SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

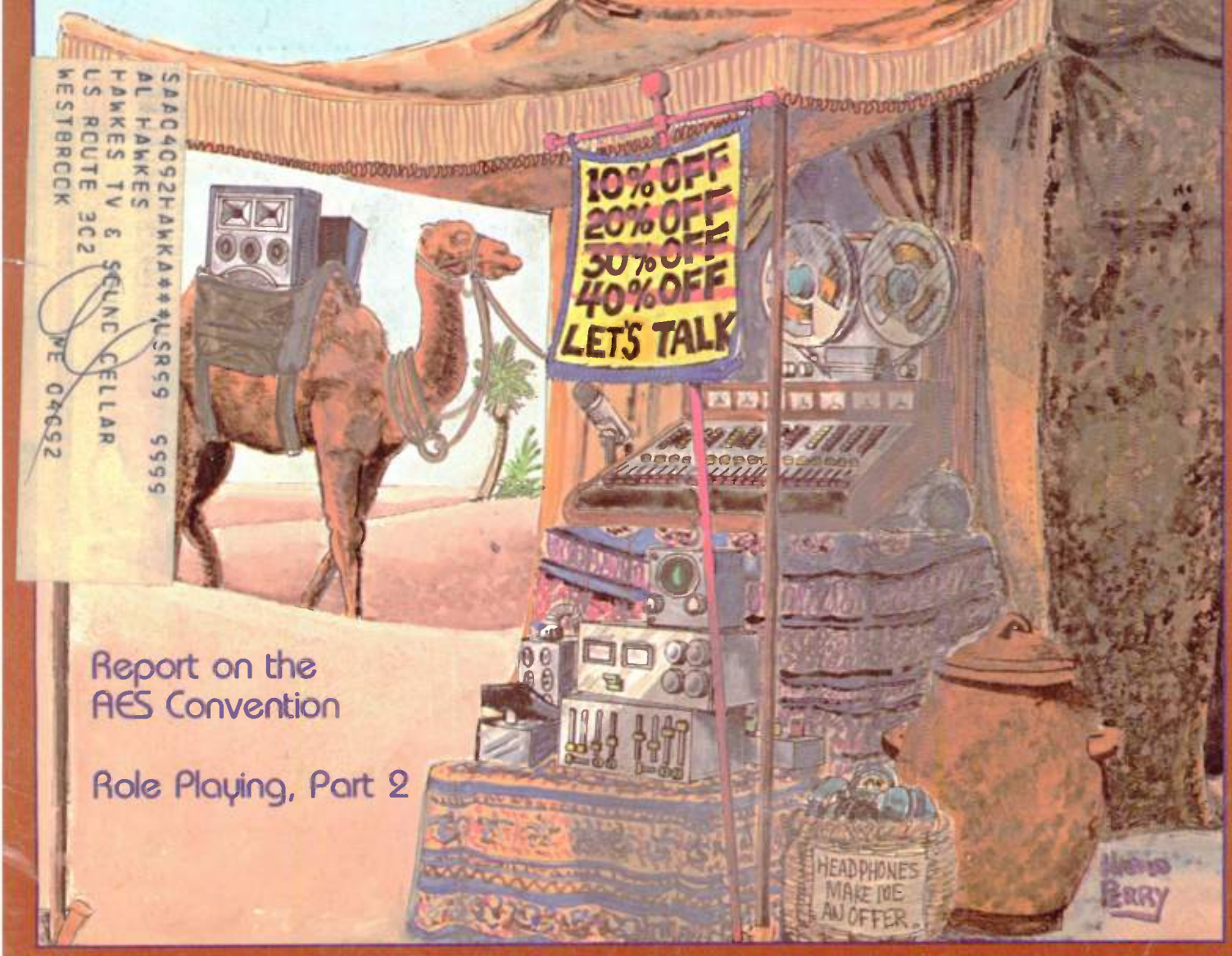
SOUND ARTS

MERCHANDISING JOURNAL

VOL. [illegible] 11
DEC[illegible] 1979

Pricing in the Marketplace

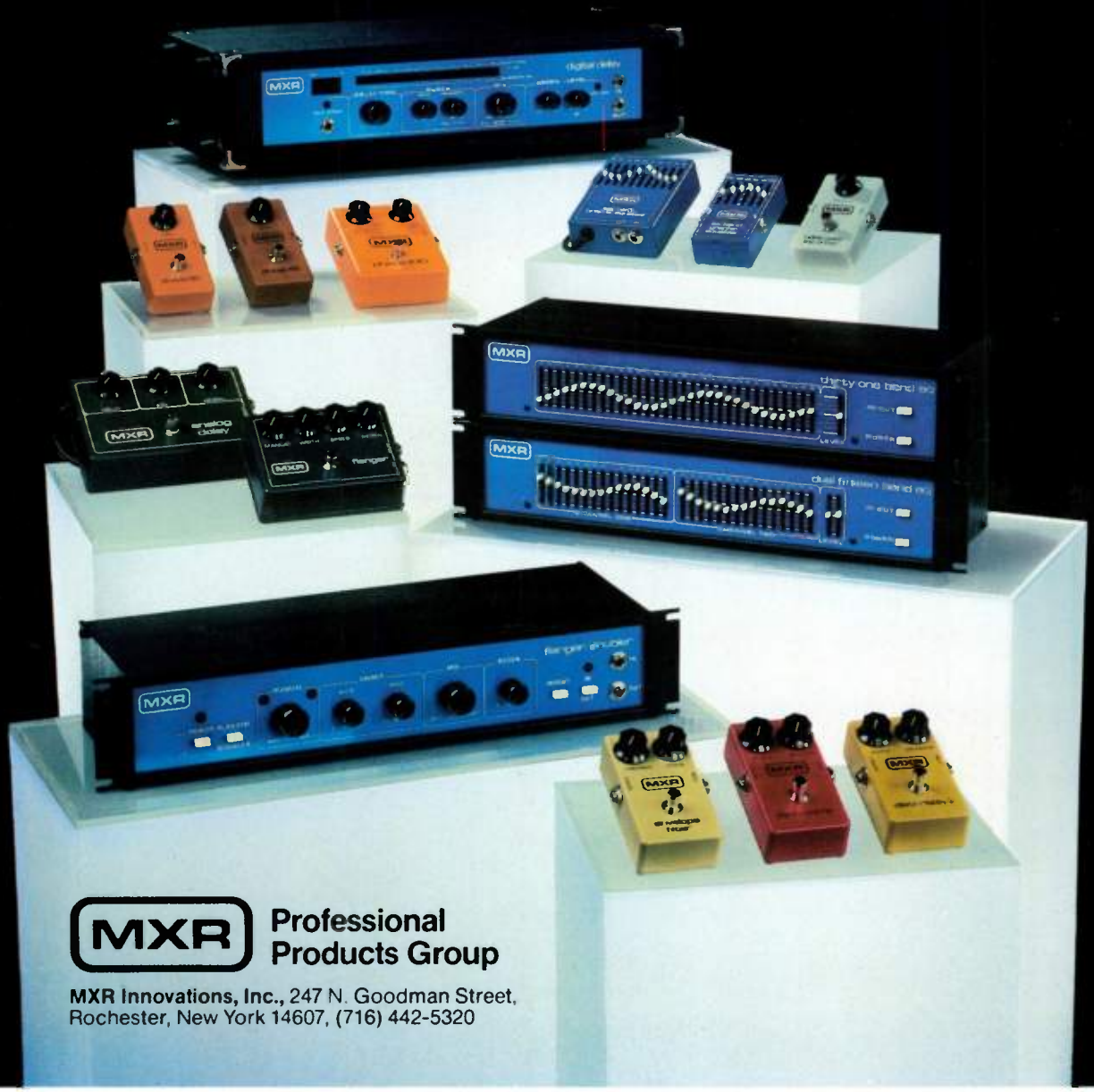
No Strings Attached:
On the Subject
of Wireless



Report on the
AES Convention

Role Playing, Part 2

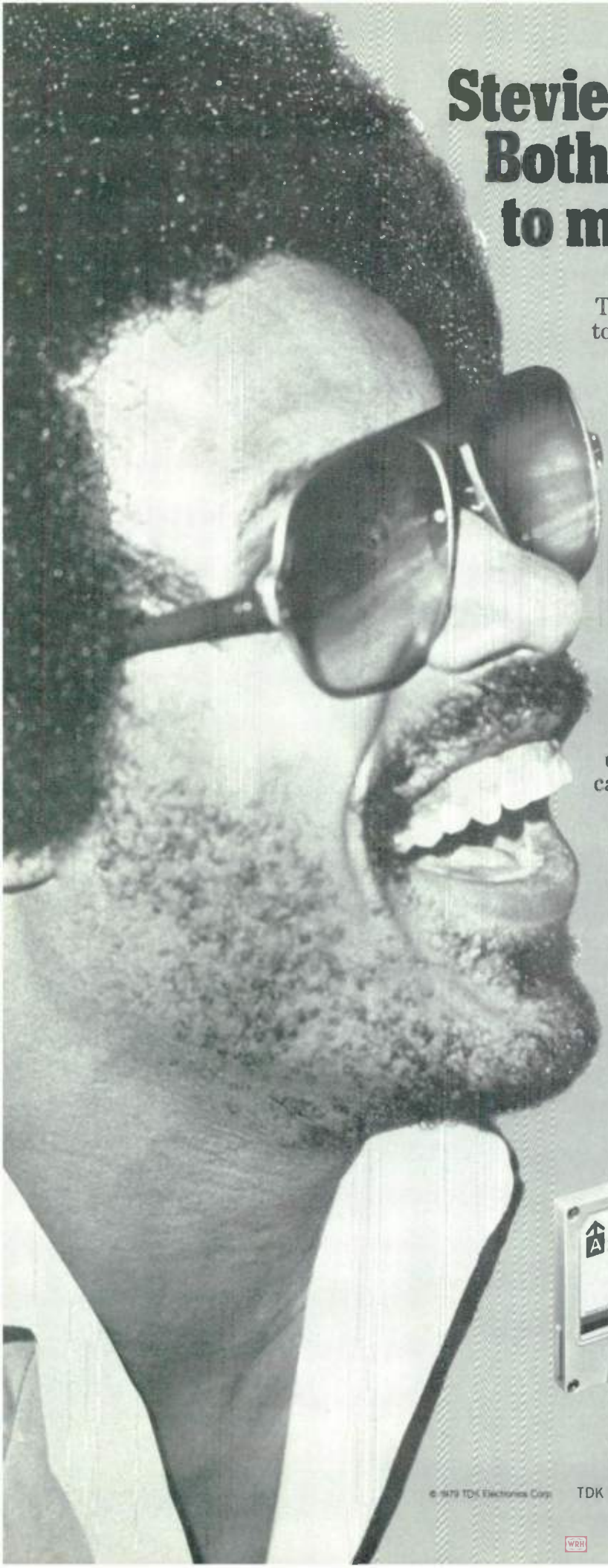
Confidence.



MXR **Professional Products Group**

MXR Innovations, Inc., 247 N. Goodman Street, Rochester, New York 14607, (716) 442-5320

CIRCLE 92 ON READER SERVICE CARD



Stevie Wonder and TDK. Both bring great music to millions.

There's nothing like music to bring people together. Your TDK cassette customers care about music. And Stevie Wonder makes the kind of music they care about. With seven gold albums and 22 gold singles, it makes perfect sense to bring Stevie Wonder and TDK together.

Beginning this fall, Stevie Wonder will be singing the praises of TDK's full line of quality cassettes. Exciting TV and radio advertising will turn on your customers across the country. A full schedule of TDK magazine and newspaper ads will be read by millions. And Stevie Wonder in-store displays and posters will create the kind of store traffic you've always dreamed about.

As our featured cassette this fall, TDK D offers co-op and promotional opportunities unprecedented in the history of premium cassette merchandising. Tie-in with TDK advertising and take advantage of special promotions including TDK D in multipacks. Remember, with hardware sales slowing down, tape has never been a more important profit-center. And economical TDK D has never been a more attractive value. Your customers recognize TDK quality, and the D cassette delivers it consistently. Watch for Stevie Wonder and TDK D this fall. Millions will.

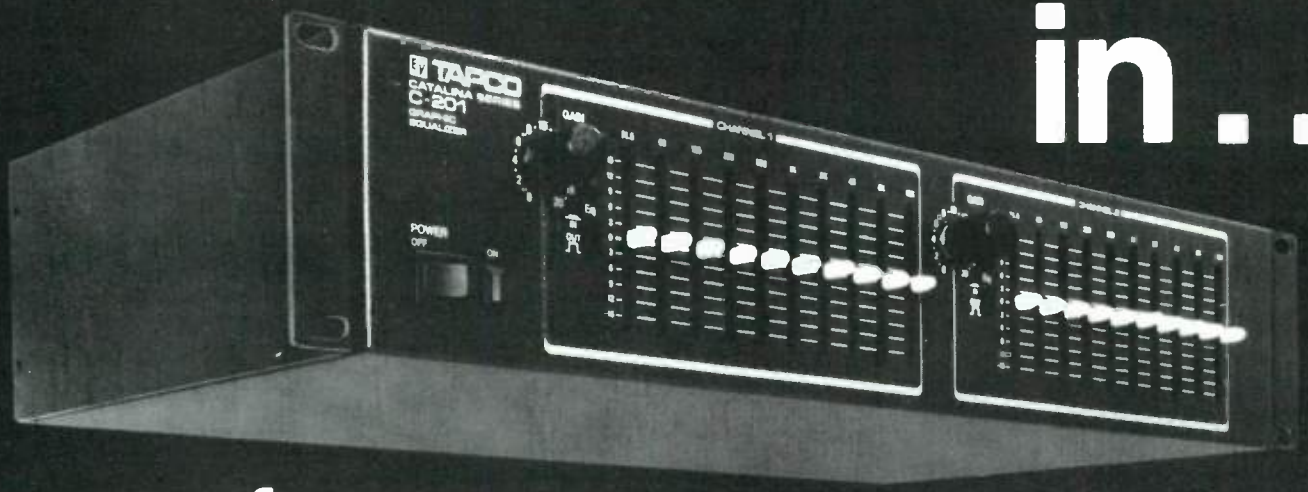
TDK

The Amazing Profit Machine.

TDK Electronics Corp., Garden City, N.Y. 11530. In Canada, Audio Specialists Inc.

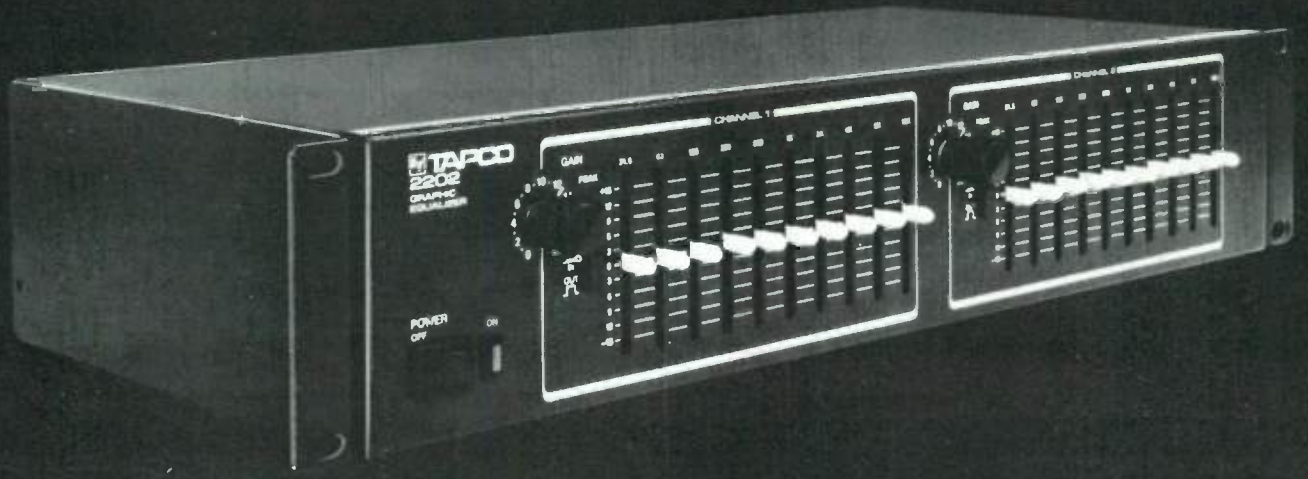
CIRCLE 7* ON READER SERVICE CARD

the Ultimate in...



performance...

C-201 the choice for all phases of professional sound reinforcement and recording that demand the highest quality in sound. • two channel • 10 band • very low noise and distortion • "O" detented sliders and output gain controls • overload LED indicators • EQ in/out switches • inputs and outputs have both XLR and ¼" phone jacks • AGLC™ (Automatic Ground Loop Compensation) • turn on/off power transient suppression • 3½" × 19" rack mount package



...and value.

2202 is tailored for economy yet does not sacrifice quality, performance, and ease of operation. This new model boasts features and performance typically found only on expensive equalizers. • two channel • 10 band • low noise and distortion • "O" calibrate position on sliders and output gain controls • overload LED indicators • EQ in/out switches • inputs and outputs have ¼" phone jacks • 3½" × 19" rack mount package

EV TAPCO®
a gulton company

3810 - 148th Ave. N.E.
Redmond, WA 98052
(206) 883-3510

In Canada:
Gulton Industries, Ltd.
Gananoque, Ontario

In Europe:
EVSA,
Nidau, Switzerland

CIRCLE 61 ON READER SERVICE CARD

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

VOL. 2 NO. 11

SOUND ARTS

MERCHANDISING JOURNAL

DEC. 1979

CONTENTS

THE FEATURES

THE STAPLES

COMING NEXT ISSUE!

Best Bets on Display Techniques
Step-by-Step: Troubleshooting the System
No Strings Attached, Part 2

Cover art by Harold Perry

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 for other than qualified individuals or companies: $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
MIKE BEIGEL
LARRY BLAKELY
WAYNE HOWE
LAWRENCE JAFFE
CHARLIE LAWING
GLEN E. MEYER
R. TIMOTHY ROONEY
KEN SCHAFFER
N. I. WEINSTOCK
Contributors

ALLISON DRASNER
Layout and Design

MOLLY VAUX
Production Manager

HAROLD PERRY
Artist

FRAN VITRANO
Artist

MELANIE DEUTSCH
Assistant to the Publisher

JANET KURTZ
Circulation Manager

BILL SLAPIN & CO.
Western
Advertising Representative

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

And the beat goes on. Music and technology continue the invitation to dance with them both. That was the message of the AES convention this fall in New York: Synthesis—not just as in synthesizers, but in artistic endeavors that depend on electronics. The new fusion takes in several disciplines—computers, recording, musical instrument design and radio (the implications for video can barely be imagined right now).

In this issue of SOUND ARTS, Mike Beigel writes about this new fusion in his report of the AES convention—where he saw, more than ever, the influence of music at the meeting of audio engineers. The main focus of equipment may be musical production and reproduction, but the designers of that equipment are responsive to innovations in related fields, such as computers. Mike found this design crossover apparent at AES, and as you know, at least one MI dealer has seen fit to expand his merchandise into stand-alone computers themselves.

Recording has moved even closer to the muse with the introduction of Teac's new Portastudio, which allows the musician immediate and portable feedback to his art. The influence here is on the musician rather than professional recording, but they both come together in the end.

Craig Anderton had this issue on his mind this month also. In his regular column, So You Want to Know, Craig begins a series on audio for musicians, beginning with a discussion of the inseparability of MI and recording.

Even radio comes into play, as Ken Schaffer shows in No Strings Attached, a discussion of wireless technology and how it can be sold today. Whatever your feelings on wireless, Ken's interpretation of the technology is valuable.

Even live sound, although it may be live, is enhanced by electronic subclassifications such as computers, recorders and radio. As for recording, at the AES show, for instance, Pioneer showed its PCM adapter to its industrial videodisc player, which produces very high quality sound. Yet can't we foresee a time when the videodisc itself supplants the aural disc as the final goal of the basement musician?

Anyway, as this new fusion takes place, it develops quickly and often has a way of getting away from the seller. Also in this issue, then, is Pricing in the Marketplace, a discussion of pricing at the retail level. Technology, no matter how attractive, can't exist in a vacuum. Selling savvy moves it to the user. And that's what SOUND ARTS is all about.

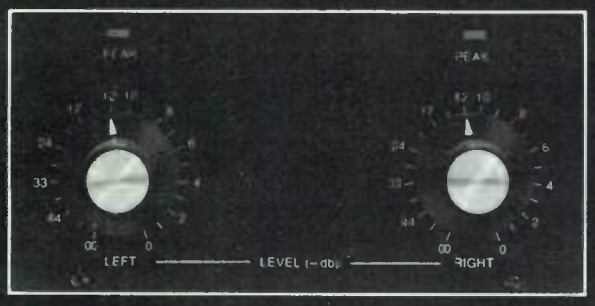
Speaking of media, we are suffering from acute embarrassment over the misuse of that word last month. The gremlins substituted media for meteor—as in Meteor Light and Sound—and we apologize to the nice folks at Meteor and to our readers. Heavy Custom Sound, the Brooklyn retailer, carries, of course, the products of Meteor Light and Sound.

Regards,
Judith Morrison Lipton

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

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

CIRCLE 70 ON READER SERVICE CARD

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

TEAR HERE

TERMS:

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Larry Blakely

Batch Number: Also sometimes referred to as *lot number*. The identification number assigned by a tape manufacturer to a given batch or run of tape. Usually this batch or lot number is stamped on the carton (that holds ten reels), or on the individual tape boxes, or on a piece of paper inside the individual tape box. If you have a bad tape, check to see what the batch or lot number is. When you get a replacement roll of tape, make sure that the new roll does not have the same batch or lot number as the defective roll that you have just returned.

Acoustic Isolation: Methods and practices that will prevent sound in one area from leaking into another area. Sound proof walls or structure between a studio and control room should have acoustic isolation to prevent the sounds in the studio from being heard (leaking) in the control room. Acoustic flats are often placed between musicians in a studio to reduce the sound level of other musical instruments being picked up by that particular instrument's microphone. Acoustic flats are another means to provide acoustic isolation.

Acoustic Reverberation Chamber: Often referred to as a "live" chamber. It is a specially designed room with hard surfaces with a loudspeaker at one end of the room and a microphone or microphones at the other end of the room. A well designed acoustic chamber will provide high quality reverberation.

Alignment Tape: A special tape with test tones of specific frequencies usually 30, 50, 100, 250, 500, 800 Hz and 1, 2.5, 5, 7.5, 10, 12, and 15 kHz. Alignment tapes are most commonly recorded one at a time and held to precise tolerances. These tapes are commonly used for the alignment of tape recorders.

Band: Usually refers to the space or spread between selections on a phonograph record.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Wayne Howe

Analog Delay Line: One method of time delay where the continuously varying input voltage is electronically segmented into small time periods. (For 20-20 kHz audio frequency response, these small time periods would be 25 millionths of a second or less.) Each of these discrete analog voltages is stored as an electrostatic charge in a small "storage" circuit. These storage circuits are linked to each other sequentially. When an electronic "clock" pulse is given, each of the "storage" circuits passes its voltage charge to the next storage circuit and accepts the voltage charge from the preceding storage circuit. In this way, each discrete voltage charge is passed down the line of storage devices until at the last storage device in the chain, the discrete voltages are smoothed out with a low-pass filter to form a delayed replica of the analog input signal. Recent technical developments have resulted in more affordable and improved analog delay devices.

Delay Time: The amount of time between the input and output of a signal. This delay time is variable on most devices, and will often affect the high frequency response of the delay device.

Mix Ratio: A control which adjusts the ratio of the input signal level to the delayed output signal level.

Regeneration Level: The amount of the output level that is fed back into the input to be delayed again. By varying the regeneration level, multiple echoes can be obtained.

Digital Delay Line: An electronic delay line that converts sampled time intervals (again, less than 25 millionths of a second for 20-20 kHz frequency response) of the input signal into a digital or binary number which stands for the sampled analog voltage value. The sampled digital numbers are then transferred through a series of sequential circuits in such a way that as one circuit passes its digital number to the following circuit, it then immediately accepts the digital number from the

SOUND REINFORCEMENT

By Glen E. Meyer

Three-to-One Ratio (continued from last month): If, to further illustrate, one is micing a musician in an orchestra at a distance of two feet, his microphone must be at least six feet away from any other microphone to prevent acoustic phase cancellation.

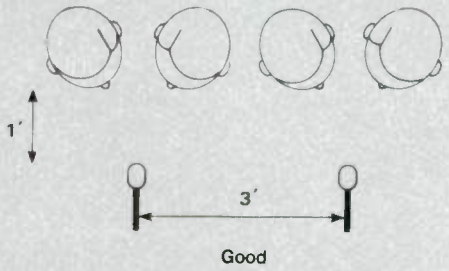


Figure 3

When two microphones must be used close together to obtain a wider coverage angle or some such reason, multiple microphone interference can be avoided by placing the heads directly together. (Note figure 5.)

When two cardioid microphones are used, the three-to-one ratio can be reduced somewhat by angling the microphones away from each other.

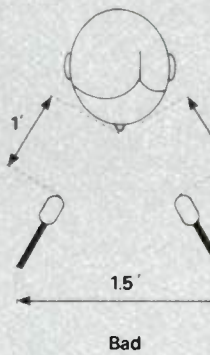


Figure 4

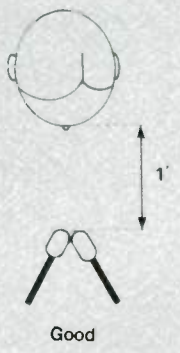


Figure 5

TERMS (CONTINUED)

A CONTINUING INDUSTRY GLOSSARY

RECORDING

Bite: A commonly used term that usually refers to a percussive attack or edge on musical instruments. If a brass part were percussive and well recorded, one would sense the extreme sharpness of the attack. A recording engineer might say after hearing this that the brass had a nice bite or edge.

Blank Tape: Usually refers to tape that has never been recorded on. This would be new tape fresh from the box. Other commonly used terms that mean the same thing are virgin tape or raw tape.

Boom, Microphone: An attachment for a microphone stand that mounts to the top of the stand. The microphone is mounted on one end of the boom instead of on the microphone stand itself. The boom has a swivel or pivot point that will allow the microphone to be raised higher or lower than the microphone stand. A boom will allow the microphone to be easily placed close to most any musical instrument that is playing in most any position.

Boomy: Usually refers to a recording, playback system, sound reinforcement system or room that has a predominant frequency or frequencies in the low frequency range. When such a condition exists, this dominant frequency range may appear louder than any other portion of the audible frequency range. When listening to a condition like this, it may appear that all you hear is boom, boom, boom, as musical instruments play notes in this dominant low frequency range.

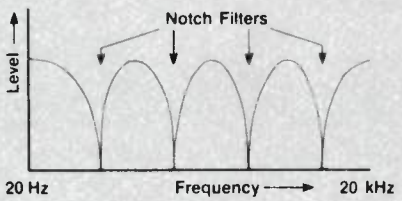
Bright: An expression that usually refers to a recording, playback system, or sound reinforcement system that has an excessive amount of high frequency energy. Such a condition would sound shrill, or as they say in the business, "bright."

Close Miking: A procedure for microphone placement where the microphones are placed close to instruments or groups of instruments, or vocals. Close miking techniques will provide a great deal of presence and an exceptional amount of detail from the instruments or vocals near the mic.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

preceding circuit. In this way, the digital numbers are passed down the chain of sequential circuits, creating a time delay. At the end of the digital delay line, the binary numbers are re-converted to analog voltage levels and fed to the output of the device. At this time, because of the expense of conversion devices, digital delay lines are relatively expensive, but are being used by a select and growing number of musicians. The advantages of digital delay lines are improved signal-to-noise measurements, and an unlimited amount of delay time with no increase in distortion and noise.

Phase Shifter: A device which varies the phase of the input signal and recombines the phase-shifted signal with the non-phased signal. The effect of adding the original signal to the phase-shifted signal results in some phase cancellations. These phase cancellations create a comb filter effect consisting of notch filters equally spaced over the frequency spectrum.



Flanger: A flanger uses time delay instead of phase shift to delay the input signal. In flanging, the original signal is added to the delayed signal with the consequent effect of a comb filter with harmonically related notch filter frequencies. The effect is a somewhat richer effect than that of phase shifting. The flanging effect was originally created by using two tape decks in the record mode and slowing down one of the tapes by dragging the hand on the reel flange. Hence the term "flanging."

SOUND REINFORCEMENT

"Variable D®" Microphone: This microphone, patented by Electro-Voice (by whom I am employed), uses instead of one port on the side of the microphone (such as used in a single-D microphone), multiple ports with high frequencies entering the port closest to the diaphragm, mid frequencies entering midway along the length of the microphone case, and low frequencies entering the port farthest from the diaphragm, as illustrated below.

"Continuously Variable D®" Microphone: With this microphone, patented by Electro-Voice, instead of using three ports along the side of the microphone, the mid and low frequency ports are replaced by a long slotted entrance which has a continuously varying frequency acceptance along its length, with the lowest frequencies entering at the farthest point from the diaphragm.

Continuously Variable-D® and Variable-D® Microphones reduce most of the bass boosting proximity effect common to single-D microphones, giving nearly the same frequency response at all working distances. The Variable-D configuration helps reduce P-popping and shock sensitivity when compared to a single-D microphone. It has basically the same advantages as the cardoid in terms of feedback reduction and working distance advantages.

Acoustic Phase Cancellation in Single Microphones: It is possible to encounter acoustic phase cancellation problems even when only one microphone is being used (note "Acoustic Phase Cancellation"). For pickups from stage or desk top, the most conventional type of microphone stand mounts the microphone about 6 to 8 inches above the reflecting surface of either the stage or the desk. In this configuration, the direct transmission of energy from the performer reaches the generating element of the microphone only fractions of a second before the almost equally strong first reflected waves from the flat surface.

THE 'OVER EASY' COMPRESSOR/LIMITER.

YOU'LL SWEAR IT ISN'T THERE.

Until now the recording engineer had to settle for a compressor/limiter that was somehow... limiting. Most compressor/limiters utilize a threshold above which compression kicks in, suddenly and audibly. The engineer has to use this device quite sparingly to preserve the "naturalness" of the music he's recording.

The dbx Model 165 is a compressor/limiter that is nothing short of revolutionary. "Over Easy"™ compression allows the signal level to pass through the threshold and gradually adds the desired amount of gain change over the range of several dB. The result is compression that doesn't sound "compressed." Engineers who have used it have checked to make sure it was really connected.

The 165 incorporates other exclusive dbx design features such as true RMS level detection and feed forward gain control. A separate input is provided to the level detector. Because attack can be completed before the signal arrives at the gain control stage, this input allows the creation of special effects.

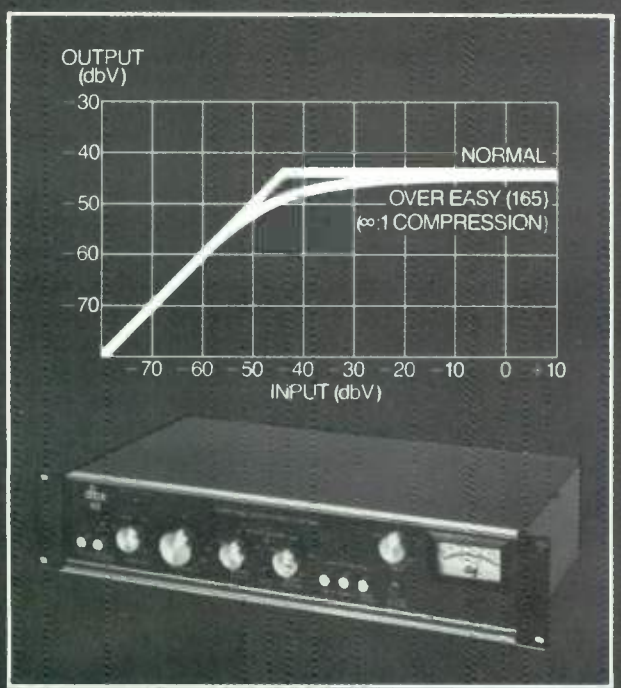
The 165 is the most flexible compressor/limiter in the dbx line. It is strappable for true stereo operation. (A master/slave switch is located conveniently on the front panel). It has manual attack and release rate controls that can be switched on for special effects. Despite all its features, it occupies only 3½" of rack space.

In the hands of a good engineer, dbx's new 165 is more than the most natural-sounding compressor/limiter you can buy; it is an integral part of the creative recording process.

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 99 ON READER SERVICE CARD

TROUBLESHOOTERS' BULLETIN

MIC ADVICE

(1)

When you are changing setups very quickly, bulk, weight and sound can be improved by an unusual miking technique. Most people mic a guitar amp by using a mic stand with one or more mics in front of the amp's speaker. However, a small omnidirectional lavolier mic draped through the handle and dropped in front of the speaker facing towards the floor will sound better

(2)

than the other arrangement. You've reduced the bulk, reduced the weight and can change the setup very quickly. Some of the lavoliers are condenser mics which need battery packs; you would be better off using a dynamic type lavolier for optimum reliability.

PAUL BUGIELSKI
SHURE BROTHERS

MORE EMERGENCY REPAIRS

(3)

Speakers that buzz on certain notes probably have a loose glue joint or the dome is buzzing against the coil form. (You should always have a bead of glue between the voice coil form and the dome.) These can be cured by adding glue to joints with inadequate amounts of glue or broken joints; or, in the case of the buzzing dome, it can be removed and refitted as described earlier.

Broken or intermittent tinsel leads can be replaced or repaired it you own a controlled heat soldering pencil. Use leads left over from cone kits or cut off of dead cones. If the lead is broken off at the cone, use an old tip on your soldering pencil to heat the remainder of the lead up at the cone termination. You will probably mess the cone up a bit in this area, so be prepared to patch it by the method described in an earlier issue. Clean the glue from the voice coil lead which is glued to the cone surface,

again using the soldering pencil. When this is clean enough to accept solder, attach the new piece of tinsel to the lead. At this point, patch the cone if necessary and coat the voice coil lead and the hole through the cone, and about 1/4" of the tinsel on the backside of the cone with glue. Solder the new lead to the terminal in the usual fashion.

We have looked at several procedures for last minute or emergency speaker repairs. Very few of these methods will give you a product that will look factory fresh,

but the results are what count here. They might get you through until you can get parts. Many of you who haven't had any reone experience may pale at the thought of this type of radical surgery, but if you think in terms of "It's dead anyway, so what do I have to lose?", it becomes easier to make that first cut. For those of you who offer reconing service, it can be a reasonably inexpensive way to make a customer happy.

BARRY MCKINNON

How can I interface synthesizers from different manufacturers? What incompatibility problems should I expect to run into?

Most manufacturers of synthesizers or synthesis modules provide access to control voltage outputs and inputs. Usually, standard quarter- or eighth-inch tip-jacks are provided for these interconnections. Considering the wide variety of synthesizer types and manufacturers, you should not expect to just plug one synthesizer into another and obtain satisfactory results. Even the simplest interconnections can be impossible if you pick the wrong pair of manufacturers.

As an example, suppose you want to control the oscillators and envelope generators of one synthesizer with the keyboard controller from another. The keyboard controller should have two types of outputs: a "control voltage" for the VCOs (typically one volt per octave), and a "gate" and/or "trigger" logic voltage to control the envelope generators. The synthesizer, or module to be controlled, would have oscillator control-voltage inputs and envelope generator "logic" inputs.

To determine whether the "patch" will work, you need to know a few things about the individual synthesis components:

What is the control voltage output of the keyboard controller? Assuming it is +1 volt per octave (the most standardized—but not universal—synthesizer control voltage), is it adjustable to "fine tune" the frequency tracking of the VCO you want to control? On the other side, does the VCO to be controlled have this type of adjustment? You may be sure that the control voltage will need adjustment if you plan to use VCOs from two different synthesizers and expect them to be in tune. Also, does the keyboard controller's "volts per octave" output match the VCO's "volts per octave" input? One may be 1 volt per octave, and the other .13 volts per octave.

Does the controller's output have a sufficiently low impedance to drive the VCO being controlled? If it does not, both the controlling synthesizer and the controlled VCO may be disastrously out of tune.

Are the "gate" and/or the "trigger" connections compatible, both in function and voltage levels? Some synthesizers use only a "trigger" voltage, which simultaneously "enables" the envelope generator and triggers its attack. Others have separate "gate" and "trigger" connections. The "gate" "enables" the envelope generator and the "trigger" provides a pulse to start a new envelope attack each time a note is played. Even if the envelope control *functions* are compatible, the "logic" *voltages* might not be compatible. Some "gates" require a ten-volt signal, others five volts, others require a "ground" signal to turn the envelope generator "on." Connecting incompatible envelope signals could cause damage to the instruments.

This example is typical of the types of considerations involved in interfacing different synthesizers. In general, the following principles will help you to determine whether different brands of synthesizers can be interconnected, and how to interconect them:

Read the owner's manual for each synthesizer to determine if the control voltages, driving impedances and logic levels are compatible.

Make sure you have the right cables and adaptors to fit the synthesizers.

Don't attempt any interconnections that aren't accessible from the input/output jacks on the synthesizers, unless you also have access to an expert technician with schematic diagrams and repair manuals.

For advanced and complex interconnections, or for connections between "incompatible" synthesizers, you may have to build an electronic box to interface control voltages and logic levels. This should be carefully considered when buying synthesizers.

Mike Beigel
Beigel Consulting Services/Electronic Product Development
Warwick, NY

What does remanence mean?

Remanence is the amount of magnetic induction that remains on magnetic tape *after* the tape has been saturated by a magnetic field. (i.e., a record head). The remanence figure given for a specific tape indicates the relative low-frequency maximum output of the tape, as well as the low-frequency distortion. In other words, a higher remanence tape will demonstrate less distortion or greater maximum output at low frequencies.

Del Eilers
3M Magnetic Audio Video Products
St. Paul, MN

Should I have a test tape for my cassette recorder? What would it prove?

I would not recommend the purchase of a cassette test tape. My answer to the consumer would be:

Test tapes are used to calibrate or check the playback level, azimuth, frequency alignment, speed, wow & flutter, crosstalk and distortion. Most of these conditions can be measured only on expensive test equipment. Others can be seen on the VU meters. Even so, the VU meters are not accurate enough (they can be out of adjustment themselves), to calibrate your cassette deck with.

In a repair shop, the test tape is considered an integral part of the repair equipment used. For you to purchase a test tape would also mean the purchase of a lot of expensive and complicated test gear. Unless you are a technician and own the proper testing gear, test tapes are almost useless.

If you suspect that your cassette recorder is out of alignment, take your unit to a reputable service center and have them test it for you. They usually have the knowledge and experience to make a quick and reliable determination.

Dale Dalke
Technical Correspondent
TEAC Corp. of America
Montebello, CA

The next step in polyphonic keyboards.

The Roland Vocoder Plus

Roland

We design the future.

RolandCorp US
2401 Saybrook Avenue
Los Angeles, CA 90040
(213) 685-5141

By Craig Anderton

Some people call it semi-pro audio. Some people call it multitrack. Some people call it pro audio. Whatever you choose to call it, we're talking about musicians using audio equipment in conjunction with musical instruments. No longer does the recording engineer sit over in one corner with audio equipment, while the musician sits in the other with an instrument and amp; the roles have started to blur, and music will never be the same again.

I feel that the most important musical development of the 1970s is not the polyphonic synthesizer, certainly not the guitar synthesizer, and not even digitally controlled devices (they'll probably come into their own in the 80s) . . . but multitrack technology filtering down from the elite few to the many. In 1969, how many musicians could afford to have 8-track home studios? For that matter, how many had 4-track studios? Today, the number of home studios and semi-pro studios is at least in the thousands —and that number is not going to diminish as the years go on.

Usually, this column is devoted to understanding technical information. But multitrack technology is a very important topic, and I want to give my own feelings on the subject so that we all know where we stand. I also want to emphasize that audio equipment brings benefits to retailers as well as musicians; the purpose of this particular column is to explain these benefits. Then, after hopefully demonstrating beyond a shadow of a doubt why semi-pro audio is good for everybody concerned, in future columns we'll explain how these systems work in simple, non-technical terms.

BENEFITS TO THE MUSICIAN

Here are what I consider to be the primary benefits to musicians of owning a multitrack recorder:

It is a composer's or songwriter's dream come true. Arrangements can be tested, portions of a tape can be rerecorded as they are improved, and a record can be kept of the development of a particular piece. When a multitrack studio is used at its most extreme potential, one musician can become an orchestra by overdubbing a variety of instruments (I've managed to cram 12 tracks, and more, on to a four-track with reasonably good sound quality).

The multitrack recorder is tremendously educational, and makes a remarkably effective teaching tool. When a musician practices without a tape recorder, it's difficult to be truly objective (in a critical or analytical sense), and still play well at the same time. By recording a performance, it can be analyzed for strengths and weaknesses, low points or glitches, and similar characteristics. It seems to me that I learned more about music in six weeks of using a multitrack recorder than I learned in six months of lessons. Additionally, a multitrack recorder allows the musician to check out harmonies, experiment with different playing techniques, learn the basics of operating a studio (big studios operate under the same basic rules as home studios; any experience acquired in the home studio can be usefully applied to experiences in other studios). And there are other educational aspects. When doing one-man-band type stuff, I learned *very* fast that if one instrument played too complex a part, this left little room for the other instruments. Based on some of the records I've been hearing recently, this is the type of lesson many musicians need to learn.

One female singer I know, by taping her voice, realized how emotionless she sounded. This caused a major shift in her attitude, because she realized the recorder was *only reflecting what was inside her.* In this case, the recorder not only showed her what needed to be changed in her voice; it precipitated a change in her personality. The first time I heard myself on tape, I was also amazed—but for an entirely different reason. I had always been rather unconfident about my playing, and like many musicians, heard the mistakes more prominently than anything else. On tape, I realized that many of the mistakes that I thought were terrible clinkers weren't so terrible after all. This increased my confidence in my playing, which led to very positive long-term results. In both the above examples, the tape recorder acted as a sort of Rorschach test, not just a "machine."

Anything that plays the part of teacher, recreation room, composing tool, and faithful objective listener for the musician is obviously something that those musicians would pay dearly for . . . thousands of dollars, if necessary. But there is still one more benefit.

Multitrack can be profitable for the musician from a strictly financial standpoint. My first recording studio cost me $1,500; after recording demos and writing articles based on my experiences using the studio, I had recouped its cost inside of two years. Eventually, money generated from the use of the studio even allowed me to upgrade it. This is significant because multitrack recorders, while amazingly low in price compared to even a few years ago, are still expensive in an absolute sense. For every musician who can afford one, there will be many others who can't. Charging other musicians to use the studio, recording sound for a lecture or radio spot, doing a jingle—all of these can generate income for the musician owning a multitrack recorder. While it may not pay back the cost of the studio, it will help defray the overall expenses of tape and the like. Additionally, by working out parts in a home studio rather than buying additional time at a large studio to do rehearsals, the savings on something like an album project can be quite dramatic. Many big-name rock stars are using their home studios to rehearse or work out with session players, and then take that "rough draft" to the big studio.

Now you know why musicians need multitrack, and why any music store that is not capitalizing on this important development is not doing itself, or its customers, any favors. But, what's in it for the store?

BENEFITS TO THE STORE OWNER

Why should retailers carry multitrack? Here are some reasons.

You pack a lot of bucks in a small space. A multitrack recorder takes up less space than a bass drum, but generates a whole lot more bucks. If you've got cramped quarters, you can add several multitrack machines in the space required by one large speaker cabinet. Mixers and other ancillary equipment also tend towards compactness.

A studio is never complete. Buying the recorder is only the beginning of setting up a studio. Home recording enthusiasts need a mixer, tape, patch cords, splicing blocks, eventually a second recorder for mixdown . . . really, a studio never stops growing. There is always the need for a new mic, a new effect, or some other gizmo.

The market is not yet saturated. This means that there is still time left to get

on the stick and carve out a niche of the market for yourself, before the guy down the street steals your thunder. The catch, of course, is that many musicians do not completely understand the full impact of having a multitrack recorder at their disposal—particularly those who have had little studio experience. You must sell them on the idea, and explain the benefits. Hopefully the first part of this column has given you some ideas about promoting the multiple benefits of multitracking to musicians.

Multitrack equipment is becoming more cost-effective all the time. Ten years ago, you were lucky if you could get a good 8-track recorder for less than $8,000. Now, you can get them for *half that price*—despite the fact that your dollar is worth half as much today as it was ten years ago (I hate to bring up unpleasant facts like that, but we do need to put things in perspective!). Now TEAC, in what I consider to be a brilliant marketing move (it will be interesting to see if their sales agree with me), is producing a portable 4 track studio for $1,100 list. If any one device was ever designed to spread multitrack technology to an even wider group of people, this is it. And as the multitrack enthusiast quickly finds out, since the equipment doesn't depreciate very much, trade-in and upgrading are natural facts of life. The person who gets a 4-track ends up wanting an 8-track; the person who has an 8-track starts dreaming about 16. Someone's going to sell that equipment . . . it might as well be you.

FINAL COMMENTS

If anybody disagrees with what I'm saying, feel free to point out any differences in opinion so that we'll have a well-balanced discussion. Maybe you've had trouble selling multitrack equipment; maybe you haven't. But in either case, I am interested in your experiences.

I'll reiterate what I said in the beginning: From a musician's standpoint, multitracking for the masses is probably the single most important musical development of the 70s. And it sure looks to me like it should be profitable for those music dealers who *understand* the subject thoroughly enough to make an effective presentation. The next few columns will be devoted to acquiring this understanding . . . see you next month.

They said we couldn't do it!

For years Peavey (and everyone else) depended on the same two or three companies to supply high efficiency, high quality loudspeaker products for use in our equipment. These few companies have been around for years and are, for the most part, producing their loudspeakers in the same way and from the same materials they always have. As the market demanded better performance, Peavey and other manufacturers increased the electronic sophistication of their products far in excess of the capabilities of the available high efficiency transducers. We attempted to explain to the "speaker geniuses" the problems and shortcomings encountered with their "beloved" products. We tried to explain why paper voice coils were inadequate. We tried to explain the power handling requirements necessary with the new generation of power amps. We tried to explain the need for better cooling, for stronger and lighter cones and diaphragms. But they wouldn't listen. They said, "**We** are the experts and we know that most equipment manufacturers and soundmen don't understand our 'precision' transducers and how to use them."

In desperation, we agonized over what we might do to satisfy our customers and to match the increasing sophistication of our electronics. After examining all the alternatives, we decided that we must apply an old adage...."**If you want it done right, then do it yourself.**"

We did!

Over five years of research and development, millions of dollars, and many thousands of hours of engineering time have gone into what we believe is the finest series of transducers avilable,... at any price.

The Black Widow loudspeakers have been designed "from the ground up" to handle the power delivered by modern amplifiers and to fulfill contemporary music and reliability requirements. These speakers are not "rehashes" of units designed back in the 30's or 40's but are **all new**, utilizing the latest in computer aided design techniques and the most efficient computer and numerically controlled production equipment. We have discovered new and superior materials, instituted new production techniques and adhesives. The need for field-replaceability was solved by having a field-replaceable basket assembly,...(A Peavey exclusive!) New technology for forming huge, 4-inch aluminum dome/coil forms and ribbon wire processing techniques we perfected to allow maximum efficiency and power handling while maintaining transient response, structural rigidity, and resistance to many classic failure mechanisms prevalent in older designs. Special attention has been paid to increased cooling capabilities with larger venting holes featuring acoustic foam/stainless steel mesh filters to prevent entry of dust.

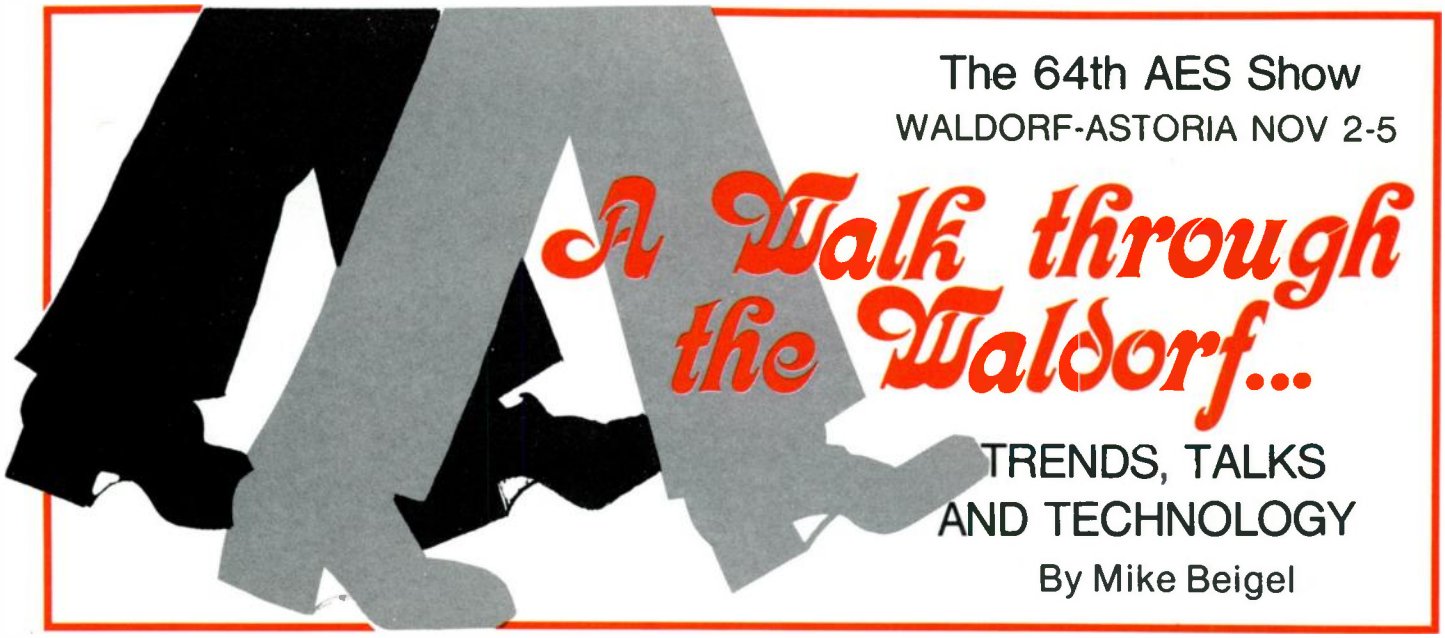
We recognized years ago the coming scarcity of **alnico** and we designed our loudspeaker around the new super-energy strontium ferrite magnets giving us additional efficiency and magnetic energy in the gap (12,500 gauss).

The "established manufacturers" of high efficiency loudspeakers have been very critical of our efforts and continue to emphasize the various features on which they have depended so long, while branding us and our products as "upstarts" and extolling the virtues of alnico and other venerable materials and techniques. Meanwhile, they have been **frantically** redesigning their dated products and you will soon see that their "fantastic new generation of loudspeakers," which will be introduced with great **hullabaloo**, will closely resemble our innovative Black Widow series. We would ask that you remember **where** you saw these features initially and also ask that you consider the amount of care and dedication we at Peavey are putting into offering you what we believe to be the finest series of loudspeakers ever introduced for sound reinforcement,...**First!**

PEAVEY

PEAVEY ELECTRONICS
711 A Street/Meridian, MS.

CIRCLE 91 ON READER SERVICE CARD



The 64th AES Show

WALDORF-ASTORIA NOV 2-5

A Walk through the Waldorf...

TRENDS, TALKS AND TECHNOLOGY

By Mike Beigel

I can't get "the parable of the pocket calculator" out of my head. At last year's AES show it descended on me, and after this year's show I really believe in it. Like all good parables, it increases in significance and depth the more you are familiar with it. You begin to understand the parable by doing a little experiment. Go get one of those little "credit card" calculators—the ones that are really *that* small. Note the price. Remember the price and size of the products that performed the same function ten years ago. Now, take that little calculator (or a digital chronograph, if you don't have a calculator) and hold it up next to every product in your store.

Try to imagine, five or ten years from now, the size and price of the products you will be buying, selling and fixing. Then go look at one of the newer calculator-AM-FM-clock-radio-timers. Can that happen in *our* industry? It can, it will, it is already starting to happen. At the AES show I saw the wheels beginning to turn. Technologically as well as psychologically the audio (and music) industry is preparing for the transition.

Instead of trying to include and review all of the new products and technological developments presented at the 64th AES Convention at the Waldorf-Astoria (impossible anyway); I would like to focus on a few products, events and technical presentations which exemplify the (unfolding) pattern of growth in the industry.

THE "SEMI-PRO" FORUM

A big event, perhaps pivotal, at the AES convention, was the forum entitled "Industry Evolution and the Semi-Pro Studio." Its significance lies in the "official" recognition that the process of professional quality recording is now accessible at a budget price to musicians outside the domain of the professional recording studio. The characteristics of the "semi-pro" or "creative audio" phenomenon were well discussed by the participants in the symposium, although firm definitions were sometimes elusive.

The panelists represented a diverse cross-section of industry areas involved in or affected by the new creative audio movement. Their names and occupations are worth mentioning. The moderator was Larry Blakely, President of CAMEO, a trade organization of 35 manufacturers specializing in semi-pro equipment. Panelists included Bill Robinson, formerly Director of Recording for Capitol Records, currently manager of Sunset Sound Recorders; Dave Harrison, President, Harrison Systems, a major manufacturer of professional mixing consoles; Hamilton Brosious, President, Audio Techniques, a diversified marketing organization involved in the audio field; Tom Rush, Columbia Records recording artist, who is now using his own semi-pro studio; Michael Tapes, President, Sound Workshop, Inc., manufacturer of professional and sophisticated semi-pro audio equipment; and Vincent Testa, who of course is publisher of SOUND ARTS and founder of *Modern Recording*.

Bill Robinson traced the evolution of the professional audio industry from the advent of the tape recorder to the present day. He noted that multi-track recording techniques, begun "by accident" and developed by Les Paul (in his garage), formed a major factor in the development of the modern recording studio. As equipment increased in quality and complexity, the associated costs caused studio time to become a very expensive "commodity."

The new home recording studios, using equipment an order of magnitude less expensive than professional studio equipment, will undoubtedly affect the pro-studio market. Demonstration tapes and even album "masters" will emerge in increasing numbers from home studios.

Robinson noted a very positive by-product of the home studio movement. It will provide a training-ground for studio engineers, who will likely emerge with enhanced expertise and resourcefulness from having "done it" themselves.

Tom Rush, who rose to fame as a folksinger in the sixties, emphasized the home studio's effect on the atmosphere of the recording process. He makes his tapes at home, then takes them to a pro studio for final mixdown and processing. To Tom, the quality of the music is the most important prod-

uct of the recording process, and the familiar environment and absence of "pressure" in his home studio allows the musical event to be more personal and relaxed. His home studio is simple: an 8-track recorder, a 4-track recorder, noise reduction system and mixing console.

Tom noted that at present the record industry may spend $100,000 to "try out" a new musician or group. With "low end" studios (we keep trying to find a name better than "semi-pro") that cost comes down to between $10,000 and $20,000. Again, cost savings of about an order of magnitude.

Hamilton Brosious, well-versed in the economic aspects of the pro audio business, commented that the "semi-pro" market is a major factor in the growth of the recording industry. A vocal opponent of the terms "semi-pro" and "low-end," he suggests simply calling a recording studio a recording studio. He notes the likelihood of upward and downward motion in the recording industry: the successful "low end" studio will enhance the quality and quantity of its equipment and grow up into a full-fledged professional outfit, whereas the lackluster pro studio may well find itself in big trouble.

The difference between low-end and high-end recording equipment is noteworthy: In audio performance and specifications, the low end equipment is quite close to high end equipment, and will more closely approach it in the future. High end equipment is designed for reliability and durability over years of constant use. But for a private studio, this factor is not so important, and the economic differential easily makes up for the reduced operational life.

THE EXHIBITS: INNOVATIONS AND TRENDS

I'm not trying to complain too much, but how *do* you report the major trends and innovations in this industry? There were five floors of exhibits, and it's my guess that just about every exhibit had a new or improved product. Do you report on the big company that introduces a digital tape-recording system or the little one that extended the dynamic range of its mixer? The effort is proportionally the same, perhaps greater for the little company with its one-man R & D department. Will a $25,000 digital synthesizer have more market impact than a computerized cassette recorder? Whose digital reverb system do you single out for comment? I don't know about you, but I'd like to take a month off just to read all the product literature and technical papers I came back with! I present here a partial list of innovations I noticed at the exhibits. Read those catalogs, folks.

- A digital synthesis system (Crumar's) with capabilities that boggle the minds of its own developers. Using the popular S-100 computer bus, it really does open up a new art and science of synthesis.
- A product (MCI's Autolock and others) that synchronizes multitrack tape recorders so accurately that they behave as a single machine. Does it offer an alternative to increasingly large and complex studio recorders?
- An audio spectrum analyzer on a board that plugs into your personal computer system, and displays the real-time spectrum on the CRT screen (Eventide).
- A four channel "portable studio" cassette recorder (TEAC's Portastudio), complete with mixing controls that make it a composer's "sketch-pad." That's right, cassette!
- A computer-controlled cassette machine (Eumig), capable of automatic indexing, remote computerized program control, with interface capabilities for most personal computers.
- Digital tape recording systems. Sixteen-bit (90 dB) dynamic range is the standard, but recording systems are not necessarily compatible. Studio machines available from two to twenty-four tracks. They are in production! (Sony, Mitsubishi and 3M were among the companies exhibiting.)
- Digital "splicing" systems for the above-mentioned digital tape-recorders. Noise-free, clock-free splicing is accomplished by examining the digital "numbers" representing the audio signal to determine the exact position of the splice. (See 3M and Sony.)
- Fluorescent panel meters. They are segmented line-graphs, sometimes in three colors. Instantaneous response to signal levels, high visibility and lack of mechanical parts make them the best "meter-movement" replacement I have seen yet. Several manufacturers are using these panels.
- Speaker systems using honeycomb-reinforcement for the bass driver (Panasonic and Sony).
- Further developments in pitch-shifting or Harmonizing* devices (MXR, Eventide and others), both digital and analog, have appeared for improved "splicing" algorythms, wider pitch-shift ranges, better dynamic range.
- Continued advances in the quality and number of digital and analog "time-processing" products, including delays and reverberation systems.
- Parametric equalizers, graphic equalizers, mixing consoles, compressors, expanders, noise reduction systems, audio analyzers, electronic crossovers, preamps, de-essers, wireless microphones, voltage controlled amplifiers, a digital metronome, headphones, studio intercom systems, faders, vocoders, music synthesizers, speakers, disc cutters, phasers, flangers, cables and connectors, and magazines.

More musical electronics companies than ever before seemed to be at this AES Convention. Which brings up a thought: How many of these product types do you presently sell? Which types might you profitably add to your stock? Without lowering its standards, the professional audio industry is becoming more interesting and more applicable to a wider public. *That*, perhaps, is the most important trend I saw.

TECHNICAL PAPERS

The technical sessions at AES represent current scientific and development work in all aspects of the audio field. Within the constraints imposed by proprietary information in our free enterprise system, the technical presentations (some of which later appear in the *Journal of the Audio Engineering Society*) are a principal source of information exchange for the audio engineer. The main subjects covered this time were as follows:

- **Transducers**, including topics on loudspeakers, microphones, and newer transducer methods such as laser-diode pickups for digital audio discs.
- **Recorded audio product manufacturing**, not just records, but also cassettes.
- **Signal processing and instrumentation**, from voltage-controlled attenuators to signal-to-noise ratios to test oscillators.
- **Distortion in audio systems.** Each link in the audio chain introduces its own form of distortion, and newer audio processes introduce new forms of distortion. Transient Intermodula-

*Harmonizer is a trademark of Eventide Clockworks.

tion Distortion currently commands great interest.

• **Sound reinforcement/architectural acoustics.** The science and art of making the sound in rooms complement the quality of audio equipment and recording techniques.

• **Magnetic and disc recording/digital recording.** Digital recording techniques, encoding systems, and questions of standardization were prominent in this session.

• **Digital techniques.** Two major issues predominate: digital representation and processing of audio signals, and digital interaction and control of analog signal processing elements. Methods of compressing audio information into the smallest possible digital "words," while retaining freedom from errors, will eventually produce an optimum digital audio protocol.

ELECTRONIC MUSIC

Two years ago, Hal Alles presented a paper about a digital synthesizer developed at Bell Laboratories. The technological attainment of the device, and the implications for music synthesis were astounding to many of us in the electronic music field. This year, Hal was chairman of the session.

Computerization was the major topic. Computerized systems can aid in the performance of electronic music by condensing the many controllable parameters into manageable and meaningful control functions. Sophisticated graphic and video displays of the complexity of musical sounds and sequences are used to provide automatic rotation and re-synthesis. Automatic keyboard effects to aid musicians with deficient keyboard technique were displayed. A microcomputer synthesizer controller produced complex and musically interesting sequences, allowing ever more freedom in live and compositional music making.

Wendy Carlos, the creator of *Switched On Bach* and a major force in the popularization of synthesized music, treated us to a demonstration of techniques used in orchestrating her amazing musical realizations. Using techniques dating back to the original multitrack overlays used in *Switched On Bach*, enhanced and improved with all the modern techniques and equipment currently available, she demonstrated musical textures of amazing beauty and complexity. A true demonstration of the attainments of a mature technology and the art of synthesis.

Tom Piggott demonstrated Crumar's computerized General Development System. Based on the amazing systems developed at Bell Labs, this system provides the bridge to future synthesis technology. The concepts and applications of digital synthesis are different in many ways from conventional methods. Musical tones can be constructed and specified in unbelievable detail. Control systems can be changed in "software" so that the control panel of the synthesizer can mean different things at different times. The position-sensitive keyboard can recognize and process the performer's musical input in ways we don't even know how to use yet. The system is so advanced that only a few individuals will be able to work with it; but as techniques are developed and simplified, digital synthesis will become more accessible to musicians at every level.

THE INFORMAL CONVENTION

Between the technical presentations, in the aisles at the exhibits, and at local restaurants; we have collected in one place most of the top people in all aspects of the audio industry. Conventions provide the opportunity (perhaps not enough) for informal interaction among these people; a mixing of ideas, plans, personalities and dreams. In between official events, the industry looks at itself and prepares the groundwork for its further growth.

Even with the intense activity and pressure of the convention, one often feels "on vacation." Even a momentary relief from the day-to-day activities required to provide "what is shown" at the show can provide the possibility for creativity that just doesn't happen under ordinary working conditions. As a friend put it, "Usually, you're too busy making a living to think about improving your business." Maybe you see one product at one booth, and another product at another booth. Over dinner with a friend you haven't seen since last year, you dream up something that's a synthesis of the two products. Perhaps a new business will be formed. Maybe in your garage. After all, Les Paul . . .

I hope your interest is stimulated. I'm convinced unparalleled opportunities exist in every aspect of the audio and music industry right now. It really is time to be creative in audio.

ROAD TOUGH? PROVE IT.

It's six long feet to the floor. What will happen when our great sound hits bottom? How long will it still sound great? We had to find out. So we picked an ATM41 Dynamic and an ATM91 Fixed-Charge Condenser out of stock, tested them, and started in.

Each was dropped seven times on its side from six feet onto the office floor. Nothing much was happening. So we repeated the series, this time dropping each microphone on its nose. Seven times from six feet. Still no problems. They looked good and sounded good, but *we* were getting tired.

So we moved to an unyielding slate floor. Here it took three more drops on its side from six feet, and three more on its nose from four feet to finally affect the ATM41. A truly remarkable record!

But what about our ATM91 Fixed-Charge Condenser? It should have given up long before a dynamic. But quite the contrary! The ATM91 withstood four side drops onto slate from six feet, three drops right on the nose from four feet, and another six drops on the nose from *six* feet and still tested OK for sound! Granted it looked anything but new, but it *still performed.*

Our little test left us arm-weary but convinced that the ATM Series microphones could easily earn their "Road Tough" name in the field. That's the testing which really counts. Try us.

Part of the secret of ATM toughness is this 3-layer windscreen. An outer heavy wire, a finer wire screen just inside, and an inner layer of woven bronze. All soldered to each other and to a solid brass ring. There's nothing else like it on any microphone.

This ATM91 survived 27 drops from as high as 6 feet!

audio-technica

INNOVATION □ PRECISION □ INTEGRITY

CIRCLE 98 ON READER SERVICE CARD

AUDIO-TECHNICA U.S., INC., Dept. 129SA, 33 Shiawassee Avenue, Fairlawn, Ohio 44313

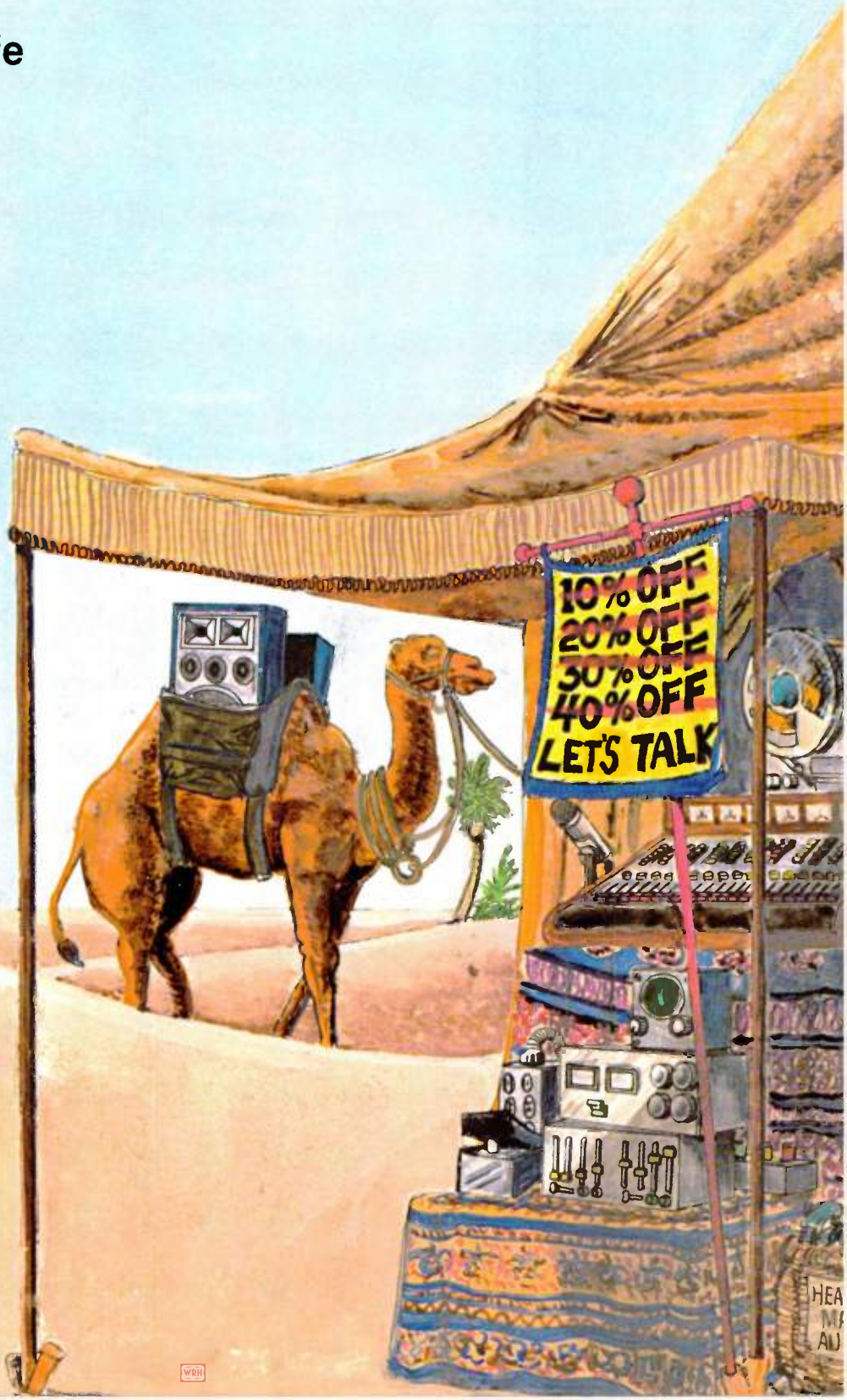
PRICING IN THE MARKETPLACE

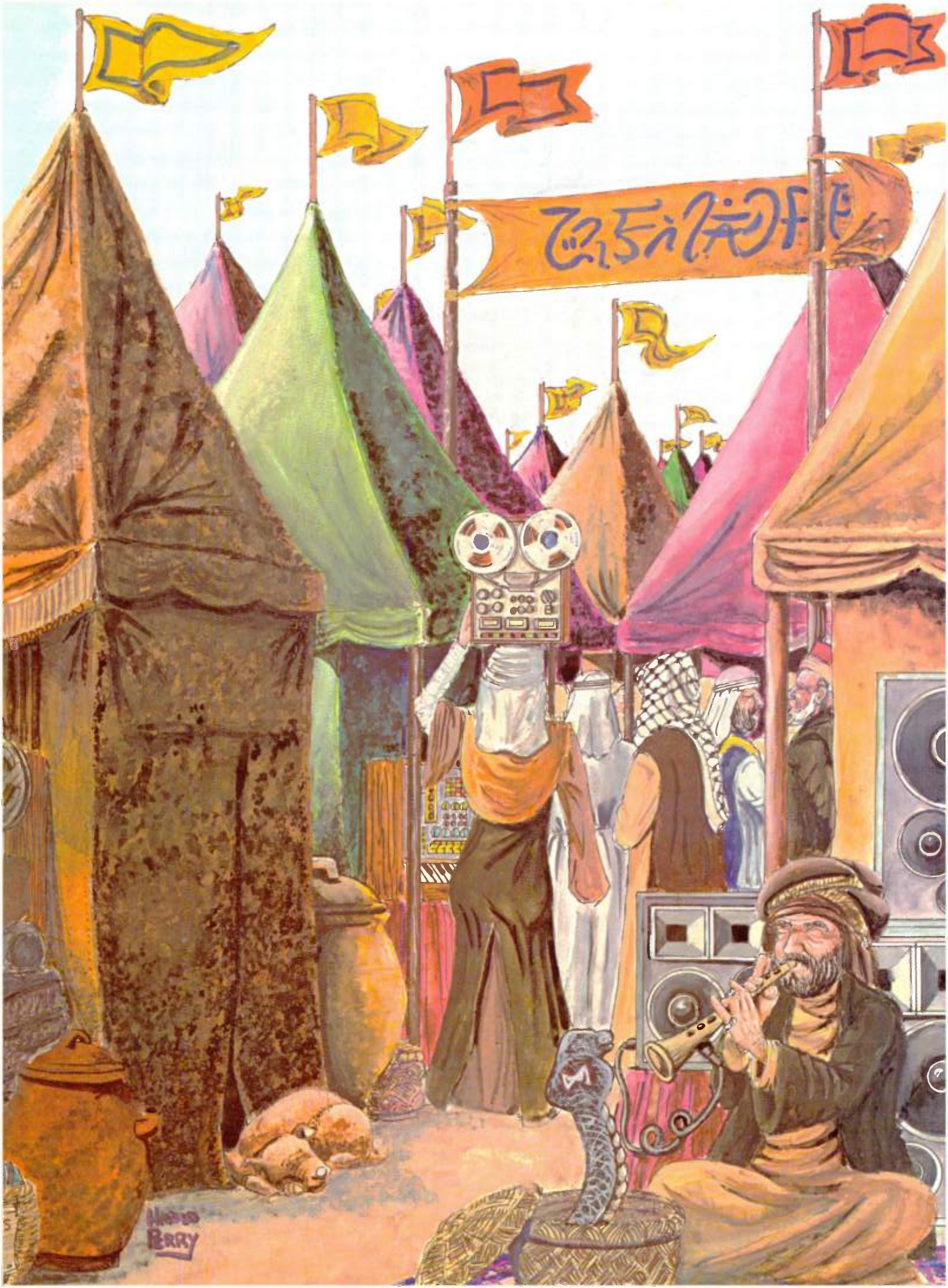
By Lawrence G. Jaffe

Discounting could possibly be the topic of hottest concern and dialog in the audio market. Especially since it is illegal to set and regulate a retail price, conversations concerning it are either held in hushed whispers, with invisible ink or not at all. That discounting is a subject of heated conversation is quite apparent by the attitude of dealers and especially of reps and manufacturers. Discussion is verboten, but it is rampant nevertheless.

Discounting's roots really lie in those ancient tales of merchants and camel trains when bartering took place. Values were thus placed on goods of comparable worth. And negotiating took place to ascertain these levels. Haggling back and forth regarding these relative amounts was considered to be common form. It was an exciting process. Both sides were gripped with spirit and decisiveness, pushing for the greatest or lowest price. Haggling resulted in the correct level for the commodity—based on the laws of supply and demand. Getting a good price was not considered a given or a fait accompli, not by a long shot. Good prices were earned, not given or expected. The net result was that the given item or commodity sought its own level or price. Even with the advent of the civilized concept of money, good prices were earned in the heated battle of seller and purchaser.

These confrontations were not always peaceful or calm. At times violence reigned and the marketplace was riddled with the blood of a sale that did not produce the expected results for one party or another. The marketplace was governed by supply and demand. Need and desire were of utmost importance, for they influenced then, and still influence, the high goddess of price, and which way she would sway.





It is important that this basis be understood. "Discount" originated in this desirable foundation. But certainly today we have an altered and ill thought out version as well.

Please understand that the opinions rendered herein are strictly those ascertained from an extensive survey of the marketplace. They are not necessarily those of the author, the company that employs him or this publication. Like I said, this is a touchy subject. People do not like to be quoted in print, but this commentary must come to light and be brought to the battlefield. Bankruptcies and business failures on the retail front are due in great part to the deadly misunderstanding regarding giveaway prices and cost plus 10. These and similar business methods result in a great deal of volume. This is a certainty, however, which unfortunately leaves little or no profit, and profit is a stimulus to staying in business.

Today's customer not only wants a discount, he expects it and requires it. What would happen if a retailer refused? Would he lose sales? Perhaps. Would he make more money on those sales that succeed? Definitely, and probably with more than enough profit to make up for the sales lost with little or no profit.

A dealer often appears to be afraid of losing a sale and therefore will go to any length to prevent the customer from "walking." Allowing customers to get away with this type of business procedure short-changes both the dealer and the customer himself—an unhappy state of affairs. A fair profit allows the retailer and his employees money in their pockets—and also permits them to continue that very business and provide a service that customers so necessarily need. This brings us to an extremely important subject, the crux of this article.

Manufacturers are interested, vitally interested, in their end users, those individuals who provide the necessary service of purchasing products with their hard won cash. It is of extreme importance that customers receiving products also receive correct information for *properly* implementing those products. This is not only important for the manufacturer's image; it certainly makes for a happy customer who will make repeat trips to said retailer. And since we are dealing with a professional customer, this takes on crucial importance. A system is sold to the professional customer not for his leisure pleasure, but to supply and help produce a living. This is quite critical and cannot be overlooked. For good sound brings in good dollars, and the reverse is also true. Systems sold "off the shelf" can have disastrous results and make for very unhappy disgruntled customers. It takes time and energy, quite a bit of it, to *design* a satisfactory system. Professional audio products do not plug together like Tinker Toys. That time and energy, needless to say, costs money.

It is extremely frustrating for the dealer who makes the technical investment to then be underbid for the system he designed by the "discounter" down the street. This is usually when the screams begin. First the rep hears and then the manufacturer hears, or sometimes both hear about it at the same time. Dealer voices carry. Boy, can I attest to the fact that they carry, and I'm sure every manufacturer can also. The bad part of the whole thing is that there is very little a manufacturer can do about it. Sure every factory has its tricks, but companies' hands are very tied as to what they can and cannot say. Certainly we live in a free enterprise system, and I do not think any manufacturer truly wants to legislate what his dealer can sell the product for. It is very difficult to service an end user with all the tools needed when you are not making any money on the sale. It is definitely not cost effective.

PRICING

Let's examine the pricing structure for a moment. It's surprising how many people in the field do not understand the most basic of business terms, confusing one with the other and vice versa. No one is saying you have to be a graduate of Harvard Business School to run a pro audio operation, but to not know the difference between mark-up and margin can truly be a disaster.

We can consider margin to be the difference between selling price and cost. It is usually expressed in percentage form and is an expression of what percentage of the suggested retail price the dealer will be paying.

Mark-up, on the other hand, is computed in exactly the opposite direction. It is the amount added on to the dealer cost in order to compute the selling price.

For example, let's take a product having a retail price of $100 and a dealer margin of 50 percent. The dealer price is therefore $50. A mark-up of 50 percent would be $50 + 25 = $75.

Somehow these terms tend to be tangled. If I've insulted your intelligence, please excuse me, but think of those fellow comrades who finally realize that a 50 percent margin is not the same as a 50 percent mark-up.

Dealers like to make money. Our business is one that is extremely small and quite personal, making it necessary, according to many dealers, to wage personal war on the marketplace and make the vendetta sale.

Judging from a personal survey, we have ascertained that dealers really need to make a minimum of a 35 percent mark-up. In today's expensive time, it is apparent that the retailer needs an even greater return on his money if he is to survive.

Manufacturers can enforce a pricing policy by keeping tight margins. This effectively prevents dealers from marking down their products to any great extent. It also has another effect: If the product is marketed cleanly, the dealer has a lower ceiling on how much can be made. The manufacturer therefore has to find the appropriate margin in order to maintain a clean pricing structure and allow the dealer to make money as well.

Manufacturers always seem to want more, dealers want as much exclusivity as possible, and the poor rep stands there with his platinum pen to write the orders. (Reps have moved up from gold to platinum pens in the last year, in case you did not know.) Nevertheless, the rep is in the middle, torn between the ever increasing demands of his manufacturer and the sales, sometimes limited, of his dealers. What alternative does the rep have to produce more numbers, even if only short term, by opening more dealers in his territory? He can somehow play the man in the middle and cajole the existing dealers into purchasing more product. He can turn to the factory and say "I cannot do anymore!" The factory of course will then put on another rep who will go through the same motions.

What is required is real up-front conversations among rep, dealer and manufacturer. Business depends on growth. Maintaining the status quo is not survival, but truly the opposite. Therefore conversations have to be centered about *commitment*, commitment from retailer and factory alike regarding sales performance and market saturation. The two go hand in hand.

Nothing produces more problems than a market loaded to the gills with product.

Here is one of the prime causes of discounting. Dealer X has to turn over the product and reduce his inventory. So he has a sale. Dealer Y sees this and cuts his prices as well. And of course Z refuses to be left out, so he too jumps in head first. Actually you are looking at what has become a normal situation. All because market planning was ignored. This of course is not universal. Not by any means. But at that first greedy step when dollar signs light the eyes, all constraint must be in place. The emotion caused by those almighty numbers must not cloud the issue as to what is best for dealer, rep, factory and most of all our friend the consumer.

It therefore is extremely important that the dealer take on the responsibility of searching out his market prior to taking on a new product line. The retailer should not take on a line just to take one on or because the guy down the street has done it, but because he needs it, and because it will complement his existing product roundup. Also because he will make money on it and fulfill the needs of both the factory and the rep in terms of growth, technical capability, etc.

It is not just up to the dealer to keep his lines clean. Dealers should align themselves with manufacturers and rep firms who are committed to their dealer structure. A manufacturer should assist the growth of its existing dealers, as well as stimulate its own expansion.

BUYING IN

A stocked dealer is a selling dealer, or so the saying goes. Everyone loves a dealer loaded up with stock in the hope that he'll sell it and make the numbers. This is only partly true. It can also lead to overkill, so ordering proper quantity is very important. But so is having the product there. We live in a "now" industry. Our clientele demands the product yesterday and a dealer without stock can lose a sale.

Additionally, ordering in quantity and paying quickly gives the dealer more margin to work with and therefore better profit. You'd be surprised as to how many dealers call up manufacturers with orders two to three weeks in a row with minimal quantity, and do not benefit from the best price. It takes planning, and this is why a good rep is indispensible. He is there on the scene, not a distant outsider. He has a handle on the product as well as the market. Knowing the amount of time a product usually takes to turn will help everyone to maximize his efforts. With a little planning in this regard everyone is happy.

CONCLUSION

A cleaner marketplace is up to you. The person who suffers the most is the customer—when neither the dealer nor the manufacturer can afford to service him.

Dealers and manufacturers should commit to each other. Not with a verbal barrage but with a step-by-step program designed to give both sides what they want. And then they have to deliver.

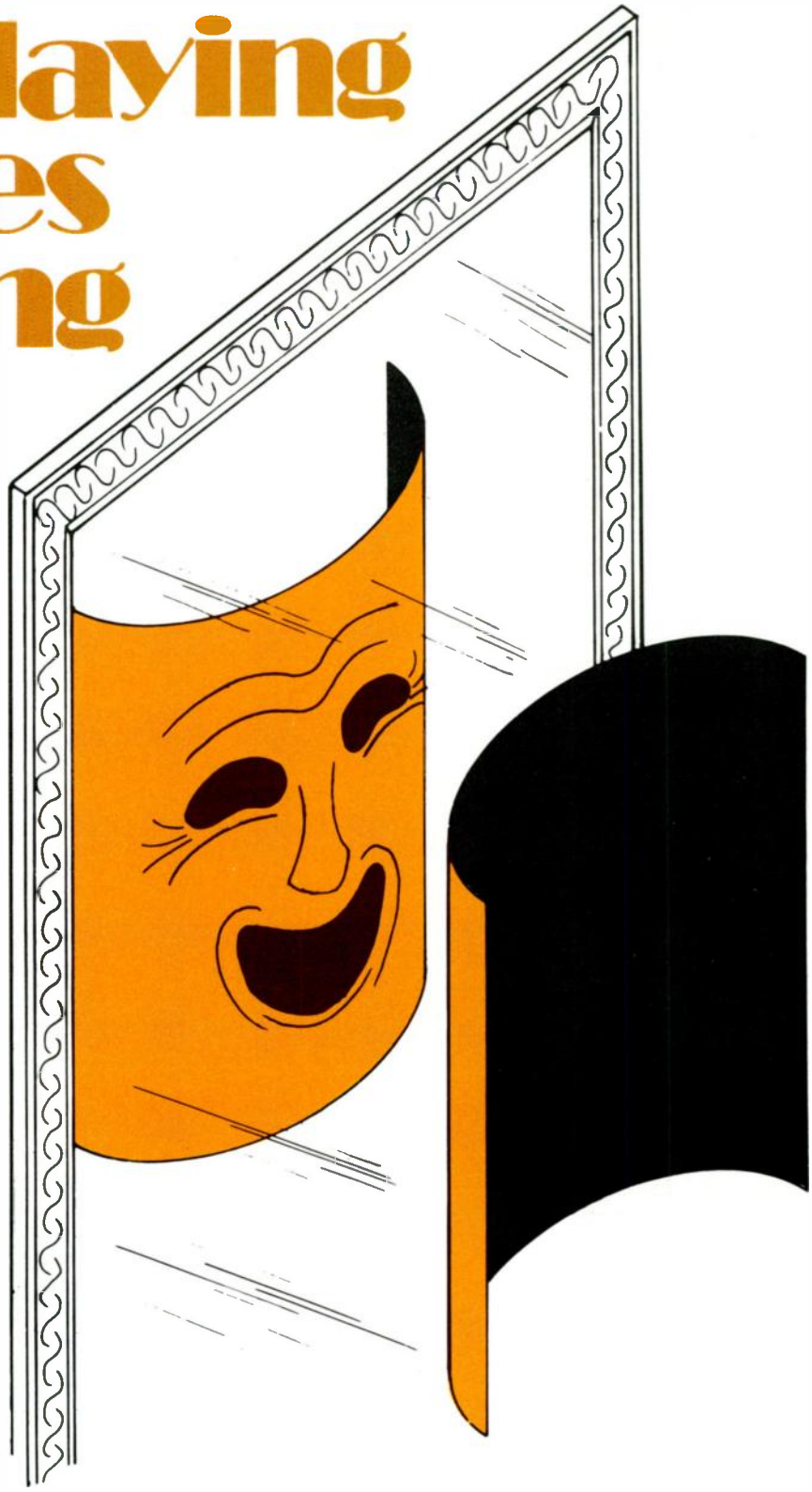
Nobody likes to talk about discounting until it happens. Then the roof comes off. Take a good look at your market and eliminate the problem before it happens. We all deserve to make a buck, and if we don't, who will take care of our customers?

Larry Jaffe is Director of Marketing and Sales, Professional Products Division of dbx, Incorporated.

Role Playing As Sales Training

Part Two

By R. Timothy Rooney



Now that we've gotten through the basic probing process in Part 1, it's time to get into bigger and better things concerning role playing in sales training. First, however, there is a technique involved in closing that should be discussed, as it not only makes a simple close easier, but can also be used to identify additional *objections* (as defined in Part 1).

The technique is a simple recap of the customer's needs and the benefits you have used to satisfy them. This is of a particular advantage if the needs are many in number. In the example used in Part 1, the close was made after two needs were satisfied. When three or more needs are involved, the closing statement should include a recap. An example of a closing recap is as follows:

Salesman: *You'll agree that you were concerned about X, Y and Z, and you've seen that this model not only fills your needs for X, but the built-in switch solves your requirement for Y, and the dual purpose connector eliminates your need to keep both types of connectors. Wouldn't you agree?*

At this point the customer's response will hopefully be affirmative. If it is, move to the cash register. If it is not, one of two things has happened. Either the customer still has a need that must be satisfied, or his needs have been satisfied—but not to the degree that allows him to comfortably make the purchase. The classic responses to your summation are, "Yes, but" and, "I'm not sure."

Tim Rooney is Director of Advertising and Sales Promotion at Electro-Voice.

Another approach to the summary statement may help isolate the problem. If the salesman states his summary in a form that requires a response after each satisfied need, additional information may be uncovered. The examples would be:

Salesman: *Your problem requires an X, and we have seen how this model fits the bill, right?*

Customer: *Sure seems to.*

Salesman: *And you need a built-in switch which this model offers, right?*

Customer: *Yes, but . . .*

The customer has just noted that he is not completely sure that the built-in switch solves his need. Or possibly some concern that some particular function of *your* built-in switch may not solve his need. (Obviously we're using a switch as an example, but this could easily apply to any feature or

function on any equipment you offer.) Perhaps the customer thinks the switch is in the wrong position. The solution will be discussed in a little bit.

If the salesman continues through his summary and receives affirmative responses to each satisfied need, but then receives a, "Yes, but" to a closing statement, then there are probably still some unsatisfied needs lurking around. To get some knowledge about the remaining needs, it will be necessary to revert to the probing technique discussed last month. A sample is as follows:

Salesman: *It looks as if this is the model for you doesn't it?*

Customer: *Yes, it does, but...*

Salesman: *I take it there is still some concern on your part. Am I right?*

Customer: *Well, yes.*

Salesman: *What's your concern?*

This forces the customer to reveal any additional needs he may have. You can attack the needs with your product's benefits as was done earlier.

In the earlier example, if a need appears to have been incompletely satisfied, you must find out why. The scenario might go as follows:

Salesman: *The built-in switch eliminates your need to have a separate switch somewhere else, right?*

Customer: *Well, yes, but...*

Salesman: *You're concerned about the ability of this switch to solve your problem, right?*

Customer: *Yes, I am*

Salesman: *Why is that?* (Invitation to expand on need or explain why your product doesn't seem to fill his need.)

Customer: *Well, your built-in switch seems like it will do the job, but that switch seems hard to get at.*

At this point two things are happening. First, the salesman has uncovered that he has not sufficiently satisfied his customer's needs, and second that the customer has a specific objection to the product that must be overcome before the sale is concluded. Rule Number 1: If a customer has an objection, *never* directly agree with him! The customer's objection may, in part, be valid, but to agree with him invites him to walk out empty handed. Quite possibly there are additional product benefits that will offset what seems to be an objection. First, restate the customer's objection in the form of a question to ensure you, and he, understand it. If you are correct, the customer must say so. If you're wrong, then you can ask him directly what his real objection is. Continuing the scenario, the following would take place.

Salesman: *I see. So you're concerned that it might be difficult to operate the switch.*

Customer: *That's right.*

Salesman: *Wouldn't you say that it is important that the switch be designed in such a manner that accidental changes in the switch's position can't occur?*

Customer: *I guess so.*

Salesman: *But it's also important that you be able to change the switch whenever you want to, right?*

Customer: *Right.*

Salesman: *Well you can, simply by inserting a pencil or any other similar object into this recess. You try it. Simple isn't it?*

Customer: *It was easier than I thought it would be.*

Salesman: *So your concerns about the switch were really unfounded, weren't they?*

Customer: *Seems so.*

Salesman: *Let's get this boxed up and shipped out to you.*

When a summary statement has already been made, and further needs have been uncovered as a result of the summary statement, it is usually unnecessary to resummarize all the customer's needs and your solutions to them. A simple statement confirming the solution to the customer's last mentioned need is usually sufficient. If you would feel more comfortable in recapping, a simple statement like this would do quite well:

Salesman: *So this product not only fills your requirements for X and Y, but as we've just discovered, your concerns about the switch actually make this product better for your application, right?*

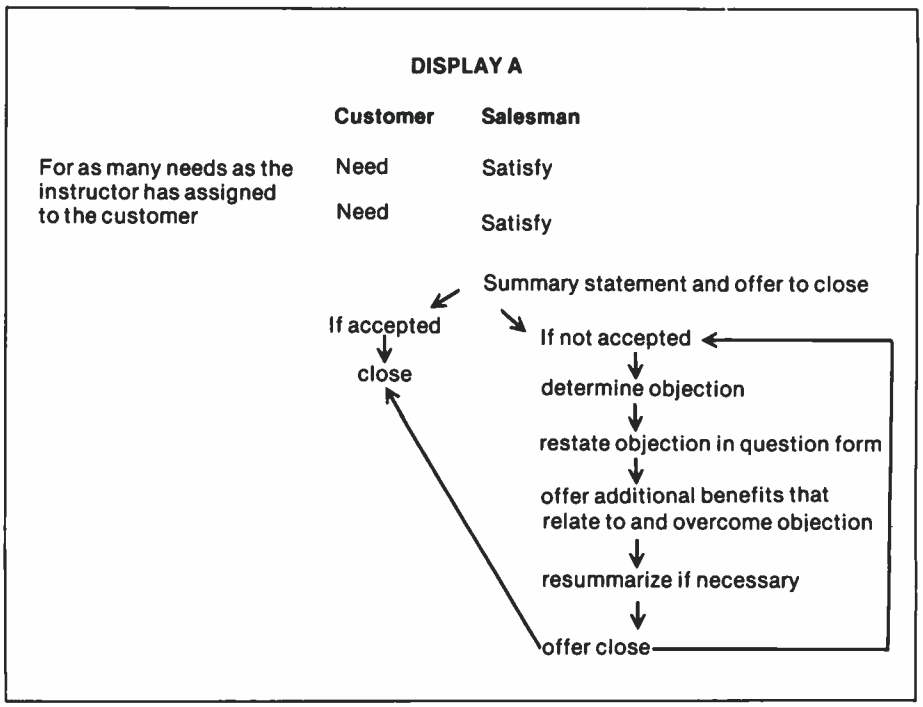
Bear in mind that in this example we are still talking about a relatively simple sale. The customer had three needs; all were satisfied except that one objection was raised that required further investigation to ensure complete satisfaction before a close. Quite often more than one of the needs will require additional work to make sure you have a satisfied customer. In the above example, the objection surfaced as part of the second need. Another objection can just as easily surface as part of the third.

For those using this article as a study guide, this would be a good place to break for practice role playing. The instructor should develop scenarios that require the salesman to satisfy at least three needs and make a summary statement prior to the "customer's" acceptance of a closing statement. The second step will be to do the above, but have the customer at some point reject the summary statement because of an objection. The salesman must properly overcome the objection and either continue with the summary statement, or make a new abbreviated summary before the customer accepts the close.

For the salesman: You've already learned the probing required to uncover and satisfy your customer's needs, so the simple flowchart (Display A) will take you through the sales process to date.

Now that we've passed through

DISPLAY A



summary statements and an example of overcoming an objection, let's try to understand objections further. First, there is the solid objection; this happens when the customer is opposed to your product. An example of a customer's statement that indicates a solid objection to your product would be, "I've had nothing but trouble with these things in the past." Second, there is the skeptical objection; this occurs when the customer agrees that the stated benefit will satisfy one of his needs, but doubts whether your product can actually provide the benefit. A sample statement indicating skepticism would be, "Yes, I need a widget with a built-in switch, but the switch on your widget doesn't seem to be properly constructed." Third, there is indifference. This is the hardest objection to overcome. Indifference is indicated when the customer doesn't seem to have any needs that can be supported by your product's benefits. A sample statement would be, "Even though your product appears to have some nice things going for it, it doesn't seem any better than what I've been using for the last two years."

Each type of objection has its own solution. The instructor should prepare a list of 20 to 30 written objections. Each of the three types should be randomly mixed and equally represented. These should be passed out to the participants in the session, who in turn must identify them. Simple letters like "O" for solid objection, "S" for skeptical objection and "I" for indifference can be used to identify the objections on the paper. The answers can be discussed to make sure everyone is on the same wavelength. Secondly, a similar list should be prepared consisting of between 40 and 60 objections. These also should be randomly mixed and equally represented. This time, though, the group leader should read them aloud and select participants at random to identify the type of objection. (The instructor can also put this material on a tape recorder equiped with a remote control switch.) After each identification there may be discussion if there is disagreement as to the type of objection just identified. These excercises serve two purposes. The salesman must first be able to identify the various types of objections. Then he must be able to recognize them when they are spoken. The latter is most important, because using the wrong technique to overcome a mis-recognized objection is, at best, a waste of time, and is, at worst, a lost sale. If the participants have trouble recognizing verbal objections after this exercise, continue practicing them until recognition is virtually second nature.

DISPLAY B

	Participant to fill in
Benefit: XYZ widgets last twice as long as any other widgets.	*Restate Benefit:* XYZ widgets do last longer than any other widget.
Proof Source: A study conducted by the American Widget Association showed that XYZ widgets had an operational life twice that of all other widgets tested.	*Proof:* In fact the American Widget Association study shows that XYZ widgets last twice as long as any other widget they tested.
Objection: I don't believe an XYZ widget can be any better than any other widget.	*Expand:* So you not only get a longer lasting widget from XYZ, but this also means you'll have less downtime due to widget replacement.

Let's tackle the techniques of overcoming various objections. We'll start with skepticism first, both because we already discussed part of it earlier, and because it's the easiest objection to overcome. The process is simple. First, restate the objection in the form of a question to ensure agreement. Second, restate the benefit. Third, offer proof. Fourth, expand the benefit. A sample conversation is as follows:

Salesman: *So you don't think the built-in switch is going to perform the way I said it will.* (A)

Customer: *That's right.*

Salesman: *This switch will perform exactly the way you want it to.* (B) *XYZ, Inc., one of your competitors, bought several recently and wrote us to say that the built-in switches not only reduced their need for other switching devices, but also totally eliminated their problem with accidental turn on's.* (C) *This product is going to save you a lot of money and headaches.* (D)

"A" restates the objection. "B" restates the benefit. "C" offers proof of the benefit. "D" expands the benefit and prepares for the close.

Proof statements can come from a variety of sources—product reviews, letters from satisfied customers, manufacturer's literature, editorials and the like. Salesmen should be aware of these items and their availability for every product they sell. It seems like a hard task; but if the customer prospect doesn't believe the salesman, and won't trust his own judgment, proof sources are the only things that stand between a sale and a "no sale." Many articles have been written noting that a customer often asks for purchasing advice from a friend who has recently bought similar equipment. The advice is nothing more than a proof statement given by a source the customer accepts.

Although it may take some time, the instructor should assemble some benefits and related proof sources from which the participants can construct sentences to overcome skepticism. A sample would look like Display B.

Quite obviously the customer may not accept the first proof source. When this happens, use an open-ended probe to find out why, then use a proof source that is more acceptable to the customer. It is not necessary to restate the benefit or expand the benefit after using the first proof source. A script for a rejected proof source, following from the above exercise, is as follows:

Salesman: *. . .less downtime due to widget replacement.*

Customer: *I still don't believe they're that good.*

Salesman: *Oh, why?*

Customer: *Because the American Widget Association is run by a bunch of crooks. They probably got paid for saying that.*

Salesman: *I see. Are you familiar with the United Society of Widget Engineers?*

Customer: *Yeah. Fine group. Used to belong to the old USWE myself.*

Salesman: *Well the Society just recently confirmed the AWA's findings in this test report. They state the XYZ widgets have a 100% longer life expectancy than any other widget on the market. Does that convince you?*

Customer: *It sure does.*

Exercise time! This time the instructional material should be made out in chart form. Enough charts should be made so that each participant can perform the salesman's role at least once. A good chart should contain all the in-

formation necessary to make the sale. A sample format would look like Display C.

All the information in the chart can be fictional. For the customer, a sample attitude and action script would be as follows. (I will use a complex example which can be modified or shortened.)

Require salesman to probe until he uncovers need number 1. Require him to satisfy this need with a product benefit. Reject first attempt at closing. Require salesman to uncover a second need. Require him to satisfy second need. When he asks for confirmation that second need has been satisfied, answer "Yes, but I'm not really sure." Require open probe to find out why. Respond that you don't believe his product will provide the second benefit. Avoid discussion until salesman has restated objection in form of a question, and gone through the restate benefit/proof/expand benefit sequence. Accept proof, but don't accept close until he uncovers a third need. Be skeptical of benefit that satisfies third need. Require response from salesman as above. Reject first proof source. Require salesman to ask why. Accept second proof source, and accept offer to close.

The customer role must be familiar with the features and benefit material available to the salesman role. Otherwise, he will be expressing needs which the salesman is, at this time, unprepared to satisfy. Later, after all the objections have been discussed, and are understood, it will be possible to ad lib these exercises. Save this type of activity for later.

Overcoming solid objections and indifference will be covered in the next article. Plus, if space permits, we'll discuss the opening benefit statement, one of the best tools you can use in guiding the course of your sales pitch towards your intended goal.

Now, after you've practiced all the material presented so far, and are convinced there's no way you can master all the techniques, I'll give you one tool that you can use immediately. It's called a "throw-away close." Essentially it's making an offer to close your customer without finding out about his needs, without satisfying them, and without overcoming any objections. The salesman's opening statement might be something like, "How many cases of widgets are you going to order today?" Who knows? He might answer, "Fifteen," and you've got your sale. This approach may only succeed one out of every fifty tries, but you will have saved yourself a bundle of time on that one easy sale.

DISPLAY C

Product_____

Feature	Benefit	Proof a) / b)
		a)_____
		b)_____
		a)_____
		b)_____
		a)_____
		b)_____

No Strings Attached

Part 1

The Subject of Wireless

By Ken Schaffer

Ever since Charlie Christian first electrified a guitar, the thought of using an umbilical cord between the instrument and its amp didn't get much adverse reaction. Consequently, in the four decades we've lived with and loved electric guitars, players have become so accustomed to plugging in and out that little thought has been given to eliminating the cord.

And just as well, too. Because it would have been a frustrated ambition. Until sometime in 1977 replacing that cord with a wireless link of even marginally comparable quality and reliability would have proven impossible.

Now cord-free stages have, at least among the more affluent world-class bands, become somewhat standard. Beginning with the Schaffer-Vega Diversity System in the spring of 1977, bands ranging from Kiss to ELO, The Rolling Stones, Heart, Foreigner and hundreds more have gone wireless, gotten rid of their cords and have adopted the new technology with such gusto that the very stages designed and used by these major acts would be mostly unusable were the musicians still dependent upon the physical limitations of cords.

Of course, the freedom of physical movement that is gained by wireless operation is obvious. But importantly, wireless instruments eliminate the possibility of the musician getting between two hot conductors.

Shocks—ranging from merely annoying zaps and lip burns to fatal electrocutions—are fully eliminated. You can't get a shock because you're no longer connected to an electrical system. This is especially important to European bands, whose mains source of 220 volts is double the American standard of 110.

While wireless mics of different sorts have been available for more than 20 years, three inherent shortcomings were significant enough to keep them off the stage. Although schemes such as infra-red and induction loops have been tried, each of the successful wireless instrument and vocal systems available today utilize radio (RF).

Clearly, there's no magic in sending a radio signal from point "A" to point "B." It's been done since the days of Hertz and Marconi. Recent improvements and miniaturization techniques make it possible, however, to eliminate the bugaboos which have kept wireless systems in the closet.

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.

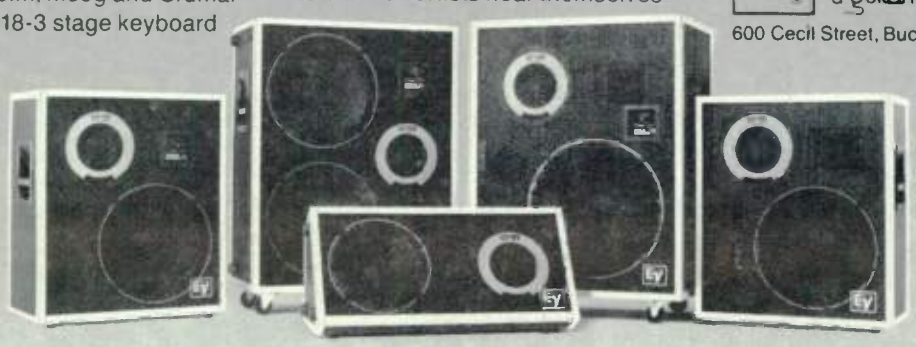
The VMR's basic accuracy is the reason you see the FM12-3 floor monitor so often on television musical broadcasts. When artists hear themselves accurately, they perform better. That's why FM12-3's sell.

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

Essentially, the three gremlins are RF signal dropouts, RF interference and overall noise. Of the three, dropouts are the most mysterious and interesting, and deserve the most attention. They're unrepeatable, and when the customer flies outraged into the store and you plug in the offending system, they probably won't recur.

Dropouts can be similar to those which occur with magnetic tape systems, at best, and create a momentary loss of signal dependent upon the performer's position relative to the receiving antenna. Moving one or two steps in any direction can, with a standard receiver, cause a perfect signal to deteriorate into inaudibility—or, worse, 100 dB noise.

Dropouts are full of personality. They're caused not so much by 'running out of range" as by *reflections.* Understand that radio wavelengths are very short—in wireless equipment only a few feet from peak to a null. The possibilities of a reflected signal coming back to the receiving antenna 180° out of phase is, therefore, a *lot* more likely than such an event occurring at audio frequencies "where the wavelengths are measured in miles."

A full 180° cancellation is not even necessary for a dropout; any number of mathematically-related phase relationships can *deteriorate* the signal and, while not causing it to be lost completely, bring the overall signal-to-noise ratio down to Edison-era nostalgia, while emptying an average coliseum before the second chorus.

Dropouts and "buzz-zones" can be prevented from over-dubbing their way onto (or out of) an otherwise gentle guitar solo by employing a technique, invented by the US Army Signal Corps, known as "diversity reception." Diversity can be taken for its literal meaning: *alternative* (in this case, a system which automatically allows for alternative signal paths between the transmitter and the receiver). Cosmetically, this calls for two antennas to be connected to the receiver. There is some dispute within the emerging wireless industry as to just what happens next.

DIVERSITY

Radio, like so much amazing magic . . . is all done with mirrors! Roughly 100 miles above us, the ionosphere curves its way around the earth and, corresponding to its health and condition of the moment, reflects radio waves back toward the sod. The ionosphere is a *radio-mirror,* and multiple reflections, at shortwave frequencies, make long-distance communication possible. Of course, this background would appear to be fairly academic to a guitarist who merely wants to make it 'cross the hall to the stage, but really, it's not.

Analogous to the often curious behavior of ionospheric reflections of powerful shortwave transmitters are the reflections which occur when a musician's RF signal hits (and bounces off) walls, lighting arrays and sizable metal objects.

For the Signal Corps, the problem was that, on a multi-bounce path such as the one between Long Island City and London, signal quality would vary over the course of hours, minutes, days and even decades. A signal would be perfectly readable at one moment and virtually undetectable the next. Though the quality of radio links at any distance can be affected by everything from sunspots to distant weather (note: the powerful RF signal generated in a South American thunderstorm acts like any other signal and bounces around the world, possibly causing interference on the link between Geneva and Istanbul!), the *immediate* cause of signal fluctuations was found to be related to the height of the ionosphere at the given moment; at noon, for instance, when the ionizing rays of the sun are stronger, the "bottom," or reflecting layer, of the ionosphere is lower, or closer to earth; a signal hitting this noon-time mirror, therefore, will not, on a single bounce, travel as far as it will later in the day, when the mirror is physically higher.

As the day progresses, from dawn to dusk, the height of the reflecting layer varies. Signals that might have made it across the Atlantic on a dozen bounces at one hour might require a dozen more—or might not make it at all—at another. Along with the hourly, *predictable* changes, there are momentary unpredictable ones. Signals can, for no apparent reason, suddenly disappear or deteriorate. Though this element of chance is part of the fascination that draws thousands of "hams" to shortwave radio; the mystery is, of course, less admired by *musicians* "taking to the air" for the first time.

According to our records, it was a Lt. Beulah Binkin who first discovered that, even on a radio path of thousands of miles, separating two receiving antennas by only *one* wavelength would produce unexpected results. During those short-interval or momentary fades, one antenna might sit in a total dropout zone, but the other antenna, with so little as a wavelength's separation (a couple of hundred feet at their frequencies; about ten feet with modern wireless systems) would invariably deliver a good, usable signal. On a 5,000 mile path!

Beulah did his "diversity" switching with a giant jack-knife switch; when he heard a fade coming, he would reach up and throw the receiver onto the "diversity" antenna, and by so juggling, kept the overall signal intelligible. The obvious extension of Lt. Binkin's unexpected luck was to try to "automate" the process by eliminating the need for the jack-knife switch. A system's analysis of the Binkin Diversity Package would show quite a complex system, actually. There was the ability to determine the onset of a fade, the capability of switching to a "better" antenna, the verification that the "better" antenna was in fact better, and, finally, the switching. Conveniently, this system could be delivered in the form of a single telegrapher and jack-knife switch, at a time when an electronic-equivalent lay in the future-realm of artificial intelligence.

Of course, the Signal Corps in those days was dealing with Morse Code, and the objective was to keep a radio-telegraphed message readable. Scratches, clicks and momentary glitches were tolerable. We've come a long way in both our needs and capabilities.

It is remarkable to note that Binkin & Co. tried the most obvious avenue to improving (automating) the antenna switching arrangement—which was to tie the two (they also tried three, four, etc.) divergent antennae in parallel, hoping that the signal delivered from the good antenna would automatically win out. Such was not the case. The parallel arrangement, which within the past year has actually become known as "*antenna diversity,*" didn't work. When tried, the signals from all antennae *summed* to produce a single, electrically and vectorally *averaged* signal to the receiver. In practical terms, it meant that the fades and dropouts, rather than being eliminated, were merely moved around, equally at random. A +5 signal from one antenna would, for instance, sum with a −5 signal from the second antenna, producing a 0 (dropout) average. Meanwhile, an operator (or "in the

WHY JBL FLATTENS THE COMPETITION.

INTRODUCING THE 4313.

Flat frequency response. It means accuracy. Naturalness. Reality.

JBL gives it to you without the bigger box that you'd expect along with it, since the 4313 only measures about 23" by 14" x 10"!

This new, compact professional monitor produces deep, distortion-free bass. And does it with a newly developed 10" driver. Its massive magnet structure and voice coil are equivalent to most 12" or 15" speakers. Yet it delivers heavy-duty power handling and

On-axis frequency response, 4313 monitor.

a smoother transition to the midrange than most larger-cone speakers.

The 4313's edge-wound voice coil midrange accurately reproduces strong, natural vocals and powerful transients.

Up top, a dome radiator provides high acoustic output with extreme clarity and wide dispersion. A large 1" voice coil gives it the ruggedness needed in professional use.

Working together, these precision-matched speakers offer superb stereo imaging, powerful sound levels and wide dynamic range.

Audition the 4313 soon.

We think you'll agree that its combination of flat response, power and moderate size flattens the competition.

James B. Lansing Sound, Inc., 8500 Balboa Boulevard, Northridge, California 91329.

JBL

FIRST WITH THE PROS.

CIRCLE 71 ON READER SERVICE CARD

far-distant future," an alternate intelligence) comparing the signals from the two antennas could, of course, make relative judgments, and switch between them and produce a solid signal to the receiver. Binkin found, as have others who have tried to simplify the technique, that both *sensing* and *switching* were necessary to duplicate diversity's advantages.

Further refinements of the diversity technique inspired by needs during the Second World War eventually saw two antennae feeding two independent receivers; after RF detection and processing, the audio outputs of the two receivers would be compared, and a sensing circuit would literally "vote" for one of the other, *sensing* signal strength at the RF stage, and *switching* at audio. With further refinements, this remains the state-of-the-art.

The most complete study of diversity and how to achieve it was done by the BBC, and it analyzed diversity as it applied to wireless microphones (identical to wireless instruments, except for the input audio). The BBC compared and analyzed the "integrity" (or signal saturation) of the links between transmitters and the three types of receivers: simple single-ended; "antenna diversity"; and "full (dual) diversity."

The tests were made between 1974 and 1976. At the time, the signal integrity of most wireless systems (at the BBC and elsewhere) was dismal. Dropouts, fades and assorted buzzes would recur throughout most wireless performances, except in fixed-site studios where technicians had an opportunity to walk-check the performing area thoroughly and place the antennas in the optimum position to either eliminate dropouts in the performing area, or at least identify the problem areas and mark them off with red gaffer's tape. (This, though not officially included in the BBC trials, has come to be known as "Las Vegas Diversity;" red tape is the reason that wireless mics have been usable in Las Vegas for a decade longer than they've been reliable anywhere else.)

Following the tests, the BBC was to commit to the next generation of wireless systems for their internal use. As possibly the world's biggest single user of wireless mics, the decision between *antenna diversity*, requiring only multiple antennas and combining networks, and *full (dual) diversity*, requiring two complete and independent receivers plus logic and switching circuits, would mean the commitment of a large difference in dollars or pounds; dual-diversity costing roughly twice as much.

And, for the results . . . it was found that a single, traditional receiver provided "saturation"—fully usable signal—over 97% of the performing area. Antenna diversity provided the same—97% (moved around somewhat, but with fades and otherwise adulterated signals equally at random). Full dual-receiver diversity provided 99.93%. Those are the raw statistics. The ultimate conclusion was that a dual-diversity VHF wireless system could be made which compared favorably with a cord in terms of the integrity of the signal delivered to the mixing console.

What that 97% means: Most any wireless instrument or microphone system you demo (or which is demo'd to you) in the store or onstage will deliver its best 97% of the time—or, more accurately, in 97% of the positions in which it might be used during a performance.

A good non-diversity system can be set up to operate as dependably as a dual-diversity system. (This is to grab your attention.) All the extra dollars for a dual-diversity system are unnecessary if the customer understands that a system must be thoroughly walk-checked through the performing area at sound-check. Diversity sensing and switching systems cover you for faulty or unfortunate antenna placement, obstructions, etc. (The Schaffer-Vega Diversity System does just that; but at a price—about $3,500 per system—which few bands could even consider.)

However, the Schaffer B & T, for instance, features the identical transmitter ($850) and the identical receiver ($1,350)—except only *one*, with a single antenna and no claims for any advantages of (cosmetic) diversity. Note that the difference in price ($1,350) is precisely that of the difference between having one and having two complete receivers. The electrical difference is correspondingly identical. Where available, the cost ratios of other manufacturers are similar.

AFTER DROPOUTS

With the availability of dual-diversity receiving systems for those who can afford them—and the more affordable availability of well designed, sensitive receivers which can, with a walk check and some attention, be made to function nearly as reliably—dropouts and fades can be either fully eliminated or minimized; we are left with the two other traditionally critical problems that till recently left wireless infamous, ignoble and offstage: interference and noise.

The most frequent form of interference occurs when another signal is on or near your system's operating frequency and, for any number of unfortunate reasons, presents a stronger signal for your receiver to choose. The radio spectrum is a crowded ghetto. Listen to a VHF/UHF scanning receiver and you'll be amazed at how many signals are in the air, ranging from public service to aircraft, taxis, hams, cops, CB's, mobile phones, security walkie-talkies, TV & FM (broadcasting), etc. Wireless systems utilizing the VHF (Very High Frequency) FM (Frequency Modulation) mode of transmission find below them the short-wave bands used for long-distance communication. Above VHF are microwaves for radar, data, cooking and other specialized point-to-point applications. Within VHF are all TV channels up to channel 13, the FM broadcast band and various business and ham bands.

Pre-1978 vintage wireless systems operated mostly on hi-VHF frequencies (between 165 and 175 MHz) which existed as "holes" within other FCC allocations. Because of their low power and short-distance capabilities, they presented very little interference potential to existing protected services, and were allowed to operate in a sort of a gray area within the FCC's province. But because FCC licensed TV broadcasters are among the major users of wireless-type equipment, network lawyers urged the FCC to formally rule on the utilization of these frequencies—or any frequencies—by this type equipment, and in 1978 the FCC ruled that wireless systems of low power (under 50 milliwatts), but which are Type Accepted by the FCC, can operate on any unused TV frequencies within a given area.

Professional systems using these hi-VHF frequencies are crystal-controlled on a single, discrete channel per system. Changing frequencies is usually a factory operation.

(continued next month)

Ken Schaffer is President of the Ken Schaffer Group.

5 reasons why the new Mu-tron can have a profitable effect on your business.

#1 New advertising and promotion:

We're telling your customers about the quality line of Mu-tron effects in magazines like **Guitar Player, Rolling Stone, International Musician & Recording World,** and **down beat.** Thousands of new Mu-tron catalogs have already been distributed — **free** — to musicians all over the United States.

#2 A built-in level of brand name recognition and consumer acceptance:

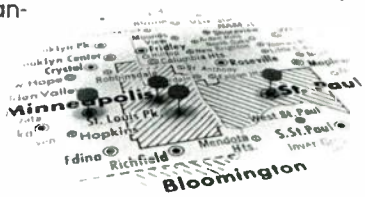
Musicians know all about Mu-tron because all sorts of professional musicians play Mu-tron effects. Artists like Jan Hammer, Larry Coryell, George Duke, Lee Ritenour, Joe Zawinul and Alphonso Johnson are just a few of the many professionals who play Mu-tron, and recommend Mu-tron in interviews and articles in major music magazines.

#3 A new company behind Mu-tron means new products ahead:

Now Mu-tron products have the sophisticated Research and Development Department of ARP Instruments backing them up, which means new and improved Mu-tron products for dealers and customers. For example, Mu-tron's new digital delay line offers tremendous features and value for the same price as analog delay lines, a real price breakthrough. And there's more to come.

#4 Selective distribution and discount structure mean added profits for you:

The Mu-tron franchise is more valuable than ever. Selective dealer appointments and a profit-oriented discount structure stand behind a full product line with proven sales power.



#5 Field sales support keeps you and your salespeople in the know:

ARP's nationwide network of District Sales Managers provides direct contact with factory personnel. You get up-to-date information on new Mu-tron products and programs so you can buy and sell more effectively.

MU-TRON

ATTN: National Sales Manager, Mu-tron, Inc., 45 Hartwell Ave., Lexington, MA 02173.

Sounds like the New Mu-tron Dealer Program is right for my store. Please have a salesman call.

Store Owner _____

Store Name _____

City _____ State _____ Zip _____

Telephone _____

Best Time to Contact: _____

Mu-tron, Inc. is a wholly-owned subsidiary of ARP Instruments, Inc., 45 Hartwell Avenue, Lexington, Massachusetts 02173.

CIRCLE 78 ON READER SERVICE CARD

The SOUND SH

Seems like only yesterday, the rock band packed everything they owned in the back of an old station wagon and rumbled off to the sock hop at the high school gym. But nowadays it takes several trailers to haul the rock band road shows around, and everything from a wardrobe to a water bottle must have its own road case.

To meet the ever-rising demand for sturdy traveling cases, **SMF Road Cases** has introduced a new line of fiberglass cases for every conceivable instrument and accessory. Cases for amps, speaker enclosures, pianos, synthesizers, organs, Leslies, tape decks and mics are all part of the standard fare offered by SMF, and custom-built cases can be made to order. Each case features heavy metal corners, recessed handles, and extruded aluminum trim. Heavy casters are provided on the larger cases. Five colors are available: blue, green, black, white and red. The fiberglass construction ensures safety during transport.

CIRCLE 1 ON READER SERVICE CARD

TEAC's new M-144 Portastudio is considered more a musical instrument than an audio/high fidelity product. As Teac describes it, the Portastudio is "a mixer-recorder for the creative artist that contains all the necessary systems you need to produce home demos in one 20-pound package."

The M-144 is a portable studio that combines a four-in two-out mixer with a multitrack cassette recorder. The entire package, which weighs less than 20 pounds, is designed specifically for the musician/composer who wants to get his ideas on tape at a minimun expense.

As many as 10 instrumental or vocal tracks can be recorded by using the simul-sync "ping-pong" technique, with only one-time dubbing for each instrument. The Portastudio will record only two tracks in sync at one time, but will play back all four tracks simultaneously.

Teac points out that the M-144 has a different head configuration that is not compatible with other products on the market.

The cassette section of the M-144 has a faster than normal tape speed of 3-¾ ips, which provides greater dynamic range. The cassette has a two-motor logic control transport with an FG-servo DC motor for the capstan, pitch control of ± 15%, and Dolby noise reduction.

OPPE

By Charlie Lawing

. In the mixer section there are four mic/line inputs, a pan pot, track-to-track dubbing capability, and bass/treble controls on each track.

The M-144 also features mixdown from four to two channels, tape cue monitoring, and four VU meters. The unit is equipped with a stereo auxiliary return input which facilitates an external echo unit interface.

The M-144 Portastudio is available for shipment and carries a suggested retail price tag of $1,100.

CIRCLE 2 ON READER SERVICE CARD

The Audioarts Engineering Model 1400 is a monophonic four-way parametric electronic crossover for use with high-power four-way and three-way speaker systems. Features include front panel crossover frequency controls, crossover depth controls (−7 to +1 dB); four front panel level controls; four phase reversal switches; a system overload indicator and a master level control. A variable high pass filter is incorporated.

CIRCLE 3 ON READER SERVICE CARD

An updated version of the popular vocoder speech synthesizer is now available from **Roland**. The new unit, the Vocoder Plus, is complemented by the addition of a String and Human Voice section.

The Vocoder section of this keyboard instrument processes the spoken or sung human voice or an external signal. The mic input of the Vocoder Plus will accept high or low impedance connectors.

The Human Voice section produces a chorus of voices which are split into two sections (upper and lower half of the keyboard) and which can be run in stereo. The upper half of the keyboard produces one male and one female chorus, while the lower half contains two male chorus sounds.

The String section, of course, produces string sounds, with independently variable tone and attack time. Release time is shared with the Human Voice section, and the String sounds can be assigned to upper, lower or full keyboard, independent of the other two sections.

In a live performance situation this instrument can add a full chorus of voices to what is being sung, but of course the Vocoder Plus, for all its good features, will only double one vocal part. Nonetheless, that one part can provide an incredibly strong vocal embellishment when used in the right places

All three sections of the Vocoder Plus can be run simultaneously, and the unit contains a balance control for all sections, as well as vibrato controls that govern rate, depth and delay of the vibrato.

The Vocoder Plus has a suggested list price of $2,695.

CIRCLE 4 ON READER SERVICE CARD

Beyer Dynamic's new M69 hypercardiod mic, designed for live performance and recording situations, has a highly directional pickup pattern which eliminates feedback and unwanted noise. The M69 has a high output (−51 dBm), a wide frequency response (50-16,000 Hz), and 200-ohm impedance. Frequency response is virtually flat above 150 Hz, and the M69 exhibits a smooth roll-off below that point, thereby eliminating rumble without losing solidity in the bass register. The M69 comes equipped with a 3-pin connector, but impedance-matching transformers and alternate connectors are available from Beyer. The suggested list price of the M69 is $149.95

Another new Beyer mic is now available, the M400, a unidirectional moving coil microphone. This mic, in contrast to the M69, has a frequency response of 50-15,000 Hz and exhibits a well-balanced rising characteristic in the upper frequencies instead of the flatness of the M69. The M400 also has a sharper low frequency rolloff and a presence boost.

The M400 has a built-in blast filter and a humbucking coil which cancels out AC line interference. The supercardioid pattern minimizes background noise and feedback. Those features, combined with the anodized aluminum case, make the M400 a good mic for traveling situations. The M400 comes equipped with a 3-pin connector, but the full range of transformers and accessories is also available for this mic. Suggested retail price is $119.

CIRCLE 5 ON READER SERVICE CARD

Sansui has introduced the SC-3300 and SC-3330 metal tape cassette decks, front-loading, two-motor components. The record/playback head is composed of an alloy of iron, silicon and aluminum. The erase head is a ferrite type with a double gap and an erasure factor of 70 dB. Features include Sansui's "Tape Lead-In" design for bypassing the leader portion of the tape; memory rewind; auto play and auto repeat. With Dolby, the signal-to-noise ratio is 69 dB. Frequency response is 20-17,000 Hz for metal tape; 20-16,000 Hz ±3 dB for CrO_2.

The SC-3330 is matte black; the SC-3300 is brushed aluminum and rosewood. Suggested retail price is $420.

CIRCLE 6 ON READER SERVICE CARD

In this age of microprocessor technology, everything is getting smaller. The parade of dwarfed amplifiers continues across the retail shelves of dealers everywhere. At each new turn, someone has built "the ultimate" in small amplifiers.

The **Barcus-Berry** XL-8, or as the manufacturer prefers to call it, "the tiny tiger," sinks its claws into the ears of the listener with 15 watts of power and a single 8-inch speaker; but wait, before you dismiss the XL-8 as "not powerful enough," take a look at a few ideas that went into the design.

First of all, the XL-8 is intended for use as a practice amp, a studio monitor, or a small-club amplifier. The thrust of the design effort was aimed at efficiency, which is why BB chose a speaker design much like those being used for bookshelf speakers on the home audio market, some of which are amazing in their clarity and overall response. As all of you know, if the speaker is efficient, less power is needed to produce a given amount of volume. The point is, although the amp may seem weak on paper, it is quite sufficient for its intended use.

CIRCLE 7 ON READER SERVICE CARD

MXR Innovations has a new battery powered variable gain preamplifier on the market now, the Micro Amp. This device has a user-adjustable gain from 0 dB to 26 dB of signal boost. Input impedance is 6.8 M ohms, and the unit has a 470 ohm output impedance.

The extremely high input impedance allows the use of piezo-electric transducers (such as a Barcus-Berry pickup) or other pickup systems with no effect on pickup response. The Micro

the SOUND SHOPPE
REAR ENTRANCE

Amp can accommodate a variety of loads due to its high output swing capability.

Wide frequency response, low noise and very little distortion are all characteristics of the Micro Amp. With a response of from 12 Hz to 24 Hz (±3 dB), equivalent input noise of −103 dBV, and total harmonic distortion of less than .12%, the Micro Amp is capable of delivering clean, reliable gain in any situation. Also, since the Micro Amp only requires 0.3 mA at nine volts, a single 9-volt battery can last up to 1500 hours! Cost of the unit (*retail* cost) is under fifty bucks.

CIRCLE 8 ON READER SERVICE CARD

The model P50 power amplifier is the first completely new product for professional applications brought out by the Professional Products Group of SAE. The 1¾ inch high amplifier is rated at 70 watts per channel into 8 ohms. With 15 amp output devices and a new cooling fan, the P50, according to SAE, is the first professional power amplifier to meet FTC specifications into 2 ohms with no thermal cycling. Features include a third input jack on the back, automatically disconnecting the stereo inputs and bridging the amplifier into mono operation with 350 watts of power; switchable high and low frequency filters which can be modified to roll off at any frequency; DC protection circuitry; overload indicator lights which are frequency and load independent.

CIRCLE 9 ON READER SERVICE CARD

Kenwood's new LS-1900 speaker system is distinguished by a computer-assisted design which features an isolated housing construction that eliminates crosstalk between the woofer and the mid-range/tweeter system.

The 13-inch ported bass reflex design of the LS-1900 features a separate housing for the midrange and tweeter system that sits atop the bass cabinet and can be pivoted up to 30 degrees to the left or right for maximum efficiency in any listening area. The separate housing also aligns the midrange and tweeter on the same vertical plane, thereby insuring precise phase coherency. To prevent the woofer's vibrations from interfering with mid and high frequencies, both drivers in the LS-1900 are mounted on a separate baffle board.

Kenwood designers isolated the two pairs of coils within the crossover network and doubled the thickness of the printed circuit board in order to prevent signal leakage between the woofer and the midrange speaker.

The LS-1900 maximum input power is 170 watts and the frequency response ranges from 30 to 21,000 Hz. The LS-1900 retails for $1,165 each.

CIRCLE 10 ON READER SERVICE CARD

By N.I. Weinstock

DEALER DOSSIER

Audio by Zimet
Roslyn, New York

Audio by Zimet has been a Long Island fixture since the 1950s. The feel of the place is very comfortable, homey, and conducive to learning about and working with audio. Not to say there isn't a lot of hectic activity there: For the last five years Audio by Zimet has been doing more and more professional sound recording, and has been building systems, and providing the sound for many live radio concerts, discos and live clubs, and all sorts of places. And they still service their by now three generations of suburban clientele. But Dick Singer, store manager, and Dave Rosen, president, talked of an age of diminishing returns in hi-fi, with real expansion only possible in the professional market. "They're using money to make money," Dave said, "and there's a constant need there." We talked in their new professional products showroom.

Well, how did it all get started?

Singer: We began operating with a single site setup, warehousing, everything, in the middle to late fifties, as just a small retail store. There were very few places on the north shore of Long Island that dealt with stereo components. There were a few TV fellows that were doing the Magnavox consoles, but nobody was doing the hi-fi equipment. And let's face it, this is a rather affluent area. And as the market progressed, so did we. We got involved in semi-pro, and pro, and it's become a very viable thing for us, the potential of the small studio. A lot of people can't be bothered with four-track—but that's an extremely viable market a lot of people overlook.

How do you feel about that word, "semi-pro"?

Singer: I think it's misused. A lot of Teac and Otari equipment are being used professionally for the same professional purposes as Ampex, Revox and Studer. Unfortunately, the stigma of "semi-pro" exists, which I don't think is valid. But at the same time, how else can you describe some of the equipment?

When did you first get into the professional gear?

Singer: I would say about five years ago. Actually, a little more than that.

Rosen: We started when Tascam came out. We were one of the first to have the board, and we've been selling them ever since. And now we also do a lot of live radio.

Let's get into the physical layout. What is upstairs?

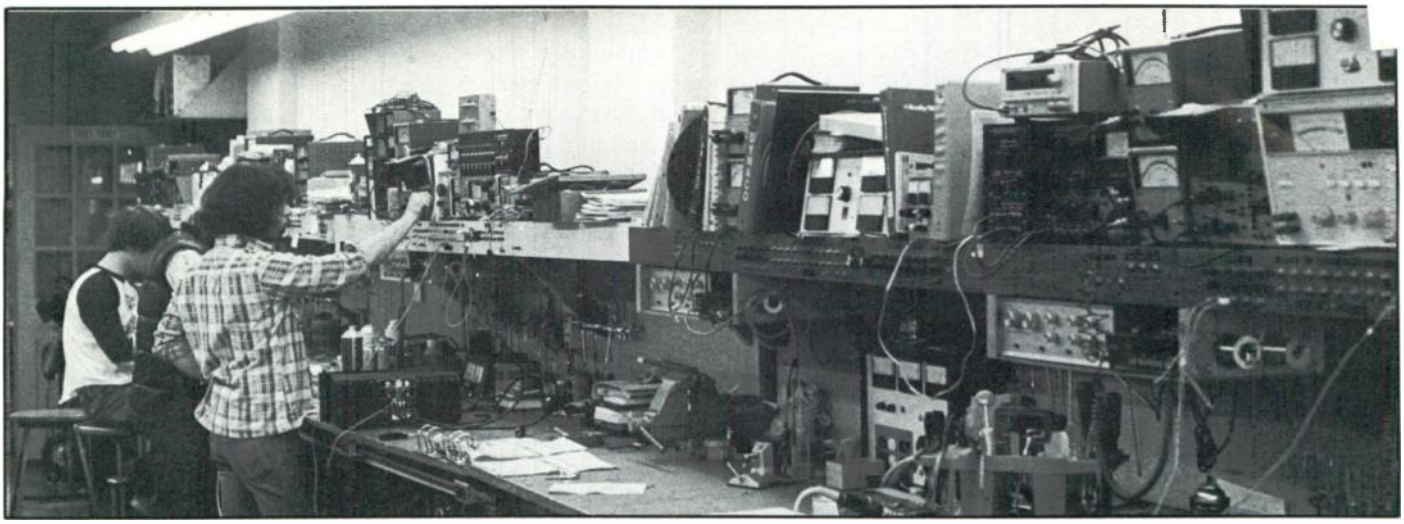
Singer: Upstairs is the office and what we call the box room. The studio is down here, and the entire basement is the stockroom.

Rosen: Of course, as you carry more and more lines, you have to have back-up stock in them. There's got to be about seven thousand feet of warehousing down there.

Singer: It's really necessary. Everything's on skids, so that anybody can go down there and not have to strain himself to find what he's looking for.

Rosen: And then we have the warehouse, in Manhasset, where we keep the real bulky items—big speakers, bulky installations. It's a warehouse, but more importantly, it's a workshop, where we build custom cabinets, custom fittings for houses, and discos, and whatnot. We call the warehouse the workshop or the workshop the warehouse.

What's the personnel breakdown there and here?



Singer: We have, full time, four people over at the workshop. That's for design and installation of all custom work. Over here we have four technicians, somebody to stock the rentals, salesmen and assistants, girls who take care of ordering everything, and there's Dave and myself. There's a total of ten or twelve people.

Do you do all your own installations?

Singer: Our people do all of our installations. Part time, we have people that help us out on large jobs. We don't like to take people out of sales and send them over to, say, the Nassau Coliseum. Economically it's not feasible for us to use all our own people at big concerts.

And the sales people?

Singer: Well, we have a full time salesman in the audio department. I primarily take care of the professional or semi-pro or whatever you want to call it. When I'm not here, most of my staff is familiar enough with the equipment and its function so that they can at least give someone who requires it a rough idea of what a particular device does.

Rosen: If someone has to go out there, I would handle it, whether it's a home or a club.

So, how do you get your customers?

Rosen: They come to us.

Singer: There's no out-of-house sales at this point in time. You see, Long Island's a strange situation. There's important, serious recording here, but it's very spread out. We get most of our business through word of mouth, and we advertise on radio stations. We advertise on the local rock station, and in the local trade papers that you'll find in studios and other music stores and things like that. In addition, there's every studio that we've done. The owner is happy with the product, and eventually when he wants something else, he comes to us. There's a tremendous amount of repeat business.

So the advertising you do is pretty limited?

Singer: Well, it's extensive on the radio. We're on the radio about twenty-two times a week, in the newspapers twice a month.

What kind of radio ads do you do?

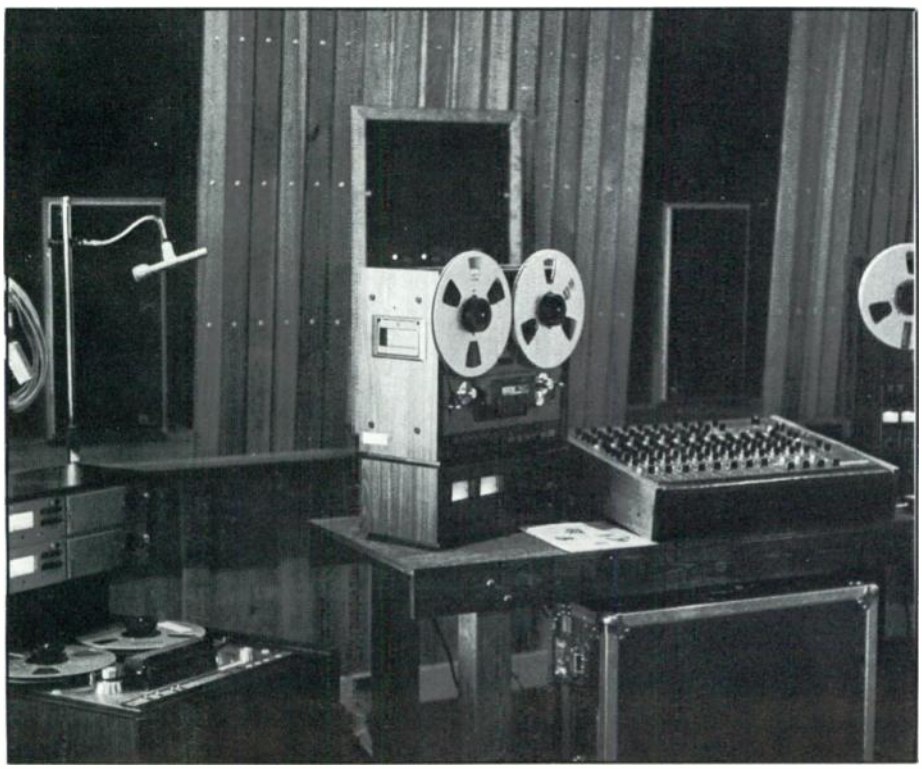
Singer: We're on WLIR [rock format]. I'd like to broaden it to WQXR (classical) and WTFM, the "mellow" sound, very soon. There's a lot of business in that. Our advertising is primarily involved in hi-fi, although it does mention our professional services. It stresses that we are a full service store with everything from low priced hi-fi to pro, which brings in more hi-fi buyers too. And I'm sure we pick up some musicians who are contemplating building a studio, but most of them come in on word of mouth.

Do you make use of co-op funds?

Singer: Occasionally, yes. We've put ads in the classified sections. Also, we used to hold clinics at one time. But it's getting to the point where economically it's impossible.

At any time did you do any different advertising or promotion?

Singer: We didn't really feel that the newspaper situation on the Island is such that it justifies the expense. We'd



have to go in for super sales, bargain of the month, that kind of nonsense. We sell only high quality, and we back everything that we sell. And to get involved in promotions, you have to be giving something away. You sell something dirt cheap, and people can expect what they pay for. You have to give people a reason to deal with you. That's one of the reasons this room was built, on a professional level. So that the equipment will really be demonstrated in a quiet atmosphere. You have to win their confidence. We've put studios together from Iran to Aspen.

However, when we do the concerts for WLIR, which is three times a week, we are named as technical assistants. They say they use the facilities of A-Z. So every time that one of those concerts is announced . . . there's promotion all the time. We've done concerts for WPIX, WNEW, and we've done just about everybody in rock.

Do you do any sound reinforcement outside of the radio shows?

Rosen: We did a live album for Jonathan Schwartz at Michael's Pub. We're going to get more and more into PA, now that disco has, well, not really played out, but is getting into something a little different—live performance at the club. Just last night I was at Xenon and we did someone live there. We're setting up systems for more and more live acts.

Singer: We're going to see the reemergence of the live bands. We've been around long enough now to see the cycles. About five years ago disco came in and we were outfitting discos. And now we're outfitting bands again.

Have you done many disco set-ups?

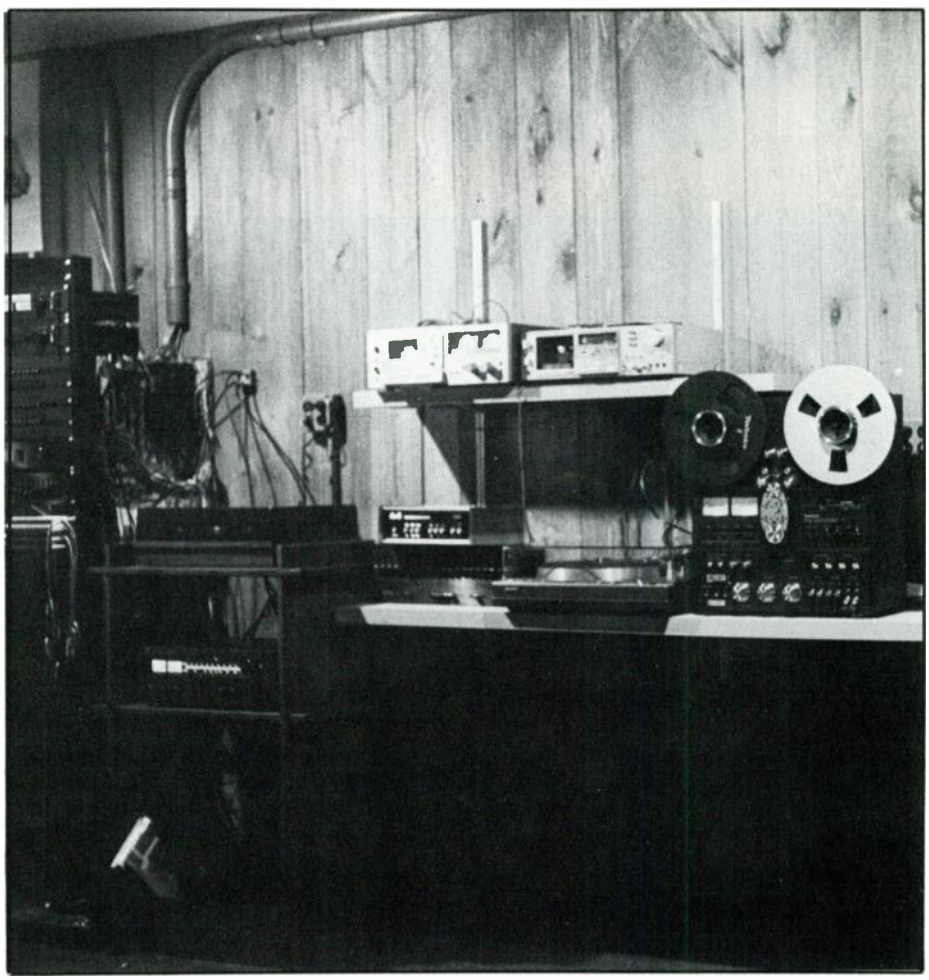
Rosen: Yes. We have done, well, Xenon, Styx, other places in the city . . . lots of them all around the country. St. Thomas . . . I won't make a service call on a system we didn't sell, because then, . . . well, you don't feel like fixing something that you don't feel is right for the job. It's easier not to step in to preexisting clubs. How do you turn around to an owner and say, well, you've got to throw out $40,000 because I'm here?

Do you do lighting also?

Rosen: No. All sound, no picture.

Do you do all your own repair work?

Rosen: Except when the manufacturer hasn't supplied parts or service manuals.



Eight good reasons to be a Beyer Buyer.

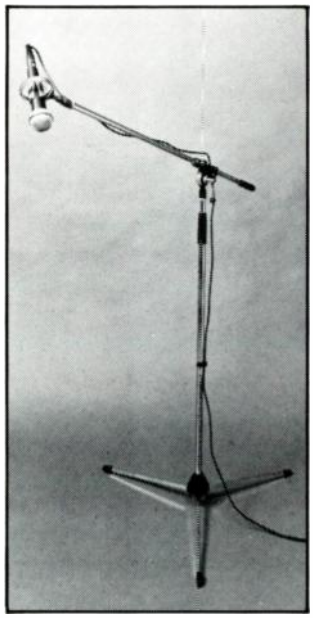
one The first reason is Beyer. We have fifty years experience making the world's finest microphones and headphones. And an unmatched reputation for quality, reliability and innovation. The choice of professionals everywhere.

two M 160. One of the world's best-loved and most versatile microphones. Warm, soft sound favored by vocalists and musicians alike. Dual ribbon design for high strength and fast transient response.

three Beyer headphones. A full range of high quality professional models for critical monitoring and reliable communication. DT 109 combines stereo headphones and boom-mounted microphone, ideal for on-air use and disco deejays. DT 444S wireless headphone receives sound from an infra-red LED transmitter up to 300 feet away. Full 20-20,000Hz frequency response. Six hour stereo operation on rechargeable NiCad batteries.

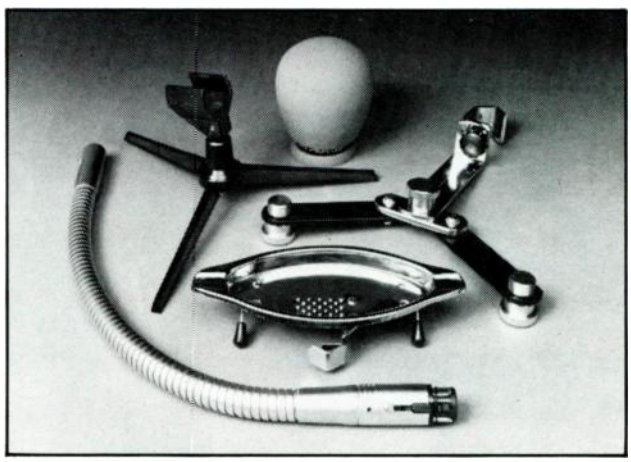
four The new M 400. A great performer's mic. Supercardioid pick-up pattern to minimize feedback. Rugged design for long life. Tapered frequency response with rising high end and rolled off lows, plus midrange presence boost. Built-in humbucking coil and pop filter. Dynamic design is unaffected by heat and humidity.

We're looking for a few more great dealers to handle the Beyer line. Contact Norm Wieland at Burns Audiotronics.



five Beyer microphone stands and booms. A full range of mic mounts for floor and desk use, with fixed and folding bases. Available with collapsible tubes for easy packing. Also heavy-duty stands for speaker cabinets.

six Beyer microphone accessories. Wind screens, impedance matching transformers, in-line switches, power supplies, wireless transmitters, stereo arms, goosenecks, clamps, thread adapters, anti-shock suspensions, and even a mic stand ashtray! The whole works. If you can use it with a mic, we make it.



seven M 713. One of our unsurpassed studio condenser mics. Modular system; accepts different transducer capsules and power supplies. Gold-vapored mylar diaphragm for high transient response. Mu-metal shield. Temperature and humidity stable.

eight See your dealer or write for information on our product line. You'll have many more reasons to be a Beyer buyer.

Beyer Dynamic

BURNS AUDIOTRONICS, INC.

5-05 Burns Avenue, Hicksville, NY 11801 • (516) 935-8000

In Canada, H. Roy Gray, Ltd.

CIRCLE 77 ON READER SERVICE CARD

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL
REACHES THE PEOPLE WHO REACH THE PEOPLE
SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY
SOUND ARTS
MERCHANDISING JOURNAL
REACHES THE PEOPLE WHO REACH

Make a profit on it?

Singer: We're not geared to make a profit on it. If it pays for itself in terms of salaries and parts, that's all we're concerned with. It can never fully pay for itself in the sense that you make a lot of profit, because a lot of time is spent in checking out something that's brand new. There's no money that's going to change hands on that. So, the service department is a tool by which we sell and it's a reason to deal with us. As long as we don't take too much of a beating on it, it definitely is justified.

In the high end, especially, there's a certain paranoia about sending pictures or schematics out. In many cases around here, a studio can't afford to be down. If they bought the equipment from us, we'll give them a loaner till we can do the repair. We'll do that for a hi-fi customer if it's relatively new. Of course, it's good policy.

Your market is basically Long Island?

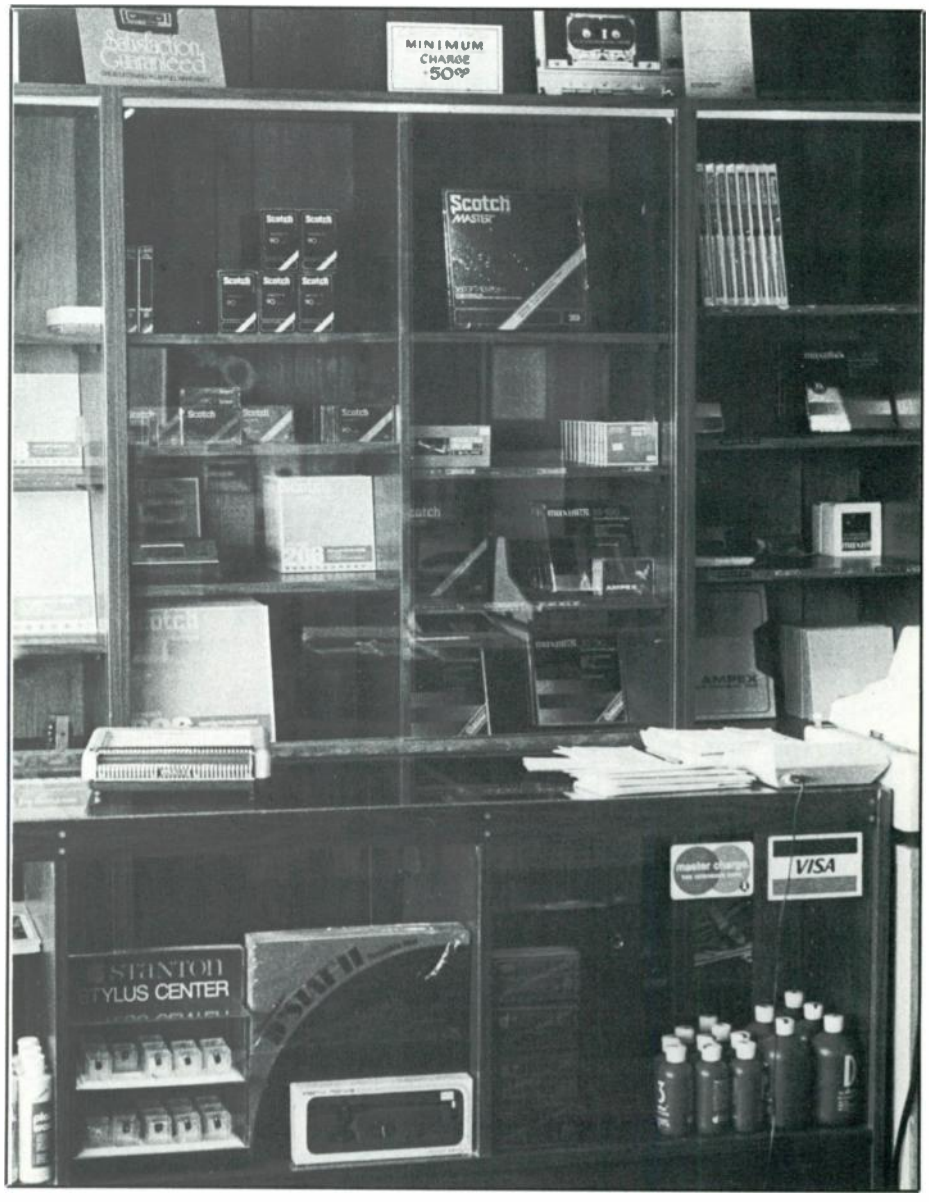
Singer: I would say basically. We certainly have enough installations in Connecticut, New York City, etc.

What are the problems peculiar to this area?

Singer: Probably mobility. Long Island has probably got the worst mass transportation system in the country. You can't get anyplace easily. We certainly felt the gas crisis. The Island's economy depends greatly on certain large employers like Fairchild and Grumman, and when people are out of work—it may not immediately be our customers, but everyone feels it.

Do you get a lot of people outfitting yachts and RVs?

Singer: We prefer not to get involved in RVs, because that's basically an automotive situation. It's just too



much of a hassle. We did a couple of installations, and came to decide this was not the way to go. The equipment takes a beating no matter how well made it is. And then it becomes a law of diminishing returns.

You seem to have avoided the big names in your hi-fi lines.

Singer: It's a twofold decision. First of all, in today's hi-fi market, you have such a proliferation of dealers, it becomes harder for each individual to make a fair profit. So basically, our philosophy is look, if everybody's got a line, then why should we get involved in it? They make such a proliferation of models that we can in no way just stock the parts for all those. Again—the service.

The second part is that what you do want to stock is not so readily available. So that you can't really be shopped easily on it. You can say to yourself, yes, I can get the parts for this, keep it in stock, and they don't change models every year and faceplates every six months, and it sounds good and offers a good value for the dollar. The value for the dollar, and the fact that we can back it—that's very important as far as we're concerned.

On the professional end, we obviously carry Teac and Tascam, Sound Workshop, BGW, Orban, dbx, Sennheiser, Ampex, Deltalab, Eventide, MXR, Shure, Electro-Voice, AKG, Sony, Otari, SpectroAcoustics, the list goes on.

What type of expansion are you thinking about?

Singer: We're getting more involved in the pro market. Right now the economy is such that the hi-fi market is . . . we're not going to discontinue it, but we're not going to go crazy trying to promote it. There are just so many dealers around that it almost doesn't pay. At the same time, we get a lot of people who trade up, so we'll stay in the hi-fi business. But it's the semi-pro and professional market that's really taking off. Ten years ago, nobody could afford an eight-track machine. Now it's become affordable. We'll stay at status quo on the hi-fi end, and we'll grow in the pro area.

INDUSTRY UPDATE

Nina Stern has been promoted to Public Relations Manager at James B. Lansing Sound, Inc. In addition to her press relations responsibilities, Stern coordinates promotions with sound companies and recording artists who use JBL products for live concert and studio work.

Ampex Corporation has reached an agreement to sell the machinery and related inventory of its "custom" duplicating facilities in Elk Grove Village, Illinois to CBS Records for an undisclosed amount of cash.

Bill Isenberg has joined RTS Systems as Senior Design Engineer for the firm's new professional audio products line. Isenberg was formerly in the research and development department at Pioneer of North America, and before that was chief engineer at SAE and served as design engineer at JBL.

Edwin W. Engberg has been appointed Product Manager of the audio products group in Ampex Corporation's Audio-Video Systems Division, responsible for management of Ampex's full line of professional audio recording systems and accessories.

Rick Plushner has been appointed Western District Manager of Sony Industries' Digital Audio Division. Prior to joining Sony, Plushner was president of Audio Design, Miami.

NAMM'S Winter Music and Sound Market will take place January 18-20 in Anaheim. The market will occupy the entire Convention Complex, including the refurbished lower level. On-site dealer registration will open at 8 am on January 18. Hours of the show will be 10 am to 6 pm each day.

Jeffrey Marks has been appointed Advertising Manager of the Magnetic Tape Division of Sony Industries. Marks was previously Advertising Manager for Sony's Business Products Division.

Allen Liberman has been promoted to Vice President of Finance of dbx, Incorporated. He was previously controller.

Jeffrey J. Pallin has been named Professional Products Field Sales Manager for Bose Corporation. He has been with Bose since 1977.

Jack McMurray has been named Vice President Marketing and Sales for Osawa's Audio Division. McMurray was previously Vice President Sales, Consumer Products at BSR. He was also with General Electric and Raytheon.

William G. McGrane has been appointed International Sales Manager of dbx, Incorporated. Prior to joining dbx, McGrane was a Manager with Tech Hi Fi.

Martin Homlish has been promoted to National Sales Manager for United Audio. Homlish has been with the company for over four years, most recently as sales manager of the professional products and cassette deck divisions.

The Institute of High Fidelity's merger into the Electronic Industries Association has been approved by the boards of both organizations. The merged organization of the IHF becomes an operating subdivision of the Audio Division of the Consumer Electronics Group, and will maintain existing IHF programs.

MXR Innovations, Inc. has made some staff changes. **Phil Moon** is now Sales Representative for the Midwestern Division. Moon comes to MXR from Calliope Sound, a pro retail outlet. **Lindsay E. Freese** has been appointed Western Sales Representative. Freese's experience includes film, concert and retail work. **Jim Rowe** has been named Southeastern Sales Representative. He is a songwriter, producer and performing musician.

Joseph A. Teceno, Jr. has been named Operations Manager of Star Instruments, Inc. Teceno was previously with Concept Industries, Eastern Electronics Manufacturing and Hamilton/Avnet Electronics.

Mark Israel has been named Eastern Regional Sales Manager for Fuji Magnetic Tape Division's consumer audio and video tape products. Israel was previously Northeast Sales Manager for TDK Electronics.

American Audioport of the Discwasher Group and Nippon Columbia (Denon) of Japan have announced "the transition of the U.S.A. Denon distributorship from American Audioport to a new company to be formed by Nippon Columbia." **Eric Fossum**, formerly of Audioport, will continue as Vice President of Sales and Marketing for the new company. Discwasher, Inc. will retain the distribution of Denon PCM digital records.

Panasonic Co. has formed a new Recording and Broadcast Division to be headed by **Jim Parks**, Assistant General Manager. The new division will develop a separate representative organization. Parks was previously Assistant General Manager in charge of Technics.

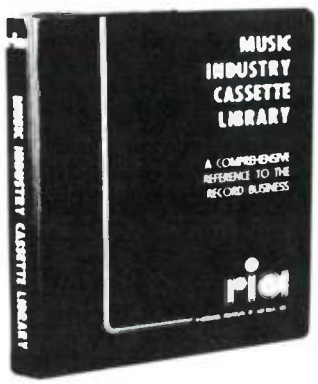
Clyde W. Moore has been appointed to the newly created post of Vice President/Planning of Crown International. He was formerly vice president of marketing before taking a one-year sabbatical.

Ron W. Fone has been promoted to President of Teledyne Acoustic Research. He was formerly vice president of the overseas operation of AR.

Shure Brothers Inc. has promoted **Aspy Tantra** to the position of Manager, Quality Assurance. Tantra joined Shure in 1977 and most recently was manager, central automation and tool engineering.

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

SUBSCRIBER SERVICE

CHANGE OF ADDRESS

Planning to move? Please let us know six weeks in advance so you won't miss a single issue of SOUND ARTS.

Attach old label and print new address in space provided. Also include your mailing label whenever you write concerning your subscription to insure prompt service on your inquiry.

SOUND ARTS
15 Columbus Circle, Suite 316
New York, N.Y. 10023

Attach Label Here

New Address Here — Please print

Name _____

Address _____

City _____ State _____

Date ___/___/___ Zip _____

Help us Help you

If you are a retailer of creative audio, sound reinforcement equipment and/or electronic musical instruments and accessories... then you and your sales staff should be getting— SOUND ARTS a continuing reference for anyone in the business of selling sound. Help us, Help you, by filling out the coupon below.

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS
MERCHANDISING JOURNAL

15 Columbus Circle, Suite 316
New York, N.Y. 10023

Name _____

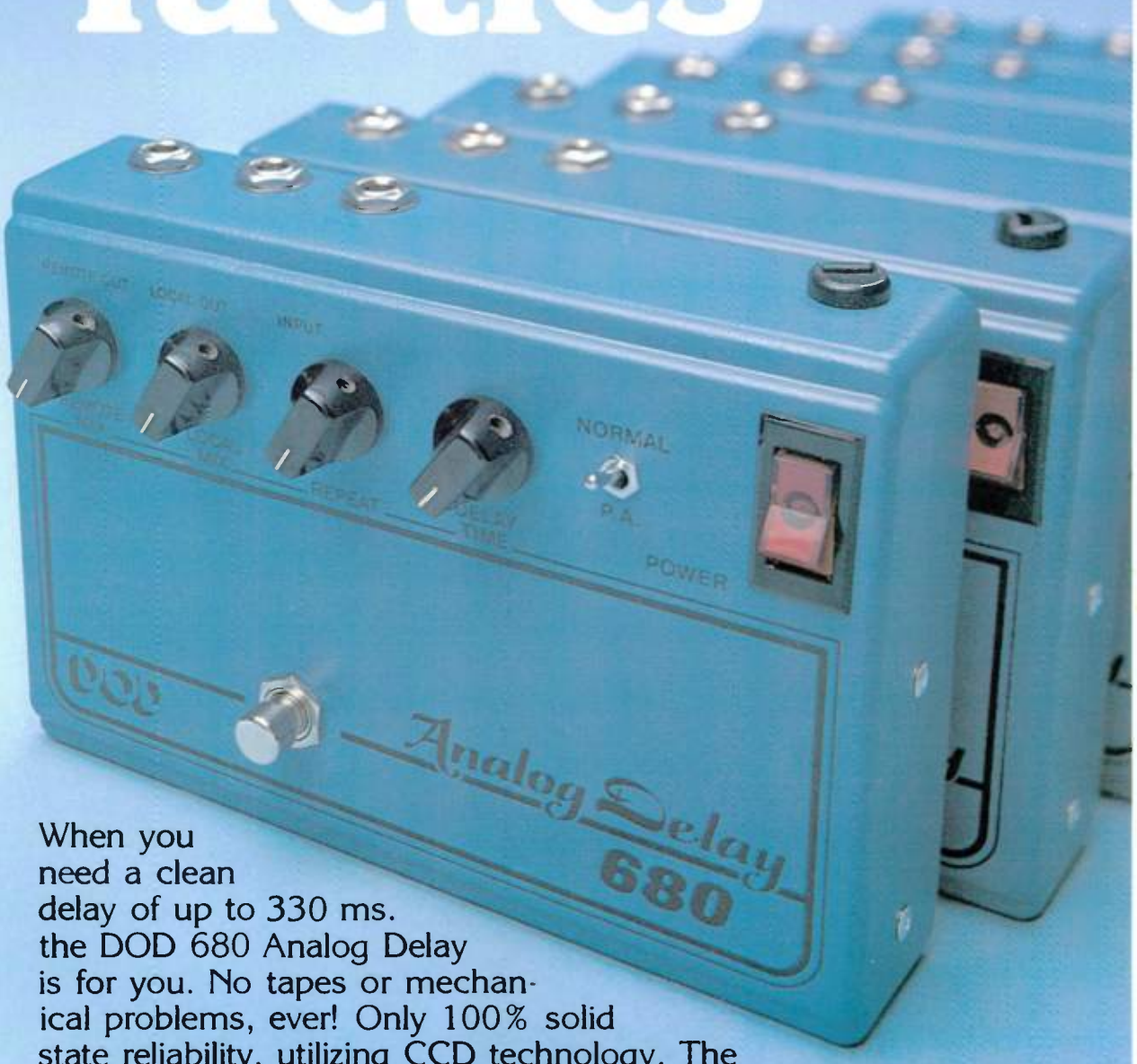
Store Name _____

Addresses _____

City, State, Zip Code _____

Advertiser's Index

Delaying Tactics

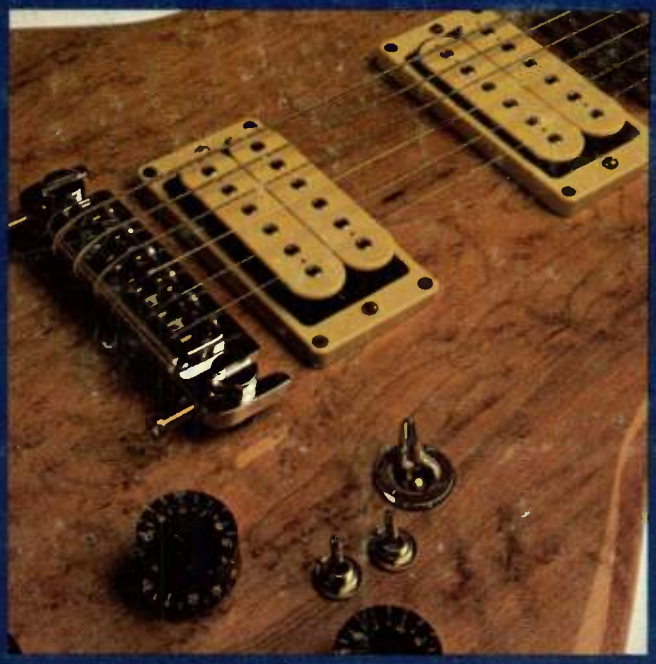


When you need a clean delay of up to 330 ms. the DOD 680 Analog Delay is for you. No tapes or mechanical problems, ever! Only 100% solid state reliability, utilizing CCD technology. The DOD 680 is ideal for instrument, mono PA or stereo PA by using the dual mix controls and output jacks. And more good news, the DOD 680 Analog Delay is only $189.95 list!

DOD ELECTRONICS CORPORATION, SALT LAKE CITY, UTAH, 84115

CIRCLE 83 ON READER SERVICE CARD

Power plays.



Dual Sound™ Humbucker

X2N Power Plus™

Super II™

No matter what type of music you're going to make, you need power. Without it, you may not be able to reach your audience when you have to. These pickups will give you the power to get through to them, and our new 4-conductor wiring will expand your sound with more tone options than ever before.

For complete specs on these and all our pickups, hardware and accessories, send $1.00 for our 24 page, full color catalog.

DiMarzio

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

CIRCLE 69 ON READER SERVICE CARD