or screw-driver on one small screw. Another good feature is the LED on/off indicator which lets the user know which mode the CE-2 is in at all times.

CIRCLE 7 ON READER SERVICE CARD

While we're on the subject, let's take a look at another new effects pedal from Roland, the **Boss** PW-1 Rocker Wah. It's a wah-wah, right? That patriarch of signal processors that Eric Clapton so effectively wielded on songs like "White Room" way back when . . . ahh, those were the days!

Well, the wah pedal has come a long way since then, taking on various forms and multiple functions. Indeed, this new pedal from Roland may be the most unique wah pedal yet, since it does not operate via the usual potentiometers, gears and bell cranks. No, the Rocker Wah employs something known as the "Hall Effect," which is a magnetic field that eliminates scratching and other noise.

The Rocker Wah has a three-position range selector that selects the center frequency at which the wah occurs. In addition, a width control determines how wide a frequency range is affected by the throw of the rocker pedal.

CIRCLE 5 ON READER SERVICE CARD

A product which was unveiled at the June 1979 NAMM show is now ready for shipment to dealers. The Prophet-10 synthesizer from **Sequential Circuits** is one of the most sophisticated polyphonic, fully programmable synthesizers available today.

The Prophet-10 is a dual-manual instrument. Each manual has five programmable voices, and each voice has two VCO's, a mixer, a four-pole low pass filter, two ADSR envelope generators, and independent modulation capabilities.

Other interesting features include pitch-bend and modulation wheels, octave transpose switches, automatic tuning, and three-band programmable equalization. The Prophet-10 has an overwhelming number of controls, options and capabilities, including programmable volume control, two assignable and programmable control voltage pedals, polyphonic modulation and stereo/mono balanced or unbalanced output.

Needless to say, the Prophet-10 is not for the faint of heart, but if your customers are looking for a monster synthesizer, this is it.

CIRCLE 8 ON READER SERVICE CARD

In most live performance situations today, guitarists, keyboard players and drummers prefer to mic their instruments rather than rely on just the amplifiers and the natural acoustic sound of drums to carry their sound to the audience. But even so, micing instruments has its limitations. Microphones must

The SOUND SHOPPE
REAR ENTRANCE

be carefully placed, and even then, the best mics usually suffer form some crosstalk during the performance. Naturally, a trunkful of mics costs quite a bit and must be handled carefully on the road.

The drawbacks of close micing in live performance has led many players to the direct box, a device which enables the user to send a signal directly from the output of the amplifier to the mixing console of the PA system.

Musimatic has two such direct boxes now available. The DL-100 is an active direct box which allows the musician to get solid sound reinforcement without noise caused by the use of microphones or transformers. The DL-100 and its passive counterpart, the DL-200, will not cause ground loops or line hum.

Guitar players usually prefer the sound of their amplifier through its own speakers rather than the house PA, but direct boxes are the ideal way to handle bass guitar and keyboard signals, because they can "clean up" a signal quite effectively.

The DL-100 retails for $93.50; the DL-200 for $85.60.

CIRCLE 6 ON READER SERVICE CARD

New from **Furman Sound** is a tunable three-way/five-way electronic crossover, the TX-4. The unit has four crossover points, each of which can be independently tuned to any frequency from 20 Hz to 20 kHz. The crossover points can be used separately in pairs or together. Tuning for each crossover point is accomplished by selecting a Frequency Range pushbutton, and then zeroing in on the exact frequency with the corresponding Crossover Frequency control. The high- and low-pass outputs of each crossover point track each other as the frequency is changed. Each input has a separate level control, with a unity gain setting at approximately seven. A setting of ten yields a gain of 6 dB. In addition, level controls are provided for each output.

The TX-4 features a red LED pilot light and a separate regulated power supply for each channel. Unbalanced inputs are standard, but balanced inputs with XLR-conmectors are available as a low-cost option.

CIRCLE 9 ON READER SERVICE CARD

One of the biggest developments in recent years in the speaker manufacturing field is the new series of loudspeakers from **JBL**, the "E Series." The other side of the coin, so to speak, in that development is the discontinuation of the popular K Series speakers.

According to JBL's engineering staff report of the new E series speakers, the JBL company held on to the Alnico magnet structures (such as were found in the K Series) long after most of the rest of the industry had converted to ferrite magnet structures, preferring the high flux levels and low distortion levels associated with the Alnico magnets.

The key to the E Series speakers, then, is that they do have a ferrite magnet structure, one which JBL says is "optimized" and capable of outperforming their conventional Alnico structures. The big difference lies in the reduction of second harmonic distortion. This is achieved through Symmetrical Field Geometry (SFG) in the gap area, which provides magnetic flux lines which are *equal* both above and below the top plate, thereby reducing second harmonic distortion.

The E Series consists of the E110, a 10″ guitar, vocal or keyboard speaker; the E120-12″ and E130-15″ speakers for lead or rhythm guitar, vocals, electric piano or organ, and the E140-15″, E145-15″, and E151-18″ speakers for electric bass or organ.

CIRCLE 10 ON READER SERVICE CARD

By Megan Ferrell

DEALER DOSSIER

Audissey
Honolulu, Hawaii

Audissey, a sole proprietorship, was started in 1972 in Honolulu, Hawaii. During the last eight years, the company has seen many changes. Originating strictly as a sales and rental organization utilizing 400 square feet, it grew to a complete one-stop audio facility that now includes sales, service, installations and engineering; small P.A. rentals and large concert systems; and a 16-track recording studio, housed in 3,600 square feet. Audissey is located in Kakaako, a section of Honolulu located mid-point between downtown Honolulu, the financial center, and Waikiki, the tourist and entertainment center. The first glimpse of Audissey's building reveals a wall mural depicting the palm and banana trees that are characteristic of Paradise.

Upon entering, one finds a reception/front office decorated with rough redwood paneling which creates different spaces for office workers. To the right, mauka (mountain) side, is a door leading to a long hallway. The redwood paneling is repeated throughout the facility. The hallway walls are filled with redwood boxes, framing a variety of local album covers, attesting to the quantity and quality of artists who have recorded at Audissey. Off to the right, the brown door leads to the musician's lounge, where a couch, tables, small bed, and indirect lighting create a comfortable environment for musicians on break during recording sessions. This room also serves for many business and staff meetings. A kitchen branches off to the left, as does the green door into the 16-track recording studio. Further down is the red door, leading into owner Sam Holt's office, and beyond that is the sales room, divided into one small and one large area. The small area serves as the office for Audissey's Sales Manager, Rick Parlee, and future control room for an 8-track production studio to be utilized by the customers for hands-on experimentation. The large room is filled with semi-pro and pro equipment, including Anvil cases; Altec, E-V and JBL speakers; Biamp, Tapco and Tascam mixers; BGW amps; AKG and Neumann microphones; Clear-Com; and the ever present literature. A loft serves as storage space, and eventually will be transformed into another control room.

Behind the green door, the studio offers a live alcove where the Yamaha Grand Piano sits, a live booth for drums, bass traps, and indirect lightng in an unparallel ceiling. Two entrances allow clients to come in through the hall, and equipment to come in through the warehouse on the other side of the building. Tapes and microphones are stored in a room off the control room, directly behind an isolation booth. Windows look from the control room into the large studio and the iso booth. The studio consists of a SpectraSonics 20×16 board, a 3M 56 16-track recorder (aka "Molly"), Ampex 2-track mastering machine, UREI limiters, AKG reverbs, cassette decks, and other peripheral gear.

Now, if one goes to the front office and turns left, or makai (ocean) side, one finds about 600 square feet which house a technician's department and a fabrication area, where speakers, amp racks and other equipment are readied for installations. Continuing makai, one finds about 1,000 square feet of warehouse filled with Audissey's small P.A. systems, concert P.A. gear and a concert monitor system.

Sam Holt, owner of Audissey, has lived in Hawaii for 16 years. He has worked in the audio business for most of those years, specializing in installations and live sound reinforcement. Rick Parlee has worked in audio for eight years, four of which have been at Audissey as Sales Manager. Rick has extensive experience in design and installation of permanent and portable systems and recording. Rick and Sam were interviewed about their operation, what is unique about doing business in Hawaii and what changes are forthcoming at Audissey.

What are your different departments?

Rick: Sales, service, design and installation, small P.A. rentals, large concert system rentals, and a 16-track recording studio.

Do you find yourself going into more high end or semi-pro sales?

Rick: We carry both, but high end seems to dominate our sales. We stay away from the musical instruments. We are not a typical retail outlet like the hi-fi shops. People don't normally just walk in off the street and come in to shop. We make appointments for people to come in and sometimes we spend a half to a full day talking about one system.

What do you find is the most lucrative in sales?

Rick: Permanent installations and portable P.A. We spend quite a bit of time designing and engineering systems, and we get into fabrication as well. Our biggest sales come from institutions. We're here for the musicians, of course, but most of our business comes from schools, larger hotels and churches. It's all music industry related: discos, bands, clubs, background music systems, etc.

What are your biggest selling items?

Sam: Speakers. JBL is our largest selling speaker, but then we're in the music industry and in the music business, and that happens to be the largest selling speaker. The spectrum

of stock goes from high end to low end. We're heavy into Tascam and Revox as well as MCI. We carry equipment for the small semi-pro or home studio, all the way up to 24-track. We also bring equipment in from England and Germany. As far as sound reinforcement equipment, we handle all the way from Biamp and Tapco to Soundcraft from England.

What permanent installations are to your credit?

Sam: We designed and built our own 16-track recording studio, from which we have learned a lot about acoustics. We've designed and installed a production studio for Brigham Young University, Hawaii Campus. We're providing equipment for a new studio on Maui and our design has been approved for a studio at Iolani School. Installation is to begin soon. Iolani will be ½-inch 8-track. The one in Maui is going to be a 2-track designed for future expansion.

Rick: We do a lot of work with Don Ho, both portable and permanent projects. We installed and maintain the Polynesian Palace Showroom system, where he performs. We custom built his monitor system for his last tour of Japan.

Sam: We do a lot of design and engineering of portable systems. Because of the way we have to travel when we do P.A.'s on the outer islands, we got really good at making compact systems that travel really well. We find that there are more people coming to us to design and build portable systems. We do all our own art work, all our own engraving and patch bays, custom designed enclosures. We put together a really roadable system. We have become very akamai [smart] in this area.

Do you notice any trends?

Rick: We find there is a definite market for high quality equipment. People want good quality, professional equipment, and in a lot of cases, money is not even a consideration. They want the best. Recently, we worked with a church in Kailua that had $2,000 to spend for a sound system. With the size of their church and their needs, you could not do it. Now, they could go to someone in town who would sell them $2,000 worth of sound equipment and install it—or worse, have them install it. It might sound a little better than what they've got, but I doubt very much for $2,000 you could get something to sound decent. The way we approach it is to take that $2,000 and apply it to a much larger

system, and divide the system up in increments. We may end up with a $5-8,000 system, but the first increment is only $2,000. They can look at it and say, "Okay, we can give the $2,000 now. Within the next six months we need this much and within the next year. . . " and so forth. They have a goal. We find our customers are a lot more receptive to something like that if they know that eventually they are going to have a good system. Then there are the rare cases where someone will put out a whole lot of money right then and there, as soon as we tell them what it will cost to do it right. They say, "Oh, okay, we got it. Do it."

What are your biggest problems with installations and fabrication?

Rick: The salt water and high humidity will break down anything, any material. The sun will dissolve anything too. We have to use stainless steel for a lot of our hardware, gold pin connectors, weatherproofed speaker cones. We have to do a lot of dipping with the cabinets in special paints. We work with J. Boyer, Cabinetmaker, who assists us in the design of enclosures and builds what we need. Being a musician, and previously into sound reinforcement, he understands the properties of custom built enclosures and does excellent work. We have to be cautious with indoor installations as well, because of the climate here.

Who handles quality control?

Rick: Usually its between Sam, Rob (Chief Tech) and myself to make sure fabrications and installations are done right and to our standards, which we feel are high. It's hard to be in three places at once, so we split the responsibility and we rely on our people.

PHOTOGRAPHS BY MICHAEL PALCIC

They know what they're doing. We've worked together long enough to know each other's work and style and can trust the consistency and high quality.

Let's talk about service. Is that department in itself profitable or is it more of a support function for sales and installations?

Sam: Service has to be up on everything we do. We really stress service. We have two techs, Rob Edgar and Bryon Hundtoft, in that department and it is really more for the customer than anything else. It holds its own.

Rick: We service everything we sell. We back everything. Our service department does everything from rewiring a mic cord to reconing to assisting in the fabrication and installation of systems. The department has a really quick turn around time. We always get it out much faster than the customer expects. Because of past experience, customers expect it will take two or three weeks, but Rob will turn it around in about two days. We get a lot of return business just because of that. Service is completely customer related, for their convenience. It is really important.

Let's talk about the concert sound reinforcement market over here. How involved are you with that area?

Sam: We originally started in sales and rentals. We had a large P.A. system at one time and provided all the sound for one Crater, which meant we had a lot of sound equipment. The Diamond Head Crater Festivals were the only reason I was into large P.A. It's different to bust your okole for a two-day festival that includes major acts one after the other and about 25,000 people having a good time. That's different from busting okole for one concert and maybe 8,000 people, maybe 500 people. When the Craters were pau [finished, no more] I decided to get out of big P.A. and specialize in monitors.

We have the largest monitor system in Hawaii, which we designed based on specs from/for mainland groups. We used to be in the big P.A. business, and we still are basically, but not for major concerts. We wanted to shed a lot of the mains and start specializing in monitors. Hawaii has always had the reputation for not having it together for big P.A.s. So, we've been working hand-in-hand with the concert sound company in town, Cozair Sound. They have developed a better, higher quality P.A. system. Bob Cozair has been building his sytem so it complements ours and vice versa.

The local market, small as it is, would not allow for two large P.A. companies. Somewhere along the line, we had to realize we all have to work together. I'm not out for all the pennies and it's much easier to divide the market up between us than to compete against each other. The market is too small.

What does your monitor system consist of?

Sam: We have custom built slants with three-way JBL speaker systems. We have Community Light & Sound small monitors, the PBL's and JBL components. The NC-12 is another CL&S speaker that we use. We have some other monitors around, plus Hawaii's first 24×8 monitor mix console, the Soundcraft II from England. Everything is biamped. We can give full on large sidefills if they want them. We have a really comprehensive monitor system.

What's different about the P.A. business in Hawaii?

Sam: Well, on the mainland most large P.A. companies hook up with a group and travel with them and all their equipment rides in 40 foot trucks. Here, it's quite different because we don't hook up with anybody, except for outer island concerts. We take them as they come. One night we might be doing Harry Belafonte in a cabaret situation in a hotel in Waikiki, the next night it's Blue Oyster Cult in an amphitheatre, and the next night it's the Symphony in the Concert Hall.It's a varied market and I guess that's different from the mainland. The P.A. market is limited, depending on the concert season. Some of the bigger acts, like Fleetwood Mac, are on world tours, dragging their monitors and mains with them. That doesn't help us, of course, and it costs them a lot more money in freight. We're seeing an increase in the rental market as groups find out what's available over here. December-February is just the pits for concerts. That hurts when you have to sit here with a large P.A. system, specialized and expensive, and it's not working for you.

Rick: The small rentals are really hot over the Christmas holidays and around graduation time, towards the end of spring and beginning of summer. A lot of large rentals come during the summer, after the rainy season, because people are doing more.

What about convention work?

Sam: Conventions have been pretty limited lately. We went through a spurt of a lot of convention work, but it's slacked off. We provide sound for the Exhibition Hall situation. When Shaklee Corporation came over here and put on a full production in one of the hotel showrooms, we provided the sound. We worked with Bob and Maggie Ring from Aquarius Sound, who were traveling along with the production.

Being such an outdoor oriented area, do you do much with sports events?

Sam: Sometimes we get involved in sports events. We just did some P.A. work for the Hula Bowl for the Polynesian Cultural Center's performance during halftime. We did the World Cup Golf Tournament on Kauai and we have some surfing contests coming up.

Let's talk about your 16-track recording studio.

Sam: We are in the process of selling the studio. The major reason is we find it competes with our sales. We really enjoy designing and building studios. We have an operational 16-track studio and we have done many records out of here. We've co-produced a lot of albums and have learned a lot about it. We want to sell the studio because we find it competing with our sales. Some people in the studio business here do not want to deal with our sales department because they see their funds feeding our studio and keeping their competition alive.

Rick: We sell a lot of studio gear and certainly just having a successful studio has been an important sales tool for us.

Sam: We've learned a lot from the studio. We knew a lot about P.A. already, which is pretty much an uncontrolled situation. But when you get into the studio, which is a very controlled situation, it's different. We learned a lot, especially about microphones.

Rick: We teach a course in Modern Recording Techniques as an affiliate of the Recording Institute of America and we don't just teach recording. We also touch upon sound reinforcement. We are spending more time now discussing P.A. related subjects—horns, dispersion, crossover. We kind of move to where the students' interests are. If half the class seems to be interested in a certain subject, then that means it warrants at least a couple of hours discussion. We always go over the ten weeks of instruction that way, but it's worth it to our customer, therefore to us as well. I teach the class. Tracy Clay, our staff engineer, works the board and acts as my assistant in coordinating the sessions.

Sam: We like to educate people as to audio. We would rather take the time with somebody to explain how to do it right and work on a total concept, a system. We're more systems-oriented anyway. We'd rather put packages together, not pieces. The people purchasing and often operating the systems we sell—the education of these people—is just part of the package. If customers come in with limited budgets and they know where they kind of want to go or we can guide them where they want to go, then we can help them spend the money in the areas which really mean a lot, where nothing becomes obsolete overnight, that will work into their total system and plans for expansion.

How many people work here?

Sam: We have four full time employees and myself. We deal with a lot of subcontractors as well, especially doing fabrication work, installations, and some P.A. work.

What is your square footage?

Sam: Fabrication and service areas comprise about 600 square feet, warehouse takes maybe 1,000 square feet, sales and offices take about 1,000 and the studio takes up about another 1,000 square feet.

Let's talk about your business philosophy.

Sam: Our commitment is to the customer, period.

Rick: We look at the customer's need, not ours. A lot of businesses have certain commitments not just to their customers, but to their suppliers who furnish their equipment. Somebody walks into the store and says: "I want a mixer," and it might be that one brand will not work as well as another brand for their requirements, but the store sells them the first brand off the floor. We sell according to the customer's needs. A lot of customers come in and dump everything in our lap. We're the professionals. We're expected to know what they need and give it to them. We could get away with just giving them what we think they need without them having any justification as to what we are doing. But we spend time explaining it to them so they understand what they are getting and why. We find they appreciate it.

Sam: The only thing that has changed about our way of doing business in the last year is financial arrangements. Up to a few months ago, we never asked for money up front. Everything was credit for a bona fide client. Now, we're working on a cash basis, with the exception of a few customers who've been with us for years, institutions and the government. We just can't afford the credit trap, floating everyone's loans. We're having no problem getting our money up front, because people know we know what we're doing and they're willing to pay for it on our terms.

How much and what kind of public relations and advertising do you do?

Sam: As far as where we get our business, it is word-of-mouth. More business comes our way that way than any other thing. We do a lot of freebies for people, like kokua [free] for P.A. systems. For example, we are doing free concerts for Save the Whales and Greenpeace Hawaii, and we just try helping people out as much as we can if we get behind their project.

For five years, we sponsored an annual party attended by 2,000+ people. We put the big P.A. up in the parking lot, put away the expensive things around, locked the phones, opened up the place as we could, and partied. The best groups in the islands performed kokua and the last party we had to turn people down who wanted to perform. We didn't do the parties for PR, though, we did the parties for my birthday. People know who we are because of the parties, though.

Do you do very much co-op advertising?

Sam: No. If more of our suppliers offered it, we would utilize it.

Since Hawaii is so small as a market, do you feel the need to expand to Japan and the South Pacific?

Sam: No. If it comes, it comes. If we get into any outside area, it will be the South Pacific, but not heavily into Japan.

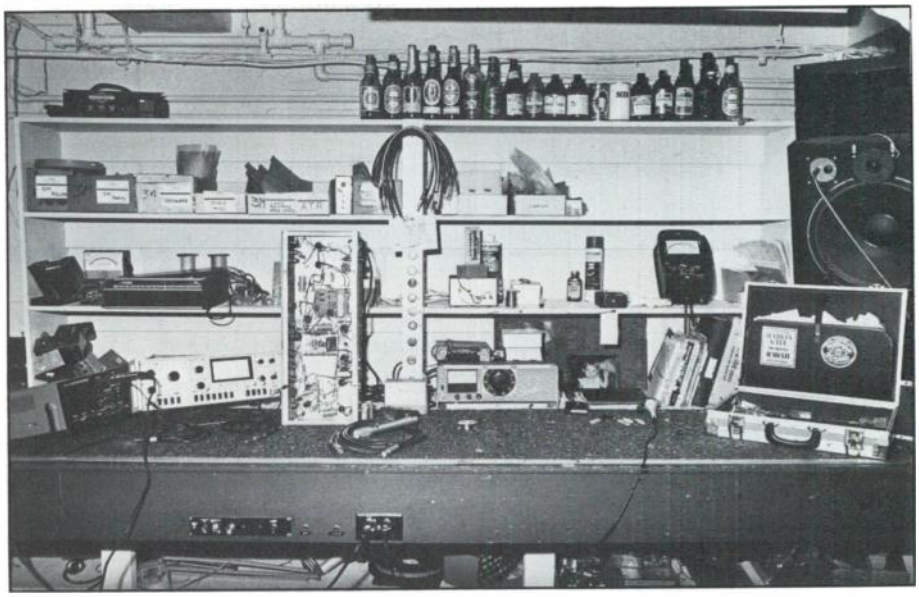
Rick: We're not actively pursuing anything in that area. It's just been coming to us. Because we are a lot closer than California, they come here. It's a lot easier to communicate with us both in a time frame and physical distance. We've worked with firms from Japan, Western Samoa and Korea. The percentage of sales we get

from those areas is not that high, but it's been on the increase. The sales are coming closer and closer together and now we've got some sales information out in that area. We're also bidding on a disco in Guam.

Sam: They come here anyway as tourists and they take back sound equipment. We're the financial hub for the Pacific, I guess, and the international traffic is really high here. There are also a lot of Japanese financial interest here.

What is your competition these days?

Sam: The competition we see that concerns me is the mainland competition: the big wholesale houses which are the people on the West Coast and in New York who can sell things at cost plus ten. They're really cheap but all they are doing is taking boxes from one point to another and doing large volume. They do not offer service. There's 2500 miles of ocean between Hawaii and the West Coast. Their cost of doing business is cheaper. Doing business in Hawaii is expensive. And, they don't have to worry about servicing the unit. We worry about that, because our philosophy is that if we're going to be in business, we want to be able to do something for somebody other than just give him a product.



Rick: That's been the key to our success so far, I think.We would have had problems if service was not up to par. Especially here. Relating to local competition, I don't think there is anyone on this island that can compete with us on a broad range, because no one does as much as we do. There are maybe two or three people who compete with us in sales, and maybe two or three people who compete with us in rentals. But there's no one place that is as much a one-stop audio center.

How do you view the state of the market? How does it affect your business and your growth plans?

Sam: Well, we can't judge by what is going on in the mainland, because we don't deal on the mainland. Hawaii, in itself, is a very unique marketplace.

INDUSTRY UPDATE

Nakamichi U.S.A. has made several new appointments. **Niro Nakamichi**, formerly Executive Vice President, is now President of the U.S. corporation. **Hiro H. Saito** is Executive Vice President/General Manager, responsible for day-to-day operations. **Walter C. Stagner, Jr.** has been named National Sales Manager. **Ted T. Nakamichi**, Marketing Manager, will concentrate his efforts in marketing planning, advertising and promotion.

Three new staff appointments have been made at Eastern Acoustic Works. **Nancy Maher** has been named Marketing Administrator. **Robert Saunders** has been appointed Chief Engineer. **Tom Hagen** has been named Production Coordinator.

Michael Kellman has been named Director of Marketing of Telarc Digital Records. Hew was previously with RCA Red Seal and Columbia Masterworks.

Robert E. Morrill has been appointed Vice President-Marketing of Electro-Voice. Morrill was previously VP-Marketing at Phase Linear. Prior to that the was with Hy-Gain Electronics and U.S. Pioneer.

Neal Ferrograph U.S.A has named **Richard Chilvers** Sales Manager. He was previously sales manager for Keith Monks Audio in the U.K. As manager of the Consortium of British Audio Manufacturers, he will continue to serve as U.S. sales manager for Monks concurrent with his new responsibilities.

Vern Eszlinger has been appointed Director, National Sales for Fender/Rogers/Rhodes. A 13-year veteran with the company, Eszlinger was most recently Fender director of marketing.

Peter V. Horsman has been named Regional Sales Manager of Rupert Neve Incorporated, operating out of Hollywood. He was formerly Manager, Professional Division of James B. Lansing Sound. **Glen McCandless** has been named Regional Sales Manager in Nashville. He was previously with Anderson Audio. Neve now has four regional sales offices in North America.

Leader Instruments Corporation has named **Charles I. Ogden** Director, National Sales. He was formerly with Honeywell Information Systems, Singer Business Machines and IBM.

Don Jay has been named Marketing Manager of Audio Control. Previously he was National Marketing Manager of Car Tapes, Inc./Jet Sound Laboratories.

Harman Kardon has announced groundbreaking for their new facilities, in Woodbury, Long Island. The relocation from their Plainview headquarters is a result of the acquisition by Shin Shirasuna, the Tokyo-based electronics manufacturer.

The Board of Directors of Ampex Corporation has unanimously approved an agreement in principle to merge Ampex with The Signal Companies, Inc. through an exchange of common stock. According to Ampex, no changes in management, research and development, or operations are anticipated.

Larry R. Linkin has been named Assistant Executive Vice President and head of staff of the National Association of Music Merchants (NAMM). Upon the retirement of NAMM Executive Vice President **William R. Gard** in June, 1981, Linkin will assume Gard's title and full responsibility for management of the association. Linkin served on the NAMM staff from 1970 to 1976, when he accepted the presidency of Slingerland/Deagan and a vice presidency of C.G. Conn, Ltd. Bill Gard, who has headed NAMM for nearly 33 years, will officially retire at the June 1981 Expo in Chicago.

Tony Hartin has been appointed a Sales Training Manager for the Sony Industries' Audio division. He was formerly National Training Manager for Technics.

Robert Forrest has been named Western Regional Sales Manager for the audio division of Akai America. He comes to Akai after seventeen years with the Marantz division of Superscope, most recently as general sales administrator.

M. Thomas Taylor has been named President of Soundcraft Inc., Kalamazoo, Michigan. Taylor was previously President of Pro-Co Sound, Inc.

White Instruments has elected **Thomas H. White** President. **Gifford E. White**, who founded the company and is the immediate past-president, has been named Chairman of the Board.

Stanley Silverman has joined Ampex Corporation in the newly created position of Director of Market Planning. He was previously with Diablo Systems, and with Xerox.

Ron S. Falkenstein has been promoted to Sales Operations Manager of Teledyne Acoustic Research. He was formerly AR's East Coast Regional Sales Manager.

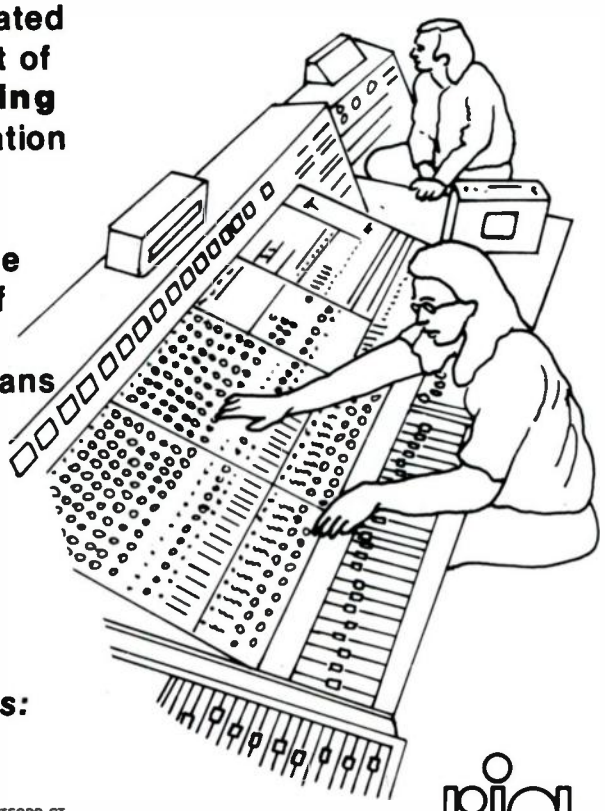
Electro-Voice has added **M. Travis Ludwig** to its marketing staff. He will be responsible for new product development and the development of marketing strategies for E-V professional microphones and Sentry studio monitors.

Frank Hohner, who has served as President of M. Hohner, Inc. for the past 26 years, has assumed the position of Chairman of the Board. Replacing Hohner as President and Chief Executive Officer is **Leland Thomas James**, who began his career with M. Hohner in 1965. **Joseph T. Bredau** has been promoted to the position of Vice President in charge of Sales and Marketing. **Horst Mucha** has been promoted to Vice President of West Coast Operations.

Adrian Delgado has been named Northeast Territorial Manager of TDK. He was previously with the Purex Corporation.

RIA, the largest and most respected network of studios offering courses in the art of multi-track recording.

When today's music conscious society made recording the new art of self-expression, the **RECORDING INSTITUTE OF AMERICA** created its national acclaimed ten week course in the art of multi-track recording, entitled **Modern Recording Techniques.** 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 of equipment. This avocational course includes live recording sessions enabling musicians and creative audio enthusiasts the chance to experience, first hand, the new world of creative recording.



ria

For information on RIA's Modern Recording Techniques course, call our local representative in the following cities:

AMES, IA
A & R Recording Studio
(515) 232-2991

ATLANTA, GA
Apogee Recording Studios
(404) 522-8460

BALTIMORE, MD
Sheffield Rec'g Ltd., Inc.
(301) 628-7280

BIRMINGHAM, AL
Solid Rock Sound
(205) 854-4180

BOSTON, MA
Century Three Inc.
(617) 267-9600

BURLINGTON, VT
Starbuck/Ashley Record
(802) 658-4616

CHARLOTTE, NC
Reflection Studio
(704) 377-4586

CHESEAPEAKE, VA
Live Oak Sound
(804) 424-1372

CHICAGO, ILL
Universal Recording Studios
(312) 642-6465

CLEVELAND, OH
Agency Recording
(216) 621-0610

COLUMBUS, OH
Mus - I - Col Rec'g
(614) 267-3133

COLUMBUS, GA
HNR Studios
(404) 327-8431

DALLAS, TX
Sound One
(214) 742-2341

DETROIT, MI
Recording Institute
(313) 779-1380

GREENVILLE/EASLEY, SC
The Sounding Board
(803) 288-7012

FRESNO, CA
Triad Recorders
(209) 237-7477

HAYS, KS
Sunset Studio
(913) 625-9634

HONOLULU, HI
Audissey Sound
(808) 521-6791

HOUSTON, TX
Sound Arts Rec'g
(713) 688-8087

JACKSONVILLE, FL
Cypress Recording Studios
(904) 246-8222

KNOXVILLE, TN
Thunderhead Sound
(615) 546-8006

LAS VEGAS, NV
Commercial Sound
(702) 384-1212

L.A./ORANGE COUNTY, CA
United Audio
(714) 547-5486

MARIETTA, PA
Atlantic Sound Prod.
(717) 426-3637

NEW HAVEN/HARTFORD, CT
Trod Nossel Productions
(203) 288-4485

NEW YORK, NY
RIA
(212) 582-3680

NORTHERN NY STATE
Michele Audio
(315) 799-2446

ORLANDO, FL
Aura Sound
(305) 298-2101

PADUCAH, KY
Audio Creations
(502) 898-6746

PHILADELPHIA, PA
Starr Recording
(215) 925-5265

PITTSBURGH, PA
Audio Innovators
(412) 471-8220

RICHMOND, VA
Alpha Audio
(804) 358-3852

SAN ANTONIO/AUSTIN
ZAZ Recording Studio
(512) 432-8591

SANTEE/SAN DIEGO, CA
Natural Sound
(714) 448-8000

SEATTLE, WA
Holden, Hamilton & Roberts
(206) 632-8300

ST. LOUIS, MO
KBK/Earth City Sound
(314) 291-4840

TULSA & OKLA CITY, OK
Ford Audio & Acoustics
(405) 525-3343

WESTBURY, NY
Don Casale Studio
(516) 333-7886

CANADIAN REPRESENTATIVES

MONTREAL, QUE
RIA
(212) 582-0400

OTTAWA, ONT
MARC Productions
(613) 741-8851

ST. PAULS, ONT
Maxim Canada
(508) 393-8886

TORONTO, ONT
Phase One Recording Studio
(416) 291-8553

CIRCLE 67 ON READER SERVICE CARD

CLASSIFIED

SALES HELP WANTED: Experienced musical salesperson to sell pro-electronics and effects line for top Eastern manufacturer. Solid company position with medical/dental benefits. Position requires 50% travel with all expenses paid. Successful applicant will be relocated to home office. Northeastern & Western territories currently open. Send resume and income requirements to: P.O. Box 23, Rochester, NY 14601.

Rates: 50c/word, $25 per one inch classified display. Minimum order is $5.00. Check or money order must accompany copy.

Classifieds should be sent to:
SOUND ARTS
Classified Dept.
15 Columbus Circle
New York, N.Y. 10023

NEW!

CLASSIFIED

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL

Classified Department

MANUFACTURERS—*Looking for sales, marketing or technical personnel*

RETAILERS—*Looking for new salesmen*

SALESMEN—*Looking for positions at manufacturing companies or other retail sales opportunities*

REPS—*Looking for new lines*

USE
SOUND ARTS CLASSIFIED

RATES
50c per word
$25 per inch
Minimum order is $5
Check or money order must accompany copy.

Classified ads should be sent to:
SOUND ARTS MERCHANDISING JOURNAL
Classified Dept.
15 Columbus Circle
New York, New York 10023

Advertiser's Index

Sound Arts will make money for you.

Sound Arts is an educational journal that will help you to merchandise and sell the new, sophisticated electronic musical instruments, home recording and sound reinforcement equipment being manufactured today.

Sound Arts Merchandising Journal will make money for you! All you have to do is read it, keep it, and use it as a continuing reference.

Order your own personal subscription now.

YES—I want to continue to receive SOUND ARTS MERCHANDISING JOURNAL every month.

Please enter my subscription:

☐ 1 yr. 12 issues
☐ 2 yrs. 24 issues

		DOMESTIC	FOREIGN
1 Year	12 issues	$18.00	$25.00
2 Years	24 issues	$26.00	$34.00

Name_____

Position_____ Dept._____

Company_____

Street Address_____

City_____

State_____ Zip_____

Please Send Copies To (if other than above:)

Address_____

City_____

State_____ Zip_____

Send Check Or Money Order To:

Sound Arts Merchandising Journal
Suite 316
15 Columbus Circle, N.Y., N.Y. 10023

PLEASE FILL OUT REVERSE SIDE OF CARD.

YES—I want to continue to receive SOUND ARTS MERCHANDISING JOURNAL every month.

Please enter my subscription:

☐ 1 yr. 12 issues
☐ 2 yrs. 24 issues

		DOMESTIC	FOREIGN
1 Year	12 issues	$18.00	$25.00
2 Years	24 issues	$26.00	$34.00

Name_____

Position_____ Dept._____

Company_____

Street Address_____

City_____

State_____ Zip_____

Please Send Copies To (if other than above:)

Address_____

City_____

State_____ Zip_____

Send Check Or Money Order To:

Sound Arts Merchandising Journal
Suite 316
15 Columbus Circle, N.Y., N.Y. 10023

PLEASE FILL OUT REVERSE SIDE OF CARD.

Sound Arts will make money for you.

Sound Arts is an educational journal that will help you to merchandise and sell the new, sophisticated electronic musical instruments, home recording and sound reinforcement equipment being manufactured today.

Sound Arts Merchandising Journal will make money for you! All you have to do is read it, keep it, and use it as a continuing reference.

Order your own personal subscription now.

Please fill out all questions

COMPANY NAME

NAME TITLE

ADDRESS

CITY STATE ZIP

SIGNATURE

TYPE OF BUSINESS *(check one only)*

- ____ Musical Instrument Retailer
- ____ Audio Retailer
- ____ Sound Contractor
- ____ Pro Audio Retailer
- ____ Manufacturers Representative

My Outlet Sells:

- ____ Home Recording Equipment
- ____ Sound Reinforcement Equipment
- ____ Electronic Musical Instruments & Accessories

My Function with the Company is Primarily:

(check one only)

- ____ management
- ____ purchasing
- ____ sales
- ____ servicing
- ____ other (please specify)

Send check or money order. (See reverse side.)

Please fill out all questions

COMPANY NAME

NAME TITLE

ADDRESS

CITY STATE ZIP

SIGNATURE

TYPE OF BUSINESS *(check one only)*

- ____ Musical Instrument Retailer
- ____ Audio Retailer
- ____ Sound Contractor
- ____ Pro Audio Retailer
- ____ Manufacturers Representative

My Outlet Sells:

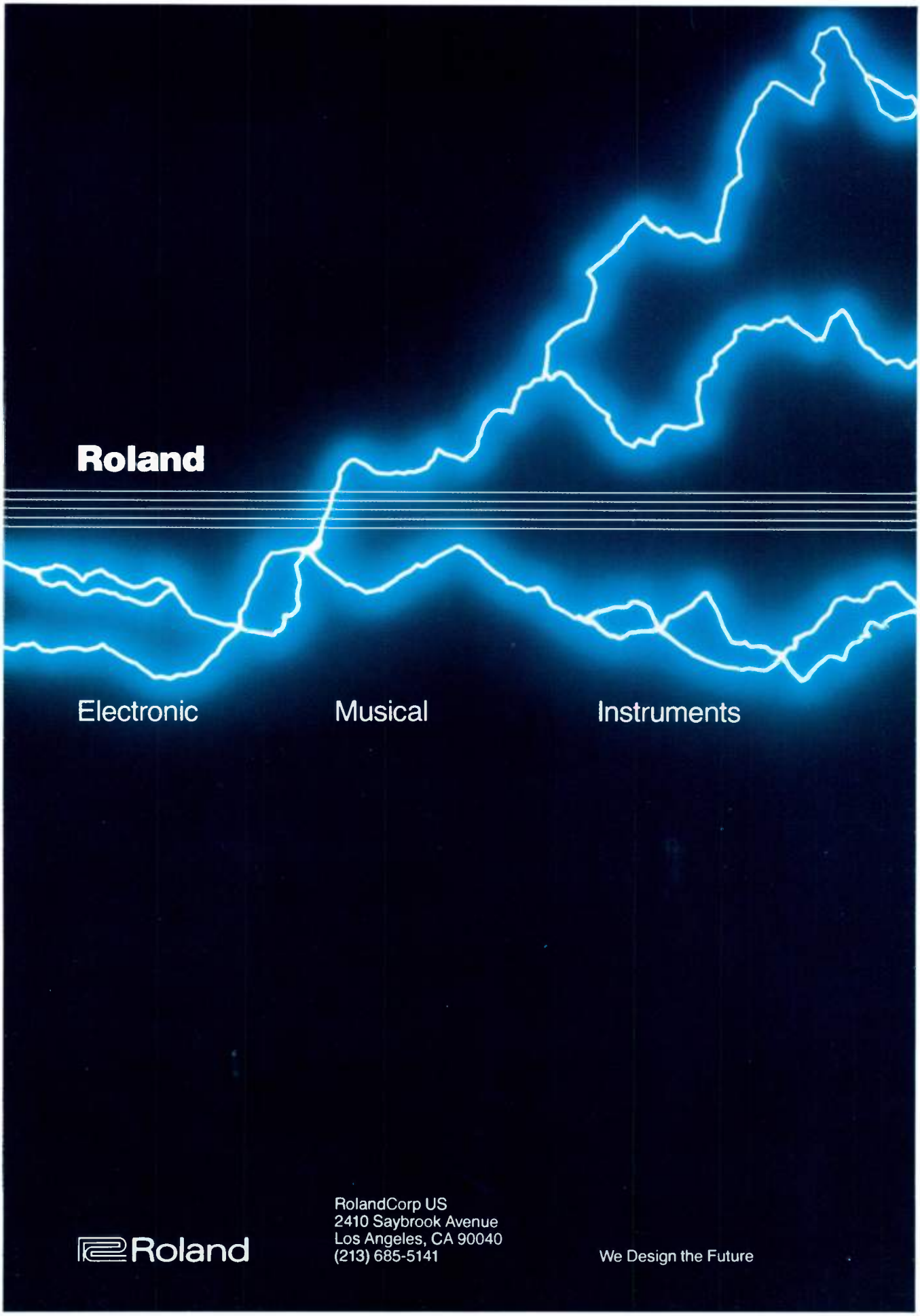
- ____ Home Recording Equipment
- ____ Sound Reinforcement Equipment
- ____ Electronic Musical Instruments & Accessories

My Function with the Company is Primarily:

(check one only)

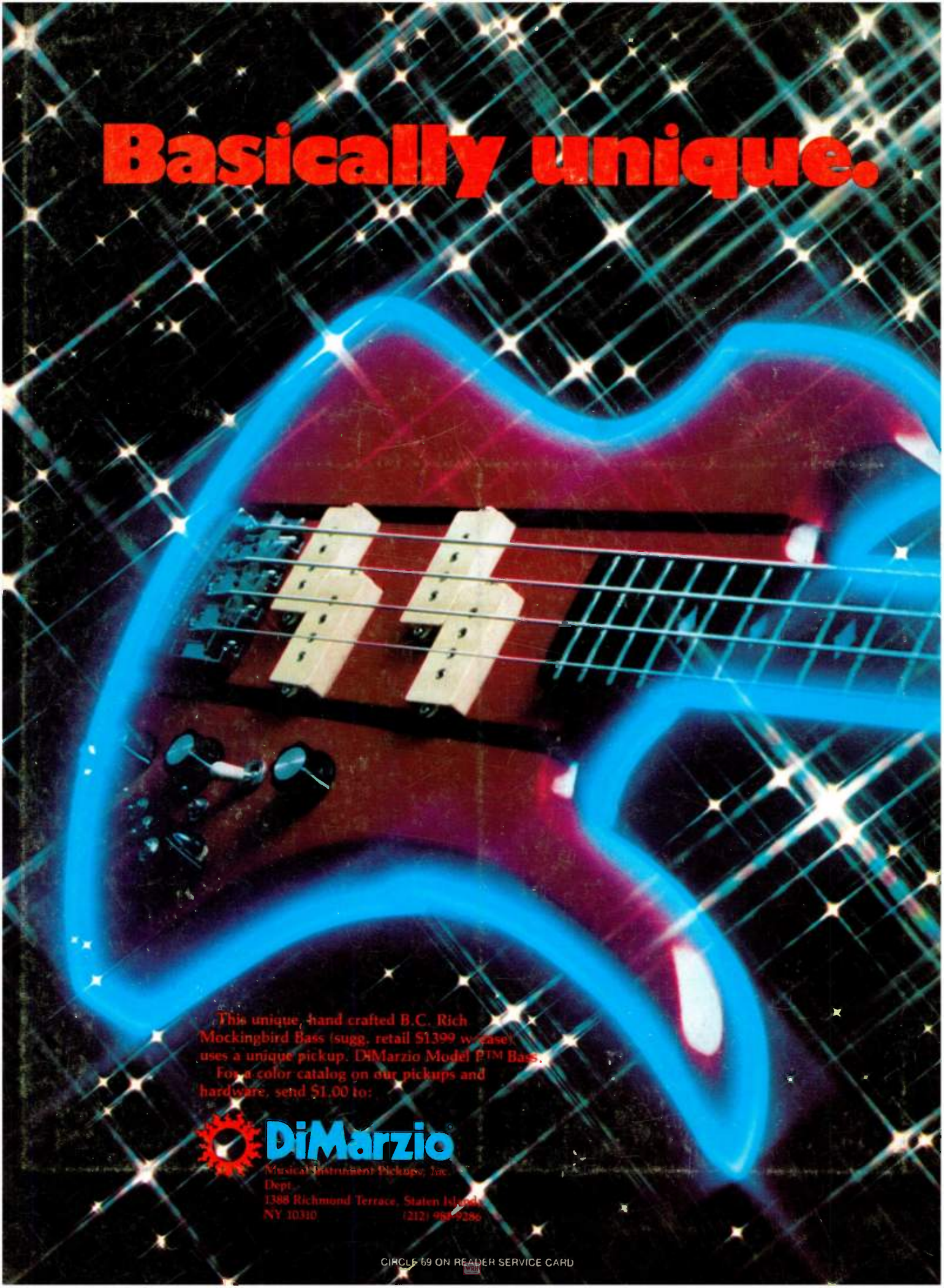
- ____ management
- ____ purchasing
- ____ sales
- ____ servicing
- ____ other (please specify)

Send check or money order. (See reverse side.)



CIRCLE 82 ON READER SERVICE CARD

Basically unique.



This unique, hand crafted B.C. Rich Mockingbird Bass (sugg. retail $1399 w/ case) uses a unique pickup. DiMarzio Model P™ Bass.

For a color catalog on our pickups and hardware, send $1.00 to:

DiMarzio

Musical Instrument Pickups, Inc.
Dept.
1388 Richmond Terrace, Staten Island
NY 10310 (212) 981-9286

CIRCLE 69 ON READER SERVICE CARD